

AUSTRALIAN DEFENCE  
FORCE ACADEMY



# Handbook 2007



DEPARTMENT  
OF DEFENCE



**UNSW**  
THE UNIVERSITY OF NEW SOUTH WALES

## The ADFA Badge

The symbology of the Australian Defence Force Academy Badge is as follows:

### The Crown surmounting the Shield

Allegiance to Crown and Country

### The Commonwealth Star

Australia

### Three-sided Shield enclosing the Single-Service Colours

Joint Service nature of the Australian Defence Force Academy

### Navy blue colouring

Royal Australian Navy

### Red colouring

Australian Army

### Light blue colouring

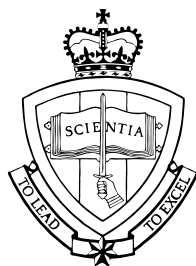
Royal Australian Air Force

### Gauntlet and Sword covering the UNSW

Book of Knowledge  
The Military/Academic bond

### The motto

'To Lead, To Excel'



## The UNSW Arms

Arms of THE UNIVERSITY OF NEW SOUTH WALES

Granted by the College of Heralds, London, 3 March 1952

In 1994 the University title was added to the Arms to create the University Symbol shown.

### Heraldic Description of the Arms

Argent on a Cross Gules a Lion passant guardant between four Mullets of eight points Or a Chief Sable charged with an open Book proper thereon the word SCIENTIA in letters also Sable.

The lion and the four stars of the Southern Cross on the Cross of St George have reference to the State of New South Wales which brought the University into being; the open book with SCIENTIA across its page reminds us of its original purpose. Beneath the shield is the motto 'Manu et Mente' ('with hand and mind'), which was the motto of the UNSW Sydney Technical College, from which the University has developed. The motto is not an integral part of the Grant of Arms and could be changed at will; but it was the opinion of the University Council that the relationship with the parent institution should in some way be recorded.



## Preface

This handbook has been designed for current and future students of UNSW@ADFA – a faculty of UNSW located in Canberra.

The University of New South Wales at the Australian Defence Force Academy (UNSW@ADFA) is a registered ACT Provider under ESOS Act 2000 - CRICOS Provider Code: 00100G

Information in this Handbook has been brought up to date as at 15 November 2006 but may be amended without notice by UNSW@ADFA. For the most current information or to find information about courses offered by other faculties of UNSW, please see the UNSW Online Handbook.

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

## Contact Details for UNSW@ADFA

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Canberra, ACT 2600, Australia**

General correspondence relating to the Academy should be addressed to the Commandant, Australian Defence Force Academy.

Correspondence on academic matters should be addressed to Student Administrative Services, UNSW@ADFA.

### Academic Enquiries

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Website: [www.unsw.adfa.edu.au](http://www.unsw.adfa.edu.au)

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## A Message to All New Undergraduate Students

### New Midshipmen and Officer Cadets

We offer our congratulations on your selection to undertake education and training at the Australian Defence Force Academy. Your program at ADFA will provide you with an excellent basis for your leadership role and career in your chosen Service.

While you are at ADFA, the emphasis of your preparations will be on academic studies to develop your intellectual capabilities, capacity for critical thinking and vocational utility. The degree that you select and the academic programs that you undertake will be key elements in the process of your development as one of the future leaders of the ADF. All of UNSW@ADFA's degrees are considered to be amongst the best offered in Australia and the educational opportunity that ADFA's students have is a remarkable one. The other very important emphasis will be on the highly challenging military education and training that is undertaken to develop your professional abilities and the qualities of character and leadership that are appropriate to officers in the Australian Defence Force.

Our intention is to provide you with an exciting, challenging and rewarding experience at ADFA, in a supportive environment where you will have the opportunity, and be encouraged, to excel.

**Professor John Baird**  
Rector, UNSW@ADFA

**Brigadier Brian Dawson, AM, CSC**  
Commandant, Australian Defence Force Academy

## A Message to All New Postgraduate Students

I would like to congratulate you on choosing the University of New South Wales at the Australian Defence Force Academy (UNSW@ADFA) for your postgraduate studies. You are joining a faculty that is part of a significant research and teaching institution which offers a supportive and stimulating environment to all of its students.

As a postgraduate student at UNSW@ADFA you will be studying towards a degree or other award of The University of New South Wales (UNSW) in a small and focused institution, with ready access to academic staff and facilities and many opportunities to interact with fellow students.

Our internationally recognised academic staff are active in pursuing original research and building our excellent research record. The benefits from their research activities are passed on to you as the student through their teaching, interaction and support.

Staff work closely with organisations in the private and public sector (including the Department of Defence) nationally and internationally to ensure that programs remain relevant in a changing environment. In view of the long-term partnership between UNSW and the Department of Defence, many of the UNSW@ADFA postgraduate programs have a Defence orientation. However all our research and teaching is undertaken in the context of a balanced and liberal education and our programs attract an interesting cross-section of Defence and non-Defence students.

I hope that you will find your studies here at UNSW@ADFA both stimulating and rewarding.

**Professor John Baird**  
Rector, UNSW@ADFA

## The Australian Defence Force Academy

The Australian Defence Force Academy (ADFA) is an Australian Defence Force unit established to provide military and academic training to midshipmen and officer cadets. It is a unique institution that develops some of the future leaders of the Australian armed forces.

The Academy educates and trains cadets through two study programs. Firstly, a program of common and single-Service military studies is provided to all Academy cadets and a small number of cadets from regional military forces. This is carried out in association with the Royal Australian Navy College, HMAS CRESWELL at Jervis Bay, the Royal Military College at Duntroon and the Royal Australian Air Force College at Point Cook. Secondly, Academy cadets enrol in a three or four year Bachelor degree from the University of New South Wales (UNSW).

ADFA is unusual amongst Western military officer training institutions in that it provides military and academic programs simultaneously to develop the best officers for the three arms of the Australian Defence Force. The Academy seeks and encourages academic excellence from its students. However, the focus on academic excellence occurs in the context of a strong emphasis on the development of those attributes which midshipmen and officer cadets will need in order to perform effectively as junior leaders when they graduate from the Academy. Entry to ADFA as a midshipman or officer cadet is by selection. Applications are invited from young men and women who are seeking careers as officers in the Australian Defence Force, and who meet the educational requirements of UNSW as well as certain physical and personal standards. All applicants must apply to Defence Force Recruiting and must also lodge an application with the Universities Admissions Centre (UAC).

UNSW@ADFA also offers postgraduate research and coursework programs to serving members and other employees of the Australian Defence Organisation, as well as to civilians including international students. Full-time or part-time programs are available from graduate certificates through to coursework masters and research degrees. Some programs are available by distance and flexible education. While postgraduate students are not formally associated with the Academy, they need to recognise the unique nature of the establishment and to appreciate that it is a facility shared by the University and Defence, requiring a courteous, cooperative and flexible approach. Applications for entry to postgraduate study programs are made through UNSW@ADFA.

The total number of students enrolled at UNSW@ADFA in 2005 was 1890. Of these 989 were undergraduate students and 901 were postgraduate students.

### Location and Site

The Australian Defence Force Academy is located a few kilometres from Canberra city centre on fifty-two hectares of land in the area bounded by Northcott Drive, General Bridges Drive and Fairbairn Avenue in the Canberra suburb of Campbell. Access to the Academy is possible from all three roads with the main entrance to the Academy being Northcott Drive. Playing fields occupy a further twenty-three hectares, separated from the main site by Fairbairn Avenue.

As may be seen from the site plan at the end of this Handbook, the Academy is divided into four main zones. To the north is the Support Zone; which also contains the Leadership Reaction Course; in a large square area south of this is the Academic Zone; further south and to the west of the grassed main parade ground is the Administration Zone; and to the far west and south-west is the Accommodation Zone comprising the Officers, Senior Non-Commissioned Officers and Junior Ranks messes, the cadet accommodation blocks and the Academy Cadets Mess.



## The University of New South Wales at the Australian Defence Force Academy (UNSW@ADFA)

Within the Academy, The University of New South Wales (UNSW) has established a college, known as UNSW@ADFA (formally University College), responsible for conducting academic programs and research. UNSW@ADFA offers undergraduate programs leading to UNSW bachelor degrees in Arts, Business, Engineering, Science, and Technology. Additionally we offer opportunities for graduate study and research leading to certificates, diplomas and higher degrees. At UNSW@ADFA our undergraduate students are midshipmen of the Royal Australian Navy and officer cadets of the Australian Regular Army and Royal Australian Air Force, who are in residence at the Academy, and other members of the Australian Defence Force. In addition to their academic studies, midshipmen and officer cadets undertake programs of military training at the Academy and at Service Training Establishments. Registration for higher degrees is available to both military and civilian applicants.

Entry to undergraduate programs at the Academy as a midshipmen or officer cadet is by selection. Applications are invited from young women and men who are seeking careers as officers in the Australian Defence Force, who have appropriate educational qualifications and meet certain physical and personal standards. Applications for postgraduate coursework and research are accepted from civilians as well as serving Defence personnel. Further information is available from the UNSW@ADFA Student Gateway ([www.unsw.adfa.edu.au/student](http://www.unsw.adfa.edu.au/student)).

## Glossary of Terms and Acronyms

- Indicates a course will be offered in Session 1, 2007.
- Indicates a course will be offered in Session 2, 2007.
- Indicates a course will be offered on-campus and via distance mode in Session 1, 2007
- ○ Indicates a course will be offered on-campus and via distance mode in Session 2, 2007
- Indicates a course will be offered via Intensive Delivery Mode in Session 1, 2007
- ■ Indicates a course will be offered via Intensive Delivery Mode in Session 2, 2007
- X Indicates that a course is not offered in 2007.

**ACME:** (School of) Aerospace, Civil and Mechanical Engineering

**ACSC:** Australian Command and Staff College

**ADFAPASS:** The password that gains access to WebCT, ADFA student email, library electronic facilities and other ADFA facilities.

**Advanced Standing:** See Credit

**ALL:** Academic Language and Learning Unit (see Academic Support Services)

**Articulated programs:** Two or more programs which can be studied in a sequence. At UNSW@ADFA, some Graduate Diploma and Masters programs are articulated. No Graduate Certificate programs are part of an articulated sequence.

**Articulation:** To move from one program to the next within the prescribed sequence. For example, a student may be eligible to articulate from a Graduate Diploma into a Masters.

**Assessment:** The process of evaluating learning outcomes, as reflected in the quality of a student's submitted assignments, examination responses and other kinds of assessment tasks, relative to the standard expected.

**Assumed Knowledge:** What a lecturer or tutor of a course could reasonably expect all students enrolled in that course to know at the outset.

**ATSOC:** Australian Technical Staff Officers Course

**C4ISREW:** Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance and Electronic Warfare

**CDF Program:** In 2006 UNSW@ADFA began offering Chief of Defence Force (CDF) programs. These are programs for academically gifted students and are endorsed by the Chief of Defence Force.

**Co-requisite:** A co-requisite course is a course that must be studied before, or at the same time as, another specified course.

**Core course:** A course which is a compulsory requirement of a major, minor, plan or specialisation.

**Course:** A unit of instruction approved by the University as being a discrete part of the requirements for a program offered by the University. It is identified by a course code.

**Course Authority:** Is responsible for the assessment in a course. A course authority is the Head of the School in which the course is taught. Often the Course Authority will delegate decision making powers to the school's Undergraduate Coordinator, Postgraduate Coursework Coordinator and/or Postgraduate Research Coordinator.

**Course Convenor:** Is responsible for a course. His or her responsibilities include the co-ordination of the academic staff teaching and/or marking in the course, the determination of the assessment, preparation and distribution of course hand-outs, and the determination of the provisional final mark for students enrolled in the course. The course convenor also acts as, or appoints in his or her stead, a referee who must be available to resolve queries at the time of any examination in the course.

**CR:** Used on myUNSW and other UNSW resources to indicate a grade of Credit. This mark is awarded for good academic performance.

**Credit:** A student who had completed previous tertiary studies at UNSW@ADFA or another recognised tertiary institution may be eligible to receive units of credit (sometimes called advanced standing) towards their current program. This effectively means the student will be required to complete fewer courses to complete their program.

**Deferment:** The University of New South Wales allows applicants to delay the commencement of a program for a period of one year. Deferment is granted once an offer has been accepted. Applicants who defer an offer have automatic entry to the same program in the following year provided they do not undertake study at a tertiary institution during the year for which the deferment is granted.

**Directed Studies:** Compulsory courses that all undergraduate students enrolled from 2002 (excluding BTEch students) must undertake as part of the degree requirements.

**Discipline:** An area of academic study.

**Distance Mode:** Where a course is delivered outside the University using various forms of media including CD-ROM, printed material and the World Wide Web. Some courses include an optional face-to-face workshop (NB: students enrol in the class type 'DM02').

**DN:** Used on myUNSW and other UNSW resources to indicate a grade of Distinction, which is awarded for a superior academic performance.

**DSTO:** Defence Science and Technology Organisation

**ETS:** Educational Technology Services

**Exclusion:** A course that has exclusions listed may not be undertaken if any of the excluded courses have been completed.

**Exemption:** If a student has completed studies or work experience which is judged to be equivalent to the teaching offered within a core course, they may be exempted from studying this core course, provided that study another courses relevant to their program. Units of credit are not granted for an exemption.

**FL:** Used on myUNSW and other UNSW resources to indicate a Fail grade

**Flexible Courses:** This is not an official mode of study but is sometimes used to describe on-campus courses that have minimal or irregular attendance requirements. On-line facilities usually provide the communication channels between course participants.

**Foundation Course:** A course which is designed to provide a student who has not completed study within a discipline at an advanced undergraduate level with the knowledge to study Graduate Diploma and Masters level course.

**FT:** Full-time

**HASS:** (School of) Humanities and Social Sciences

**HD:** Used on myUNSW and other UNSW resources to indicate a grade of High Distinction which is awarded for an outstanding academic performance.

**HPW:** Hours Per Week – the number of class contact hours for a course per week.

**ICTS:** Information, Communication and Technology Services

**IDM:** See *Intensive Delivery Mode*

**IT:** Information Technology

**ITEE:** (School of) Information Technology and Electrical Engineering

**Intensive Delivery Mode (IDM):** Where a course is delivered using a variety of media including CD-ROM, printed material and the World Wide Web. The student must attend the University for a period of face-to-face instruction usually in the form of one full-time week often preceded and followed by a period of online interaction (NB: students enrol in the class type 'IDM3').

**Leave of Absence:** Once a student has completed at least one full-time (or equivalent) session of study, Leave of Absence may be granted for a period of up to one year. Only in exceptional circumstances will a student be granted more than a total of two sessions of leave. Students who are granted a leave of absence do not have access to university resources and services (such as Academy Library and email services) during their leave of absence. Undergraduate students are generally not approved for program leave due to their military commitments.

**Major:** An approved combination of 48 units of credit in the one discipline area, of which at least 36 units of credit are for upper-level courses.

**Minor:** An approved combination of 24 units of credit in the one discipline area, of which at least 12 units of credit are for upper-level courses.

**Modes of Delivery:** See Distance Mode, IDM and On-Campus

**myUNSW:** An essential online gateway where students can enrol in courses, view results and update personal information. Access to this service requires a UNIPASS. **Visit:** [www.my.unsw.edu.au](http://www.my.unsw.edu.au)

**Non-award:** For students who are enrolled in course/s but are not proceeding to a degree, diploma or graduate certificate of the University.

**On-campus:** Where a course is delivered primarily using face-to-face teaching and students are required to regularly attend classes at the University. Some courses may include an optional face-to-face workshop. (NB: students enrol in the class type '0001').

**PC:** Used on myUNSW and other UNSW resources to indicate a grade of Pass Conceded. This grade may be awarded if an overall course mark of 45-50% is achieved, depending on the overall performance of the student during the course of their program.

**PS:** Used on myUNSW and other UNSW resources to indicate a Pass grade which is awarded for an acceptable level of academic performance.

**PEMS:** (School of) Physical, Environmental and Mathematical Sciences

**Plan:** Also known as a Major in undergraduate degrees. In postgraduate coursework programs, it is an area of concentration or specialisation defined by a sequence of courses which must be completed.

**Postgraduate:** At UNSW@ADFA, a postgraduate student will be studying a Graduate Certificate, Graduate Diploma, Masters or PhD.

**Pre-requisite:** An essential prescribed level of achievement that must be reached in specified course/s before a student is permitted to enrol in that course. If pre-requisites are not required, a level of assumed knowledge is usually specified.

**Professional Practicum:** A scheme designed for students from overseas universities who wish to come to UNSW to obtain research experience or professional/industrial practice. The professional practicum is for a limited period and is usually between two and six months in duration.

**Program:** An approved path of study leading to an award of the university. A student is admitted to a program, and on successful completion of all program requirements is awarded the relevant degree.

**Program Authority:** Is responsible for all matters that affect students enrolled in an award program and is normally the Head of School. Often the Program Authority will delegate decision making powers to the school's Undergraduate Coordinator, Postgraduate Coursework Coordinator and/or Postgraduate Research Coordinator.

**PT:** Part-time

**RAAFER:** Royal Australian Air Force Engineers Retention scheme

**Recognised tertiary institution:** A tertiary institution which is equal in quality and services to UNSW. Usually a Program Authority will assess if an external institution is a recognised tertiary institution in relation to a request for credit.

**S1:** Session 1 – The first half of the UNSW@DFA teaching year.

**S2:** Session 2 – The second half of the UNSW@ADFA teaching year.

**SAS:** Student Administrative Services.

**School:** An organisational unit of the University which is fully or partially responsible for directly teaching one or more courses and/or for fully or partially supervising one or more research students. A School directly provides staff and resources used in the teaching (delivery) of courses and/or supervision of research students.

**SOB:** School of Business

**Specialisation:** See Plan.

**Session:** A standard session is a period of prescribed teaching (13 or 14 weeks) followed by an assessment period. Many universities call this a 'semester'.

**Undergraduate:** A student who is studying a Bachelor degree. Most undergraduate students at UNSW@ADFA are members of the Australian Defence Force.

**UNIPASS:** The password that permits access to *myUNSW*.

**Units of Credit (UOC):** The University of New South Wales operates a uniform units of credit system for all of its programs. Under this system each standard full-time year of a degree program will accrue 48 units of credit, i.e. 24 units of credit per session. As a guide, 1 unit of credit equates to approximately 25-30 hours of work per session (including lectures, tutorials, labs and private study).

**UNSW:** University of New South Wales

**UNSW@ADFA:** The University of New South Wales at the Australian Defence Force Academy.

**WAM:** Weighted Average Mark – This is calculated by multiplying the mark obtained for each relevant result by the units of credit of the particular course, adding up the products and dividing by the total number of units of credit for the relevant courses. A 'Term WAM' is calculated for relevant results in a session, and a separate cumulative WAM is calculated for relevant results over the student's entire program.

**WebCT:** The online learning system that supports many courses. Logging in with your student ID and ADFAPASS will bring up a list of your courses that have an online component.

## 10 steps to complete before commencing study

### Student Administrative Services

**Contact:** +61 2 6268 6000 or [sas@adfa.edu.au](mailto:sas@adfa.edu.au)

We are your first point of contact for enquiries regarding enrolment or progression during your studies. We provide advice to all students on a range of administrative issues, from completing credit applications to interpreting degree rules. Please read the following information and visit the *Essential Information Online* before you enrol in your courses. Feel free to contact us or one of the *Academic Support Units* if you require further assistance.

Students should complete these steps before the commencement of session. Distance students should complete them two weeks before the first week of study. First year undergraduate students will be taken through these steps upon arrival.

#### 1. Create your passwords

To access essential online services, you must create a UNIPASS and an ADFAPASS. If you accepted your offer online you would have been allocated a UNIPASS. Please note that your username is always 'z' followed by your ID number. Visit: [www.unsw.adfa.edu.au/student/passwords](http://www.unsw.adfa.edu.au/student/passwords)

#### 2. Update your personal information

Once you have created your UNIPASS, log onto myUNSW and update your contact information. This is the information UNSW@ADFA staff will use to contact you, so it is important to update this whenever you change address or phone number. Keeping this information current is also a requirement of the Commonwealth Higher Education Support Act.

#### 3. Understand your Faculty Regulations and Degree Rules

Before enrolling it is essential to understand the rules of your program to ensure you do not complete a course which will not count towards your degree. These rules can be found in this handbook. The various academic rules can be complicated, so feel free to contact Student Administrative Services if you require any clarification.

#### 4. Apply for credit

If you have completed tertiary studies in the past, you may be eligible for credit (sometimes referred to as Advanced Standing). You should apply for credit as soon as possible so you can finalise your enrolment before the start of session. Please see the *Essential Information Online* section.

#### 5. Enrol in your courses online

Access myUNSW using your UNIPASS and begin enrolling by clicking on 'Update your enrolment'. All students are responsible for ensuring they are enrolled in their correct courses by the appropriate deadline. For further guidance, visit the UNSW@ADFA Student Gateway (see *Essential Information Online*).

#### 6. Setup your email account

Email is a primary mode of communication between UNSW and students, so it is vital that students check their email regularly. Students have the option of redirecting their UNSW@ADFA email to an external account. Email can be accessed via web browser at: <http://uwc.adfa.edu.au>

#### 7. Obtain an ID card

The ICTS Helpdesk provides all students with ID cards. If you are on-campus, simply visit the ICTS centre at least one day after enrolling online. If you are a distance student, please visit the ICTS website for more information (see *Academic Support Units*).

#### 8. Visit the Learning and Teaching website

This website provides communication and research tools for students. It is especially useful for those who are studying by distance and need to keep in touch with lecturers and other students. Before commencing, you are invited to join in the online discussion at WebCT. See the *Academic Support Units* section.

#### 9. View the Essential Information Online

The Student Gateway and other UNSW@ADFA websites are the first point of reference for most student issues. You will also find contact information for people and units who can provide further assistance. See the following section.

#### 10. Take Advantage of our Support Services

There are units and staff available to help you with all aspects of your study. See the following *Academic Support Units* section for details.



## Essential information online

### Student Gateway

A starting point for finding information about your studies  
[www.unsw.adfa.edu.au/student](http://www.unsw.adfa.edu.au/student)

### myUNSW

An essential online portal for enrolments and academic records.  
[www.my.unsw.edu.au](http://www.my.unsw.edu.au)

### WebCT

Where students can access online components of their courses and various support services.  
[www.webct.adfa.edu.au](http://www.webct.adfa.edu.au)

### Timetable information

For current course, exam and military timetables. Undergraduate students should visit this site to learn which courses clash and therefore cannot be taken concurrently.  
[www.unsw.adfa.edu.au/student/timetables/index.html](http://www.unsw.adfa.edu.au/student/timetables/index.html)

### Examinations

Information about exam periods held at the end of each session.  
[www.unsw.adfa.edu.au/student/exams](http://www.unsw.adfa.edu.au/student/exams)

### Credit for previous studies

If you have completed tertiary studies at a recognised tertiary institution, you may be able to gain credit towards your UNSW@ADFA degree.  
[www.unsw.adfa.edu.au/student/credit](http://www.unsw.adfa.edu.au/student/credit)

### Special Consideration

If you believe your studies have suffered due to misadventure you may be eligible to receive Special Consideration.  
[www.unsw.adfa.edu.au/student/sc](http://www.unsw.adfa.edu.au/student/sc)

### Program Leave

If you need to take a break from your studies, you can apply for Program Leave. This is not an option for undergraduate students.  
[www.unsw.adfa.edu.au/student/forms/leave.html](http://www.unsw.adfa.edu.au/student/forms/leave.html)

### Student Forms

Most administrative processes require a student to complete and lodge a form.  
[www.unsw.adfa.edu.au/student/forms](http://www.unsw.adfa.edu.au/student/forms)

### Graduation

For information on the graduation ceremony in 2007.  
[www.unsw.adfa.edu.au/student/graduation](http://www.unsw.adfa.edu.au/student/graduation)

### Distance Students

Information and links for students studying off-campus.  
[www.unsw.adfa.edu.au/student/distance](http://www.unsw.adfa.edu.au/student/distance)

### Off-campus Language Study

For undergraduate students who wish to study a language as part of their degree.  
[www.unsw.adfa.edu.au/student/xinst/](http://www.unsw.adfa.edu.au/student/xinst/)

### Scholarships

Contact the Research and Research Training Officer for information about scholarships offered at UNSW@ADFA.  
[www.unsw.adfa.edu.au/units/research](http://www.unsw.adfa.edu.au/units/research)

### Prizes and Awards

UNSW@ADFA acknowledges outstanding academic performance through various prizes and awards.  
[www.unsw.adfa.edu.au/student/prizes](http://www.unsw.adfa.edu.au/student/prizes)

### UNSW A-Z Guide

Log onto myUNSW to access this useful resource which provides information on a wide range of subjects.  
[www.my.unsw.edu.au](http://www.my.unsw.edu.au)

## Academic Support Units

### Student Administrative Services

For general advice regarding all aspects of studying, including enrolment, timetables, results, exams, graduation and admissions.

(02) 6268 6000  
[sas@adfa.edu.au](mailto:sas@adfa.edu.au)  
[www.unsw.adfa.edu.au/student](http://www.unsw.adfa.edu.au/student)

### UNSW@ADFA Academic Library

This is where students can access an extensive collection of books, journals and multimedia holdings, such as DVDs. The Library also offers support services, such as information sessions. [www.lib.adfa.edu.au/](http://www.lib.adfa.edu.au/)

### Learning and Teaching

A portal where students can access various resources designed to enhance the learning experience for students, particularly those studying by distance and other flexible methods.  
[www.unsw.adfa.edu.au/learning\\_teaching](http://www.unsw.adfa.edu.au/learning_teaching)

### Information, Communication and Technology Services (ICTS)

Providing tech information and help for those who have forgotten their passwords. They also issue ADFACards (student ID cards).

[www.unsw.adfa.edu.au/ict](http://www.unsw.adfa.edu.au/ict)  
 Helpdesk: (02) 6268 8140  
[helpdesk@adfa.edu.au](mailto:helpdesk@adfa.edu.au)

### Academic Language and Learning (ALL) Unit

Providing a wide range of support services for students who wish to improve academic skills, such as essay writing and public speaking.  
[www.unsw.adfa.edu.au/all](http://www.unsw.adfa.edu.au/all)

### Educational Technology Services (ETS)

ETS provides a wide range of services related to distance and flexible learning. They also provide publication and multimedia production services.  
[www.unsw.adfa.edu.au/ets](http://www.unsw.adfa.edu.au/ets)

### Research and Research Training Office

This unit provides administrative support to research students and information about scholarships.  
[www.unsw.adfa.edu.au/units/research](http://www.unsw.adfa.edu.au/units/research)

## Academic Misconduct and Student Misconduct

The Australian Defence Force Academy core attributes of Adaptability, Determination, Initiative, Integrity and Professionalism are fostered in both the Military Education and Training Program and the University educational component.

The issue of student academic misconduct goes to the heart of these attributes, because it concerns the integrity of the degree from The University of New South Wales and the integrity and professionalism of graduates of the Academy.

As a broad principle, the University expects all students to behave in an appropriate manner, which includes:

- no cheating in exams or tests
- not attempting to gain an advantage over other students, other than by proper academic endeavour
- submission of one's own assignments in a fair and honest manner
- appropriate attribution of the work of others in work submitted for assessment, and no plagiarism
- reasonable behaviour towards others, and
- no misuse of facilities.

Severe penalties may be imposed by the University for breaches of these guidelines.

Bachelor degree students are reminded that information concerning academic misconduct is related to your performance at the Academy and will be disclosed to the Military. This is covered by the provision for the disclosure and handling of personal information consistent with the 2003 Agreement between the Commonwealth of Australia and The University of New South Wales for the provision of educational services at the Australian Defence Force Academy, and the personal information disclosure forms signed by all undergraduate students.

Postgraduate students sponsored by the Department of Defence are reminded that information concerning academic misconduct will be disclosed to your sponsor within the Department. This is covered by the provision for the disclosure and handling of personal information consistent with the 2003 Agreement between the Commonwealth of Australia and The University of New South Wales for the provision of educational services at the Australian Defence Force Academy and the personal information disclosure forms signed by all postgraduate students sponsored by the Department of Defence.

### 1. Introduction

Students and staff are governed by the normal laws which regulate our daily lives. In addition, the University has its own code of rules and conduct which are fundamental to the mission of the University as an institution devoted to the pursuit of excellence in scholarship and research, and to the service of society. These principles apply not only to students but to the whole University community, including staff engaged in research. The principles have been developed over many years and are widely supported by staff and students who are committed to good conduct and academic honesty, and who are keen to see that these values and principles are upheld.

The University Council has defined student misconduct as follows (29 August 1994): Student misconduct includes student academic misconduct and also encompasses conduct which impairs the reasonable freedom of other persons to pursue their studies or research or to participate in the life of the University.

It is very important that all students are familiar with the rules under which they attend the University, use University facilities, and are assessed. This is because students are responsible for managing their own conduct and for knowing the University's rules concerning good conduct.

Ignorance of the rules is not an acceptable defence against charges of misconduct.

If you have any concerns about what constitutes misconduct either in general or specific situations, make sure you discuss them with the relevant University authority. In academic matters this will usually be the lecturer in charge of a particular course. Advice can also be obtained from your Head of School, the Faculty Student Ethics Officer, or the Manager, Student Administrative Services.

## 2. Student Academic Misconduct

These notes describe the University's policy on student academic misconduct and define actions and behaviour which constitute such misconduct. They include a description of procedures followed by the University where student academic misconduct is alleged and penalties which the University may impose on students guilty of such misconduct.

### 2.1 What is Student Academic Misconduct?

The University Council has defined student academic misconduct as follows (29 August 1994):

Student Academic Misconduct means:

- a) breach of such rules or guidelines relating to student academic conduct as may be prescribed by the Vice-Chancellor, Faculties, Boards or Schools;
- b) misconduct relating to assessment or examinations; and any other conduct (the general nature of which has been made known to students) regarded as student academic misconduct according to current academic usage.

### 2.2 Types of Student Academic Misconduct

It is important that students realise just how broad the definition of student academic misconduct may be. It certainly covers practices such as cheating or copying or using another person's work. Furthermore, practices which may be acceptable in other situations or cultures may be considered to be misconduct according to current academic usage within the University.

The following are important examples of the actions which have resulted in students being found guilty of student academic misconduct in recent years:

Misconduct concerning examinations:

- taking unauthorised materials or devices into an examination;
- impersonation in examinations;
- permitting another student to copy answers in an examination;
- exchanging notes between students in an examination;
- improperly obtaining prior knowledge of an examination paper and using that knowledge in the examination;
- removing an examination paper from an examination room when it is specified that the paper is not to be retained by the student.

Misconduct concerning academic works:

- failing to acknowledge the source of material in an assignment;
- quoting without the use of quotation marks or other academically acceptable device to indicate a quotation, even if the source is acknowledged;
- plagiarism;
- submitting work for assessment knowing it to be the work of another person.

Misconduct through misrepresentation:

- submitting a falsified medical certificate;
- submitting a falsified academic transcript.

Two instances of academic misconduct – plagiarism and cheating in exams - are discussed further in Sections 2.3.1 and 2.3.2 below.

### 2.3 Specific examples of Student Academic Misconduct

The following are two examples of student academic misconduct that have been detected in recent years. Penalties imposed on students found guilty of misconduct in these areas have included reduction in marks (including to zero) for the assessment concerned, failure in the course, and/or exclusion from the University for periods as long as five years.

#### 2.3.1 Plagiarism and Failure to Acknowledge Sources

Plagiarism involves using the ideas or work of another person and presenting it as one's own. Acts of plagiarism include copying parts of a document without acknowledging and providing the source for each quotation or piece of borrowed material. The rules against plagiarism apply whatever the source of the work relied upon may be whether printed, retrieved from any electronic storage medium including data bases,, or found on the World Wide Web or Internet.

Similarly, using or extracting another person's concepts, experimental results or conclusions, summarising another person's work or, where, there is collaborative preparatory work, submitting substantially the same final version of any material as another student constitutes plagiarism.

It is your responsibility to make sure you acknowledge within your writing where you have "sourced" the information, ideas and facts, etc.

The basic principles are that you should not attempt to pass off the work of another person as your own, and it should be possible for a reader to check the information and ideas that you have used by going to the original source material. Acknowledgement should be sufficiently accurate to enable the source to be located speedily. If you are unsure whether, or how, to make acknowledgement consult your lecturer.

The following are some examples of breaches of these principles:

- Quotation without the use of quotation marks or other academically acceptable device. It is a serious breach of these rules to quote another's work without using quotation marks or other academically acceptable device, even if one then refers to the quoted source. The fact that it is quoted must be acknowledged appropriately in your work.
- Significant paraphrasing, e.g. several sentences, or one very important sentence, which in wording are very similar to the source. This applies even if the source is mentioned, unless there is also due acknowledgement of the fact that the source has been paraphrased.
- Unacknowledged use of information or ideas, unless such information or ideas are commonplace.

Citing sources (e.g. texts) which you have not read, without acknowledging the 'secondary' source from which knowledge of them has been obtained.

- Submitting work which is the result of collaboration with others unless so approved by the relevant academic staff member.

It is a serious breach of these principles to submit work which is the result of collaboration unless the relevant academic staff member gives a clear indication that, for a particular assignment, joint work or collaborative work is acceptable. In this latter situation, you should specify the nature and extent of the collaboration and the identity of your co-workers.

These principles apply to both text and footnotes of sources. They also apply to sources such as teaching materials, and to any work by any student which has been or will be otherwise submitted for assessment. You must obtain the prior approval of the relevant academic staff member if you wish to submit to that staff member an essay substantially similar to one which has already been, or will be, submitted to another academic staff member.

Using the principles mentioned above about proper acknowledgement, you should also proceed on the general assumption that any work to be submitted for assessment should in fact be your own work. A good test is to ask one-self: is this my own work?

Students should note that essays, written assignments, computational assignments, designs, laboratory reports, computer code and the like may be electronically tested for text-matching, for example with source documents on the Internet, electronic reserves, data bases and other students' submissions from current or past years. Though text-matching is not specifically a test for plagiarism, it will reveal where text has been taken from other published sources.

Note: As specified in clause 4.4 below - any student who assists another to commit plagiarism will be subject to the same procedures and penalties as the student who committed the plagiarism.

#### 2.3.2 Unauthorised Materials in Exams

The possession of unauthorised materials in exams (which is taken to include class tests/quizzes) is another example of student academic misconduct. The University's rules for the conduct relating to examinations state that no materials are to be brought into the examination room other than those specified in the examination timetable.

The following are examples of materials and devices which would be regarded as unauthorised (if not specified as being permitted in the examination):

- a bag, writing paper, blotting paper, manuscript or book, other than the specified material;
- a mobile telephone or other communication device or any type of playback device such as compact disc, mini disk, MP3 or similar devices. (If brought into the examination room, such devices must be switched off and placed under the candidate's seat for the duration of the examination);
- written or printed notes of any kind or size;
- writing on any part of the body or clothing;
- writing on a ruler or any other instrument;
- a calculator or hand-held computer where these are not permitted or where calculators are supplied by the University for the examination;
- use of the stored memory capability of a calculator or other electronic device where this is not permitted.

There are simple steps that you can take to ensure you do not infringe the University's rules for examinations:

- read the examination timetable carefully and make sure you fully understand what materials are permitted in the exam;
- place all bags and belongings outside or at the front of the room before the exam commences;
- check your pockets and inside any pencil cases or calculators to ensure that you haven't accidentally left notes in them;
- listen carefully to the instructions given to you by the examination supervisor. Ask for assistance if you have any questions about the rules and arrangements for the examination;
- surrender any unauthorised notes or other materials before the exam begins: if you are found with these after the exam commences you will have broken the examination rules; and
- use your common sense in the interpretation of these rules and regulations.

## 2.4 Penalties

Students found guilty of academic misconduct can be excluded from the University. Because of the different circumstances in individual cases, the period of exclusion can range from one session to permanent exclusion from the University.

## 2.5 Student Academic Misconduct Procedures

The University has detailed procedures for dealing with allegations or complaints of student academic misconduct. The full text of the Council resolution on student misconduct, which contains details of these procedures, can be obtained from the UNSW web site:

## 2.6 Student Misconduct Rules:

[www.my.unsw.edu.au/student/academiclife/assessment/StudentMisconductRules.html](http://www.my.unsw.edu.au/student/academiclife/assessment/StudentMisconductRules.html)

Procedures for dealing with cases of student misconduct and student academic misconduct at UNSW@ADFA are available online at [www.unsw.adfa.edu.au/student/misconduct](http://www.unsw.adfa.edu.au/student/misconduct)

# 3. Student Misconduct

## 3.1 University Rules and Codes of Conduct

While the University has not formulated a formal general code of conduct, it has defined rules and good practice for many activities. That is, a number of areas within the University have specified rules and codes of conduct for particular activities and for the use of facilities.

There are, in addition, University rules governing student misconduct. These are described below.

## 3.2 What is Student Misconduct?

Student misconduct includes behaviour of a kind that impairs the reasonable freedom of other persons to pursue their studies or research or to participate in the life of the University.

It includes such activity as:

- a) breach of any rule relating to student conduct in the University;
- b) conduct which unduly disrupts or interferes with a class, a meeting or any other official activity within the University;

- c) conduct detrimental to University property, such as stealing, destroying or deliberately damaging laboratory equipment;
- d) stealing, destroying, impairing the accessibility of, or defacing any part of the University Library collection;
- e) using University computing or communications facilities or networks in a manner which is illegal or which will be detrimental to the rights and properties of others;
- f) acting so as to cause students or staff or other persons within the University to fear for their personal safety;
- g) refusing or failing to identify oneself truthfully when so required by a member of the academic staff or other officer of the University.

## 3.3 Penalties

The following penalties may apply:

- a) a student who commits a breach of the University rules or damages University property (including, but not limited to fittings, fixtures, equipment, facilities, trees, plants, shrubs and lawns) shall be guilty of a breach of discipline and shall be liable for the payment to the University of a fine not exceeding \$1,000;
- b) a student who misuses University Library facilities, or computing or communications facilities, shall be guilty of a breach of discipline and shall be liable for the payment to the University of a fine not exceeding \$1,000 and/or restriction or withdrawal of borrowing or access privileges;
- c) fines and other penalties may only be imposed under these Rules by the Rector on behalf of the Registrar and Deputy Principal, or a person who holds a written delegation from the Registrar so authorising her or him;
- d) it shall not be necessary for the University to prove in any case that it has suffered financial or actual loss;
- e) the University may withhold any benefit (including any degree, diploma or result) from a student until any penalty imposed under these Rules has been discharged;
- f) students adversely affected by determinations made and penalties imposed under this rule may appeal to the Vice-Chancellor. The appeal must be in writing and lodged within fourteen days of the student receiving notification of the adverse determination. Such notification shall include notice of the student's right of appeal. In all other respects, action under this rule is final.

In addition, in situations where it is considered that students present a threat of destruction to University property and/or disruption of academic instruction, assessment, examinations, and the proper functioning of the University, they may be temporarily suspended from part or all of the University.

## 3.4 Student Misconduct Procedures

The University has detailed procedures for dealing with allegations or complaints of student misconduct. The full text of the Council resolution on student misconduct, which contains details of these procedures, can be obtained from the UNSW web site: [www.my.unsw.edu.au/student/academiclife/assessment/StudentMisconductRules.html](http://www.my.unsw.edu.au/student/academiclife/assessment/StudentMisconductRules.html)



## 4. Plagiarism - Process At UNSW@ADFA

Students should expect that all work submitted for assessment will be checked for plagiarism, including the use of automated text-matching software.

Where a case of suspected plagiarism is identified, the following process will apply at UNSW@ADFA:

### 4.1 Investigation

In the first instance, a case of suspected plagiarism must be reported by the responsible academic staff member to the relevant Head of School for investigation. Depending on its severity, and whether or not this is a first offence, a case may be referred to the Faculty Student Ethics Officer.

For cases investigated by the Head of School, the Head of School will arrange a meeting with the academic staff member and the student, who may be accompanied by a support person or observer if the student so chooses. Prior to the meeting, the Head of School will have clearly identified to the student the nature of the suspected plagiarism.

A similar process will apply for cases investigated by the Faculty Student Ethics Officer.

### 4.2 Penalties

Where a case of plagiarism is substantiated and dealt with at UNSW@ADFA, academic penalties that may be awarded include:

- the student receiving a reduced mark (possibly zero) in a piece of assessment,
- the student being failed in the course concerned.

The penalty awarded will depend on the severity of the plagiarism and whether or not this case is a first offence. Differential penalties, determined on a case-by-case basis, may be awarded to students involved in the same investigation.

At the discretion of the Faculty Student Ethics Officer, the matter can be dealt with under the UNSW Student Misconduct Rules and penalties referred to under section 3 above can apply.

### 4.3 Reporting

Where a case of plagiarism is substantiated:

The Manager, Student Administrative Services will be notified and the student's name will be recorded on either the Academic Caution/Reprimand Register or the Academic Misconduct Register as appropriate.

The Faculty Student Ethics Officer will be informed.

For Bachelor degree students, the Deputy Commandant, ADFA will be informed, except that for Army students undertaking Honours programs or final year engineering programs, the DMA, RMC Australia will be informed.

For postgraduate coursework students enrolled in Defence-funded programs (e.g. ATSOC, RAAF Retention Scheme, ACSC etc.), the relevant program sponsor will be notified.

For postgraduate research students, the Associate Dean (Research) will be notified.

Students should be aware that cases of plagiarism are regarded very seriously by the University and the Military staff at ADFA and RMC. Where a case is substantiated involving a Bachelor degree student, the Deputy Commandant, ADFA or the DMA, RMC Australia will take appropriate action according to current Defence policies and regulations.

### 4.4 Assisting Another Student to Commit Plagiarism

Any student who assists another to commit plagiarism will be subject to the same procedures and penalties as the student who committed the plagiarism.

## Attendance at Classes

Students are expected to be regular and punctual in attendance at all classes in the programs and courses in which they are enrolled.

If through illness or other unavoidable cause a student is prevented from attending classes for an extended period or is otherwise unable to meet the course requirements, he or she may be excused by the relevant Course Convenor for not attending classes for a period of up to one month. Explanations of absences or requests for permission to be absent for such causes must be made in writing to the relevant Course Convenor and, when appropriate, accompanied by a medical certificate.

If the period of absence includes an examination or other form of assessment, this should be stated in the student's application.

The onus is upon the student to advise the relevant member of staff of unavoidable absences from classes.

In certain circumstances, a student who is repeating a course may be exempted from attending some classes in that course.

If students attend less than 80% of scheduled classes in a course they may be refused final assessment and may receive a fail result for the course.

For courses delivered in distance mode or another form of flexible delivery, the course authority may define corresponding conditions.

## Provision of Information on Student Assessment

The University is committed to a policy of openness regarding exchange of information in matters involving the assessment of students. To this end:

- Course authorities are responsible for ensuring that there is provided for each course a clear written statement of expectations, which should include at a minimum: a statement of objectives of the course; the teaching strategy; how the University's graduate attributes are met; its assessment plan, including weights allocated to each significant assessable component and related submission dates; a policy on late submissions and the kind of evidence required for consideration to be given to late submissions; special attendance requirements such as field trips etc, a course schedule or timetable; textbooks and recommended reading; course materials and other requirements; to be presented at the first class of each session/term, recognising always the ability to negotiate changes with the students concerned within the first week.
- All items of assessment completed during session should be marked promptly and returned to students with a mark or grade and, where appropriate, comments. Course authorities where appropriate should provide information on the distribution of results in all items of assessment so that students can gauge their own performance against that of the other members of the class. Timely feedback on assessment will assist students to judge their performance in the course.

- (c) Final composite marks in courses as determined by the Assessment Review Groups should continue to be provided to students on result notifications.
- (d) Final examination scripts (other than those returned to students) are to be retained in the School for six months. Students should have access to their own scripts and be able to consult the examiner or the course authority on their performance. Faculties may determine the conditions under which access may be granted.
- (e) Where examination question papers or other forms of assessment need to be kept confidential (e.g. multiple-choice question papers where questions are re-used in later examinations) arrangements should be made for students to receive advice on their own performance with reference to their own examination script but in a way which does not prejudice the examination mode.
- (f) In the case of the examination of theses and project reports, the examiners' reports should be released to the student, following determination of the student's results. The names of examiners, while remaining undisclosed prior to assessment, should be released subsequently unless a particular examiner requests that this information be not released.

Further information is available under 'Assessment' on the UNSW A-Z Guide. Visit myUNSW: [www.my.unsw.edu.au](http://www.my.unsw.edu.au)

## Grievances

### Procedures for the Resolution of Student Grievances and Disputes

The University of New South Wales recognises that all decisions which affect a student's standing or progress in a program or course must be made fairly and must be based on appropriate academic criteria.

#### Guidelines

The University is committed to providing a harmonious work and study environment, and will listen seriously to complaints and resolve them quickly if possible. The resolution procedures ensure that students are able to air legitimate complaints knowing that ad hoc, vindictive or arbitrary action will not be taken against them or the staff complained about. By providing a clear set of procedures, it is hoped that grievances can be dealt with satisfactorily and expeditiously, and will prevent a minor grievance from becoming a major problem.

These procedures apply to all enrolled students and to any decisions which may affect a student's standing in a course or program. Many of these decisions concern assessment, but they may relate to other matters which could adversely affect a student's standing such as the granting of advanced standing, discontinuation, supervision arrangements, access to facilities, the award of scholarships and prizes, and decisions regarding fees. Research students may have a grievance concerning a thesis topic, access to facilities or supervision.

As there are many different decision-making processes in the University potentially affecting academic standing, not all of them can be covered specifically in one set of procedures. It is however the University's intention that a student's right to resolution of a grievance or dispute is not limited by this statement of procedures. Existing appeal procedures established for the re-enrolment rules for undergraduate students or for decisions on allegations of academic misconduct are not affected by these procedures. Information on these procedures is available earlier in the ADFA Handbook, or from Student Administrative Services.

A student is required to make his/her grievance known within a reasonable time frame, normally within a month of the decision being communicated.

The University expects that student grievances and claims of unfair treatment should in most instances be able to be resolved through informal discussion and consultation without recourse to formal appeal. However, where resolution is not possible, the University is committed to listen seriously to complaints and resolve them quickly, if possible, by the following procedures.

#### Grievance Procedure

**Step 1** – The student should attempt to resolve the grievance with the staff member(s) concerned within a reasonable time frame.

**Step 2** – If the grievance is still unresolved, it should be directed to the Head of School (or other responsible officer nominated by the Rector) who will attempt to resolve the grievance informally. Reasons should be provided by the Head of School (or nominated officer) for any recommendation or decision in respect of the matter.

**Step 3** – If the matter is not satisfactorily resolved at this stage, the student should refer the grievance to the Registrar or Manager, Student Administrative Services.

**Step 4** – Except when insufficient or unfounded reasons have been given by the student to support the complaint, the Registrar will take the complaint in writing, inform the respondent officially, commence an investigation, including reference to the Rector or Presiding Member of UNSW@ADFA Academic Board, and give an answer (including reasons) normally within 7 days.

**Step 5** – If the student is still dissatisfied, an appeal may be lodged in writing with the Presiding Member of the Postgraduate or Undergraduate Education Committee within 14 days of receiving the Registrar's notification. The Presiding Member may decline to take action in cases where insufficient or unfounded reasons have been given by the student and shall inform the student accordingly.

If the matter has not already been considered by the Postgraduate or Undergraduate Education Committee, this appeal will be heard by an Appeal Sub-Committee, empanelled for the purpose by the Presiding Member of the appropriate Education Committee. The Presiding Member will appoint as Chair of the Appeal Sub-Committee a member of the corresponding Education Committee.

If the matter has already been considered by the Postgraduate or Undergraduate Education Committee, this appeal will be heard by an Appeal Sub-Committee of the Academic Board, empanelled for the purpose by the Presiding Member of the Board. The Presiding Member will appoint as Chair of the Appeal Sub-Committee a member of the Academic Board.

The Appeal Sub-Committee will consist of at least three members, one of whom will be a student. The student member will be drawn from the Academic Board.

No member of the Appeal Sub-Committee will have been associated with either the original decision or any earlier step in the appeal process.

Within two months the Appeal Sub-Committee will make a decision on the matter. Decisions made by the Appeal Sub-Committee will be reported annually to the Academic Board. There will be no further right of appeal.

Each stage is to be handled expeditiously.

Further information is available under 'Grievances' on the UNSW A to Z Guide. Visit myUNSW: [www.my.unsw.edu.au](http://www.my.unsw.edu.au)

## Equity and Equal Opportunity (EEO)

Under the Federal Racial Discrimination Act (1975) and Sex Discrimination Act (1984), Disability Discrimination Act (1992) and the New South Wales Anti-Discrimination Act (1977), the University is required not to discriminate against students or prospective students on the grounds of age; sex; marital status; pregnancy; race (including nationality, descent, ethnic, ethno-religious or national origin or immigration); colour; sexuality; religious or political affiliation; views or beliefs; transgender or transsexuality; or disability. Under The University of New South Wales Act (1989), the University declares that it will not discriminate on the grounds of religious or political affiliations, views or beliefs.

As well as recognising its statutory obligations as listed, the University will eliminate discrimination on any grounds which it deems to constitute disadvantage. The University is committed to providing a place to study free from harassment and discrimination, and one in which every student is encouraged to work towards her/his maximum potential. The University further commits itself to course design, curriculum content, classroom environment, assessment procedures and other aspects of campus life which will provide equality of educational opportunity to all students.

The University will encourage the enrolment of students who belong to disadvantaged groups through programs such as the ACCESS Scheme.

For further details visit [www.unsw.adfa.edu.au/about/equity/](http://www.unsw.adfa.edu.au/about/equity/)

## Occupational Health and Safety Policy (OH&S)

Each student is responsible for:

- complying with all legislation and all relevant Defence and/or UNSW@ADFA policies, procedures and instructions;
- complying with risk mitigation strategies to eliminate or control hazards;
- taking action to avoid, eliminate or minimise hazards;
- reporting all hazards, accidents, incidents and dangerous occurrences in accordance with relevant Defence and UNSW@ADFA policies and procedures, and statutory requirements;
- making proper use of all safety devices and personal protective equipment;
- not creating or increasing a risk to the health and safety of themselves or any other any person at the workplace;
- seeking information or advice regarding hazards, risk controls and procedures, where necessary, before carrying out new or unfamiliar work;
- being familiar with and following emergency and evacuation procedures; and
- being familiar with the location of first aid kits, emergency control personnel and emergency equipment, and if appropriately trained, using the emergency equipment.

**Current course and  
program information  
is now available through the  
UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

**UNSW@ADFA**  
CANBERRA • AUSTRALIA

# Undergraduate Programs

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# Understanding your UNSW@ADFA degree

There are various sets of rules that you should understand before enrolling in your courses. If you require assistance understanding these rules, please contact Student Administrative Services or the relevant school. This information applies to students who commence study in 2007. Continuing students should refer to the handbook from the year they commenced study.

You must also read the *Information for All Students* on page 7 of this handbook.

## Faculty Regulations for Undergraduate Students

These rules apply to all undergraduate students regardless of the degree they are studying.

These rules can be found on the following page.

### Academic Rules

These rules detail the requirements and structure of each specific degree. Please refer to the index on the previous page to locate your degree rules.

### General Education and Directed Studies

All undergraduate students, unless exempted, are required to complete four GE courses worth 12UOC in total. You may be excluded from enrolling in some GE courses. Please see the information on page 66 before enrolling in your GE courses.

All students are also required to complete two Directed Studies courses unless exempt by the *Faculty Regulations for Undergraduate Students*.

### Major and Minor Rules

If you are studying a BA or BSc you are required to complete majors and/or minors as part of your degree. These rules detail courses a student must complete in order to meet the requirements of a major or minor. In most cases, students must understand these rules before enrolling to ensure the courses they complete will count towards their degree. You do not need to commit to your majors and minors until the start of second year. In first year you simply choose four areas of study.

Students studying BBus, BEng or BTech degrees enrol in the courses set out in their Academic Rules and do not need to complete majors or minors.

## Contacts for guidance and information

### Student Administrative Services

Ph 02 6268 6000  
Fax 02 6268 8666  
sas@adfa.edu.au  
www.unsw.adfa.edu.au/student

### School of Aeronautical, Civil and Mechanical Engineering (ACME)

Ph 02 6268 8335  
ugcoord.acme@adfa.edu.au  
www.unsw.adfa.edu.au/acme

### School of Business

02 6268 6098  
studentadmin.sob@adfa.edu.au  
www.unsw.adfa.edu.au/sbus

### School of Humanities and Social Sciences (HASS)

02 6268 8867  
ugcoord.hass@adfa.edu.au  
www.unsw.adfa.edu.au/hass

### School of Information Technology and Electrical Engineering (ITEE)

02 6268 8580  
ugcoord.itee@adfa.edu.au  
www.unsw.adfa.edu.au/itee

### School of Physical, Environmental and Mathematical Sciences (PEMS)

02 6268 6278  
ugcoord.pems@adfa.edu.au  
www.unsw.adfa.edu.au/pems



# FACULTY REGULATIONS FOR UNDERGRADUATE STUDENTS

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information, which appear in the following section. All rules in this Handbook apply to each student who enters an undergraduate program in 2007. The rules remain applicable until the student exits their program, either by discontinuation or graduation. Students who entered a program in another year should consult the rules and regulations for that year.

For definitions of specific terms, please consult the Glossary within this handbook.

## 1.0 Meeting degree requirements

- 1.1 To be eligible to graduate, a student must comply with the Faculty Regulations for Undergraduate Students and specific program rules.
- 1.2 Every student must complete courses as part of their degree. The requirements of a course will be outlined by its course convenor.
- 1.3 A student will be prevented from enrolling in a course if they have not met the prerequisites specified.
- 1.4 A student will be prevented from enrolling in a course if they have not met the co-requisites specified.
- 1.5 Students are required to complete the prescribed amount of first-year courses, or be granted the equivalent credit from a recognised tertiary institution, before enrolling in Level II or Upper-Level courses.
- 1.6 Students are required to complete the prescribed amount of Level II courses, or be granted the equivalent credit from a recognised tertiary institution, before enrolling in Level III courses.
- 1.7 Each course completed or granted as credit towards a program may be counted towards only one major/minor in that program.

## 2.0 Multiple enrolment

- 2.1 No student will be admitted into a UNSW program without the approval of the relevant Head of School if they are already enrolled in another program of study at any tertiary institution.

## 3.0 Study required per UOC

- 3.1 25-30 hours of work, including face-to-face teaching sessions and private study time, is expected for 1 UOC per session (e.g. 150-180 hours of study is expected for a 6UOC course).

## 4.0 Directed Studies courses

- 4.1 All undergraduate students must complete the Directed Studies courses ZBUS2801 Leadership and Management and ZHSS2002 Introduction to Strategic Studies (12UOC) except in the following circumstances:
- 4.2 Students enrolled in the BTech (Aero) or BTech (Aviation) are exempt from the Directed Studies requirement.
- 4.3 Students enrolled in the Bachelor of Engineering are exempt from ZBUS2801 Leadership and Management (by virtue of meeting the Leadership and Management requirement through equivalent work in the engineering schools).
- 4.4 Students enrolled in the Bachelor of Business are exempt from ZBUS2801 Leadership and Management.
- 4.5 ZHSS2002 An Introduction to Strategic Studies may be taken as part of a major or minor in History or Politics. Students who choose this option must complete an additional 6UOC Upper-Level course to

make up the 144 UOC required for their Bachelor of Arts or Bachelor of Science degree.

- 4.6 Students are exempt from ZBUS2801 Leadership and Management if they complete both ZBUS1101 Organisational Behaviour and ZBUS2302 Leadership. Students who choose this option must complete an additional 6UOC Upper-Level course to make up the 144 units of credit required for their Bachelor of Arts or Bachelor of Science degree.
- 4.7 Any student who has completed ZBUS1101 Organisational Behaviour but not ZBUS2302 Leadership is required to take ZBUS2802 Leadership and Management (Leadership) but is exempt from enrolling in ZBUS2801 Leadership and Management and ZBUS2803 Leadership and Management (Management). Students who choose this option must complete an additional 3UOC Upper-Level course to make up the 144 units of credit required for their Bachelor of Arts or Bachelor of Science degree.
- 4.8 Students studying the Chief of Defence Force (CDF) programs may be exempt from studying one or both Directed Studies courses. Students within CDF programs should refer to their program rules for Directed Studies requirements.

## 5.0 General Education courses

- 5.1 All undergraduate students must include 12UOC of General Education courses in their program. These courses cannot be counted towards a major or minor.
- 5.2 No more than two General Education courses can be taken from any discipline area, as set out in the General Education Schedule, unless exempted in the Degree Rules.
- 5.3 No student can take a General Education course concurrent with or subsequent to a first-year course in the same discipline area.
- 5.4 Normally mainstream courses may not be substituted for General Education requirements. In exceptional circumstances students may seek to substitute one first-year course (6UOC) for two GE courses. This first-year course must be substantially different in nature to the remaining mainstream courses in their degree.

## 6.0 Limit of Pass Conceded (PC)

- 6.1 A student cannot be awarded more than 18UOC for PCs.

## 7.0 Limitation on enrolment each semester

- 7.1 In any session, a student cannot enrol in more than 27 UOC without the approval of the Registrar's Nominee (Manager, Student Administrative Services).

## 8.0 Credit Cancellation Period

- 8.1 No units of credit shall count towards any award at undergraduate level if ten or more years have elapsed since a candidate accumulated the units of credit.

## 9.0 Credit for previous study

- 9.1 Credit may be granted on the basis of previous studies at a recognised tertiary institution provided a Credit for Previous Study form is submitted and approved within the credit cancellation period.
- 9.2 If a student believes their previous studies and/or work experience have given them the knowledge and skills taught within a core course, but they have not completed suitable studies at a recognised tertiary institution, they may seek approval from the relevant program authority to substitute this course for one outside their degree rules.

## 10.0 Variation of program or course requirements

- 10.1 Upon sufficient cause being shown, the Presiding Member, Academic Board may, in special cases, vary the requirements of the degree rules provided that any proposed variation shall be initiated by a recommendation from the relevant Head of School and the Registrar's Nominee.

# BACHELOR OF ARTS

School of Business  
School of Humanities and Social Sciences  
School of Information Technology and Electrical Engineering  
School of Physical, Environmental and Mathematical Sciences

**Award/s:** 4400 – Bachelor of Arts and Bachelor of Arts (Honours)  
(BA and BA (Hons))

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

## Program Description:

The BA is a three-year program at pass level and a four-year program at Honours level.

Pass-level students in arts should complete their degree programs within three years. Honours students and engineering students who are RAN and RAAF officer cadets continue with their programs at UNSW@ADFA and complete their degrees at the end of the fourth year. Army officer cadets, however, at the end of the third year transfer to the Royal Military College, Duntroon. After completing a year of military training they are commissioned as lieutenants and those who are continuing with Honours programs return to the Academy to complete their degree.

## Program Objectives and Learning Outcomes:

The BA degree rules allow students to include a mix of both Arts and Science courses. A number of elective courses of particular relevance to some students are available. Students admitted to a degree with sufficient advanced standing may be able to complete a combined degree.

The following Arts discipline areas are available in the BA and the BA (Hons):

Economics  
English  
Indonesian  
Indonesian-Malay Studies  
Information Systems  
Geography  
History  
Management  
Politics

The following Science discipline areas are available in the BA:

Chemistry  
Computer Science  
Geography  
Information Systems  
Mathematics  
Oceanography  
Operations Research  
Physics

## Program Structure:

The BA is one of the most flexible programs available through UNSW@ADFA, allowing you to construct your degree in one of the following three ways:

### Major plus two Minors

Arts major, plus Arts minor, plus Science or Arts minor

### Two Majors

Arts major, plus Arts major

### Two Majors plus a Minor

Arts major, plus Science major, plus Arts minor

## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Arts take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Rules Dictionary

2.1 “Major” means an approved combination of 48 units of credit in the one discipline area, of which at least 36 units of credit are for upper-level courses.

2.2 “Minor” means an approved combination of 24 units of credit in the one discipline area, of which at least 12 units of credit are for upper-level courses.

2.3 “Level I” means courses at an introductory level, normally taken in Year 1.

2.4 “Upper level” means courses at Level II and Level III, normally taken in Years 2 or 3.

2.5 “Arts discipline areas” means Economics, English, Geography, History, Indonesian, Indonesian-Malay Studies, Information Systems, Management and Politics.

2.6 “Science discipline areas” means Chemistry, Computer Science, Geography, Information Systems, Mathematics, Oceanography, Operations Research, and Physics.

2.7 “Elective courses” means courses from any related discipline area as identified in Clauses 2.5 and 2.6 above.

#### 3.0 Degree Requirements

3.1 A student must obtain, normally over three years of study, a minimum of 144 units of credit, including one of the following combinations (“a”, “b”, or “c”) –

- a). 96 units of credit for two majors from Arts discipline areas; and –
  - i. 24 units of credit for elective courses at Level I.
  - ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 An Introduction to Strategic Studies, or approved equivalents;
  - iii. 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third year of study.
- b). 96 units of credit for one major from an Arts discipline area, plus two minors, one of which must be from an Arts discipline area; and –
  - i. 12 units of credit for elective courses at Level I.
  - ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 An Introduction to Strategic Studies, or approved equivalents;
  - iii. 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third year of study.
  - iv. 12 units of credit for elective courses at Upper Level.
- c). 120 units of credit for one major from an Arts discipline area, one major from a Science discipline area, and one minor from an Arts discipline area; and
  - i. 12 units of credit for elective courses at Level I, chosen from Arts discipline areas;
  - ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 An Introduction to Strategic Studies, or approved equivalents.



3.2 No more than 48 units of credit may be gained for Level I courses.

3.3 36 units of credit for Level I courses must be from Arts discipline areas.

#### 4.0 Special Rules

4.1 Students who complete ZBUS1101 and ZBUS2302 must substitute 6 units of credit of upper-level elective courses for the ZBUS2801 Leadership and Management requirement.

4.2 Students who complete ZBUS1101 Organisational Behaviour but not ZBUS2302 Leadership, are required to complete ZBUS2802 Leadership and Management (Leadership). They may not then include the 6UOC course ZBUS2801 Leadership and Management or the 3UOC course ZBUS2803 Leadership and Management (Management) in their degree.

4.3 Students who include ZHSS2002 An Introduction to Strategic Studies as part of a minor or major in either History or Politics are required to take 6 units of credit of upper-level elective courses in place of the Directed Studies requirement set out in rule 3.1 above.

#### Honours:

#### Rules governing the award of the degree of Bachelor of Arts with Honours

##### 5.0 Entry

5.1 To enrol for the award of the degree at Honours level in one or two specialisations, a student must –

a). complete the pass-degree program requirements; or -

b). gain an approved award from elsewhere; and -

c). have achieved at least a credit average (65) across the entire undergraduate program including a credit average over the Level III / upper-level courses in a major sequence which is in the same discipline area as the proposed Honours program.

#### 6.0 Degree Requirements

6.1 A student must obtain, normally over one year of study, a minimum of 48 units of credit in one or two areas of study approved by the Head of School.

#### 7.0 Class of Honours

7.1 The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3).

#### Sample Program:

The programs shown below are samples of those available under the rules for the BA degree. They are intended to illustrate the operation of the degree rules, and to be a ready reference for degree structures, typical programs and the sorts of options available. Nothing in this chapter replaces or modifies any part of the degree rules. This section should be read in conjunction with the Rules governing the award of the degrees of Bachelor of Arts.

NB: In Level I course selections students will also need to select courses that are outside the discipline areas in which they build majors and minors. In some cases students will have to choose Level II or Level III courses to the value of 12UOC outside their major and minor sequences. These courses have been designated as "Electives" for the purposes of the diagrams.

#### Option 1

##### Bachelor of Arts

|        | Arts<br>MAJOR   | Arts<br>MINOR  | Arts or Science<br>MINOR | Electives         | General<br>Education | Directed<br>Studies | UOC |
|--------|-----------------|----------------|--------------------------|-------------------|----------------------|---------------------|-----|
|        | <i>Politics</i> | <i>English</i> | <i>History</i>           | <i>Management</i> |                      |                     |     |
| Year 1 | 12UOC           | 12UOC          | 12UOC                    | 12UOC             |                      |                     | 48  |
| Year 2 | 12UOC           | 12UOC          | 12UOC                    |                   | 6UOC                 | 6UOC                | 48  |
| Year 3 | 24UOC           |                |                          | 12UOC             | 6UOC                 | 6UOC                | 48  |

#### Option 2

##### Bachelor of Arts

|        | Arts<br>MAJOR     | Arts<br>MAJOR    |  | Electives                      | General<br>Education | Directed<br>Studies | UOC |
|--------|-------------------|------------------|--|--------------------------------|----------------------|---------------------|-----|
|        | <i>Indonesian</i> | <i>Economics</i> |  | <i>English &amp; Chemistry</i> |                      |                     |     |
| Year 1 | 12UOC             | 12UOC            |  | 24UOC                          |                      |                     | 48  |
| Year 2 | 12UOC             | 12UOC            |  |                                | 12UOC                | 12UOC               | 48  |
| Year 3 | 24UOC             | 24UOC            |  |                                |                      |                     | 48  |

#### Option 3

##### Bachelor of Arts

|        | Arts<br>MAJOR  | Science<br>MAJOR    | Arts<br>MINOR    | Electives      |  | Directed<br>Studies | UOC |
|--------|----------------|---------------------|------------------|----------------|--|---------------------|-----|
|        | <i>English</i> | <i>Computer Sc.</i> | <i>Economics</i> | <i>History</i> |  |                     |     |
| Year 1 | 12UOC          | 12UOC               | 12UOC            | 12UOC          |  |                     | 48  |
| Year 2 | 12UOC          | 12UOC               | 12UOC            |                |  | 12UOC               | 48  |
| Year 3 | 24UOC          | 24UOC               |                  |                |  |                     | 48  |

## Majors and Minors – Arts

### Economics

#### School of Business

Economics is about the ways in which individuals, firms and countries make the best use of their scarce and valuable resources: time, energy, knowledge, land, equipment and muscle power. It also helps us understand the scope for, and deficiencies of, government policy.

#### Plan Structure

##### Minor

**For students entering the BA or BSc in 2004 and subsequent years, a minor in Economics comprises of Two Level 1 courses**

ZBUS1102 Introduction to Economics (6UOC) ••  
ZBUS1103 Introduction to Accounting and Finance (6UOC) •

**12 units of credit in two upper-level courses, comprising**

ZBUS2200 Production, Prices and Trade (6UOC) •

**plus one of the following courses**

ZBUS2001 Quantitative Methods in Economics and Management (6UOC) •  
ZBUS2202 Growth and Fluctuations in Open Economies (6UOC) ••  
ZBUS2203 The Making of Economic Policy (6UOC) ••  
ZBUS2204 Asia-Pacific Economic Development (6UOC) •  
ZBUS2205 Applied Economics (6UOC) •  
ZBUS2401 Finance (6UOC) ••

Students are required to complete the two Level 1 courses (ZBUS1103 *Introduction to Accounting and Finance* and ZBUS1102 *Introduction to Economics*) before entering upper-level study. Pre-requisites must be met.

##### Major

**For students entering the BA or BSc in 2004 and subsequent years, a major in Economics comprises: Two Level 1 courses**

ZBUS1102 Introduction to Economics (6UOC) ••  
ZBUS1103 Introduction to Accounting and Finance (6UOC) •  
**and**

ZBUS2200 Production, Prices and Trade (6UOC) •  
ZBUS2202 Growth and Fluctuations in Open Economies (6UOC) ••  
ZBUS2203 The Making of Economic Policy (6UOC) ••  
ZBUS2204 Asia-Pacific Economic Development (6UOC) •

**and two of the following courses**

ZBUS2001 Quantitative Methods in Economics and Management (6UOC) •  
ZBUS2401 Finance (6UOC) ••  
ZBUS2205 Applied Economics (6UOC) •

Students are required to complete the two Level 1 courses (ZBUS1103 *Introduction to Accounting and Finance* and ZBUS1102 *Introduction to Economics*) before entering upper-level study. Pre-requisite requirements must be met.

Students who entered the Academy prior to 2004 should consult with the School of Business on the program they should follow. Information is also available on the School website at [www.unsw.adfa.edu.au/sbus](http://www.unsw.adfa.edu.au/sbus)

##### Honours

Students must perform in Economics courses taken in the third year to at least a Credit level to be eligible for entry to the Honours year.

## English

### School of Humanities and Social Sciences

In 2007, the first-year courses in English deal with contemporary writing and the media (including science fiction and fantasy writing) and with the experience of war in literature and film. After first year, students in English are able to choose freely from a range of upper-level courses, including some devoted to chronological and introductory surveys of major periods of English, American and Australian writing.

#### Plan Structure

##### Minor

**A minor sequence in English comprises of two Level 1 courses**

ZHSS1101 English 1A: Writing the Present, Imagining the Future (6UOC) •  
ZHSS1102 English 1B: The Experience of War in Fiction and Film (6UOC) ••

**and 12 units of credit in upper-level English courses. These courses are listed below.**

##### Major

**A major sequence in English comprises Two Level 1 courses**

ZHSS1101 English 1A: Writing the Present, Imagining the Future (6UOC) •  
ZHSS1102 English 1B: The Experience of War in Fiction and Film (6UOC) ••

**and 36 units of credit from the following upper-level English courses.**

ZHSS2101 The English Renaissance (3UOC) x  
ZHSS2102 Dream and Disillusionment (3UOC) x  
ZHSS2104 Studies in the Media (3UOC) •  
ZHSS2105 Modernism and After (3UOC) x  
ZHSS2106 The Century's Corpse (3UOC) x  
ZHSS2108 American Renaissance and After (6UOC) ••  
ZHSS2109 Romanticism & Revolution (6UOC) •  
ZHSS2110 Modern Drama (6UOC) ••  
ZHSS2111 Australian War Literature (6UOC) x  
ZHSS2112 Creative Writing and Reading (6UOC) •  
ZHSS2116 Australian Drama, Film and Television (6UOC) x  
ZHSS2119 Post-Colonial Literature (6UOC) ••  
ZHSS2120 Heroism, Banditry and Manhood (6UOC) ••  
ZHSS2121 Classic Literary Texts (6UOC) •  
ZHSS2123 Contemporary Literary Theory and Criticism (6UOC) ••  
ZHSS2131 The Hollywood Cut (6UOC) x  
ZHSS2133 Contemporary Australian Literature (6UOC) •

##### Honours

The School of Humanities and Social Sciences offers a fourth-year honours program consisting of coursework and sub-thesis which expands and further develops the intellectual skills of our best students. Admission to honours in English is at the discretion of the Head of School. Interested students should contact the School Administrator within HASS.

## Geography

### School of Physical, Environmental and Mathematical Sciences

All Geography courses are available to both Arts and Science students. The School makes no distinction in curricula between students who are enrolled in the degrees of Bachelor of Arts and Bachelor of Science. Geography is the study of both the physical and human environments in which we live and the interactions between people and nature. Geography provides a bridge between the social and natural sciences. It provides students with the techniques to analyse our environment

and society, including Geographic Information Systems and Remote Sensing.

### Plan Structure

#### Level I Geography

In both Level I courses an integrative approach is developed to the understanding of environmental processes and human activities that take place on the surface of the earth.

#### Level II Geography

In Level II Geography, students can begin to specialise in one of the systematic branches of the discipline, either human or physical geography, or alternatively they can select a mix of courses from these two branches as well as geographical techniques (Remote Sensing and Geographical Information Analysis) and area studies (Melanesia).

Potential honours students are encouraged to take more than 12UOC of Level II Geography.

#### Level III Geography

While there is no specified assumed knowledge for Level III Geography courses, it is generally expected that students will have completed some Level II Geography before enrolling in Level III. Students who have not done this should discuss their intended enrolment with the Head of School.

### Minor

**A minor sequence in Geography comprises of two Level I courses:**

- ZPEM1201 Geography 1A: Introduction to Global Change (6UOC) •
- ZPEM1202 Geography 1B: Contemporary Global Change (6UOC) ••

**and 12 units of credit of Level II and/or Level III Geography courses (listed below).**

### Major

**A major sequence in Geography comprises of two Level I courses:**

- ZPEM1201 Geography 1A (Introduction to Global Change) (6UOC) •
- ZPEM1202 Contemporary Global Change (6UOC) ••

**and 36 units of credit from the following Level II and/or Level III Geography courses.**

- ZINT2505 Custom and Change in Melanesia (6UOC) x
- ZPEM2202 Ecological Biogeography (6UOC) •
- ZPEM2203 Fundamentals of Remote Sensing (3UOC) ••
- ZPEM2205 Rivers and Coasts (6UOC) ••
- ZPEM2206 Remote Sensing: A Tool for Earth Observation (6UOC) ••
- ZPEM2207 Social Geography (6UOC) •
- ZPEM2209 Development and Change (6UOC) ••
- ZPEM3202 Cultural Geography (6UOC) ••
- ZPEM3203 Conservation Biogeography (6UOC) •
- ZPEM3204 Environmental Hazards (6UOC) •
- ZPEM3207 Making Decisions in Geography (6UOC) •
- ZPEM3208 Geographic Research Methods (6UOC) ••
- ZPEM3209 Water Matters (6UOC) ••
- ZPEM3213 Resource Management (6UOC) ••
- ZPEM3215 Transport Geography (6UOC) •
- ZPEM3221 Special Topics – Geography (6UOC) •••

To complete a major in Geography, students must complete at least one Level II course that includes a residential field school (such as ZPEM2202 *Ecological Biogeography* or ZPEM2207 *Social Geography*) and a Level III Geography course that includes the residential field school (such as ZPEM3208 *Geographic Research Methods*).

### Honours

Geography Honours is designed for students showing a special interest in and aptitude for work in the discipline and who satisfy the requirements for entry into either the degree of Bachelor of Arts with Honours or the degree of Bachelor of Science with Honours. The Honours program provides students with the opportunity to undertake a research project and to present their results in a thesis. Coursework in the form of seminars, lectures and assignments is also normally undertaken.

### History

#### School of Humanities and Social Sciences

All the history courses in the School of Humanities and Social Sciences are designed to develop critical intelligence through the study of the past. The School offers a variety of approaches to history, each emphasising the basic disciplinary skills of assimilating and weighing evidence, analysing historical problems, constructing and testing historical hypotheses and presenting conclusions clearly and logically.

These skills are important to both Arts and Science students. The critical and analytical skills that history can impart are useful in whichever specialised branch of the Services cadets may choose.

### Plan Structure

All major and minor sequences in History begin with Level I History. Students have maximum flexibility in completing major or minor sequences. They are able to select their own combinations of single-session courses at upper-level.

In 2007, the first-year courses will consist of two session-long subjects focussed on the major military and civil conflicts of the twentieth century. As well as the conflicts themselves, students will examine their causes and consequences, in order to gain an understanding of the major forces which have marked the century. At the upper-level students are able to choose from a wide range of courses dealing with the military, social and cultural history of Australia, Asia, Europe and the United States.

### Minor

**A minor sequence in History comprises:**

#### Two Level I courses

- ZHSS1201 History 1A: Conflicts in Context: Aspects of World History 1900-1941 (6UOC) •
- ZHSS1202 History 1B: Conflicts in Context: Aspect of World History 1941 to the Present (6UOC) ••

**and 12UOC of upper-level History courses.**

### Major

**A major sequence in History comprises:**

#### Two Level I courses

- ZHSS1201 History 1A: Conflicts in Context: Aspects of World History 1900-1941 (6UOC) •
- ZHSS1202 History 1B: Conflicts in Context: Aspect of World History 1941 to the Present (6UOC) ••

**and 36 units of credit from the following upper-level History courses.**

- ZHSS2201 East Asia: Between Tradition and Modernity (6UOC) •
- ZHSS2202 Modern Australia: Politics and Culture (6UOC) x
- ZHSS2203 Naval History and Sea Power in C20 (6UOC) •
- ZHSS2204 The Rise of Modern Navies (6UOC) x
- ZHSS2206 Social Change in East Asia (6UOC) x
- ZHSS2207 Soviet History (6UOC) ••
- ZHSS2209 The Making of Contemporary Society (6UOC) x
- ZHSS2210 The Origins of Modern War (6UOC) ••
- ZHSS2211 The Second World War (6UOC) x

- ZHSS2212 Australian Military History 1788 to the Present (6UOC) ••
- ZHSS2214 The History of Indonesian Defence Policy (6UOC) x
- ZHSS2216 US Military History (6UOC) •
- ZHSS2217 Genocide: Crime of Crimes (6UOC) ••
- ZHSS2220 Australian Colonial History (6UOC) ••
- ZHSS2221 Ireland and Britain: 1879-1998 (6UOC) •
- ZHSS2223 Indian Society (6UOC) ••
- ZHSS2224 Rise and Fall of Imperial Germany (6UOC) x
- ZHSS2225 Rise and Fall of Nazi Germany (6UOC) x
- ZINT2505 Custom and Change in Melanesia (6UOC) x

### Honours

The School of Humanities and Social Sciences offers a fourth-year honours program consisting of coursework and sub-thesis which expands and further develops the intellectual skills of our best students. Admission to honours in History is at the discretion of the Head of School. Interested students should contact the School Administrator within HASS.

## Indonesian

### School of Humanities and Social Sciences

Two streams of Indonesian language and culture are available at UNSW@ADFA as detailed under the options for constructing major or minor sequences in Indonesian.

### Plan Structure

#### Minor (Students who have little or no prior knowledge of Indonesian):

- ZHSS1301 Indonesian 1A (6UOC) •
- ZHSS1302 Indonesian 1B (6UOC) ••
- ZHSS2301 Indonesian 2A (6UOC) •
- ZHSS2302 Indonesian 2B (6UOC) ••

#### Major (Students who have little or no prior knowledge of Indonesian)

- ZHSS1301 Indonesian 1A (6UOC) •
- ZHSS1302 Indonesian 1B (6UOC) ••
- ZHSS2301 Indonesian 2A (6UOC) •
- ZHSS2302 Indonesian 2B (6UOC) ••
- ZHSS3301 Indonesian 3A (12UOC) •
- ZHSS3302 Indonesian 3B (12UOC) ••

#### Minor (Students who have completed Year 12 or equivalent)

- ZHSS1303 Intermediate Indonesian 1C (6UOC) •
- ZHSS1304 Intermediate Indonesian 1D (6UOC) ••
- ZHSS2303 Advanced Indonesian 2C (12UOC) •
- ZHSS2304 Advanced Indonesian 2D (12UOC) ••

#### Major (Students who have completed Year 12 or equivalent)

- ZHSS1303 Intermediate Indonesian 1C (6UOC) •
- ZHSS1304 Intermediate Indonesian 1D (6UOC) ••
- ZHSS2303 Advanced Indonesian 2C (6UOC) •
- ZHSS2304 Advanced Indonesian 2D (6UOC) ••
- ZHSS3303 Reading Course in Indonesian I (12UOC) •
- ZHSS3304 Reading Course in Indonesian II (12UOC) ••

### Honours

The School of Humanities and Social Sciences offers a fourth-year honours program consisting of coursework and sub-thesis which expands and further develops the intellectual skills of our best students. Admission to honours in Indonesian is at the discretion of the Head of School. Interested students should contact the School Administrator within HASS.

## Indonesian – Malay Studies

### School of Humanities and Social Sciences

The School of Humanities and Social Sciences offers a minor in Indonesian-Malay Studies which includes study of Indonesian and Malay history, society and politics and culture. The minor consists of courses taught by staff within the Indonesian, Politics and History disciplines. Enrolment in the minor does not require any language study.

### Plan Structure

Students commence the minor in their second year, with 12 UOC in first-year History, Indonesian or Politics serving as prerequisites for each of the courses which form the minor.

### Minor

**After completion of the prerequisites at Level I, a minor sequence in Indonesian-Malay Studies comprises: 24 units of credit from the following courses**

- ZHSS2402 Political Cultures in Asia and the Pacific (6UOC) x
- ZHSS2408 Civil-Military Relations in the Asia-Pacific Region (6UOC) x
- ZHSS2411 Political Change in Indonesia (6UOC) x
- ZHSS2501 Contemporary Muslim Identity in Indonesia and Beyond (6UOC) ••
- ZHSS2502 Becoming Indonesian: Regional, National and Global Identities (6UOC) •
- ZHSS2503 State Systems in Pre-Colonial Southeast Asia (6UOC) x

## Information Systems

### School of Information Technology and Electrical Engineering

Information Systems is one of three disciplines of study offered in the field of Information Technology. It can be studied as either an Arts or Science discipline. The study of Information Systems concentrates on the application of computer systems to information processing and control. It is distinguished from Computer Science in that it accentuates the role of information in the service of management, and thus is interested in the analysis, design and implementation of systems rather than the computer itself. A "systems view" is taken throughout, where the organisational context for an information system is stressed. In the first two years the teaching is principally in the areas of information analysis and the mastery of the tools and techniques used to model systems and then implement them. The final year of the three-year program has a core concentration in software project lifecycle management. This third-year work is oriented strongly to Defence-related computing projects with direct Service input and guidance. Typical examples which have been undertaken include the analysis of computing support requirements, the design and implementation of various data and graphical applications, and the construction of Web sites and virtual environments.

### Plan Structure

### Minor

**A minor sequence in Information Systems comprises: Two Level I courses**

- ZITE1301 Introduction to Information Systems (6UOC) •
- ZITE1302 Information Systems in Organisations (6UOC) ••

**and 2 specified Level II courses in Information Systems:**

- ZITE2301 Design of Information Systems (6UOC) •
- ZITE2302 Operation of Information Systems (6UOC) ••



## Major

**A major sequence in Information Systems comprises:  
Two Level I courses**

- ZITE1301 Introduction to Information Systems (6UOC) •
- ZITE1302 Information Systems in Organisations (6UOC) ••

**and 2 specified Level II courses in Information Systems:**

- ZITE2301 Design of Information Systems (6UOC) •
- ZITE2302 Operation of Information Systems (6UOC) ••

**plus 4 specified Level III courses:**

- ZITE3301 Applications of Information Systems (6UOC) •
- ZITE3302 Management of Work Systems (6UOC) •
- ZITE3303 Selection of Systems (6UOC) ••
- ZITE3304 Computing Project – Information Systems (6UOC) ••

## Honours

Students wishing to take an Honours program in Information Systems need to take the full Information Systems major sequence as listed above. In their fourth year of study they undertake the following courses.

### Full Time

- ZITE4303 Information Systems 4 (Honours) (48UOC – 24UOC a session for one year) • ••

### Part Time

- ZITE4304 Information Systems 4 (Honours) (24UOC – 12UOC a session for one year) • ••

It is also possible to do a combined Honours program in Information Systems and another discipline. Students wishing to take such a combined Honours program need to take the full Information Systems major sequence as listed above. In their fourth year of study they undertake the following courses.

### Full Time

- ZITE4301 Information Systems 4 (Combined Honours) (48UOC – 24UOC a session for one year) • ••

### Part Time

- ZITE4302 Information Systems 4 (Combined Honours) (24UOC – 12UOC a session for one year) • ••

Students interested in taking an Honours program are advised to contact the School Office early in the year prior to the proposed Honours year.

## Management

### School of Business

Management is about good decision-making in organisations in relation to human, financial and physical resources. The aim is to understand how to work successfully towards achieving the best outcomes for an organisation, taking account of competing opportunities and continuous change in an uncertain business environment.

### Plan Structure

#### Minor

**A minor sequence in Management for students entering the BA or BSc in 2004 and subsequent years comprises:  
Two Level I courses**

- ZBUS1101 Organisational Behaviour (6UOC) ••
- ZBUS1103 Introduction to Accounting (6UOC) and Finance (6UOC) •

**and 12 units of credit in upper-level courses chosen from the following:**

- ZBUS2001 Quantitative Methods in Economics and Management (6UOC) •
- ZBUS2101 Business Law (6UOC) •
- ZBUS2102 Project Management (6UOC) •
- ZBUS2103 Human Resource Management (6UOC) ••

- ZBUS2301 Management Accounting (6UOC) ••
- ZBUS2302 Leadership (6UOC) •
- ZBUS2303 Logistics Management (6UOC) ••
- ZBUS2401 Finance (6UOC) ••
- ZITE2001 Managing Information Systems (6UOC) ••

## Major

**A major sequence in Management for students entering the BA or BSc in 2004 and subsequent years comprises:**

**Two Level I courses**

- ZBUS1101 Organisational Behaviour (6UOC) ••
- ZBUS1103 Introduction to Accounting and Finance (6UOC) •

**and 36 units of credit in upper-level courses chosen from the following:**

- ZBUS2001 Quantitative Methods in Economics and Management (6UOC) •
- ZBUS2101 Business Law (6UOC) •
- ZBUS2102 Project Management (6UOC) •
- ZBUS2103 Human Resource Management (6UOC) ••
- ZBUS2301 Management Accounting (6UOC) ••
- ZBUS2302 Leadership (6UOC) •
- ZBUS2303 Logistics Management (6UOC) ••
- ZBUS2401 Finance (6UOC) ••
- ZITE2001 Managing Information Systems (6UOC) ••

Students who entered the Academy prior to 2004 should consult with the School of Business on the program that they should follow. Information is also available on the School website at [www.unsw.adfa.edu.au/sbus](http://www.unsw.adfa.edu.au/sbus).

## Honours

Students must perform in Management courses taken in the third year to at least a Credit level to be eligible for entry to the Honours year.

## Politics

### School of Humanities and Social Sciences

The School of Humanities and Social Sciences offers courses which introduce students to the major ideas and issues of politics, both domestic and international. The teaching program is designed, in the first year, to introduce students to the study of politics.

In upper years, the teaching program focuses on:

- studying the political systems of countries that are of strategic significance to Australia
- exploring the nature of security and relations between states in the international system
- analysing security challenges in regions of significance to Australia
- and exploring some advanced topics in political analysis.

### Plan Structure

#### Minor

**A minor sequence in Politics comprises of two Level I courses**

- ZHSS1401 Politics 1A (6UOC) •
- ZHSS1402 Politics 1B (6UOC) ••

**and 12 units of credit in upper-level Politics courses.**

#### Major

**A major sequence in Politics comprises two Level I courses**

- ZHSS1401 Politics 1A (6UOC) •
- ZHSS1402 Politics 1B (6UOC) ••

**and 36 units of credit in upper-level Politics courses**

- ZHSS2401 Japan: From Warmonger to Peacekeeper (6UOC) •
- ZHSS2402 Political Cultures in Asia and the Pacific (6UOC) x
- ZHSS2403 Politics of China (6UOC) x

|          |   |
|----------|---|
| ZHSS2404 | Politics of the USA (6UOC) ••                         |
| ZHSS2407 | War and Politics (6UOC) x                             |
| ZHSS2408 | Civil-Military Relations In the Asia-Pacific (6UOC) x |
| ZHSS2410 | Modern Political Ideologies (6UOC) •                  |
| ZHSS2411 | Political Change in Indonesia (6UOC) x                |
| ZHSS2412 | Politics of Australian Security (6UOC) ••             |
| ZHSS2414 | Regional Security Issues (6UOC) •                     |
| ZHSS2415 | Politics of International Law (6UOC) x                |
| ZHSS2416 | Politics of Southeast Asia (6UOC) ••                  |
| ZHSS2417 | Ethnopolitics (6UOC) x                                |
| ZHSS2418 | Plagues and Politics (6UOC) ••                        |

### Honours

The School of Humanities and Social Sciences offers a fourth-year honours program consisting of coursework and sub-thesis which expands and further develops the intellectual skills of our best students. Admission to Politics honours is at the discretion of the Head of School. Interested students should contact the School Administrator within HASS.

**Current course and  
program information**  
is now available through the  
**UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

**UNSW@ADFA**  
CANBERRA • AUSTRALIA

## BACHELOR OF SCIENCE

**School of Physical, Environmental and Mathematical Sciences**  
**School of Information Technology and Electrical Engineering**  
**School of Business**  
**School of Humanities and Social Sciences**

**Award/s:** 4410 – Bachelor of Science and Bachelor of Science (Honours) (BSc and BSc (Hons))

**Duration:** 3 years full-time or part-time equivalent plus an additional year for Honours.

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

### Program Description:

The BSc is a three-year program at pass level and a four-year program at honours level. Science is the understanding of the physical universe (from sub-atomic particles and microbes through to the planet's environment and the origin of the universe itself), and human interactions with it. Just as important is the scientific process by which this understanding is gained. In turn, science is the foundation of the modern technologies that enhance the quality of lives and provide ever more sophisticated means of applying the scientific process. In addition, science is crucial in control of disease, biotechnology, new sustainable energy sources, information technology, and management of precious natural resources.

Pass-level students in Science should complete their degree programs within three years. Honours students who are RAN and RAAF officer cadets continue with their programs at UNSW@ADFA and complete their degrees at the end of the fourth year. Army officer cadets, however, at the end of the third year transfer to the Royal Military College, Duntroon. After completing a year of military training they are commissioned as lieutenants and those who are continuing with honours programs return to the Academy to complete their degree.

### Program Objectives and Learning Outcomes:

The BSc degree rules allows students to include a mix of both Arts and Science courses. A number of elective courses of particular relevance to some students are available.

Students admitted to a degree with sufficient advanced standing may be able to complete a combined degree.

The following Science discipline areas are available in the BSc and the BSc (Hons):

Chemistry  
Computer Science  
Geography  
Information Systems  
Mathematics  
Oceanography  
Operations Research  
Physics

The following Arts discipline areas are available in the BSc:

Economics  
English  
Geography  
Information Systems  
History  
Indonesian  
Indonesian-Malay Studies  
Management  
Politics

## Program Structure:

The BSc is one of the most flexible programs available through UNSW@ADFA, allowing you to construct your degree in one of the following three ways:

### Major plus two Minors

Science major, plus Science minor, plus Science or Arts minor

### Two Majors

Science major, plus Science major

### Two Majors plus a Minor

Science major, plus Arts major, plus Science minor

## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the Undergraduate Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Science take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Rules Dictionary

- 2.1 "Major" means an approved combination of 48 units of credit in the one discipline area, of which at least 36 units of credit are for upper-level courses.
- 2.2 "Minor" means an approved combination of 24 units of credit in the one discipline area, of which at least 12 units of credit are for upper-level courses.
- 2.3 "Level I" means courses at an introductory level, normally taken in Year 1.
- 2.4 "Upper level" means courses at Level II and Level III, normally taken in Years 2 or 3.
- 2.5 "Science discipline areas" means Chemistry, Computer Science, Geography, Information Systems, Mathematics, Oceanography, Operations Research, and Physics.
- 2.6 "Arts discipline areas" means Economics, English, Geography, Information Systems, History, Indonesian, Indonesian-Malay Studies, Management and Politics.
- 2.7 "Elective courses" means courses from any related discipline area as identified in Clauses 2.5 and 2.6 above.

#### 3.0 Degree Requirements

- 3.1 A student must obtain, normally over three years of study, a minimum of 144 units of credit, including one of the following combinations ("a", "b", or "c") –
  - a). 96 units of credit for two majors from Science discipline areas; and –
    - i. 24 units of credit for elective courses at Level I.
    - ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 An Introduction to Strategic Studies, or approved equivalents;
    - iii. 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third year of study.
  - b). 96 units of credit for one major from a Science discipline area, plus two minors, one of which must be from a Science discipline area; and –
    - i. 12 units of credit for elective courses at Level I.

- ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 Introduction to Strategic Studies, or approved equivalents;
- iii. 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third year of study;
- iv. 12 units of credit for elective courses at Upper Level.
- c). 120 units of credit for one major from a Science discipline area, one major from an Arts discipline area, and one minor from a Science discipline area; and –
  - i. 12 units of credit for elective courses at Level I, chosen from a Science discipline area;
  - ii. 12 units of credit for Directed Studies courses, including ZBUS2801 Leadership and Management and ZHSS2002 Introduction to Strategic Studies, or approved equivalents.
- 3.2 No more than 48 units of credit may be gained for Level I courses.
- 3.3 36 units of credit for Level I courses must be from Science discipline areas.

#### 4.0 Special Rules

- 4.1 Students who complete a major or a minor in Management, which includes ZBUS1101 and ZBUS2302, must substitute 6 units of credit of upper-level elective courses for the ZBUS2801 Leadership and Management requirement.
- 4.2 Students who complete a major or a minor in Management, which includes ZBUS1101 but not ZBUS2302, are required to complete ZBUS2802. Such students cannot include ZBUS2801 or ZBUS2803 in their degree.
- 4.3 Students who include ZHSS2002 An Introduction to Strategic Studies as part of a minor or major in either History or Politics are required to take 6 units of credit of upper-level elective courses in place of the Directed Studies requirement set out in rule 3.1 above.

## Honours

Rules governing the award of the degree of Bachelor of Science with Honours

### 5.0 Entry

- 5.1 To enrol for the award of the degree at Honours level in one or two specialisations, a student must –
  - a). complete the pass-degree program requirements; or –
  - b). gain an approved award from elsewhere; and –
  - c). have achieved at least a credit average (65) across the entire undergraduate program including a credit average over the Level III courses in a major sequence which is in the same discipline area as the proposed Honours program.

### 6.0 Degree Requirements

- 6.1 A student must obtain, normally over one year of study, a minimum of 48 units of credit in one or two areas of study approved by the Head of School.

### 7.0 Class of Honours

- 7.1 The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3).



### Sample Program:

The programs shown below are samples of those available under the rules for the BSc degree. They are intended to illustrate the operation of the degree rules, and to be a ready reference for degree structures, typical programs and the sorts of options available. Nothing in this chapter replaces or modifies any part of the degree rules.

This section should be read in conjunction with the rules governing the award of the degrees of Bachelor of Science.

NB: In Level I course selections students will need to select courses that are outside the discipline areas in which they build majors and minors. In the case of combination (b) of Rule 3.1, students will have to choose Level II or Level III courses to the value of 12UOC outside their major and minor sequences. These courses have been designated as “Electives” for the purposes of the diagrams.

### Option 1

#### Bachelor of Science

|        | Science<br>MAJOR   | Science<br>MINOR    | Arts or Science<br>MINOR | Electives       | General<br>Education | Directed<br>Studies | UOC |
|--------|--------------------|---------------------|--------------------------|-----------------|----------------------|---------------------|-----|
|        | <i>Mathematics</i> | <i>Oceanography</i> | <i>Physics</i>           | <i>Politics</i> |                      |                     |     |
| Year 1 | 12UOC              | 12UOC               | 12UOC                    | 12UOC           |                      |                     | 48  |
| Year 2 | 12UOC              | 12UOC               | 12UOC                    |                 | 6UOC                 | 6UOC                | 48  |
| Year 3 | 24UOC              |                     |                          | 12UOC           | 6UOC                 | 6UOC                | 48  |

### Option 2

#### Bachelor of Science

|        | Science<br>MAJOR | Science<br>MAJOR   |  | Electives                      | General<br>Education | Directed<br>Studies | UOC |
|--------|------------------|--------------------|--|--------------------------------|----------------------|---------------------|-----|
|        | <i>Chemistry</i> | <i>Mathematics</i> |  | <i>Physics &amp; Economics</i> |                      |                     |     |
| Year 1 | 12UOC            | 12UOC              |  | 24UOC                          |                      |                     | 48  |
| Year 2 | 12UOC            | 12UOC              |  |                                | 12UOC                | 12UOC               | 48  |
| Year 3 | 24UOC            | 24UOC              |  |                                |                      |                     | 48  |

### Option 3

#### Bachelor of Science

|        | Science<br>MAJOR    | Arts<br>MAJOR     | Science<br>MINOR    | Electives           |  | Directed<br>Studies | UOC |
|--------|---------------------|-------------------|---------------------|---------------------|--|---------------------|-----|
|        | <i>Computer Sc.</i> | <i>Management</i> | <i>Ops Research</i> | <i>Oceanography</i> |  |                     |     |
| Year 1 | 12UOC               | 12UOC             | 12UOC               | 12UOC               |  |                     | 48  |
| Year 2 | 12UOC               | 12UOC             | 12UOC               |                     |  | 12UOC               | 48  |
| Year 3 | 24UOC               | 24UOC             |                     |                     |  |                     | 48  |

## Majors and Minors – Science

### Chemistry

#### School of Physical, Environmental and Mathematical Sciences

Chemistry is a foundation science of civilisation and is central to modern technology and medicine. It began with early studies of medicine and metallurgy in many parts of the world, including Africa, Asia and Europe, and developed into its modern form after the European Renaissance. Australians have won six Nobel prizes in sciences to date, including a Nobel Prize for Chemistry won by Sir John Comforth in 1975. One Nobel Prize was one for Physics and led to major advances in chemistry, biology and materials science (W.H. Bragg, W.L. Bragg, 1915). The other three were won in Medicine and contained substantial chemical components (Florey, 1945, MacFarlane Burnett, 1960, Eccles, 1963, and Doherty, 1996).

Chemistry is science at the molecular level. Chemical science underpins defence technology at every level from lasers and high-speed computers to food science and energetic materials. Ordnance and Engineering are particular areas where ADFA Chemistry majors have found employment. A science or arts degree built around Chemistry courses is a solid basis for pursuing a balanced and liberal education.

The chemistry of materials is taught at UNSW@ADFA in support of the BE and BTech programs for Engineering, Technology and Aviation students. The contributions of Chemistry and chemists to the modern world are taught as part of the UNSW program of elective General Education courses for students of the Humanities and Social Sciences (BA), Engineering (BE) and Technology (BTech).

Chemistry is divided into several sub-fields. The School of PEMS has strengths in Physical and Theoretical Chemistry as well as Inorganic and Biological Chemistry. As well as teaching, academic staff carry out research in these fields. Fourth-year Honours and higher-degree-by-research (MSc, PhD) programs are available within a range of specified areas.

#### Plan Structure

##### Minor

**A minor sequence in Chemistry comprises:**  
**Two Level I courses**

- ZPEM1101 Chemistry 1A (6UOC) •
- ZPEM1102 Chemistry 1B (6UOC) ••

**plus 12 units of credit of Level II Chemistry courses:**

- ZPEM2101 Inorganic Chemistry 2 (3UOC) ••
- ZPEM2102 Organic Chemistry 2 (3UOC) •
- ZPEM2103 Physical Chemistry 2 (3UOC) ••
- ZPEM2109 Environmental Chemistry (3UOC) •

##### Major

**A major sequence in Chemistry comprises:**  
**Two Level I courses**

- ZPEM1101 Chemistry 1A (6UOC) •
- ZPEM1102 Chemistry 1B (6UOC) ••

**plus 12 units of credit of the following Level II Chemistry courses:**

- ZPEM2101 Inorganic Chemistry 2 (3UOC) ••
- ZPEM2102 Organic Chemistry 2 (3UOC) •
- ZPEM2103 Physical Chemistry 2 (3UOC) ••
- ZPEM2109 Environmental Chemistry (3UOC) •

**and 24 units of credit of Level III Chemistry courses:**

- ZPEM3121 Supramolecular Chemistry (6UOC) ••
- ZPEM3106 Biological Chemistry (6UOC) ••
- ZPEM3107 Explosives (6UOC) •
- ZPEM3103 Physical Chemistry 3 (6UOC) •

### Honours

ZPEM4101 *Honours Chemistry* is offered as part of the Degree of Bachelor of Science with Honours program. The course allows students to develop their own research program under the supervision of academic staff and hence to incorporate higher-level skills and a greater depth of scientific experience in their university studies. Such projects usually lead to new science and publication in scientific journals. Students nominate for selection through their respective Services in Session 2 of third-year studies at the Academy. UNSW@ADFA requires high achievement in the Chemistry components of the normal pass degree, with a credit average or higher at Level III and an overall credit average or better for the BSc program.

Prospective honours students are invited to discuss projects with the Head of School and academic staff early in their third year.

### Computer Science

#### Information Technology and Electrical Engineering

Computer Science is one of three disciplines of study offered in the field of Information Technology. The study of Computer Science is intimately linked with the study of the modern digital computer, its design, operational characteristics and control. Teaching is concentrated principally in the areas of algorithm specification, data structures, programming languages, operating systems, computer networks and artificial intelligence. The final year of the three-year program has a core concentration in software engineering, followed by project design and implementation. This third-year work is oriented strongly to Defence-related computing projects with direct Service input and guidance. Typical examples which have been undertaken include resource allocation studies for RAAF, system specification for the RAN Command Centre, war-gaming projects for Army, RAAF Staff College and for the ADF Warfare Centre.

#### Plan Structure

##### Minor

**A minor sequence in Computer Science comprises of two Level I courses:**

- ZITE1101 Introduction to Computer Science (6UOC) •
- ZITE1102 Programming Fundamentals (6UOC) ••

**and 2 specified Level II courses in Computer Science:**

- ZITE2103 Data Structures and Representation (6UOC) •
- ZITE2102 Computing Technology (6UOC) ••

##### Major

**A major sequence in Computer Science comprises of two Level I courses:**

- ZITE1101 Introduction to Computer Science (6UOC) •
- ZITE1102 Programming Fundamentals (6UOC) ••

**and 2 specified Level II courses in Computer Science:**

- ZITE2103 Data Structures and Representation (6UOC) •
- ZITE2102 Computer Technology (6UOC) ••

**plus specified Level III courses:**

- ZITE3110 Software Engineering (6UOC) •
- ZITE3113 Computer Languages and Algorithms (6UOC) x
- ZITE3101 Computing Project – Computer Science (6UOC) ••

**plus 6UOC comprising of one or two of the following electives:**

- ZITE3211 Microcomputer Interfacing (3UOC) •
- ZITE4204 Communications Networks (3UOC) ••
- ZITE4207 Digital Image Processing and Remote Sensing (3UOC) ••
- ZITE2401 Computer Tools for Decision Making (3UOC) ••
- ZITE3102 Cryptography (3UOC) x
- ZITE2402 Decision Analysis (3UOC) •

|          |   |
|----------|---|
| ZITE3104 | Electronic Commerce (3UOC) •                  |
| ZITE3105 | Human Computer Interaction (3UOC) •           |
| ZITE3106 | Interactive Computer Graphics (3UOC) ••       |
| ZITE3107 | Multimedia and Virtual Environments (3UOC) •• |
| ZITE3108 | Java Programming Applications (3UOC) ••       |
| ZITE3109 | Knowledge Based Systems (3UOC) x              |
| ZITE3404 | Simulation (3UOC) •                           |
| ZITE3111 | Special Topic (3UOC) •                        |
| ZITE3114 | Internetworking (3UOC) •                      |
| ZITE3115 | Systems and Network Administration (3UOC) •   |
| ZITE3116 | XML Technologies (3UOC) ••                    |

### Honours

Student wishing to take an Honours program in Computer Science need to take the full Computer Science major sequence as listed above. In their fourth year of study they undertake the following courses.

#### Full Time

|          |  |
|----------|--|
| ZITE4103 | Computer Science 4 (Honours) (48UOC – 24UOC a session for one year) • •• |
|----------|--|

#### Part Time

|          |  |
|----------|--|
| ZITE4104 | Computer Science 4 (Honours) (24UOC – 12UOC a session for one year) • •• |
|----------|--|

It is also possible to do a combined Honours program in Computer Science and another discipline. Students wishing to take such a combined Honours program need to take the full Computer Science major sequence as listed above. In their fourth year of study they undertake the following courses.

#### Full Time

|          |   |
|----------|---|
| ZITE4101 | Computer Science 4 (Combined Honours) (48UOC – 24UOC a session for one year) • •• |
|----------|---|

#### Part Time

|          |   |
|----------|---|
| ZITE4102 | Computer Science 4 (Combined Honours) (24UOC – 12UOC a session for one year) • •• |
|----------|---|

Students interested in taking an Honours program are advised to contact the School Office early in the year prior to the proposed Honours year.

## Geography

### School of Physical, Environmental and Mathematical Sciences

All Geography courses are available to both Arts and Science students. The School makes no distinction in curricula between students who are enrolled in the degrees of Bachelor of Arts and Bachelor of Science. Geography is the study of both the physical and human environments in which we live and the interactions between people and nature. Geography provides a bridge between the social and natural sciences. It provides students with the techniques to analyse our environment and society, including Geographic Information Systems and Remote Sensing.

### Plan Structure

#### Level I Geography

In both Level I courses an integrative approach is developed to the understanding of environmental processes and human activities that take place on the surface of the earth.

#### Level II Geography

In Level II Geography, students can begin to specialise in one of the systematic branches of the discipline, either human or physical geography, or alternatively they can select a mix of courses from these two branches as well as geographical techniques (Remote Sensing and Geographical Information Analysis) and area studies (Melanesia).

Potential honours students are encouraged to take more than 12UOC of Level II Geography.

### Level III Geography

While there is no specified assumed knowledge for Level III Geography courses, it is generally expected that students will have completed some Level II Geography before enrolling in Level III. Students who have not done this should discuss their intended enrolment with the Head of School.

### Minor

**A minor sequence in Geography comprises of two Level I courses:**

|          |  |
|----------|--|
| ZPEM1201 | Geography 1A: Introduction to Global Change (6UOC) • |
| ZPEM1202 | Geography 1B: Contemporary Global Change (6UOC) ••   |

**and 12 units of credit of Level II and/or Level III Geography courses (listed below).**

### Major

**A major sequence in Geography comprises of two Level I courses:**

|          |   |
|----------|---|
| ZPEM1201 | Geography 1A (Introduction to Global Change) (6UOC) • |
| ZPEM1202 | Contemporary Global Change (6UOC) ••                  |

**and 36 units of credit from the following Level II and/or Level III Geography courses.**

|          |  |
|----------|--|
| ZINT2505 | Custom and Change in Melanesia (6UOC) x                |
| ZPEM2202 | Ecological Biogeography (6UOC) •                       |
| ZPEM2203 | Fundamentals of Remote Sensing (3UOC) ••               |
| ZPEM2205 | Rivers and Coasts (6UOC) ••                            |
| ZPEM2206 | Remote Sensing: A Tool for Earth Observation (6UOC) •• |
| ZPEM2207 | Social Geography (6UOC) •                              |
| ZPEM2209 | Development and Change (6UOC) ••                       |
| ZPEM3202 | Cultural Geography (6UOC) ••                           |
| ZPEM3203 | Conservation Biogeography (6UOC) •                     |
| ZPEM3204 | Environmental Hazards (6UOC) •                         |
| ZPEM3207 | Making Decisions in Geography (6UOC) •                 |
| ZPEM3208 | Geographic Research Methods (6UOC) ••                  |
| ZPEM3209 | Water Matters (6UOC) ••                                |
| ZPEM3213 | Resource Management (6UOC) ••                          |
| ZPEM3215 | Transport Geography (6UOC) •                           |
| ZPEM3221 | Special Topics – Geography (6UOC) • ••                 |

To complete a major in Geography, students must complete at least one Level II course that includes a residential field school (such as ZPEM2202 *Ecological Biogeography* or ZPEM2207 *Social Geography*) and a Level III Geography course that includes the residential field school (such as ZPEM3208 *Geographic Research Methods*).

### Honours

Geography Honours is designed for students showing a special interest in and aptitude for work in the discipline and who satisfy the requirements for entry into either the degree of Bachelor of Arts with Honours or the degree of Bachelor of Science with Honours. The Honours program provides students with the opportunity to undertake a research project and to present their results in a thesis. Coursework in the form of seminars, lectures and assignments is also normally undertaken.

## Information Systems

### School of Information Technology and Electrical Engineering

Information Systems is one of three disciplines of study offered in the field of Information Technology. It can be studied as either an Arts or Science Discipline. The study of Information Systems concentrates on the application of computer systems to information processing and control. It is distinguished from Computer Science in that it accentuates the role of information in the service of management, and thus is interested in the analysis, design and implementation of systems rather than the computer

itself. A “systems view” is taken throughout, where the organisational context for an information system is stressed. In the first two years the teaching is principally in the areas of information analysis and the mastery of the tools and techniques used to model systems and then implement them. The final year of the three-year program has a core concentration in software project lifecycle management.

This third-year work is oriented strongly to Defence-related computing projects with direct Service input and guidance. Typical examples which have been undertaken include the analysis of computing support requirements, the design and implementation of various data and graphical applications, and the construction of Web sites and virtual environments.

## Plan Structure

### Minor

**A minor sequence in Information Systems comprises two Level I courses**

- ZITE1301 Introduction to Information Systems (6UOC) •  
ZITE1302 Information Systems in Organisations (6UOC) ••

**and 2 specified Level II courses in Information Systems:**

- ZITE2301 Design of Information Systems (6UOC) •  
ZITE2302 Operation of Information Systems (6UOC) ••

### Major

**A major sequence in Information Systems comprises two Level I courses:**

- ZITE1301 Introduction to Information Systems (6UOC) •  
ZITE1302 Information Systems in Organisations (6UOC) ••

**and 2 specified Level II courses in Information Systems:**

- ZITE2301 Design of Information Systems (6UOC) •  
ZITE2302 Operation of Information Systems (6UOC) ••

**plus 4 specified Level III courses:**

- ZITE3301 Applications of Information Systems (6UOC) •  
ZITE3302 Management of Work Systems (6UOC) •  
ZITE3303 Selection of Systems (6UOC) ••  
ZITE3304 Computing Project  
– Information Systems (6UOC) •••

### Honours

Students wishing to take an Honours program in Information Systems need to take the full Information Systems major sequence as listed above. In their fourth year of study they undertake the following courses.

#### Full Time

- ZITE4303 Information Systems 4 (Honours) (48UOC – 24 UOC a session for one year) •••

#### Part Time

- ZITE4304 Information Systems 4 (Honours) (24UOC – 12UOC a session for one year) •••

It is also possible to do a combined Honours program in Information Systems and another discipline. Students wishing to take such a combined Honours program need to take the full Information Systems major sequence as part of their undergraduate degree. In their fourth year of study they undertake the following courses.

#### Full Time

- ZITE4301 Information Systems 4 (Combined Honours) (48UOC – 24 UOC a session for one year) •••

#### Part Time

- ZITE4302 Information Systems 4 (Combined Honours) (24UOC – 12UOC a session for one year) •••

Students interested in taking an Honours program are advised to contact the School Office early in the year prior to the proposed Honours year.

## Operations Research

### School of Information Technology and Electrical Engineering

Operations Research is one of three disciplines of study offered in the field of Information Technology. Applying mathematical models to the solution of problems encountered by individuals, groups and organisations became a science during World War II and is now known as Operations Research or Management Science. The techniques developed were, after the war, modified and extended to be applicable in the civilian world, in areas such as banking, mining, the oil industry, transportation and many others. Today, the study of Operations Research and Management Science provides insight into decision making.

Study in Operations Research is only available as a minor sequence listed below.

## Plan Structure

### Minor

**A minor sequence in Operations Research comprises two Level I courses**

#### Either

- ZITE1101 Introduction to Computer Science (6UOC) •  
ZITE1102 Programming Fundamentals (6UOC) ••

#### or

- ZITE1301 Introduction to Information Systems (6UOC) •  
ZITE1302 Information Systems in Organisation (6UOC) ••

**plus 12UOC from the following Level II Information Technology courses:**

- ZITE2401 Computer Tools for Decision Making (3UOC) ••  
ZITE2402 Decision Analysis (3UOC) •  
ZITE2403 Management Science in Practice (3UOC) ••  
ZITE3404 Simulation (3UOC) •

**Students are also encouraged to take the following courses as electives in their degree:**

- ZPEM1301 Mathematics 1A (6UOC) •  
ZPEM1302 Mathematics 1B (6UOC) ••

### Honours

Honours is not currently available in Operations Research

## Mathematics

### School of Physical, Environmental and Mathematical Sciences

Mathematics teaches us how to define a problem with precision, how to break it up into a series of clearly defined steps and analyse it logically and how to assess the answer and its implications.

The skills developed when problems are defined and analysed in mathematics are universal and of value to anyone who has to face complex problems and make decisions.

Science and Technology are based on mathematical thinking and use the language of mathematics. The humanities as well as the natural sciences draw on the power of mathematics, particularly probability and statistics, to predict, plan and understand natural and human affairs. As society becomes increasingly dependent on technology, mathematics is becoming more of an essential tool in our lives.

## Plan Structure

The Level I courses build on high-school mathematics to give a broad introduction to the basic language and techniques of mathematics. Students who wish to major in other areas of Science are encouraged to take at least the Level I Mathematics courses. These are pre-requisites for the Level II Mathematics courses.



At Level II, ZPEM2301 *Linear Systems* builds on the basic concepts of linear algebra introduced in ZPEM1301 *Mathematics 1A* and looks at a variety of applications. ZPEM2304 *Discrete Dynamics* is the study of quantities that change at discrete points in time such as the size or genetic make-up of populations, while ZPEM2303 *Modelling Continuous Systems* shows how differential equations are used to describe aspects of the natural and artificial world.

The ZPEM2305 *Networks and Patterns* course provides an introduction to the mathematics of graphs and networks, looking at some of the key problems and applications.

Level III courses go into a variety of applications of mathematics and also delve into mathematical techniques in greater depth. Students wishing to obtain a major in Mathematics must complete at least 24 UOC at Level III.

### Minor

**A minor sequence in Mathematics and Statistics comprises two Level I courses:**

ZPEM1301 Mathematics 1A (6UOC) •

ZPEM1302 Mathematics 1B (6UOC) ••

**plus the following courses to make 12 UOC in Level II Mathematics courses.**

ZPEM2301 Linear Systems (3UOC) •

ZPEM2303 Modelling Continuous Systems (3UOC) ••

ZPEM2304 Discrete Dynamics (3UOC) •

ZPEM2305 Networks & Patterns (3UOC) ••

### Major

**A major sequence in Mathematics comprises of two Level I courses**

ZPEM1301 Mathematics 1A (6UOC) •

ZPEM1302 Mathematics 1B (6UOC) ••

**plus the following courses to make 12 UOC in Level II Mathematics courses**

ZPEM2301 Linear Systems (3UOC) •

ZPEM2303 Modelling Continuous Systems (3UOC) ••

ZPEM2304 Discrete Dynamics (3UOC) •

ZPEM2305 Networks & Patterns (3UOC) ••

**plus the following Level III courses to make a further 24UOC**

ZPEM3301 Applied Mathematical Techniques (3UOC) •

ZPEM3306 Fluid Mechanics (3UOC) ••

ZPEM3307 Waves (3UOC) ••

ZPEM3309 Elements of Optimisation (3UOC) ••

ZPEM3311 Mathematical Methods for Differential Equations (6UOC) •

ZPEM3320 Special Topic 3A (3UOC) •

ZPEM3321 Special Topic 3B (3UOC) ••

### Honours

A fourth, Honours, year is offered to students with talent and enthusiasm for mathematics. In an honours year, students use the mathematics they have learnt to pursue a research project, as well as undertaking further coursework.

## Oceanography

### School of Physical, Environmental and Mathematical Sciences

The study of Oceanography begins with Level I Marine Science and continues in second and third year with Level II and III Oceanography to develop a major or a minor. Level I Marine Science provides students with a broad introduction to the study of the oceans, including topics in ocean and atmosphere circulation, marine physics, chemistry, biology, ecology and geology. Level II and III Oceanography use physical and applied mathematical arguments to develop an understanding of physical phenomena that take place within the world's oceans. The emphasis in Level II and III Oceanography is placed on physical oceanography, including components covering marine acoustics and optics, marine chemistry or remote sensing.

Note: For students wishing to study Level II Oceanography, ZPEM1301 Mathematics 1A and ZPEM1302 Mathematics 1B are pre-requisites, as the courses require a basic understanding of algebraic manipulations and calculus.

### Plan Structure

#### Minor

**A minor sequence in Oceanography comprises: Two Level I courses**

ZPEM1401 Marine Science 1A (includes field school) (6UOC) •

ZPEM1402 Marine Science 1B (6UOC) ••

**Four Level II courses consisting of the three following courses**

ZPEM2401 Ocean Dynamics 2A (Includes field school) (3UOC) •

ZPEM2402 Ocean Dynamics 2B (3UOC) ••

ZPEM2507 Sonar and Underwater Optics (3UOC) ••

**Plus one of the following:**

ZPEM2111 Marine Chemistry 2 (3UOC) •

ZPEM2203 Fundamentals of Remote Sensing (3UOC) ••

#### Major

**A major sequence in Oceanography comprises of two Level I courses:**

ZPEM1401 Marine Science 1A (includes field school) (6UOC) •

ZPEM1402 Marine Science 1B (6UOC) ••

**Four Level II courses consisting of the three following courses**

ZPEM2401 Ocean Dynamics 2A (includes field school) (3UOC) •

ZPEM2402 Ocean Dynamics 2B (3UOC) ••

ZPEM2507 Sonar and Underwater Optics (3UOC) ••

**Plus one of the following:**

ZPEM2111 Marine Chemistry 2 (3UOC) •

ZPEM2203 Fundamentals of Remote Sensing (3UOC) ••

**plus 24 units of credit in Level III Oceanography courses.**

ZPEM3401 Ocean Circulation and Mixing (6UOC) •

ZPEM3402 Continental Shelf Dynamics (3UOC) ••

ZPEM3403 Oceanographic Data Acquisition and Analysis (3UOC) •

ZPEM3404 Internal Waves (3UOC) ••

ZPEM3405 Oceanography Research Report (3UOC) •

ZPEM3406 Regional Oceanography (3UOC) ••

ZPEM3407 Oceanography Research Project (3UOC) ••

### Honours

Oceanography Honours is designed for students showing a special interest and aptitude for work in the discipline and who satisfy the requirements for entry into the degree of Bachelor of Science with Honours. The Honours program provides students with the opportunity to undertake a research project and to present their results in a thesis. Coursework in the form of seminars, lectures and assignments is also normally undertaken.

## Physics

### School of Physical, Environmental and Mathematical Sciences

Physics is the systematic study of the basic properties of matter. Its scope ranges from elementary particles at one end of the size scale to galaxies, quasars and the universe itself at the other. It also encompasses some of the deepest scientific questions of the day and sustains a wealth of practical applications. The three-year major program covers key principles of physics and includes a comprehensive account of the physics of astronomy, meteorology and materials. It provides future ADF officers with the technical versatility and understanding necessary for them to employ and exploit the advanced technology at the core of modern defence systems and operations.

The Pass Program is constructed around four broad themes that between them span the field of physics:

- Space, Stars and the Universe
- Earth, Atmosphere and Oceans
- Remote Sensing and Surveillance
- Atoms, Matter and Modern Materials.

Threading through the Program, these themes provide a framework within which the student is introduced to the concepts of physics. In addition, they furnish practical examples and applications which reinforce and enhance understanding and display the value, utility and pervasive character of the principles of physics.

### Plan Structure

Level I Physics is structured primarily to lead into Level II Physics. However ZPEM1501 *Physics 1A* and ZPEM1502 *Physics 1B* are self-contained courses suitable for those Science and Arts candidates majoring in other fields of study. In addition, some of the Level II and Level III courses may be taken by students majoring in other fields of study provided that the School is satisfied that their background knowledge is appropriate.

Physics offers two electives for the General Education Program: ZGEN2401 *Astronomy*, and ZGEN2402 *Introductory Meteorology*. These courses are available to business, humanities and engineering students. ZGEN2401 *Astronomy* is available to BTech students.

### Minor

A minor sequence in Physics comprises in two Level I courses:

- ZPEM1501 *Physics 1A* (6UOC) •
- ZPEM1502 *Physics 1B* (6UOC) ••

plus 12 units of credit of Level II Physics courses as outlined below:

- ZPEM2501 *Electronic Properties of Materials* (3UOC) ••
- ZPEM2502 *Waves and Remote Sensing* (3UOC) •
- ZPEM2503 *Astronomy and Astrophysics* (3UOC) •
- ZPEM2506 *Meteorology and Atmospheric Physics* (3UOC) ••

### Major

A major sequence in Physics comprises if two Level I courses:

- ZPEM1501 *Physics 1A* (6UOC) •
- ZPEM1502 *Physics 1B* (6UOC) ••

plus 12 units of credit of Level II Physics courses as outlined below:

- ZPEM2501 *Electronic Properties of Materials* (3UOC) ••
- ZPEM2502 *Waves and Remote Sensing* (3UOC) •
- ZPEM2503 *Astronomy and Astrophysics* (3UOC) •
- ZPEM2506 *Meteorology and Atmospheric Physics* (3UOC) ••

plus 24 units of credit of Level III Physics courses as outlined below:

- ZPEM3501 *Atmospheric Dynamics* (3UOC) ••
- ZPEM3502 *Cosmology and Relativistic Astrophysics* (3UOC) •
- ZPEM3503 *Electromagnetic Remote Sensing* (3UOC) ••
- ZPEM3504 *Physics of Advanced Materials* (3UOC) •
- ZPEM3521 *Experimental Physics – Laboratory* (3UOC) •
- ZPEM3522 *Experimental Physics - Project* (3UOC) ••
- ZPEM3524 *Navigation and Guidance Physics* (3UOC) ••
- ZPEM3528 *Thermodynamics and Propulsion* (3UOC) •

### Honours

Students with a special interest and aptitude in Physics are encouraged to apply for an Honours program. Combined Honours programs extending across two disciplines are also possible, with proposals considered on a case-by-case basis. The standard for entry to all programs is typically a credit average or better.

The courses available within this Honours program are:

- ZPEM4501 *Physics 4 (Honours)* F/T (48UOC – 24 UOC a session for one year) • ••
- ZPEM4502 *Physics 4 (Honours)* P/T (24 UOC – 12 UOC a session for two years) • ••
- ZPEM4503 *Physics 4 (Combined Honours)* F/T (48UOC-24UOC a session for one year) • ••
- ZPEM4504 *Physics 4 (Combined Honours)* P/T (24UOC – 12 UOC a session for two years) • ••

All programs incorporate both coursework and a research project. In Combined Honours the research project is on a topic which incorporates both Physics and another discipline, and is jointly supervised and examined.

**Current course and  
program information  
is now available through the  
UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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# BACHELOR OF BUSINESS

## School of Business

**Award/s:** 4405 – Bachelor of Business and Bachelor of Business (Honours) (BBus and BBus (Hons))

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

## Program Description:

The degree has been introduced to enhance business acumen among future leaders and managers in the Australian Defence Organisation and to provide them with the capacity to interact effectively with external business providers. It aims to lay solid foundations in communication, numeracy and general problem solving capabilities developed within a specifically business-oriented context of study and to build students' knowledge in a diverse range of areas associated with organisational management and leadership.

## Program Objectives and Learning Outcomes:

Students taking this degree will become familiar with bodies of knowledge and develop graduate attributes which will give them a strengthened capacity to manage Defence business throughout their Service careers.

The degree structure reflects the diversity of knowledge and skills which contribute to the study and analysis of business issues, a focus on what are regarded as core business capabilities, the recognition that a business education requires integration among its parts and an acknowledgement that business managers and leaders benefit from exposure to thinking outside purely business-related areas.

## Program Structure:

The degree balances business-related courses to other broader study in a ratio of 2:1. Within the business-related component of the degree, all students are required to complete a core of ten (6UOC) courses, four in first year and six at the upper-level (Years 2 and 3). A spine of three, session-length integrating courses runs through the core, providing students with problem-solving, analytical and general management skills embedded in a business context.

In addition to core courses, students take six (6UOC) business-related electives, some of which are offered by Schools other than the School of Business. In some discipline areas (Economics and Information Systems are possible examples) students may be able to take as many courses within the BBus as they could if undertaking a major in the BA or BSc, thus enabling them to achieve a particular "flavour" within the degree.

The first year of the BBus comprises the "foundation core": four session-length courses (Introduction to Accounting and Finance, Introduction to Economics, Organisational Behaviour and Integrating Core 1). Students must complete all four pre-requisite courses before proceeding to upper-level study (including Production, Prices and Trade) in the BBus.

All courses offered in the BBus have a standard value of 6UOC, except for General Education courses which have a value of 3UOC each.

**(a) Core business-related courses, 60UOC: all mandatory for BBus students**

### Level I courses

- ZBUS1101 Organisational Behaviour (6UOC) ••
- ZBUS1102 Introduction to Economics (6UOC) ••
- ZBUS1103 Introduction to Accounting and Finance (6UOC) •
- ZBUS1104 Integrating Core 1 (6UOC) •

### Upper-level courses

- ZBUS2101 Business Law (6UOC) •
- ZBUS2103 Human Resource Management (6UOC) ••
- ZBUS2102 Project Management (6UOC) •
- ZBUS2104 Integrating Core 2 (6UOC) •
- ZBUS3104 Integrating Core 3 (6UOC) ••
- ZITE2001 Managing Information Systems (6UOC) ••

**(b) Business-related electives, 36UOC: students may choose any six from the following upper-level courses**

- ZBUS2303 Logistics Management (6UOC) ••
- ZBUS2302 Leadership (6UOC) •
- ZBUS2401 Finance (6UOC) ••
- ZBUS2301 Management Accounting (6UOC) ••
- ZITE3303 Selection of Systems (6UOC) ••

If a student completes the course

- ZBUS2200 Production, Prices and Trade (6UOC) •

as an elective, the following electives may be taken subsequently.

- ZBUS2202 Growth and Fluctuations in Open Economies (6UOC) ••
- ZBUS2203 The Making of Economic Policy (6UOC) ••
- ZBUS2204 Asia-Pacific Economic Development (6UOC) •
- ZBUS2205 Applied Economics (6UOC) •

**(c) Other courses at Level 1, 24UOC**

**(d) General Education courses, 12UOC**

**(e) Directed Studies: Strategic Studies, 6UOC**

**(f) Non-business upper-level elective, 6UOC**

Note: students may, if sufficient appropriate courses are offered, choose Upper-Level electives to a value of up to 36UOC in a single discipline area such as economics or information systems, if Level 1 pre-requisites have been met.

## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Business take precedence over the Faculty Regulations for Undergraduate Students..

#### 2.0 Degree Rules Dictionary

- 2.1 "Level I" means courses at an introductory level, normally taken in Year 1.
- 2.2 "Upper Level" means courses at Level II and Level III, normally taken in Years 2 or 3.
- 2.3 "Business Core" means compulsory courses in the Bachelor of Business as listed in the Program Structure (see above section).
- 2.4 "Business Electives" means elective courses in the Bachelor of Business as listed in the Program Structure (see above section).

#### 3.0 Degree Requirements

- 3.1 To qualify for the degree of Bachelor of Business, a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 units of credit (normally 24 units in each full-time session), including:
  - (a) Level I courses totalling 48 units of credit, with 24 units chosen from Business Core courses;



- (b) Upper-Level Business Core courses totalling 36 units of credit;
  - (c) Business Electives totalling 36 units of credit;
  - (d) 12 units of credit of specified General Education courses;
  - (e) 6 units of credit for the Directed Studies course ZHSS2002 An Introduction to Strategic Studies;
  - (f) 6 units of credit taken from an Upper-Level course offered by a School other than the School of Business and which is not offered as a Business Elective.
- 3.2 No more than 12 units of credit may be gained from General Education courses, with none to be taken solely within the School of Business and a maximum of 6 units of credit to be taken in any one discipline area.
- 3.3 No more than 48 units of credit may be gained for Level I courses.
- 3.4 At least 84 units of credit must be taken from Upper-Level courses.

## Honours

### Rules governing the award of the degree of Bachelor of Business with Honours

#### 4.0 Entry

- 4.1 To enrol for the award of the degree at Honours level, a student must –
- a) complete the pass-degree program requirements; or
  - b) gain an approved award from elsewhere; and
  - c) a) have achieved at least a credit average (65) across the entire undergraduate program including a credit average over the Upper-Level courses.

#### 5.0 Degree Requirements

- 5.1 In addition to the degree requirements for the Bachelor of Business Pass Degree, students seeking to satisfy the requirements of the Bachelor of Business with Honours must obtain, normally over one year of study, a minimum of 48 units of credit in the School of Business and follow a program of study prescribed by the Head of School.

#### 6.0 Class of Honours

- 6.1 The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3).

| Year One           | Year Two                        | Year Three                              |
|--------------------|---------------------------------|---|
| 4 x 6UOC core      | 3 x 6UOC core                   | 3 x 6UOC core                           |
| Business courses   | Business courses                | Business courses                        |
| 4 x 6UOC non-      | 3 x 6UOC                        | 3 x 6UOC                                |
| Business electives | Business-related<br>electives   | Business<br>related electives           |
|                    | 2 x 3UOC                        | 2 x 3UOC                                |
|                    | General<br>Education<br>courses | General<br>Education<br>courses         |
|                    | 1 x 6UOC<br>Strategic Studies   | 1 x non-<br>Business elective<br>course |

# BACHELOR OF ENGINEERING IN AERONAUTICAL ENGINEERING

## School of Aerospace, Civil and Mechanical Engineering

**Award/s:** 4424 – Bachelor of Engineering (BE) in Aeronautical Engineering

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 192UOC

### Program Description:

Schools offering engineering degrees within UNSW@ADFA aim to provide outstanding engineering education to the future leaders of the Australian Defence Force and to pursue excellence through contributions to the engineering profession, industry and the community.

The BE program is of four years duration and the degree may be awarded as a pass or an honours degree. The engineering programs at UNSW@ADFA have been granted full accreditation by Engineers Australia.

All Engineering degrees lead to a Bachelor of Engineering degree, with the type of engineering specified.

First-Year engineering students enrol in separate programs in Aeronautical, Civil, Electrical or Mechanical Engineering. There is, however, considerable commonality in the first-year within the engineering programs. More than half of the first-year programs are devoted to mathematics, physics and computer science.

### Program Objectives and Learning Outcomes:

Aeronautical engineering is the study of the design, development, manufacture, maintenance and control of machines or vehicles operating in the earth's atmosphere or in outer space.

The design of a flight vehicle is quite complex and demands a knowledge of many engineering disciplines such as aerodynamics, propulsion systems, structural design, materials, avionics, and stability and control systems. Maintaining and operating a flight vehicle requires an understanding of materials, reliability and maintenance, structural analysis for necessary repairs, together with knowledge of the disciplines within the design process.

The Aeronautical Engineering program has been designed to meet the needs of the Australian Defence Force as Australia's largest aircraft operator and covers the design, and reliability and maintenance of fixed and rotary wing aircraft. Air Force BE(Aero) graduates may be involved in the operation and maintenance of aircraft and then become responsible for the airworthiness and modification of aircraft and engines, or the acquisition and introduction of new equipment into the Service. Army BE(Aero) graduates are most likely to be involved in the maintenance and repair of the Army's rapidly growing fleet of fixed wing and rotary wing aircraft. Navy BE(Aero) graduates are required for maintenance and repair, modifications, operational deployments and airworthiness of Navy's fleet of rotary wing aircraft.

The BE program in Aeronautical Engineering is firmly based on mathematics and the physical sciences in Year 1 and the engineering sciences in Year 2, leading into an engineering approach to analysis, design and operation in the later years. The major streams of the course are aerodynamics, stability and control, structures, materials, airworthiness, design, and management.

Students are encouraged to develop resourceful and innovative attitudes throughout the course especially in their final year thesis. A number of elective courses are available in the final year. Electives may be selected from courses offered in other schools, subject to the approval of the Heads of Schools concerned.

### Program Structure:

The Bachelor of Engineering degrees require a prescribed program structure as determined by the engineering program chosen. Descriptions of the courses which comprise the degree program are given in the Course Catalogue section of this Handbook. Specialisation in Aeronautical Engineering increases as the degree program progresses. At the final year level, thesis projects and elective courses are offered permitting further specialisation in particular areas.

### Academic Rules:

#### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the *Faculty Regulations for Undergraduate Students*.

#### 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Engineering shall be conferred as a pass degree or as an Honours degree. Honours may be awarded in the following categories:
- Honours Class I
  - Honours Class II, Division I
  - Honours Class II, Division II
- 2.2 To qualify for the degree of Bachelor of Engineering, a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).
- 2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

#### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

### Sample Program:

#### First-Year Program

- ZACM1010 Engineering Graphical Communications 3 ••
- ZACM1020 Statics (3UOC) •
- ZACM1040 Dynamics (3UOC) ••
- ZACM1050 Introduction to Aeronautical Engineering & Workshop Practice (3UOC) •
- ZACM1051 Introduction to Flight (3UOC) ••
- ZINT1001 Engineering Computational Methods 1 (3UOC) •
- ZITE1001 Computer Tools for Engineers (3UOC) ••
- ZPEM1103 Engineering Chemistry 1A (3UOC) •
- ZPEM1303 Engineering Mathematics 1A (6UOC) •
- ZPEM1304 Engineering Mathematics 1B (6UOC) ••
- ZPEM1503 Engineering Physics 1A (6UOC) •
- ZPEM1504 Engineering Physics 1B (6UOC) ••

#### Second-Year Program

- One General Education Course (3UOC) • ••
- ZACM2010 Design 1 (3UOC) •
- ZACM2020 Materials Science (3UOC) •
- ZACM2021 Mechanics of Solids A (3UOC) •
- ZACM2022 Mechanics of Solids B (3UOC) ••
- ZACM2030 Thermofluids (6UOC) •
- ZACM2031 Thermodynamic Cycles (3UOC) ••
- ZACM2032 Real and Inviscid Flows (3UOC) ••
- ZACM2040 Aircraft Performance and Stability (3UOC) ••
- ZACM2041 Introduction to Vibration (3UOC) ••
- ZITE2002 Principles of Electrical & Electronics Technology (3UOC) •
- ZPEM2309 Engineering Mathematics 2A (6UOC) •
- ZPEM2310 Engineering Mathematics 2B (6UOC) ••

#### Third-Year Program

- Two General Education Courses (6UOC) • ••
- ZACM3010 Aircraft Design 2 (3UOC) ••
- ZACM3011 Component Design (3UOC) •
- ZACM3020 Engineering Materials (3UOC) •
- ZACM3021 Structural Mechanics 1 (3UOC) •
- ZACM3030 Gas Turbines (3UOC) •
- ZACM3031 Subsonic Finite Wing (3UOC) •
- ZACM3032 Rotary Wing Aerodynamics (3UOC) ••
- ZACM3040 Flight Dynamics & Control (3UOC) ••
- ZACM3041 Introduction to Control (3UOC) •
- ZACM3060 Engineering Management 1 (3UOC) ••
- ZACM3433 Compressible Flow (3UOC) ••
- ZHSS2002 An Introduction to Strategic Studies (6UOC) • ••
- ZINT3001 Aircraft Systems & Avionics (3UOC) ••

#### Final-Year Program

- One General Education Course (3UOC) • ••
- ZACM4010 Aircraft Design 3 (3UOC) •
- ZACM4011 Aircraft Design 4 (3UOC) ••
- ZACM4020 Computational Structures (3UOC) •
- ZACM4021 Structural Mechanics 2 (3UOC) ••
- Three Electives (9UOC) • ••
- ZACM4030 Heat Transfer (3UOC) •
- ZACM4051 Maintenance, Management and Repair (3UOC) •
- ZINT4001 Systems Engineering & Risk Management (3UOC) •
- ZACM4050 Aeronautical Engineering: Project Thesis & Practical Experience\* (15UOC – 6UOC S1 & 9UOC S2) • ••

\* See Rule 6 of the BE Degree Rules

#### Elective Courses

- ZACM4911 Control Theory (3UOC) ••
- ZACM4918 Missile Design (3UOC) •
- ZACM4927 Rotocraft Performance (3UOC) •
- ZACM4900 Acoustic Noise (3UOC) ••
- ZACM4920 Non-Destructive Inspection (3UOC) ••
- ZACM4928 Adv Rotocraft Engineering (3UOC) ••
- ZACM4921 Occasional Elective 1 (3UOC) • ••
- ZITE4222 Systems Engineering (3UOC) ••
- ZACM4927 Rotocraft Performance (3UOC) •
- ZITE4207 Digital Image Processing & Remote Sensing (3UOC) ••
- ZACM4260 Engineering Management 2A (3UOC) ••
- ZACM4922 Occasional Elective 2 •
- ZPEM3527 Atmospheric Systems and Meteorology (3UOC) •

# BACHELOR OF ENGINEERING IN CIVIL ENGINEERING

**School of Aerospace, Civil and Mechanical Engineering**

**Award/s:** 4421 – Bachelor of Engineering (BE) in Civil Engineering

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 192UOC

## Program Description:

Schools offering engineering degrees within UNSW@ADFA aim to provide outstanding engineering education to the future leaders of the Australian Defence Force and to pursue excellence through contributions to the engineering profession, industry and the community.

The BE program is of four years duration, and the degree may be awarded as a pass or an honours degree. The engineering programs at UNSW@ADFA have been granted full accreditation by Engineers Australia.

All Engineering degrees lead to a Bachelor of Engineering degree, with the type of engineering specified.

First-year engineering students enrol in separate programs in Aeronautical, Civil, Electrical or Mechanical Engineering. There is, however, considerable commonality in the first year within the engineering programs. More than half of the programs are devoted to mathematics, physics and computer science.

## Program Objectives and Learning Outcomes:

Civil Engineering takes its name from the division of engineering in the Middle Ages between military and civilian works. The profession of civil engineering was recognised by the formation of the Institution of Civil Engineers (UK) in 1825. In the 19th Century, the broadening scope of engineering led to the division of civilian engineering into civil, mechanical and electrical, with further specialisations (aeronautical, chemical, industrial, materials, electronic etc) having developed in the 20th Century.

After contracting its sphere of interest over a long period of time, civil engineering is now broadening its scope with the recognition of the wider implications of its effects on modern society. Attention is given both to the interaction between civil engineering and other disciplines and to the effect of civil engineering works on the environment. Present day civil engineering has maintained strong commonality with military engineering - the design and construction of facilities such as roads, bridges, airfields, buildings, water supply and waste treatment facilities, structures of all types, and the associated planning and management of projects.

Students participate in field trips and visits to a number of engineering sites in the region as well as construction and workshop activities. The Engineering Surveying course includes a field experience with various surveying techniques and applications. All students are required to gain experience in a professional engineering organisation before their final year of study.

A Civil Engineer in the ADF may be employed in the Royal Australian Engineers Corps of the Australian Army or as an Airfield Engineering Officer in the RAAF. The degree will provide graduates with professional engineering design, construction and management skills on a broad spectrum of engineering tasks required by the Australian Defence Force. Graduates will also develop enhanced planning and decision making skills and technical expertise to provide guidance to superiors and direction to subordinates, as required of Service officers.

The Bachelor of Engineering degrees require a prescribed program structure as determined by the engineering program chosen. The BE program in Civil Engineering is firmly based on mathematics and the physical sciences in Year 1 and the engineering sciences in Year 2, leading into an engineering approach to analysis and design and engineering management in the later years. The major streams of the course are structural engineering, materials engineering, geotechnical engineering, water engineering, environmental engineering, engineering surveying, the construction of civil engineering works, transport engineering, and the management of engineering projects.

Students are encouraged to develop resourceful and innovative attitudes throughout the course, especially in their final year thesis or integrated design activities. A number of elective courses are available in the final year. Electives may be selected from courses offered in other schools subject to the approval of the Heads of Schools concerned.

The Civil Engineering degree program leads to the Bachelor of Engineering degree, and Pass and Honours classifications are determined at the conclusion of the course.

## Program Structure:

Descriptions of the courses which comprise the degree program are given in the Course Catalogue section of this Handbook. Specialisation in Civil Engineering increases as the degree program progresses.

The Practical Experience component of Thesis/Integrated Design should be completed before the start of Session 1 in the final year.

## Academic Rules:

### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the Faculty Regulations for Undergraduate Students.

### 2.0 Degree Requirements

2.1 The degree of Bachelor of Engineering shall be conferred as a pass degree or as an honours degree. Honours may be awarded in the following categories:

Honours Class I  
Honours Class II, Division I  
Honours Class II, Division II

2.2 To qualify for the degree of Bachelor of Engineering, a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).

2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.

2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.

2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.



### 3.0 Practical Experience Requirements

3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

#### Program:

##### First-Year Program

ZACM1010 Engineering Graphical Communications (3UOC) • •  
 ZACM1020 Statics (3UOC) •  
 ZACM1040 Dynamics (3UOC) • •  
 ZACM1250 Civil Engineering Practice (3UOC) •  
 ZINT1001 Engineering Computational Methods 1 (3UOC) • •  
 ZITE1001 Computer Tools for Engineers (3UOC) •  
 ZPEM1103 Engineering Chemistry 1A (3UOC) •  
 ZPEM1104 Engineering Chemistry 1B (3UOC) • •  
 ZPEM1303 Engineering Mathematics 1A (6UOC) •  
 ZPEM1304 Engineering Mathematics 1B (6UOC) • •  
 ZPEM1503 Engineering Physics 1A (6UOC) •  
 ZPEM1504 Engineering Physics 1B (6UOC) • •

##### Second-Year Program

Two General Education Courses (3UOC) (3UOC) • •  
 ZACM2020 Materials Science (3UOC) •  
 ZACM2021 Mechanics of Solids A (3UOC) •  
 ZACM2022 Mechanics of Solids B (3UOC) • •  
 ZACM2030 Thermofluids (6UOC) •  
 ZACM2211 Engineering Surveying (3UOC) •  
 ZACM2221 Geotechnical Engineering and Engineering Construction (6UOC) • •  
 ZACM2230 Fluid Engineering (3UOC) • •  
 ZACM2250 Environmental Engineering Fundamentals (3UOC) • •  
 ZPEM2309 Engineering Mathematics 2A (6UOC) •  
 ZPEM2310 Engineering Mathematics 2B (6UOC) • •

### Third-Year Program

Two General Education Courses (6UOC) • • •  
 ZACM3060 Engineering Management 1 (3UOC) • •  
 ZACM3210 Structural Design 1A (3UOC) •  
 ZACM3211 Structural Design 1B (3UOC) • •  
 ZACM3212 Environmental Engineering Applications (3UOC) • •  
 ZACM3213 Geometric Design of Transport Systems (3UOC) •  
 ZACM3220 Civil Engineering Materials A (3UOC) •  
 ZACM3221 Civil Engineering Materials B (3UOC) • •  
 ZACM3222 Geotechnical Engineering 2A (3UOC) •  
 ZACM3223 Geotechnical Engineering 2B (3UOC) • •  
 ZACM3224 Structural Analysis 1A (3UOC) •  
 ZACM3225 Structural Analysis 1B (3UOC) • •  
 ZACM3230 Hydraulics (3UOC) •  
 ZHSS2002 Introduction to Strategic Studies (6UOC) • • •

### Final-Year Program

ZACM4210 Structural Design 2A (3UOC) •  
 ZACM4211 Structural Design 2B (3UOC) •  
 ZACM4220 Pavement Engineering (3UOC) •  
 ZACM4223 Geotechnical Eng 3 (3UOC) •  
 ZACM4224 Structural Analysis 2 (3UOC) •  
 ZACM4231 Water Resources (3UOC) • •  
 ZACM4250 Environmental Engineering Practice (3UOC) • •  
 ZACM4252 Thesis and Seminar & Practical Experience\*  
 (15UOC – 6UOC S1 & 9UOC S2) • • •  
 ZACM4253 Integrated Design & Practical Experience\*  
 (12UOC – 3UOC S1 & 9UOC S2) • • •  
 ZACM4260 Engineering Management 2A (3UOC) • •  
 ZACM4261 Engineering Management 2B (3UOC) •  
 Electives 3 at 3 units of credit each  
 (3UOC S1 & 6UOC S2) • • •

\* See Rule 3 of the BE Degree Rules.

### Elective Courses

ZACM4905 Blast Design (3UOC) • •  
 ZACM4900 Acoustic Noise (3UOC) • •  
 ZACM4915 Geosynthetics (3UOC) •  
 ZACM4920 Non-Destructive Inspection (3UOC) • •  
 ZACM4921 Occasional Elective I (3UOC) • • •  
 ZITE4207 Digital Image Processing & Remote Sensing (3UOC) • •  
 ZITE4222 Systems Engineering (3UOC) • •  
 ZPEM3527 Atmospheric Physics & Meteorology (3UOC) •

## Defence-Funded Postgraduate Studies at ADFA...

# Gain a free postgraduate degree!

**Applications are now being taken from Defence personnel interested in gaining a postgraduate award from the University of New South Wales for Free!**

UNSW@ADFA is a campus of the University of New South Wales that is committed to providing postgraduate degrees for both ADF and Defence APS personnel (including Reserve Force Members on continuous full time service).

**Areas of study include: Arts | Defence Studies | Engineering Science | Information Technology | Management | Science**

Study can be undertaken by distance or on campus modes.

No return of service is applied to Defence personnel gaining a Defence funded postgraduate award at ADFA, and an undergraduate degree is not always necessary depending on whether you have relevant work experience or academic/professional qualifications.

For further information on gaining a free postgraduate degree, visit [http://intranet.defence.gov.au/det/pg\\_adfa/](http://intranet.defence.gov.au/det/pg_adfa/) or contact Lisa Wallace on 02 6266 0357 or email [pgstudy@defence.adc.edu.au](mailto:pgstudy@defence.adc.edu.au)

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# BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING

## School of Information Technology and Electrical Engineering

**Award/s:** 4422 – Bachelor of Engineering (BE) in Electrical Engineering

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 192UOC

### Program Description:

The aim of the schools offering engineering degrees within The University of New South Wales at the Australian Defence Force Academy is to provide an outstanding engineering education to future leaders in the Australian Defence Force and to pursue excellence through contributions to research, the profession, industry and the community.

The BE program is of four years duration, and the degree may be awarded as a pass or an honours degree. The engineering programs have been granted full accreditation by the Engineers Australia and in addition the Electrical Engineering program has been recognised by the Institute of Electrical and Electronics Engineers.

All Engineering degrees lead to a Bachelor of Engineering degree, with the type of engineering specified.

First-Year engineering students enrol in separate programs in Aeronautical, Civil, Electrical or Mechanical Engineering. There is, however, considerable commonality in the first year within the engineering programs. More than half of the programs are devoted to mathematics, physics and computer science.

### Program Objectives and Learning Outcomes:

The BE course in Electrical Engineering is built on a foundation of mathematics, computing science and physical science. A small component of electrical engineering is introduced in the first year, with progressively larger components in second and third year. The final year is devoted exclusively to electrical engineering courses. Each year of the program comprises a number of discipline-based courses and courses taught by other discipline areas. Apart from the general education courses the first three years of the program are common for all electrical engineering students. In the final year students have the option to specialise in areas such as communications, surveillance and radar, computer engineering and guided weapons electronics.

The Electrical Engineer in the Navy is known as a WEO – a Weapons Electrical Officer, and is responsible for electronic systems associated with gun and missile control systems, navigation systems, air and ground communications, radar and sonar systems and data systems. WEOs are not only responsible for technical matters but are a vital link in management: they may become involved also in personnel, financial and resource management.

RAAF Electrical Engineers usually are employed to manage a wide variety of operations including the repair and maintenance of modern radar, navigation, communications and computing equipment. They may be posted to a squadron in charge of an avionics section, or to a development area working on technical problems associated with new equipment. As they gain experience they can be expected to be posted to one of the commands, usually as a project officer concerned with the management and funding of projects.

Army Electrical Engineers usually pursue a career either in the Royal Australian Corps of Signals or the Royal Australian Corps of Electrical and Mechanical Engineers. New graduates may be involved in such areas as the operation, management and repair of state-of-the-art communications equipment or the management of guided weapons systems, laser designation and range finding equipment and radar.

Electrical Engineering is one of the newer branches of engineering. It has its origin in the turning to practical use of the discoveries of Faraday, Ampere, Maxwell and a number of other eminent 19th century physicists. It has remained the most strongly science-oriented branch of engineering.

At first it had its major impact by providing the means for the generation, distribution and utilisation of electric power. However, while this remains an important sub-area of the whole discipline, the last few decades particularly have seen a rapid and extensive diversification into the fields of computers and control as well as electronics and communications, and beyond them into such areas as biology, medicine and space technology. It is now true to say that there are very few areas of civilised activity that have remained untouched by the ideas and products of modern electrical engineering. The absorption of recent scientific development has been very rapid and has demanded a fully developed scientific outlook on the part of electrical engineers for a proper understanding of the problems involved. Many devices, scarcely more than laboratory prototypes a decade ago, are now in widespread use as fully engineered hardware.

### Program Structure:

The Bachelor of Engineering degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses (identified by the prefix ZITE) and courses taught by other Schools within UNSW@ADFA. Completion of each year, thereby allowing progression to the next year, is normally achieved by satisfactory progress in each of the courses given in that year. At the discretion of the Head of School, students may be allowed to concurrently enrol in courses from more than one year of the program.

### Academic Rules:

#### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Requirements

2.1 The degree of Bachelor of Engineering shall be conferred as a pass degree or as an honours degree. Honours may be awarded in the following categories:

Honours Class I  
Honours Class II, Division I  
Honours Class II, Division II

2.2 To qualify for the degree of Bachelor of Engineering, a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).

2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.

- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

### Program Structure:

#### First-Year Program

- ZITE1101 Introduction to Computer Science (6UOC) •  
 ZITE1201 Circuits and Systems 1 (3UOC) •  
 ZITE1202 Digital Systems 1 (3UOC) •  
 ZITE1203 Digital Systems 2 (3UOC) ••  
 ZITE1204 Electronics 1 (3UOC) ••  
 ZITE1102 Programming Fundamentals (6UOC) ••  
 ZPEM1303 Engineering Mathematics 1A (6UOC) •  
 ZPEM1304 Engineering Mathematics 1B (6UOC) ••  
 ZPEM1505 Electrical Engineering Physics 1A (6UOC) •  
 ZPEM1506 Electrical Engineering Physics 1B (6UOC) ••

#### Second-Year Program

- ZHSS2002 An Introduction to Strategic Studies (6UOC) • ••  
 ZITE2201 Advanced Programming for Engineers (6UOC) •  
 ZITE2202 Circuits and Systems 2 (3UOC) •  
 ZITE2203 Digital Systems 3 (3UOC) ••  
 ZITE2204 Electronics 2 (3UOC) •  
 ZITE2205 Electronics Design Laboratory 1 (3UOC) •  
 ZITE2206 Signals and Systems (3UOC) ••  
 ZPEM2309 Engineering Mathematics 2A (6UOC) •  
 ZPEM2310 Engineering Mathematics 2B (6UOC) ••  
 ZPEM2510 Electrical Engineering Physics 2 (3UOC) ••  
 Two General Education courses (3UOC each) • ••

#### Third-Year Program

- ZACM3060 Engineering Management 1 (3UOC) ••  
 ZITE3201 Analogue Communications (3UOC) •  
 ZITE3202 Control Theory 1 (3UOC) •  
 ZITE3203 Control Theory 2 (3UOC) ••  
 ZITE3204 Digital Communications (3UOC) ••  
 ZITE3205 Electrical Power and Machines (3UOC) •  
 ZITE3206 Electronics 3 (3UOC) •

- ZITE3207 Electronics Design Laboratory 2 (3UOC) ••  
 ZITE3208 Engineering Electromagnetics 1 (3UOC) •  
 ZITE3209 Engineering Electromagnetics 2 (3UOC) ••  
 ZITE3210 Management Science E (3UOC) •  
 ZITE3211 Microcomputer Interfacing (3UOC) •  
 ZITE3212 Optoelectronic Techniques (3UOC) ••  
 ZITE3214 Power Electronics and Electrical Drives (3UOC) ••  
 General Education courses (3UOC each) • ••

### Final-Year Program

- ZITE4222 Systems Engineering (3UOC) ••  
 ZITE4299 Electrical Engineering: • ••  
 Project, Thesis  
 Laboratory Work,  
 Practical Experience  
 and Specialist Lectures (12UOC)  
 ZITE4299 Electrical Engineering: • ••  
 Project, Thesis  
 Laboratory Work,  
 Practical Experience  
 and Specialist Lectures (12UOC)

Students taking the final year Electrical Engineering program will select a further seven courses from the following list, subject to the approval of the Head of the School, to make a balanced program. Students will not normally be allowed to take courses from other schools as part of their final year program.

- ZITE4201 Advanced Communication Techniques (3UOC) x  
 ZITE4202 Antennas and Propagation (3UOC) x  
 ZITE4203 Avionics and Navigational Aids (3UOC) •  
 ZITE4204 Communications Networks (3UOC) ••  
 ZITE4205 Communications Systems (3UOC) •  
 ZITE4207 Digital Image Processing & Remote Sensing (3UOC) ••  
 ZITE4208 Digital Signal Processing (3UOC) •  
 ZITE4210 Guided Weapons Electronics (3UOC) ••  
 ZITE4211 Image and Video Transmission Systems (3UOC) •  
 ZITE4212 Introduction to Radar & Radar Imaging (3UOC) ••  
 ZITE4213 Lasers and Laser Applications (3UOC) •  
 ZITE4215 Occasional Option 1  
 (Underwater Communications) (3UOC) ••  
 ZITE4216 Occasional Option 2 (3UOC) •  
 ZITE4217 Occasional Option 3 (3UOC) •  
 ZITE4218 Occasional Option 4 (3UOC) ••  
 ZITE4222 Systems Engineering (3UOC) ••  
 ZITE3107 Multimedia & Virtual Environments ••  
 ZITE4206 Computer Control Theory ••  
 ZITE4209 Electronics 4 •  
 ZITE4214 Modelling and Simulation x  
 ZITE4219 Power Systems x  
 ZITE4220 Robotics & Mechanical Systems ••  
 ZITE4221 Software Engineering: Principles and Practice x

**Students may also complete one of the following courses:**

- ZITE3102 Cryptography (3UOC) x  
 ZITE3105 Human Computer Interaction (3UOC) •  
 ZITE3106 Interactive Computer Graphics (3UOC) ••  
 ZITE3108 Java Programming Applications (3UOC) ••

# BACHELOR OF ENGINEERING IN MECHANICAL ENGINEERING

## School of Aerospace, Civil and Mechanical Engineering

**Award/s:** 4423 – Bachelor of Engineering (BE) in Mechanical Engineering

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 192UOC

### Program Description:

Schools offering engineering degrees within UNSW@ADFA aim to provide outstanding engineering education to the future leaders of the Australian Defence Force and to pursue excellence through contributions to the engineering profession, industry and the community.

The BE program is of four years duration, and the degree may be awarded as a pass or an honours degree. The engineering programs at UNSW@ADFA have been granted full accreditation by Engineers Australia.

All Engineering degrees lead to a Bachelor of Engineering degree, with the type of engineering specified.

First-Year engineering students enrol in separate programs in Aeronautical, Civil, Electrical or Mechanical Engineering. There is, however, considerable commonality in the first year within the engineering programs. More than half of the first-year programs are devoted to mathematics, physics and computer science.

### Program Objectives and Learning Outcomes:

Mechanical Engineering is the branch of engineering that is concerned with machines and the production of power, and particularly with forces and motion. It became a separate branch of engineering in the early 1800s, when steam power began to be used in manufacture and transportation.

‘One can identify four functions that are common to all branches of mechanical engineering.

The first is the understanding of and dealing with the bases of mechanical science. These include dynamics, concerning the relationship between forces and motion, such as vibration; automatic control; thermodynamics, dealing with the relations among the various forms of heat, energy, and power; fluid flow; heat transfer; lubrication; and properties of materials.

Second is the sequence of research, design, and development. This function attempts to bring about the changes necessary to meet present and future needs. Such work requires not only a clear understanding of mechanical science and an ability to analyse a complex system into its basic factors, but also the originality to synthesise and invent.

Third is production of products and power, which embraces planning, operation and maintenance. The goal is to produce the maximum value with the minimum investment and cost while maintaining or enhancing longer term viability of the enterprise or the institution.

Fourth is the co-ordinating function of the mechanical engineer, including management, consulting and, in some cases marketing.

In all of these functions there is a long continuing trend towards the use of scientific instead of traditional or intuitive methods. Operations research, value engineering and reliability centred maintenance are typical titles of such new rationalised approaches. Creativity, however, cannot be rationalised.

The ability to take the important and unexpected step that opens up new solutions remains in mechanical engineering, as elsewhere, largely a personal and spontaneous characteristic’.

(The above description was adapted from the Encyclopaedia Britannica).

Army BE(Mech) graduates can expect to be posted to the Royal Australian Electrical and Mechanical Engineers (RAEME), Armour, or Infantry Corps. Typically they will work in workshops, or headquarters or on equipment procurement in the Materiel Branch. Navy BE(Mech) graduates will undertake courses to enhance their professional development as Naval officers and Marine Engineers before taking up postings at sea or ashore.

The BE program in Mechanical Engineering is firmly based on mathematics and the physical sciences in Year 1 and the engineering sciences in Year 2, leading into an engineering approach to analysis, design and operation in the later years. The major streams of the course are dynamics, fluids, structures, materials and design.

Students are encouraged to develop resourceful and innovative attitudes throughout the course especially in their final year thesis. A number of elective courses are available in the final year. Electives may be selected from courses offered in other schools, subject to the approval of the Head of School concerned.

### Program Structure:

The Bachelor of Engineering degrees require a prescribed program structure as determined by the engineering program chosen. Descriptions of the courses which comprise the degree program are in the Course Catalogue section of this Handbook. Specialisation in Mechanical Engineering increases as the degree program progresses. At the final year level, thesis projects and elective courses are offered permitting further specialisation in particular areas.

During the first and second years of the program, students may go on appropriate industrial visits.

### Academic Rules:

#### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Requirements

2.1 The degree of Bachelor of Engineering shall be conferred as a pass degree or as an honours degree. Honours may be awarded in the following categories:

Honours Class I  
Honours Class II, Division I  
Honours Class II, Division II

2.2 To qualify for the degree of Bachelor of Engineering, a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).

2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.

2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.



- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

### Program:

#### First-Year Program

- ZACM1010 Engineering Graphical Communications (3UOC) • •  
 ZACM1020 Statics (3UOC) •  
 ZACM1040 Dynamics (3UOC) • •  
 ZACM1450 Introduction to Profession of Mechanical Engineering & Workshop Practice (3UOC) •  
 ZINT1001 Engineering Computational Methods 1 (3UOC) • •  
 ZINT2504 Introduction to Electrical & Mechanical Engineering Plant (3UOC) • •  
 ZITE1001 Computer Tools for Engineers (3UOC) •  
 ZPEM1103 Engineering Chemistry 1A (3UOC) •  
 ZPEM1303 Engineering Mathematics 1A (6UOC) •  
 ZPEM1304 Engineering Mathematics 1B (6UOC) • •  
 ZPEM1503 Engineering Physics 1A (6UOC) •  
 ZPEM1504 Engineering Physics 1B (6UOC) • •

#### Second-Year Program

- One General Education Course (3UOC) • • •  
 ZACM2010 Design 1 (3UOC) •  
 ZACM2020 Materials Science (3UOC) •  
 ZACM2021 Mechanics of Solids A (3UOC) •  
 ZACM2022 Mechanics of Solids B (3UOC) • •  
 ZACM2030 Thermofluids (6UOC) •  
 ZACM2031 Thermodynamic Cycles (3UOC) • •

- ZACM2041 Introduction to Vibration (3UOC) • •  
 ZACM2230 Fluid Engineering (3UOC) • •  
 ZACM2440 Mechanics of Machines (3UOC) • •  
 ZITE2002 Principles of Electrical and Electronics Technology (3UOC) •  
 ZPEM2309 Engineering Mathematics 2A (6UOC) •  
 ZPEM2310 Engineering Mathematics 2B (6UOC) • •

### Third-Year Program

- Three General Education Courses (3UOC each) • • •  
 Elective (One course worth 3UOC) • • •  
 ZACM3011 Component Design (3UOC) •  
 ZACM3020 Engineering Materials (3UOC) •  
 ZACM3021 Structural Mechanics 1 (3UOC) •  
 ZACM3030 Gas Turbines (3UOC) •  
 ZACM3041 Introduction to Control (3UOC) •  
 ZACM3060 Engineering Management 1 (3UOC) • •  
 ZACM3410 Design 2 (3UOC) • •  
 ZACM3430 Refrigeration (3UOC) • •  
 ZACM3431 Viscous Flows (3UOC) • •  
 ZACM3440 Dynamics of Mechanical Systems (3UOC) • •  
 ZHSS2002 An Introduction to Strategic Studies (6UOC) • • •

### Final-Year Program

- ZACM4020 Computational Structures (3UOC) •  
 ZACM4021 Structural Mechanics 2 (3UOC) • •  
 ZACM4030 Heat Transfer (3UOC) •  
 ZACM4051 Maintenance Management & Repair (3UOC) •  
 ZACM4410 Design 3 (3UOC) •  
 ZACM4411 Design 4 (3UOC) • •  
 ZACM4430 Turbomachines (3UOC) • •  
 ZACM4450 Mechanical Engineering: Project Thesis & Practical Experience\* (15UOC – 6UOC S1 & 9UOC S2) • • •  
 ZINT4001 Systems Engineering & Risk Management (3UOC) •  
 Electives 3 courses worth 3UOC each (1 course S1 and 2 courses S2) • • •

\* See Rule 3 of the BE Degree Rules.

### Elective Courses

- ZACM3032 Rotary Wing Aerodynamics (3UOC) • •  
 ZACM4911 Control Theory (3UOC) • •  
 ZACM4918 Missile Design (3UOC) •  
 ZACM4927 Rotorcraft Performance (3UOC) •  
 ZACM4900 Acoustic Noise (3UOC) • •  
 ZACM4920 Non-Destructive Inspection (3UOC) • •  
 ZACM4921 Occasional Elective I (3UOC) • • •  
 ZACM4928 Advanced Rotorcraft Engineering (3UOC) • •  
 ZACM4922 Occasional Elective 2 (3UOC) •  
 ZPEM3527 Atmospheric Physics & Meteorology (3UOC) •  
 ZACM4260 Engineering Management 2A (3UOC) • •

# Ask Us...

...about gaining credit in UNSW@ADFA postgraduate programs.

UNSW@ADFA runs a number of professional and managerial courses suitable for Defence personnel and Defence related industries looking to keep in touch with current trends in systems engineering, project management, communication and Defence.

Full course outlines and registration details can be found online or contact the Business Services Unit.

### Business Services Unit

UNSW@ADFA  
 Administration Building  
 Australian Defence Force Academy  
 Northcott Drive  
 CAMPBELL ACT 2600

Tel: 02 6268 8421 or 02 6268 8135  
 Fax: 02 6268 8690  
 Email: [business.office@adfa.edu.au](mailto:business.office@adfa.edu.au)  
[www.unsw.adfa.edu.au/bdo](http://www.unsw.adfa.edu.au/bdo)



# BACHELOR OF TECHNOLOGY - AERONAUTICAL ENGINEERING

## School of Aerospace, Civil and Mechanical Engineering

**Award/s:** 4430 – Bachelor of Technology (Aeronautical Engineering) (BTech(Aero))

**Duration:** 3 years full-time or part-time equivalent for BTech programs

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

### Program Description:

The aim of Schools offering engineering technology degrees within UNSW@ADFA is to provide outstanding technology education to the future leaders of the Australian Defence Force and to pursue excellence through contributions to the engineering profession, industry and community.

The BTech (Aero) program is a three-year degree at pass level. There is provision for students who have completed the BTech to articulate to a BE degree in Aeronautical Engineering by undertaking up to 18 months further study at a later stage.

This three-year technology program at UNSW@ADFA is accredited by Engineers Australia at the Engineering Technologist level.

### Program Objectives and Learning Outcomes:

The BTech (Aero) program is organised into streams developed for basic science/engineering principles and moving into specialised applications over three years. These streams include: mathematics and computing tools, physics, materials and structures, dynamics and control, thermofluids, design and management as well as discipline specific streams such as aircraft systems and engines.

The BTech (Aero) program is very similar to the first three years of the BE(Aero) program. During the first and second years of the program, students may go on appropriate industrial visits. The BTech(Aero) is primarily designed for officer cadets and midshipmen of the Australian Defence Force who intend to become aircrew and wish to enhance their understanding of the operation and performance of aircraft. It is differentiated from the BTech (Aviation) program by providing a broader engineering technology foundation.

### Program Structure:

The BTech program in Aeronautical Engineering is firmly based on mathematics and the physical sciences in Year 1 and the engineering sciences in Year 2, leading into an engineering approach to analysis, design and operation in the third year. The major streams of the course are: aerodynamics; stability and control; structures; materials; airworthiness; and management. A project in the final year gives the students an opportunity to explore a topic in greater depth.

The Bachelor of Technology degrees require a prescribed program structure as determined by the technology program chosen. Before completing their academic studies, students must complete 20 days of approved practical experience which must be done in one block with one employer. During the first and second years of the program, students may go on appropriate industrial visits.

Descriptions of the courses which comprise the degree program are given in the Course Catalogue section of this Handbook.

## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Technology take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Requirements

2.1 To qualify for the degree of Bachelor of Technology, a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 units of credit (normally 24 units in each full-time session).

2.2 A candidate completing a Standard Program shall complete courses, in the years prescribed, as set out in the relevant schedule.

2.3 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.4 (below), timetabling requirements and approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.

2.4 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

#### 3.0 Practical Experience Requirements

3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

## Program:

### First-Year Program

ZACM1010 Engineering Graphical Communications 3 ••

ZACM1020 Statics (3UOC) •

ZACM1040 Dynamics (3UOC) ••

ZACM1050 Introduction to Aeronautical Engineering & Workshop Practice (3UOC) •

ZACM1051 Introduction to Flight (3UOC) ••

ZINT1001 Engineering Computational Methods 1 (3UOC) ••

ZITE1001 Computer Tools for Engineers (3UOC) •

ZPEM1103 Engineering Chemistry 1A (3UOC) •

ZPEM1303 Engineering Mathematics 1A (6UOC) •

ZPEM1304 Engineering Mathematics 1B (6UOC) ••

ZPEM1503 Engineering Physics 1A (6UOC) •

ZPEM1504 Engineering Physics 1B (6UOC) ••

**Second-Year Program**

- One General Education Course (3UOC) • ••
- ZACM2010 Design 1 (3UOC) •
- ZACM2020 Materials Science (3UOC) •
- ZACM2021 Mechanics of Solids A (3UOC) •
- ZACM2022 Mechanics of Solids B (3UOC) ••
- ZACM2030 Thermofluids (6UOC) •
- ZACM2031 Thermodynamic Cycles (3UOC) ••
- ZACM2032 Real and Inviscid Flows (3UOC) ••
- ZACM2040 Aircraft Performance and Stability (3UOC) ••
- ZACM2041 Introduction to Vibration (3UOC) ••
- ZITE2002 Principles of Electrical & Electronics Technology (3UOC) •
- ZPEM2309 Engineering Mathematics 2A (6UOC) •
- ZPEM2310 Engineering Mathematics 2B (6UOC) ••

**Third-Year Program**

- Three General Education Courses (3UOC each) • ••
- ZACM3010 Aircraft Design 2 (3UOC) ••
- ZACM3011 Component Design (3UOC) •
- ZACM3020 Engineering Materials (3UOC) •
- ZACM3021 Structural Mechanics 1 (3UOC) •
- ZACM3030 Gas Turbines (3UOC) •
- ZACM3031 Subsonic Finite Wing (3UOC) •
- ZACM3032 Rotary Wing Aerodynamics (3UOC) ••
- ZACM3040 Flight Dynamics & Control (3UOC) ••
- ZACM3041 Introduction to Control (3UOC) •
- ZACM3060 Engineering Management 1 (3UOC) ••
- ZACM3650 Aero Project & Practical Experience\* (3UOC) ••
- ZINT3001 Aircraft Systems & Avionics (3UOC) ••
- ZPEM3527 Atmospheric Physics & Meteorology (3UOC) •

\* See Rule 3 of the BTech Degree Rules

## ARTICULATION – BTECH(Aeronautical) ENGINEERING TO BE(Aeronautical Engineering)

**School of Aerospace, Civil and Mechanical Engineering**

**Award/s:** 4425 – Articulation Program BTech(Aero) to BE(Aero)

**Duration:** 18 months full-time or part-time equivalent for BTech programs

**UOC per session:** 27UOC (full-time) and 24 UOC based on a 12 month program

**UOC for award:** 51UOC

**Program Description:**

The Bachelor of Technology (Aeronautical) program and the Bachelor of Engineering program in Aeronautical Engineering have been designed so that a graduate with the Bachelor of Technology program may, under normal circumstances, articulate to the Bachelor of Engineering in Aeronautical Engineering program with 12 - 18 months of additional study.

**Program Objectives and Learning Outcomes:**

The program objectives and learning outcomes for this program are identical to Bachelor of Engineering (Aeronautical Engineering).

**Program Structure:**

The actual program will depend upon when the Bachelor of Technology (Aeronautical) was completed and the current Bachelor of Engineering in Aeronautical Engineering program. Please note that the options previously completed in the Bachelor of Technology program will not be available to the student in the Articulation Program and selection will be subject to the approval of the Head of School. Pre-requisite requirements will apply.

# Do you want to be academically challenged?



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## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Technology take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Requirements

- 2.1 To qualify for the degree of Bachelor of Technology, a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 units of credit (normally 24 units in each full-time session).
- 2.2 A candidate completing a Standard Program shall complete courses, in the years prescribed, as set out in the relevant schedule.
- 2.3 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.4 (below), timetabling requirements and approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.4 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

#### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 20 days of approved practical experience which must be done in one block with one employer.

### Sample Program:

ZACM3021 Structural Mechanics 1 (3UOC) •  
 ZACM3040 Flight Dynamics & Control (3UOC) ••  
 ZACM4010 Aircraft Design 3 (3UOC) •  
 ZACM4011 Aircraft Design 4 (3UOC) ••  
 ZACM4020 Computational Structures (3UOC) •  
 ZACM4021 Structural Mechanics 2 (3UOC) ••  
 ZACM4030 Heat Transfer (3UOC) •  
 ZACM3433 Compressible Flow (3UOC) ••  
 ZACM4050 Aeronautical Engineering: Project Thesis & Practical Experience\* (15UOC – 6UOC S1 & 9UOC S2) • ••  
 Four Electives (3UOC each)\*\* • ••

\* See Rule 3 of the BE Degree Rules

\*\* Students who have already completed ZACM3040 Flight Dynamics and Control will need to enrol in another elective in lieu of this course.

# BACHELOR OF TECHNOLOGY (AVIATION)

### School of Aerospace, Civil and Mechanical Engineering

**Award/s:** 4437 – Bachelor of Technology (Aviation) (BTech(Av))

**Duration:** 3 years full-time or part-time equivalent for BTech programs

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

### Program Description:

The aim of schools offering engineering technology degrees within UNSW@ADFA is to provide outstanding technology education to the future leaders of the Australian Defence Force and to pursue excellence through contributions to the engineering profession, industry and community.

This three-year technology program at UNSW@ADFA is accredited by Engineers Australia at the Engineering Technologist level.

The program combines aviation theory taught at UNSW@ADFA with flying training conducted at Defence facilities. It is differentiated from the BTech (Aero) program in providing a shorter pathway and more focused program for pilots.

### Program Objectives and Learning Outcomes:

The specialist components of the BTech(Av) program use a systems approach to provide the student with a deep understanding of the various systems that contribute to the safe operation of aircraft, the interactions of those systems and likely failure modes. Aircraft accidents and/or incidents are considered as failures of the system.

The BTech(Av) program is designed for potential pilots entering the Australian Defence Force. It covers both the technical and organisational aspects, with a concentration on the safety of aviation as a whole and highlights the safe practices of the components that make up aviation (e.g. pilot, maintenance, air traffic control, etc...).

UNSW@ADFA has introduced a suite of exciting and stimulating undergraduate programs designed to challenge high performing students...

### Find out if you qualify to participate in the Chief of Defence Force Students Program.

The aim of the CDFSP is to build a strong research culture into a high achievers degree by developing critical thinking and independent research skills beyond that available in the existing undergraduate degree programs.

Exciting opportunities are available in:

Arts | Business | Engineering | Science | Technology (Aero)

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Email: [sas@adfa.edu.au](mailto:sas@adfa.edu.au)

Cricos Provider Code: 00100G

## Program Structure:

The Bachelor of Technology degrees require a prescribed program as determined by the technology program chosen. The plan comprises a first year at UNSW@ADFA which is designed to provide the students with a range of specialist courses in the field of Aviation and a third year which includes a project and the flying component of the degree. The latter is presented by the Australian Defence Force at Tamworth (Session 1) and Pearce (Session 2). An alternate completion path is provided for students who fail their flying training courses.

Descriptions of the courses which comprise the degree program are given in the Course Catalogue section of this Handbook. The program shown below is a standard program (i.e. it can be completed within the minimum amount of time).

## Academic Rules:

### Pass Degree

#### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Technology take precedence over the Faculty Regulations for Undergraduate Students.

#### 2.0 Degree Requirements

- 2.1 To qualify for the degree of Bachelor of Technology, a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 units of credit (normally 24 units in each full-time session).
- 2.2 A candidate completing a Standard Program shall complete courses, in the years prescribed, as set out in the relevant schedule.
- 2.3 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.4 (below), timetabling requirements and approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.4 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

#### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 20 days of approved practical experience which must be done in one block with one employer.

### Program:

#### First-Year Program

- ZACM1010 Engineering Graphical Communications (3UOC) ••
- ZACM1020 Statics (3UOC) •
- ZACM1040 Dynamics (3UOC) ••
- ZACM1051 Introduction to Flight (3UOC) ••
- ZACM1850 History and Science of Aviation (3UOC) •
- ZACM1851 Introduction to Aviation - a Systems Approach (3UOC) ••
- ZITE1001 Computer Tools for Engineers (3UOC) •
- ZPEM1103 Engineering Chemistry 1A (3UOC) •
- ZPEM1303 Engineering Mathematics 1A (6UOC) •••
- ZPEM1304 Engineering Mathematics 1B (6UOC) ••
- ZPEM1503 Engineering Physics 1A (6UOC) •
- ZPEM1504 Engineering Physics 1B (6UOC) ••

#### Second-Year Program

- Four General Education Courses (3UOC each) •••
- ZACM2040 Aircraft Performance and Stability (3UOC) ••
- ZACM2820 Introduction to Aircraft Structures (3UOC) ••
- ZACM2830 Aviation Aerodynamics (3UOC) •
- ZACM2840 Aircraft Performance for Aviators (3UOC) ••
- ZACM2850 Aircraft Systems for Aviators (6UOC) •

- ZACM2851 Aviation Safety (6UOC) •
- ZACM3851 Aviation Project (3UOC) •••
- ZITE2003 Avionics for Aviators (3UOC) ••
- ZPEM2511 Introductory Meteorology AV (3UOC) •
- ZPEM2512 Aviation Meteorology AV (3UOC) ••

### Third-Year Program

- ZACM3850 Advanced Aviation Safety (6UOC) •
- ZACM3851 Aviation Project\* (6UOC) •••
- ZACM3852 Basic Flying Theory (12UOC) •••
- ZACM3853 Flying Training (24UOC) •••

\* The course ZACM3851 Aviation Project provides the practical experience requirement specified in the rules governing Bachelor of Technology Degrees (Rule 3).

The courses listed below are available to students who are unable to complete ZACM3853 Flying Training. These courses provide an alternative educational path to the degree of BTech(Aviation). Enrolment in these courses as part of the BTech (Aviation) is at the discretion of the Head of the School of Aerospace, Civil and Mechanical Engineering.

- ZACM3060 Engineering Management 1 (3UOC) ••
- ZACM3860 Aviation Resource Management (6UOC) •••
- ZBUS2801 Leadership and Management (6UOC) ••
- ZHSS2002 Introduction to Strategic Studies (6UOC) •••
- One Elective (3UOC) •••

### Elective Courses

- ZACM4900 Acoustic Noise (3UOC) ••
- ZACM4920 Non-Destructive Inspection (3UOC) ••
- ZITE4222 Systems Engineering (3UOC) ••

## COMBINED DEGREE RULES AT UNSW@ADFA

### BE/BSc degrees

UNSW@ADFA offers a five-year full-time equivalent program leading to the award of the Bachelor of Engineering (Aeronautical, Civil, Electrical or Mechanical) and Bachelor of Science degrees. However, current service obligations prevent cadets from enrolling in a five-year program.

To be able to complete the requirements of both degrees in four years, with a standard workload of 24 UOC per session, an applicant will need sufficient credit from previous studies at a recognised tertiary institution.

### Degree rules

1. These degree rules must be used in conjunction with the UNSW@ADFA *Faculty Regulations for Undergraduate Students*.
2. The program is a five-year full-time combined program leading to the award of the Bachelor of Engineering (BE) and Bachelor of Science (BSc) degrees.
3. These rules are designed to operate in conjunction with the BE and BSc degree rules. These are published in the UNSW@ADFA Handbook for the same year that the student commences studying the double degree program.
4. The program will include a minimum of 240 units of credit overall, including:
  - 4.1 174UOC for the BEng degree
  - 4.2 48UOC for a BSc major
  - 4.3 12UOC for elective courses chosen from Science disciplines



- 4.4 6UOC for one Directed Studies course.
- 5 Students will be exempt from the General Education requirements of both degrees.
- 6 Neither degree will be awarded until the requirements of both are met at the completion of the five-year program. Students will receive a testamur for each degree.
- 7 After commencing the program, a student may elect to transfer into either the BSc or BE program. The student then need only meet the requirements of the specified single degree to be eligible to graduate.
- 8 Honours
- 9 Students who meet the requirements of the double program may seek approval from the relevant Head of School to enrol in the standard BSc (Honours) program.
- 10 Honours in the BE degree will be awarded as determined by the standard BE (Honours) criteria.

## BA/BE degrees

UNSW@ADFA offers a five-year full-time equivalent program leading to the award of the Bachelor of Engineering (Aeronautical, Civil, Electrical or Mechanical) and Bachelor of Arts degrees. However, current service obligations prevent cadets from enrolling in a five-year program.

To be able to complete the requirements of both degrees in four years, with a standard workload of 24 UOC per session, an applicant will need sufficient credit from previous studies at a recognised tertiary institution.

### Degree rules

- 1 These degree rules must be used in conjunction with the UNSW@ADFA *Faculty Regulations for Undergraduate Students*.
- 2 The program is a five-year full-time combined program leading to the award of the Bachelor of Engineering (BE) and Bachelor of Arts (BA) degrees.
- 3 These rules are designed to operate in conjunction with the BE and BA degree rules. These are published in the UNSW@ADFA Handbook for the same year that the student commences studying the double degree program.
- 4 The program will include a minimum of 240 units of credit overall, including:
  - 4.1 174UOC for the BE degree
  - 4.2 48UOC for a BA major
  - 4.3 12UOC for elective courses chosen from Arts disciplines
  - 4.4 6UOC for one Directed Studies course.
- 5 Students will be exempt from the General Education requirements of both degrees.
- 6 Neither degree will be awarded until the requirements of both are met at the completion of the five-year program. Students will receive a testamur for each degree.
- 7 After commencing the program, a student may elect to transfer into either the BA or BE program. The student then need only meet the requirements of the specified single degree to be eligible to graduate.

- 8 Honours
- 8.1 Students who meet the requirements of the double program may seek approval from the relevant Head of School to enrol in the standard BA (Honours) program.
- 8.2 Honours in the BE degree will be awarded as determined by the standard BE (Honours) criteria.

## BA/BSc degrees

UNSW@ADFA offers a four-year full-time equivalent program leading to the award of the Bachelor of Arts(BA) and Bachelor of Science(BSc) degrees. However, current service obligations prevent cadets from enrolling in a four-year program, unless approved to study a Bachelor of Engineering.

To be able to complete the requirements of both degrees in three years, with a standard workload of 24 UOC per session, an applicant will need sufficient credit for previous study at a recognised tertiary institution.

### Degree rules

- 1 These degree rules must be used in conjunction with the UNSW@ADFA *Faculty Regulations for Undergraduate Students*.
- 2 The combined BA/BSc is a four-year full-time program leading to the award of the Bachelor of Arts and Bachelor of Science degrees.
- 3 These rules are designed to operate in conjunction with the BA and BSc degree rules. These are published in the UNSW@ADFA Handbook for the same year that the student commences studying the double-degree program.
- 4 The program will include a minimum of 192 units of credit overall completed over eight sessions, including:
  - 4.1 48UOC for an Arts major
  - 4.2 24UOC for an Arts minor
  - 4.3 48UOC for a Science major
  - 4.4 24UOC for a Science minor
  - 4.5 36UOC for elective courses
  - 4.6 12UOC for Directed Studies courses
- 5 Students will be exempt from the General Education requirements of both degrees.
- 6 Neither degree will be awarded until the requirements of both are met at the completion of the four-year program. Students will receive a testamur for each degree.
- 7 After commencing the program, a student may elect to transfer into either the BSc or BA program. The student then need only meet the requirements of the specified single degree to be eligible to graduate.
- 8 Honours
- 8.1 Students who meet the requirements of the double program may seek approval from the relevant Head of School to enrol in the standard BSc (Honours) or BA (Honours) program.



# BACHELOR OF ARTS

(Chief of Defence Force Students Program)

**School of Humanities & Social Sciences**

**School of Business**

**School of Physical, Environmental & Mathematical Sciences**

**School of Information Technology & Electrical Engineering**

**Award:** 4461 – Bachelor of Arts (Chief of Defence Force Students Program)

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 144 UOC

## Program Description:

The Chief of Defence Force Students Program in Arts offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard three-year BA program. Students in the CDF Students Program will complete majors/minors as per the standard BA and, in addition, will undertake a stream of research courses, normally through Years 2 and 3, working in close collaboration with academic supervisors. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events.

Commencing in Year 2, the research projects, offered as separate courses, will be supervised by academic staff from the relevant discipline. The availability of research projects in any year will be on the approval of the CDF Students Program Subcommittee of the UNSW@ADFA Undergraduate Education Committee, acting on recommendation of the relevant Head of School. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Final assessment, due by the end of session, will be based on a written paper and an oral presentation.

## Program Objectives and Learning Outcomes:

The BA(CDF) program has objectives and learning outcomes in common with the standard BA program though it extends the educational principles embodied in the standard BA to a higher level.

In the program, students will be exposed in first year to research methods in the discipline or disciplines in which they are pursuing the program, and will be offered significant extensions to the ideas and analysis in the standard program. This will allow the CDF students to undertake research projects at the appropriate level in their later years, thereby more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give students the ability to develop their full potential.

The following Arts disciplines are available in the BA (CDF):

Economics  
English  
Geography  
History  
Indonesian  
Information Systems  
Management  
Politics

The following Science disciplines are available in the BA (CDF):

Chemistry  
Computer Science  
Geography  
Information Systems  
Mathematics and Statistics  
Oceanography  
Operations Research and Statistics  
Physics

## Program Structure:

The degree has the following structure: Arts major plus two minors, each of which may be in Arts or Science, plus one Arts elective plus CDF electives plus General Education plus Directed studies, as set out in the table to the right.

CDF electives for the BA are available in the following discipline areas:

Economics & Management  
Humanities & Social Sciences  
Geography  
Information Systems

## Academic Rules:

### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Arts (CDF) take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Arts (CDF), shall be conferred as an Honours Degree after successful completion of an Honours Year.
- 2.2 To qualify for the degree of Bachelor of Arts (CDF), a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 UOC, normally 24 units in each full-time session.
- 2.3 A candidate completing the program shall complete courses, in the years prescribed as set out in the relevant schedule.
- 2.4 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
- 2.5 A candidate for enrolment for the degree of Bachelor of Arts (CDF) shall hold an Entrance Rank equivalent to a UAI of no less than 95.
- 2.6 To qualify for the degree of Bachelor of Arts (CDF), a candidate shall normally maintain a Weighted Average Mean (WAM) of 80% throughout the program.
- 2.7 Normally, a candidate who does not comply with the requirements of Rule 2.6 shall be transferred to candidature for the degree of Bachelor of Arts. Such review will occur at the end of each Session.
- 2.8 A candidate for the degree of Bachelor of Arts may, at the discretion of the relevant Head of School, transfer to the degree of Bachelor of Arts (CDF) upon completion of a minimum of 24 UOC with a WAM of 80 or greater in Session 1 of the Year 1 program. Transfer to the Bachelor of Arts (CDF) may be allowed up until the commencement of the Year 2 research courses.

In the following table, each letter represents a discipline area.

### Option (i) (Single Major plus Two Minors)

|         | Arts Major                | Arts or Science Minor | Arts or Science Minor | Arts Elective | CDF Electives            | General Education | Directed Studies | UOC |
|---------|---------------------------|-----------------------|-----------------------|---------------|--------------------------|-------------------|------------------|-----|
| Yr 1 S1 | A-1a                      | B-1a                  | C-1a                  | D-1a          |                          |                   |                  | 24  |
| Yr 1 S2 | A-1b                      | B-1b                  | C-1b                  | D-1b          |                          |                   |                  | 24  |
| Yr 2 S1 | A-2a                      | B-2a                  | C-2a                  |               | Introduction to Research |                   |                  | 24  |
| Yr 2 S2 | A-2b                      | B-2b                  | C-2b                  |               | Research Project 1       |                   |                  | 24  |
| Yr 3 S1 | A-3a & 3b                 |                       |                       |               | Research Project 2       | 2 X GE            |                  | 24  |
| Yr 3 S2 | A-3c & Research Project 3 |                       |                       |               |                          | 2 X GE            | ZHSS or ZBUS     | 24  |

### Option (ii) (Two Majors)

|         | Arts Major                | Arts or Science Major | Arts Elective | Arts Elective | CDF Electives            | General Education | Directed Studies | UOC |
|---------|---------------------------|-----------------------|---------------|---------------|--------------------------|-------------------|------------------|-----|
| Yr 1 S1 | A-1a                      | B-1a                  | C-1a          | D-1a          |                          |                   |                  | 24  |
| Yr 1 S2 | A-1b                      | B-1b                  | C-1b          | D-1b          |                          |                   |                  | 24  |
| Yr 2 S1 | A-2a                      | B-2a                  |               |               | Introduction to Research | 2 X GE            |                  | 24  |
| Yr 2 S2 | Research Project 1        | B-2b                  |               |               |                          | 2 X GE            | ZHSS or ZBUS     | 24  |
| Yr 3 S1 | A-3a & Research Project 2 | B-3a & 3b             |               |               |                          |                   |                  | 24  |
| Yr 3 S2 | A-3c & Research Project 3 | B-3c & 3d             |               |               |                          |                   |                  | 24  |

### The following table applies to students studying a major in Geography or Information Systems.

|         | Arts Major | Arts or Science Minor | Arts or science minor | Arts Elective        | General Education | Directed Studies | UOC |
|---------|------------|-----------------------|-----------------------|----------------------|-------------------|------------------|-----|
| Yr 1 S1 | A-1a       | B-1a                  | C-1a                  | D-1a                 |                   |                  | 24  |
| Yr 1 S2 | A-1b       | B-1b                  | C-1b                  | ZPEM1901 or ZITE1901 |                   |                  | 24  |
| Yr 2 S1 | A-2a       | B-2a                  | C-2a                  |                      | 2 X GE            |                  | 24  |
| Yr 2 S2 | A-2b       | B-2b                  | C-2b                  | ZPEM2901 or ZITE2901 |                   |                  | 24  |
| Yr 3 S1 | A-3a & b   |                       |                       | ZPEM3901 or ZITE3901 | 2 X GE            | ZHSS or ZBUS     | 24  |
| Yr 3 S2 | A-3c & d   |                       |                       | ZPEM3902 or ZITE3902 |                   |                  | 24  |



# BACHELOR OF SCIENCE

(Chief of Defence Force Students Program)

**School of Physical, Environmental and Mathematical Sciences**

**School of Information Technology and Electrical Engineering**

**School of Business**

**School of Humanities and Social Sciences**

**Award:** 4463 – Bachelor of Science (Chief of Defence Force Students Program)

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 144 UOC

## Program Description

The Chief of Defence Force Students Program in Science offers the opportunity for students either entering UNSW@ADFA with a high Entrance Rank, or who achieve a high WAM in their first year, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard three-year BSc program. Students in the CDF Students Program will complete majors/minors as per the standard BSc and, in addition, will undertake a stream of research courses, normally through Years 2 and 3, working in close collaboration with an academic supervisor. In Year 1 of the program, students will enrol in an introductory course on research methodology either in Science or in Information Technology and will undertake a project. They will also be engaged with group activities so as to develop and maintain their interest and continuing involvement in the program (such as seminars, general reading and social events).

Research projects will require the approval of the CDF Students Program Subcommittee of the UNSW@ADFA Undergraduate Education Committee, acting on the recommendation of the relevant Head of School. Students in the research courses may work independently or as part of a team, depending on the nature of the project

undertaken, though all students will submit individual assessment. Students in the research courses will be expected to present a short introductory seminar on their topic outlining their understanding of the project and their approach to the research to be undertaken. Final assessment, due by the end of session, will be based on a written paper and an oral presentation.

Entry into the program is limited and is subject to the approval of the Head of School.

## Program Objectives and Learning Outcomes

The BSc(CDF) program has objectives and learning outcomes in common with the standard BSc program though it extends the educational principles embodied in the standard BSc to a higher level. In the program, students will be exposed in first year to research methods in the Sciences and will be offered significant extensions to the ideas and analysis performed in the standard program. This will allow the CDF students to undertake research projects, at the appropriate level, in their later years thereby more fully integrating research into their undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

## Admission Requirements

Admission requirements for the Bachelor of Science (CDF Students Program) would be the same as for the Bachelor of Science, with the following variations:

Enrolment requires approval of the Head of School

The Entrance Rank will be a UAI of 98 or higher;

A student enrolled in a standard BSc may, at the discretion of the Head of School, transfer to the BSc(CDF) on completion of a minimum of 24 units of credit of Level 1 Science courses in Session 1 of Year 1 with a WAM of 85 or greater. Transfer to the BSc(CDF) may also be allowed up to the commencement of the Year 2 research courses provided the student has a WAM of 85 or greater.

## Program Structure

In the tables below A, B, and C represent discipline areas.

### Option (a) – See Academic Rule 3.1 (below)

|           | Science Major                                 | Science Major                                 | Science Elective | Science Elective                | General Education | Directed Studies               | UOC |
|-----------|---|---|------------------|---------------------------------|-------------------|--------------------------------|-----|
| Yr 1 S1   | A-1a (6UOC)                                   | B-1a (6UOC)                                   | C-1a (6UOC)      | D-1a (6UOC)                     |                   |                                | 24  |
| Yr 1 S2   | A-1b (6UOC)                                   | B-1b (6UOC)                                   | C-1b (6UOC)      | ZPEM 1901 or ZITE 1901 (6UOC)   |                   |                                | 24  |
| Yr 2 S1   | A-2a (6UOC)                                   | B-2a (6UOC)                                   |                  |                                 | 2xGE (6UOC)       | ZHSS 2002 or ZBUS 2801* (6UOC) | 24  |
| Yr 2 S2   | A-2b (6UOC)                                   | B-2b (6UOC)                                   |                  | ZPEM 2901 or ZITE 2901 (6UOC)** | 2xGE (6UOC)       |                                | 24  |
| Yr 3 S1   | A-3a (6UOC) and ZPEM 3901 or ZITE 3901 (6UOC) | B-3a & b (12 UOC)                             |                  |                                 |                   |                                | 24  |
| Yr 3 S2   | A-3b & 3c (12UOC)                             | B-3c (6UOC) and ZPEM 3902 or ZITE 3902 (6UOC) |                  |                                 |                   |                                | 24  |
| Total UOC | 48  | 48  | 12               | 18                              | 12                | 6                              | 144 |

\* Currently the only Directed Studies course available in S1 is ZHSS2002

\*\* This course will be an integral part of one or both of the Majors



**Option (b) – See Academic Rule 3.1 (below)**

|           | Science Major    | Science Minor | Science Minor | Science Elective                | General Education | Directed Studies               | UOC |
|-----------|------------------|---------------|---------------|---------------------------------|-------------------|--------------------------------|-----|
| Yr 1 S1   | A-1a (6UOC)      | B-1a (6UOC)   | C-1a (6UOC)   | D-1a (6UOC)                     |                   |                                | 24  |
| Yr 1 S2   | A-1b (6UOC)      | B-1b (6UOC)   | C-1b (6UOC)   | ZPEM 1901 or ZITE 1901 (6UOC)   |                   |                                | 24  |
| Yr 2 S1   | A-2a (6UOC)      | B-2a (6UOC)   | C-2a (6UOC)   |                                 | 2xGE (6UOC)       |                                | 24  |
| Yr 2 S2   | A-2b (6UOC)      | B-2b (6UOC)   | C-2b (6UOC)   | ZPEM 2901 or ZITE 2901 (6UOC)   |                   |                                | 24  |
| Yr 3 S1   | A-3a & b (12UOC) |               |               | ZPEM 3901 or ZITE 3901 (6UOC)** |                   | ZHSS 2002 or ZBUS 2801* (6UOC) | 24  |
| Yr 3 S2   | A-3c & d (12UOC) |               |               | ZPEM 3902 or ZITE 3902 (6UOC)** | 2xGE (6UOC)       |                                | 24  |
| Total UOC | 48               | 24            | 24            | 30                              | 12                | 6                              | 144 |

\* Currently the only Directed Studies course available in S1 is ZHSS2002

\*\* These courses will be an integral part of the Major

**Academic Rules:****Pass Degree****1.0 Faculty Regulations for Undergraduate Students**

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Science (CDF) take precedence over the *Faculty Regulations for Undergraduate Students*.

**2.0 Degree Rules Dictionary**

2.1 “Major” means an approved combination of 48 units of credit in the one discipline area, of which at least 36 units of credit are for upper-level courses.

2.2 “Minor” means an approved combination of 24 units of credit in the one discipline area, of which at least 12 units of credit are for upper-level courses.

2.3 “Level I” means courses at an introductory level, normally taken in Year 1.

2.4 “Upper level” means courses at Level II and Level III, normally taken in Years 2 or 3.

2.5 “Science discipline areas” means Chemistry, Computer Science, Geography, Information Systems, Mathematics, Oceanography, Operations Research and Physics.

2.6 “Arts discipline areas” means Economics, English, History, Indonesian, Indonesian-Malay Studies, Management and Politics.

2.7 “Elective courses” means courses from any related discipline area as identified in Clause 2.5 above.

**3.0 Degree Requirements**

3.1 A student must obtain, normally over three years of study, a minimum of 144 units of credit, including one of the following combinations (“a” or “b”)–

- a) 96 units of credit for two Majors from Science discipline areas.

One major must include the Level III course ZPEM3901 Research Project 2 or the Level III course ZITE3901 Information Technology Research Project 2, each worth 6 units of credit. The other major must include the Level III course ZPEM3902 Research Project 3 or the Level III course ZITE3902 Information Technology Research Project 3, each worth 6 units of credit.

Also included must be –

- 6 units of credit for Science elective courses at Level I.
- 6 units of credit from the Level I course ZPEM1901 Contemporary Issues in Science or the Level I Course ZITE1901 Introduction to Research in Information Technology.
- 6 units of credit from the Level II course ZPEM2901 Information Technology Research Project 1 or the Level II course ZITE2901 Information Technology Research Project 1.
- 6 units of credit for a Directed Studies course, either ZBUS2801 Leadership and Management or ZHSS2002 Introduction to Strategic Studies, or an approved equivalent.\*
- 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third years of study.

\*Currently the only Directed Studies course available in Session 1 is ZHSS2002

- b) 96 units of credit for one major and two minors from Science discipline areas; and –
- 18 units of credit for Science elective courses at Level I.
  - 6 units of credit from the Level I course ZPEM1901 Contemporary Issues in Science or the Level I course ZITE1901 Introduction to Research in Information Technology.
  - 6 units of credit from the Level II course ZPEM2901 Research Project 1 or the Level II course ZITE2901 Information Technology Research Project 1.
  - 6 units of credit from the Level III course ZPEM3901 Research Project 2 or the Level III course ZITE3901 Information Technology Research Project 2.
  - 6 units of credit from the Level III course ZPEM3902 Research Project 3 or the Level III course ZITE3902 Information Technology Research Project 3.
  - 6 units of credit for a Directed Studies course, either ZBUS2801 Leadership and Management or ZHSS2002 Introduction to Strategic Studies, or an approved equivalent.\*

- vii. 12 units of credit for General Education courses, or approved equivalents, normally taken in the second and third year of study.

\* Currently the only Directed Studies course available in Session 1 is ZHSS2002

#### 4.0 Special Rules

- 4.1 To enrol for the degree of BSc(CDF), a student must have an Entrance Rank equivalent to a UAI of no less than 98.
- 4.2 A student in the BSc(CDF) who does not maintain an overall Weighted Average Mean (WAM) of 85 or better at the end of each session will be transferred to a standard BSc program degree.\*
- 4.3 A student enrolled in a standard BSc may, at the discretion of the Head of School, transfer to the BSc(CDF) on completion of a minimum of 24 units of credit of Level I Science courses in Session 1 of Year 1 with a WAM of 85 or greater. Transfer to the BSc(CDF) may also be allowed up to the commencement of the Year 2 research courses provided the student has a WAM of 85 or greater.

\* A student transferring from the BSc(CDF) program to a standard BSc program will be granted credit for successful completion of ZPEM1901 or ZITE1901 and if applicable, ZPEM2901 or ZITE2902

#### Honours

##### Rules governing the award of the degree of Bachelor of Science (CDF) with Honours

#### 5.0 Entry

- 5.1 To enrol for the award of the degree at Honours level in one or two specialisations, a student must –
- complete the pass-degree program requirements; and
  - have achieved a WAM of at least 85 across the entire undergraduate program including a WAM of at least 85 over the Level III courses in a major sequence which is in the same discipline area as the proposed Honours program.

#### 6.0 Degree Requirements

- 6.1 A student must obtain, normally over one year of study, a minimum of 48 units of credit in one or two areas of study approved by the Head of School.

#### 7.0 Class of Honours

- 7.1 The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3).

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## BACHELOR OF BUSINESS

(Chief of Defence Force Students Program)



#### School of Business

**Award:** 4462 – Bachelor of Business (Chief of Defence Force Students Program)

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 144 UOC

#### Program Description:

The Chief of Defence Force Students Program in Business offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research that will develop their critical thinking and independent research skills beyond that available in the standard three-year BBus program. Students in the CDF Students Program will complete the core business-related courses and a selection of business-related electives offered in the standard BBus and, in addition, will undertake a stream of research courses, normally through Years 2 and 3, working in close collaboration with an academic supervisor. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events.

Commencing in Year 2, the research projects, each offered as separate courses, will be supervised by academic staff with the same or closely related discipline expertise. The availability of research projects in any year will be on the approval of the CDF Students Program Subcommittee of the UNSW@ADFA Undergraduate Education Committee, acting on the recommendation of the relevant Head of School. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Students in the research courses will be expected to present a short introductory seminar on their topic outlining their understanding of the project and their approach to the research to be undertaken. Projects will normally run over a single session with final assessment due by the end of session based on a written paper and an oral presentation. In exceptional cases, the two research courses in Year 3 may be used sequentially to generate a project running over a full year.

#### Program Objectives and Learning Outcomes:

The BBus (CDF) program has objectives and learning outcomes in common with the standard BBus program though it extends the educational principles embodied in the standard BBus to a higher level. In the program, students will be exposed in the first year to research methods in business-related areas and will be offered significant extensions to the ideas and analysis performed in the standard program. This will allow the CDF students to undertake research projects, at the appropriate level, in their later years thereby more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

## Academic Rules:

### 1.0 Faculty Regulations for Undergraduate Students

- 1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Business take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

- 2.1 To qualify for the degree of Bachelor of Business (CDF), a candidate shall normally be enrolled for a minimum of six sessions and gain a minimum of 144 UOC, normally 24 units in each full-time session, including:
- Level 1 courses totalling 48 UOC, including 24 UOC from core courses in the BBus, excluding ZBUS1104 Integrating Core 1 but including the BBus (CDF) course ZBUS1901 Critical Analysis in Business Research;
  - Upper-Level Business core courses in the BBus totalling 36 UOC;
  - Upper-Level research project courses totalling 18 UOC;
  - Business Electives in the BBus totalling 24 UOC;
  - 12 UOC of specified General Education courses;
  - 6 UOC for the Directed Studies course ZHSS2002 An Introduction to Strategic Studies.
- 2.2 No more than 12 UOC may be gained from General Education courses, with none to be taken solely within the School of Business and a maximum 6 UOC to be taken in any one discipline area.
- 2.3 No more than 48 UOC may be gained for Level 1 courses.
- 2.4 At least 84 UOC must be taken from Upper-Level courses.
- 2.5 A candidate for enrolment for the degree of Bachelor of Business (CDF) shall hold an Entrance Rank equivalent to a UAI of no less than 95.
- 2.6 To qualify for the degree of Bachelor of Business (CDF), a candidate shall normally maintain a Weighted Average Mean (WAM) of 80% throughout the program.

- 2.7 Normally, a candidate who does not comply with the requirements of Rule 2.6 shall be transferred to candidature for the degree of Bachelor of Business. A review of progress will occur at the end of each Session.
- 2.8 A candidate for the degree of Bachelor of Business may, at the discretion of the Head of School, transfer to the degree of Bachelor of Business (CDF) up until the commencement of the Year 2 research course, conditional upon having completed all courses to that point with a WAM of 80 or greater. Transfer to the Bachelor of Business(CDF) may be allowed
- 2.9 The degree of Bachelor of Business (CDF), shall be conferred as an Honours Degree after successful completion of an Honours Year.

## Degree Structure:

### a) First Year Program

- ZBUS1101 Organisational Behaviour (6UOC) ••  
 ZBUS1102 Introduction to Economics (6UOC) ••  
 ZBUS1103 Introduction to Accounting and Finance (6UOC) •  
 ZBUS1901 Critical Analysis in Business Research (6UOC) •  
 24UOC in Non Business-related Level 1 courses • ••

### b) Upper Level Program

- ZBUS2101 Business Law (6UOC) •  
 ZBUS2102 Project Management (6UOC) •  
 ZBUS2103 Human Resource Management (6UOC) ••  
 ZBUS2104 Integrating Core 2: Evidence-based decision-making (6UOC) •  
 ZBUS3104 Integrating Core 3: Organisation Theory and Management (6UOC) ••  
 ZITE2001 Managing Information Systems (6UOC) ••  
 ZBUS2902 Research Project in Business 1 (6UOC) ••  
 ZBUS3901 Research Project in Business 2 (6UOC) •  
 ZBUS3902 Research Project in Business 3 (6UOC) ••

Business-related electives (24UOC) chosen from list under BBus Program Information. • ••

### c) General Education courses, (four courses at 3UOC each) • ••

### d) Directed Studies: ZHSS2002 Introduction to Strategic Studies, (6UOC) • ••

Sample Program

|              |                                |  |                           |                              |                          |                          |                          |                          |
|--------------|--------------------------------|--|---------------------------|------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Upper Levels | Research Project               | Research Project                       | Integrating Core 3        | Managing Information Systems | Strategic Studies        | GE x 2                   | GE x 2                   |                          |
|              | Research Project               | Integrating Core 2                     | Business Law              | Human Resource Management    | Project Management       | Business Elective 1      | Business Elective 2      | Business Elective 3      |
| First Year   | Critical Analysis for Business | Introduction to Accounting and Finance | Introduction to Economics | Organisational Behaviour     | Non-business elective A1 | Non-business elective A2 | Non-business elective B1 | Non-business elective B2 |



# BACHELOR OF ENGINEERING IN AERONAUTICAL ENGINEERING

(Chief of Defence Force Students Program)

## School of Aerospace, Civil and Mechanical Engineering

**Award:** 4465 – Bachelor of Engineering in Aeronautical Engineering (Chief of Defence Force Students Program)

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24 (full time)

**UOC for award:** 192 UOC

## Program Description:

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard Engineering program. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events.

Commencing in Year 2, the research projects, each offered as separate courses, will be supervised by academic staff from the same or closely related discipline. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Final assessment, due by the end of session, will be based on a written paper and an oral presentation. The Program is of four years duration, and is awarded as an Honours degree. This program is in the process of being accredited by Engineers Australia.

## Program Objectives and Learning Outcomes:

The BE (AeroCDF) program has program objectives and learning outcomes in common with the standard BE Aero program.

The program extends the educational principles embodied in the BE to a higher level of the degree. In the program, students will be exposed in first year to research methods in Engineering and will be offered significant extensions to the ideas and analysis performed in the standard degree program. This will allow them to undertake research projects, at the appropriate level, in their later years, thereby, more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

## Program Structure:

The Bachelor of Engineering (CDF) degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses and courses taught by other Schools within UNSW@ADFA. Specialisation in Aeronautical Engineering increases as the degree program progresses. A research component is taken each session in years 1-3, culminating in a full year thesis in the final year.

## Academic Rules:

### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Engineering (CDF), shall be conferred as an Honours Degree.
- 2.2 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).
- 2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
- 2.6 A candidate for enrolment for the degree of Bachelor of Engineering (CDF) shall hold a Universities Admissions Index (UAI) or equivalent, of no less than 98.
- 2.7 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally achieve a sessional Weighted Average Mean (WAM) of 75.
- 2.8 Normally, a candidate who does not comply with the requirements of Rule 2.7 (above) shall be transferred to candidature for the degree of Bachelor of Engineering. Such review will occur at the end of each Session.
- 2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduant status.
- 2.10 A candidate for the degree of Bachelor of Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (CDF) upon completion of 24 units of credit with a WAM of 80 or greater in Sessions 1 or 2 of the Year 1 program.

### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.



**Program:****First Year Program**

ZACM1051 Introduction to Flight (3UOC) ••  
 ZINT1001 Engineering Computational Methods (3UOC) ••  
 ZPEM1103 Engineering Chemistry 1A (3UOC) •  
 ZPEM1303 Engineering Mathematics 1A (6UOC) •  
 ZPEM1304 Engineering Mathematics 1B (6UOC) ••  
 ZPEM1503 Engineering Physics 1A (6UOC) •  
 ZPEM1504 Engineering Physics 1B (6UOC) ••  
 ZACM1901 Engineering Research 1A (6UOC) •  
 ZACM1902 Engineering Research 1B (6UOC) ••  
 ZITE1001 Computer Tools for Engineers (3UOC) •

**Second Year Program****Students must complete the following compulsory courses:**

ZACM2901 Engineering Research 2A (6UOC) •  
 ZACM2902 Engineering Research 2B (6UOC) ••  
 ZPEM2309 Engineering Mathematics 2A (6UOC) •  
 ZPEM2310 Engineering Mathematics 2B (6UOC) ••  
 One General Education Course (3UOC) • ••

For the courses ZACM2901 *Engineering Research 2A* and ZACM2902 *Engineering Research 2B* students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

ZACM2010 Design 1 (3UOC) •  
 ZACM2020 Materials Science (3UOC) •  
 ZACM2021 Mechanics of Solids A (3UOC) •  
 ZACM2022 Mechanics of Solids B (3UOC) ••  
 ZACM2030 Thermofluids (6UOC) •  
 ZACM2031 Thermodynamic Cycles (3UOC) ••  
 ZACM2032 Real and Inviscid Flows (3UOC) ••  
 ZACM2040 Aircraft Performance and Stability (3UOC) ••  
 ZACM2041 Introduction to Vibration (3UOC) ••  
 ZITE2002 Principles of Electrical & Electronics Technology (3UOC) •

**Third Year Program****Students must complete the following compulsory courses:**

ZACM3901 Engineering Research 3A (6UOC) •  
 ZACM3902 Engineering Research 3B (6UOC) ••  
 ZHSS2002 Introduction to Strategic Studies (6UOC) • ••  
 Two General Education Courses (6UOC) • ••

For the courses ZACM3901 *Engineering Research 3A* and ZACM3902 *Engineering Research 3B* students must choose to replace any 6UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

ZACM3010 Aircraft Design 2 (3UOC) ••  
 ZACM3011 Component Design (3UOC) •  
 ZACM3020 Engineering Materials (3UOC) •  
 ZACM3021 Structural Mechanics 1 (3UOC) •  
 ZACM3030 Gas Turbines (3UOC) •  
 ZACM3031 Subsonic Finite Wing (3UOC) •

ZACM3032 Rotary Wing Aerodynamics (3UOC) ••  
 ZACM3040 Flight Dynamics & Control (3UOC) ••  
 ZACM3041 Introduction to Control (3UOC) •  
 ZACM3060 Engineering Management 1 (3UOC) ••  
 ZINT3001 Aircraft Systems and Avionics (3UOC) ••  
 ZACM3433 Compressible Flow (3UOC) ••

**Final Year Program**

ZACM4010 Aircraft Design 3 (3UOC) •  
 ZACM4011 Aircraft Design 4 (3UOC) ••  
 ZACM4020 Computational Structures (3UOC) •  
 ZACM4021 Structural Mechanics 2 (3UOC) ••  
 ZACM4030 Heat Transfer (3UOC) •  
 ZACM4050 Aeronautical Engineering: Project Thesis & Practical Experience (3UOC) • ••  
 ZACM4051 Maintenance Management and Repair (3UOC) •  
 ZINT4001 Systems Engineering and Risk Management (3UOC) •  
 Electives (3 at 3UOC each – two courses S2, one course S1) • ••  
 One General Education Course (3UOC) • ••

**Elective Courses**

Electives to be chosen as per BE Aeronautical Engineering Program (see page 37)

**Current course and  
program information**  
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# BACHELOR OF ENGINEERING IN CIVIL ENGINEERING

(Chief of Defence Force Students Program)

## School of Aerospace, Civil and Mechanical Engineering

**Award:** 4466 – Bachelor of Engineering in Civil Engineering (Chief of Defence Force Students Program)

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 192 UOC

## Program Description

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard Engineering program. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events.

Commencing in Year 2, the research projects, each offered as separate courses, will be supervised by academic staff from the same or closely related discipline. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Final assessment, due by the end of session, will be based on a written paper and an oral presentation.

The Program is of four years duration, and is awarded as an honours degree. The Program is in the process of being accredited by Engineers Australia.

## Program Objectives and Learning Outcomes

The BE(CivilCDF) program has program objectives and learning outcomes in common with the standard BE Civil program. The program extends the educational principles embodied in the BE to a higher level of the degree. In the program, students will be exposed in first year to research methods in Engineering and will be offered significant extensions to the ideas and analysis performed in the standard degree program. This will allow them to undertake research projects, at the appropriate level, in their later years, thereby, more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

## Program Structure

The Bachelor of Engineering(CDF) degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses and courses taught by other Schools within UNSW@ADFA. Specialisation in Mechanical Engineering increases as the degree program progresses. A research component is taken each session in years 1-3, culminating in a full year thesis in the final year.

## Academic Rules

### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Engineering (CDF), shall be conferred as an Honours Degree.
- 2.2 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).
- 2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Head of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
- 2.6 A candidate for enrolment for the degree of Bachelor of Engineering (CDF) shall hold a Universities Admissions Index (UAI) or equivalent, of no less than 98.
- 2.7 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally achieve a sessional Weighted Average Mean (WAM) of 75.
- 2.8 Normally, a candidate who does not comply with the requirements of Rule 2.7 (above) shall be transferred to candidature for the degree of Bachelor of Engineering. Such review will occur at the end of each Session.
- 2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduant status.
- 2.10 A candidate for the degree of Bachelor of Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (CDF) upon completion of 24 units of credit with a WAM of 80 or greater in Sessions 1 or 2 of the Year 1 program.

### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.) For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

## Program:

### First Year Program

- ZINT1001 Engineering Computational Methods (3UOC) ••
- ZPEM1103 Engineering Chemistry 1A (3UOC) •
- ZPEM1104 Engineering Chemistry 1B (3UOC) ••
- ZPEM1303 Engineering Mathematics 1A (6UOC) •
- ZPEM1304 Engineering Mathematics 1B (6UOC) ••
- ZPEM1503 Engineering Physics 1A (6UOC) •
- ZPEM1504 Engineering Physics 1B (6UOC) ••
- ZACM1901 Engineering Research 1A (6UOC) •
- ZACM1902 Engineering Research 1B (6UOC) ••
- ZITE1001 Computer Tools for Engineers (3UOC) •

### Second Year Program

#### Students must complete the following compulsory courses:

- ZACM2901 Engineering Research 2A (6UOC) •
- ZACM2902 Engineering Research 2B (6UOC) ••
- ZPEM2309 Engineering Mathematics 2A (6UOC) •
- ZPEM2310 Engineering Mathematics 2B (6UOC) ••
- Two General Education Courses (3UOC each – one course each session) • ••

For the courses ZACM2901 Engineering Research 2A and ZACM2902 Engineering Research 2B students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

#### Courses

- ZACM2020 Materials Science (3UOC) •
- ZACM2021 Mechanics of Solids A (3UOC) •
- ZACM2022 Mechanics of Solids B (3UOC) ••
- ZACM2030 Thermofluids (6UOC) •
- ZACM2211 Engineering Surveying (3UOC) •
- ZACM2221 Geotechnical Engineering and Engineering Construction (6UOC) ••
- ZACM2230 Fluid Engineering (3UOC) ••
- ZACM2250 Environmental Engineering Fundamentals (3UOC) ••

### Third Year Program

#### Students must complete the following compulsory courses:

- ZACM3901 Engineering Research 3A (6UOC) •
- ZACM3902 Engineering Research 3B (6UOC) ••
- ZHSS2002 Introduction to Strategic Studies (6UOC) • ••
- Two General Education Courses (3UOC each – one course each session) • ••

For the courses ZACM3901 Engineering Research 3A and ZACM3902 Engineering Research 3B students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

- ZACM3060 Engineering Management 1 (3UOC) ••
- ZACM3210 Structural Design 1A (3UOC) •
- ZACM3211 Structural Design 1B (3UOC) ••
- ZACM3212 Environmental Engineering Applications (3UOC) ••
- ZACM3213 Geometric Design of Transport Systems (3UOC) •
- ZACM3220 Civil Engineering Material A (3UOC) •
- ZACM3221 Civil Engineering Materials B (3UOC) ••
- ZACM3222 Geotechnical Engineering 2A (3UOC) •
- ZACM3223 Geotechnical Engineering 2B (3UOC) ••
- ZACM3224 Structural Analysis 1A (3UOC) •
- ZACM3225 Structural Analysis 1B (3UOC) ••
- ZACM3230 Hydraulics (3UOC) •

### Final Year Program

- ZACM4210 Structural Design 2A (3UOC) •
  - ZACM4211 Structural Design 2B (3UOC) •
  - ZACM4220 Pavement Engineering (3UOC) •
  - ZACM4223 Geotechnical Engineering 3 (3UOC) •
  - ZACM4224 Structural Analysis 2 (3UOC) •
  - ZACM4231 Water Resources (3UOC) ••
  - ZACM4250 Environmental Engineering Practice (3UOC) ••
  - ZACM4260 Engineering Management 2A (3UOC) ••
  - ZACM4261 Engineering Management 2B (3UOC) •
  - Electives (3 courses at 3UOC each – one course S1, two courses S2) • ••
  - ZACM4252 Civil Engineering: Thesis, Seminar & Practical Experience (3UOC S1, 9UOC S2) • ••
- or
- ZACM4253 Integrated Design & Practical Experience (3UOC S1, 9UOC S2) • ••

### Elective Courses

Electives to be chosen as per BE Civil Engineering Program (see page 39).

**Current course and program information is now available through the UNSW Online Handbook:**

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# BACHELOR OF ENGINEERING IN ELECTRICAL ENGINEERING

(Chief of Defence Force Students Program)

## School of Information Technology and Electrical Engineering

**Award/s:** 4464 – Bachelor of Engineering in Electrical Engineering (Chief of Defence Force Students Program)

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full-time)

**UOC for award:** 192 UOC

## Program Description:

The aim of the Schools offering engineering degrees within The University of New South Wales at the Australian Defence Force Academy is to provide an outstanding engineering education to future leaders in the Australian Defence Force and to pursue excellence through contributions to research, the profession, industry and the community.

The Chief of Defence Force Students Program offers the opportunity for students to be exposed to research in the first year of the program and to undertake research in a range of disciplines over years two and three, whilst still covering the engineering body of knowledge. All fourth year students in the program will produce a thesis on research carried out in that year.

The BE CDF Students Program is of four years duration, and is awarded as an honours degree. The engineering programs have been granted full accreditation by the Institution of Engineers Australia and in addition the Electrical Engineering program has been recognised by the Institute of Electrical and Electronics Engineers. The Engineering CDF Students programs are in the process of being accredited.

All Engineering degrees lead to a Bachelor of Engineering degree, with the type of engineering specified. First-Year engineering students enrol in separate programs in Aeronautical, Civil, Electrical, or Mechanical Engineering and their CDF Students Programs analogues. There is, however, considerable commonality in the first year within the engineering programs. More than half of the programs are devoted to mathematics, physics and computer science.

## Program Objectives and Learning Outcomes:

The BE(ElecCDF) has program objectives and learning outcomes in common with the standard BE(Elec) program. The program extends the educational principles embodied in the BE to a higher level of the degree. In the program, students will be exposed in first year to research methods in Engineering and will be offered significant extensions to the ideas and analysis performed in the standard degree program. This will allow them to undertake research projects, at the appropriate level, in their later years, thereby, more fully integrating research into the standard coursework undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

The BE program in Electrical Engineering is built on a foundation of mathematics, computing science and physical science. The program is specifically designed for undergraduate students who have shown academic excellence in their studies and it incorporates significant elements of training in research methods at all years of the program. A small component of electrical engineering is introduced in the first year, with progressively larger components in second and third year. The final year is

devoted exclusively to electrical engineering courses. Each year of the program comprises a number of discipline-based courses, courses taught by other discipline areas and problem-based learning courses. Apart from the general education courses, the first two years of the program are common for all electrical engineering CDF students. In the third and fourth years students have the option to specialise in areas such as communications, surveillance and radar, computer engineering and guided weapons electronics.

The Electrical Engineer in the Navy is known as a WEO – a Weapons Electrical Officer, and is responsible for electronic systems associated with gun and missile control systems, navigation systems, air and ground communications, radar and sonar systems and data systems. WEOs are not only responsible for technical matters but are a vital link in management: they may become involved also in personnel, financial and resource management.

RAAF Electrical Engineers usually are employed to manage a wide variety of operations including the repair and maintenance of modern radar, navigation, communications and computing equipment. They may be posted to a squadron in charge of an avionics section, or to a development area working on technical problems associated with new equipment. As they gain experience they can be expected to be posted to one of the commands, usually as a project officer concerned with the management and funding of projects.

Army Electrical Engineers usually pursue a career either in the Royal Australian Corps of Signals or the Royal Australian Corps of Electrical and Mechanical Engineers. New graduates may be involved in such areas as the operation, management and repair of state-of-the-art communications equipment or the management of guided weapons systems, laser designation and range finding equipment and radar.

Electrical Engineering is one of the newer branches of engineering. It has its origin in the turning to practical use of the discoveries of Faraday, Ampere, Maxwell and a number of other eminent 19th century physicists. It has remained the most strongly science-oriented branch of engineering. At first it had its major impact by providing the means for the generation, distribution and utilisation of electric power. However, while this remains an important sub-area of the whole discipline, the last few decades particularly have seen a rapid and extensive diversification into the fields of computers and control as well as electronics and communications, and beyond them into such areas as biology, medicine and space technology. It is now true to say that there are very few areas of civilised activity that have remained untouched by the ideas and products of modern electrical engineering. The absorption of recent scientific development has been very rapid and has demanded a fully developed scientific outlook on the part of electrical engineers for a proper understanding of the problems involved. Many devices, scarcely more than laboratory prototypes a decade ago, are now in widespread use as fully engineered hardware.

## Program Structure:

The Bachelor of Engineering (CDF) degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses (identified by the prefix ZITE) and courses taught by other Schools within UNSW@ADFA. Completion of each year, thereby allowing progression to the next year, is normally achieved by satisfactory progress in each of the courses given in that year. A research component is taken each session in years 1-3, culminating in a full year project in the final year. At the discretion of the Head of School, students may be allowed to concurrently enrol in courses from more than one year of the program.



## Academic Rules:

### 1.0 General Award Rules

- 1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Engineering take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Engineering (CDF) shall be conferred as an Honours degree. Honours may be awarded in the following categories:

Honours Class I

Honours Class II, Division I

Honours Class II, Division II

- 2.2 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).
- 2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
- 2.6 A candidate for enrolment for the degree of Bachelor of Electrical Engineering (CDF), shall hold a Universities Admissions Index (UAI) of no less than 98 or equivalent on an alternative Tertiary Entrance Index.
- 2.7 To qualify for the degree of Bachelor of Electrical Engineering (CDF), a candidate shall normally achieve a Session Weighted Average Mean (WAM) of 75.
- 2.8 Normally, a candidate who does not comply with the requirements of Rule 2.7 (above) shall be transferred to candidature for the degree of Bachelor of Electrical Engineering.
- 2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduant status.
- 2.10 A candidate for the degree of Bachelor of Electrical Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Electrical Engineering (CDF) upon completion of 24 units of credit with a WAM of 80 or greater in Sessions 1 or 2 of Year 1.

### 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years. For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

## Program:

### First-Year Program

- ZITE1101 Introduction to Computer Science (6UOC) •  
 ZITE1102 Programming Fundamentals (6UOC) ••  
 ZITE1290 Electrical Engineering Research 1A (6UOC) •  
 ZITE1291 Electrical Engineering Research 1B (6UOC) ••  
 ZPEM1303 Engineering Mathematics 1A (6UOC) •  
 ZPEM1304 Engineering Mathematics 1B (6UOC) ••  
 ZPEM1505 Electrical Engineering Physics 1A (6UOC) •  
 ZPEM1506 Electrical Engineering Physics 1B (6UOC) ••

### Second-Year Program

- ZHSS2002 An Introduction to Strategic Studies (6UOC) • ••  
 ZITE2292 Advanced programming for CDF Engineers (3UOC) •  
 ZITE2202 Circuits and Systems 2 (3UOC) •  
 ZITE2204 Electronics 2 (3UOC) •  
 ZITE2206 Signals and Systems (3UOC) ••  
 ZPEM2309 Engineering Mathematics 2A (6UOC) •  
 ZPEM2310 Engineering Mathematics 2B (6UOC) ••  
 ZITE2290 Electrical Engineering Research 2A (6UOC) •  
 ZITE2291 Electrical Engineering Research 2B (6UOC) ••  
 Two General Education courses (3UOC each) • ••

### Third-Year Program

- ZACM3060 Engineering Management 1 (3UOC) ••  
 ZITE3201 Analogue Communications (3UOC) •  
 ZITE3202 Control Theory 1 (3UOC) •  
 ZITE3207 Electronics Design Laboratory 2 (3UOC) ••  
 ZITE3208 Engineering Electromagnetics 1 (3UOC) •  
 ZITE3210 Management Science E (3UOC) •  
 ZITE3205 Electrical Power and Machines (3UOC) •  
 ZITE3290 Electrical Engineering Research 3 (6UOC) • ••  
 Two General Education courses (3UOC each) • ••

Students taking the third year Electrical Engineering (CDF) program will select a further three courses from the following list, subject to the approval of the Head of the School, to make a balanced program. Students will not normally be allowed to take courses from other Schools as part of their third year program.

- ZITE3203 Control Theory 2 (3UOC) ••  
 ZITE3204 Digital Communications (3UOC) ••  
 ZITE3209 Engineering Electromagnetics 2 (3UOC) ••  
 ZITE3212 Optoelectronic Techniques (3UOC) ••  
 ZITE3214 Power Electronics and Electrical Drives (3UOC) ••

### Final-Year Program

- ZITE4222 Systems Engineering (3UOC) ••  
 ZITE4290 Electrical Engineering: •  
 Project, Thesis  
 Practical Experience  
 and Specialist Lectures (12UOC)  
 ZITE4290 Electrical Engineering: ••  
 Project, Thesis  
 Practical Experience  
 and Specialist Lectures (12UOC)

Students taking the final year Electrical Engineering (CDF) program will select a further seven courses from the following list, subject to the approval of the Head of the School, to make a balanced program. Students will not normally be allowed to take courses from other Schools as part of their final year program.

- ZITE4202 Antennas and Propagation (3UOC) x  
 ZITE4203 Avionics and Navigational Aids (3UOC) •  
 ZITE4204 Communications Networks (3UOC) ••  
 ZITE4205 Communications Systems (3UOC) •  
 ZITE4206 Computer Control Theory (3UOC) ••  
 ZITE4207 Digital Image Processing & Remote Sensing (3UOC) ••  
 ZITE4209 Electronics 4 (3UOC) •  
 ZITE4210 Guided Weapons Electronics (3UOC) ••

|          |   |
|----------|---|
| ZITE4211 | Image and Video Transmission Systems (3UOC) •             |
| ZITE4212 | Introduction to Radar & Radar Imaging (3UOC) ••           |
| ZITE4213 | Lasers and Laser Applications (3UOC) •                    |
| ZITE4215 | Occasional Option 1 (Underwater Communications) (3UOC) •• |
| ZITE4216 | Occasional Option 2 (3UOC) •                              |
| ZITE4220 | Robotics & Mechanical Systems (3UOC) ••                   |
| ZITE4201 | Advanced Communication Techniques (3UOC) x                |
| ZITE4208 | Digital Signal Processing (3UOC) •                        |
| ZITE4214 | Modelling and Simulation (3UOC) x                         |
| ZITE4217 | Occasional Option 3 (3UOC) •                              |
| ZITE4218 | Occasional Option 4 (3UOC) ••                             |
| ZITE4219 | Power Systems (3UOC) x                                    |
| ZITE4221 | Software Engineering: Principles and Practice (3UOC) x    |

Students may also select courses for which they have not previously enrolled from the list of third year options.

|          |   |
|----------|---|
| ZITE3203 | Control Theory 2 (3UOC) ••                        |
| ZITE3204 | Digital Communications (3UOC) ••                  |
| ZITE3209 | Engineering Electromagnetics 2 (3UOC) ••          |
| ZITE3212 | Optoelectronic Techniques (3UOC) ••               |
| ZITE3214 | Power Electronics and Electrical Drives (3UOC) •• |
| ZITE3206 | Electronics 3 (3UOC) •                            |

Students may also take up to one of the following courses:

|          |   |
|----------|---|
| ZITE3102 | Cryptograph (3UOC) x                        |
| ZITE3105 | Human Computer Interaction (3UOC) •         |
| ZITE3106 | Interactive Computer Graphic (3UOC) ••      |
| ZITE3107 | Multimedia & Virtual Environments (3UOC) •• |
| ZITE3108 | Java Programming Applications (3UOC) ••     |

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## BACHELOR OF ENGINEERING IN MECHANICAL ENGINEERING

(Chief of Defence Force Students Program)



### School of Aerospace, Civil and Mechanical Engineering

**Award:** 4467 – Bachelor of Engineering in Mechanical Engineering (Chief of Defence Force Students Program)

**Duration:** 4 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 192 UOC

### Program Description:

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard Engineering program. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events.

Commencing in Year 2, the research projects, each offered as separate courses, will be supervised by academic staff from the same or closely related discipline. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Final assessment, due by the end of session, will be based on a written paper and an oral presentation.

The Program is of four years duration, and is awarded as an honours degree. The Programs is in the process of being accredited by Engineers Australia.

### Program Objectives and Learning Outcomes:

The BE (MechCDF) program has program objectives and learning outcomes in common with the standard BE(Mech) program. The program extends the educational principles embodied in the BE to a higher level of the degree. In the program, students will be exposed in first year to research methods in Engineering and will be offered significant extensions to the ideas and analysis performed in the standard degree program. This will allow them to undertake research projects, at the appropriate level, in their later years, thereby, more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

### Program Structure:

The Bachelor of Engineering (CDF) degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses and courses taught by other Schools within UNSW@ADFA. Specialisation in Mechanical Engineering increases as the degree program progresses. A research component is taken each session in years 1-3, culminating in a full year thesis in the final year.

### Academic Rules:

#### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a

conflict, the rules for the Bachelor of Engineering take precedence over the *Faculty Regulations for Undergraduate Students*.

## 2.0 Degree Requirements

- 2.1 The degree of Bachelor of Engineering (CDF), shall be conferred as an Honours Degree.
- 2.2 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 192 units of credit (normally 24 units in each full-time session).
- 2.3 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
- 2.4 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Head of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
- 2.5 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
- 2.6 A candidate for enrolment for the degree of Bachelor of Engineering (CDF) shall hold a Universities Admissions Index (UAI) or equivalent, of no less than 98.
- 2.7 To qualify for the degree of Bachelor of Engineering (CDF), a candidate shall normally achieve a sessional Weighted Average Mean (WAM) of 75.
- 2.8 Normally, a candidate who does not comply with the requirements of Rule 2.7 (above) shall be transferred to candidature for the degree of Bachelor of Engineering. Such review will occur at the end of each Session.
- 2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduant status.
- 2.10 A candidate for the degree of Bachelor of Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (CDF) upon completion of 24 units of credit with a WAM of 80 or greater in Sessions 1 or 2 of the Year 1 program.

## 3.0 Practical Experience Requirements

- 3.1 Before graduation a candidate shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each block being in the service of a single employer.

Note: Service Training and Practical Experience Requirements

Service training conducted during the degree program is recognised as partially satisfying practical experience requirements in the following ways:

For Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW@ADFA is not eligible for consideration.)

For Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.

For Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

## First Year Program

- ZINT2504 Introduction to Electrical & Mechanical Plant (3UOC) ••
- ZINT1001 Engineering Computational Methods (3UOC) ••
- ZPEM1103 Engineering Chemistry 1A (3UOC) •
- ZPEM1303 Engineering Mathematics 1A (6UOC) •
- ZPEM1304 Engineering Mathematics 1B (6UOC) ••

- ZPEM1503 Engineering Physics 1A (6UOC) •
- ZPEM1504 Engineering Physics 1B (6UOC) ••
- ZACM1901 Engineering Research 1A (6UOC) •
- ZACM1902 Engineering Research 1B (6UOC) ••
- ZITE1001 Computer Tools for Engineers (3UOC) •

## Second Year Program

Students must complete the following compulsory courses:

- ZACM2901 Engineering Research 2A (6UOC) •
- ZACM2902 Engineering Research 2B (6UOC) ••
- ZPEM2309 Engineering Mathematics 2A (6UOC) •
- ZPEM2310 Engineering Mathematics 2B (6UOC) ••
- One General Education Course (3UOC) •••

For the courses ZACM2901 *Engineering Research 2A* and ZACM2902 *Engineering Research 2B* students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s):

- ZACM2010 Design 1 (3UOC) •
- ZACM2020 Materials Science (3UOC) •
- ZACM2021 Mechanics of Solids A (3UOC) •
- ZACM2022 Mechanics of Solids B (3UOC) ••
- ZACM2030 Thermofluids (6UOC) •
- ZACM2031 Thermodynamic Cycles (3UOC) ••
- ZACM2041 Introduction to Vibration (3UOC) ••
- ZACM2230 Fluid Engineering (3UOC) ••
- ZACM2440 Mechanics of Machines (3UOC) ••
- ZITE2002 Principles of Electrical & Electronics Technology (3UOC) •

## Third Year Program

Students must complete the following compulsory courses:

- ZACM3901 Engineering Research 3A (6UOC) •
- ZACM3902 Engineering Research 3B (6UOC) ••
- ZHSS2002 Introduction to Strategic Studies (6UOC) •••
- Three General Education Courses (3UOC each - two during S1 and one during S2) •••

For the courses ZACM3901 *Engineering Research 3A* and ZACM3902 *Engineering Research 3B* students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

- ZACM3011 Component Design (3UOC) •
- ZACM3020 Engineering Materials (3UOC) •
- ZACM3021 Structural Mechanics 1 (3UOC) •
- ZACM3030 Gas Turbines (3UOC) •
- ZACM3041 Introduction to Control (3UOC) •
- ZACM3410 Design 2 (3UOC) ••
- ZACM3430 Refrigeration (3UOC) ••
- ZACM3431 Viscous Flows (3UOC) ••
- ZACM3060 Engineering Management 1 (3UOC) ••
- ZACM3440 Dynamics of Mechanical Systems (3UOC) ••
- ZACM3450 Instrumentation (3UOC) x

## Final Year Program

- ZACM4020 Computational Structures (3UOC) •
- ZACM4021 Structural Mechanics 2 (3UOC) ••
- ZACM4030 Heat Transfer (3UOC) •
- ZACM4051 Maintenance Management and Repair (3UOC) •
- ZACM4410 Design 3 (3UOC) •
- ZACM4411 Design 4 (3UOC) ••
- ZACM4430 Turbomachines 3 (3UOC) ••
- ZACM4450 Mechanical Engineering: Project Thesis & Practical Experience (6UOC S1, 9UOC S2) •••
- ZINT4001 Systems Engineering and Risk Management (3UOC) •
- Electives (3 at 3UOC each. Two during S1 and one during S2) •••

## Elective Courses

Electives to be chosen as per BE Mechanical Engineering Program (see page 43).





# BACHELOR OF TECHNOLOGY - AERONAUTICAL ENGINEERING

(Chief of Defence Force Students Program)

**School of Aerospace, Civil and Mechanical Engineering**

**Award:** 4430 – Bachelor of Technology in Aeronautical Engineering (Chief of Defence Force Students Program)

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24 UOC (full time)

**UOC for award:** 144 UOC

## Program Description:

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW@ADFA with a high Entrance Rank, and who maintain a high level of performance in their studies, to undertake research in a range of disciplines that will develop their critical thinking and independent research skills beyond that available in the standard Engineering program. In Year 1 of the program, students will be engaged with cohort activities so as to develop and maintain their interest and continuing involvement in the program via invited lectures, seminars, general reading and social events. Commencing in Year 2, the research projects, each offered as separate courses, will be supervised by academic staff from the same or closely related discipline. Students in the research courses may work independently or as part of a team, depending on the nature of the project undertaken, though all students will submit individual assessment. Final assessment, due by the end of session, will be based on a written paper and an oral presentation. The Program is of three years duration, and is awarded as a pass degree. There is provision for students who have completed the BTech to upgrade it to a BE degree in Aeronautical Engineering by undertaking at least 18 months further study at a later stage. The Programs is in the process of being accredited by Engineers Australia.

## Program Objectives and Learning Outcomes:

The BTech (AeroCDF) program is very similar to the first three years of the BE(Aero) program. The BTech (Aero) is primarily designed for RAAF Officer Cadets who intend to become aircrew and wish to enhance their understanding of the operation and performance of aircraft. The program extends the educational principles embodied in the BTech to a higher level of the degree. In the program, students will be exposed in first year to research methods in Engineering and will be offered significant extensions to the ideas and analysis performed in the standard degree program. This will allow them to undertake research projects, at the appropriate level, in their later years, thereby, more fully integrating research into the standard undergraduate degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the program and give the students the ability to develop their full potential.

## Program Structure:

The Bachelor of Technology (CDF) degrees require a prescribed program structure as determined by the engineering program chosen. Each year of the program comprises a number of School-based courses and courses taught by other Schools within UNSW@ADFA. Specialisation in Aeronautical Engineering increases as the degree program progresses. A research component is taken each session in years 1-3.

## Academic Rules:

### 1.0 Faculty Regulations for Undergraduate Students

1.1 A student must comply with the *Faculty Regulations for Undergraduate Students*. In the event of a conflict, the rules for the Bachelor of Technology take precedence over the *Faculty Regulations for Undergraduate Students*.

### 2.0 Degree Requirements

2. To qualify for the degree of Bachelor of Technology (CDF), a candidate shall normally be enrolled for a minimum of eight sessions and gain a minimum of 144 units of credit (normally 24 units in each full-time session).
  - 2.2 A candidate completing a Standard Program shall complete courses, in the years prescribed, for all engineering students and those pertaining to one particular branch of engineering as set out in the relevant schedule.
  - 2.3 A candidate completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (below), timetabling requirements and the approval of the appropriate Heads of School, be permitted to enrol in any one year in courses selected from more than one year of the relevant schedule.
  - 2.4 Before a candidate's enrolment will be accepted for any course, the candidate must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.
  - 2.5 A candidate for enrolment for the degree of Bachelor of Technology (CDF) shall hold a Universities Admissions Index (UAI) or equivalent, of no less than 98.
  - 2.6 To qualify for the degree of Bachelor of Technology (CDF), a candidate shall normally achieve a sessional Weighted Average Mean (WAM) of 75.
  - 2.7 Normally, a candidate who does not comply with the requirements of Rule 2.7 (above) shall be transferred to candidature for the degree of Bachelor of Technology. Such review will occur at the end of each Session.
  - 2.8 A candidate for the degree of Bachelor of Technology may, at the discretion of the Head of School, transfer to the degree of Bachelor of Technology (CDF) upon completion of 24 units of credit with a WAM of 80 or greater in Sessions 1 or 2 of the Year 1 program.
  - 2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduant status.
- ### 3.0 Practical Experience Requirements
- 3.1 Before graduation a candidate shall complete 20 days of approved practical engineering experience which must be done in one block with one employer.

## Program:

### First Year Program

- ZACM1051 Introduction to Flight (3UOC) ••
- ZINT1001 Engineering Computational Methods (3UOC) ••
- ZPEM1103 Engineering Chemistry 1A (3UOC) •
- ZPEM1303 Engineering Mathematics 1A (6UOC) •••
- ZPEM1304 Engineering Mathematics 1B (6UOC) ••
- ZPEM1503 Engineering Physics 1A (6UOC) •
- ZPEM1504 Engineering Physics 1B (6UOC) ••
- ZACM1901 Engineering Research 1A (6UOC) •
- ZACM1902 Engineering Research 1B (6UOC) ••
- ZITE1001 Computer Tools for Engineers (3UOC) •



## Second Year Program

### Students must complete the following compulsory courses:

- ZACM2901 Engineering Research 2A (6UOC) •
- ZACM2902 Engineering Research 2B (6UOC) ••
- ZPEM2309 Engineering Mathematics 2A (6UOC) •
- ZPEM2310 Engineering Mathematics 2B (6UOC) ••
- One General Education Course (3UOC) • ••

For the courses ZACM2901 Engineering Research 2A and ZACM2902 Engineering Research 2B students must choose to replace any 6 UOC from the following courses in each semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s).

- ZACM2010 Design 1 (3UOC) •
- ZACM2020 Materials Science (3UOC) •
- ZACM2021 Mechanics of Solids A (3UOC) •
- ZACM2022 Mechanics of Solids B (3UOC) ••
- ZACM2030 Thermofluids (6UOC) •
- ZACM2031 Thermodynamic Cycles (3UOC) ••
- ZACM2032 Real and Inviscid Flows (3UOC) ••
- ZACM2040 Aircraft Performance and Stability (3UOC) ••
- ZACM2041 Introduction to Vibration (3UOC) ••
- ZITE2002 Principles of Electrical & Electronics Technology (3UOC) •

## Third Year Program

Students must complete the following compulsory courses:

- ZACM3901 Engineering Research 3A (6UOC) •
- ZACM3902 Engineering Research 3B (6UOC) ••
- ZHSS2002 Introduction to Strategic Studies 6 • ••
- Three General Education Courses 3 6 (one during S1 and two during S2) • ••

For the course ZACM3901 Engineering Research 3A students must choose to replace any 6 UOC from the following courses in the first semester with an appropriate project by negotiation with the Program Coordinator and course lecturer(s). For the course ZACM3902 Engineering Research 3B students must choose to replace 3 UOC from the following courses:

Note: The practical Experience component must also be completed.

- ZACM3010 Aircraft Design 2 (3UOC) ••
- ZACM3011 Component Design (3UOC) •
- ZACM3020 Engineering Materials (3UOC) •
- ZACM3021 Structural Mechanics 1 (3UOC) •
- ZACM3030 Gas Turbines (3UOC) •
- ZACM3031 Subsonic Finite Wing 3 (3UOC) •
- ZACM3032 Rotary Wing Aerodynamics (3UOC) ••
- ZACM3040 Flight Dynamics & Control (3UOC) ••
- ZACM3041 Introduction to Control (3UOC) •
- ZACM3060 Engineering Management 1 (3UOC) ••
- ZINT3001 Aircraft Systems and Avionics (3UOC) ••
- ZPEM3527 Atmospheric Physics & Meteorology (3UOC) •

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Four (4) session-length courses or their equivalent in combinations of session-length and year-long courses; and

Fifty-six (56) hours of study which foster acceptance of professional and ethical action and social responsibility.

### General Education Requirements at UNSW@ADFA

Every UNSW@ADFA degree program must include 12UOC of General Education courses and these courses cannot form part of a major or minor. A range of courses have been specifically designed as General Education courses at UNSW@ADFA and these are offered by a variety of Schools, in a number of discipline areas.

UNSW@ADFA students are deemed to have fulfilled the UNSW requirement in the area of professional and ethical action and social responsibility by virtue of completing their Common Military Training.

### Restrictions on the selection of courses

No student can take a General Education course concurrently with, or subsequent to, a first-year course in the same discipline area.

No more than two General Education courses can be taken from any discipline area, as set out in the General Education Schedule, unless exempt in the degree rules.

Normally, mainstream courses may not be substituted for General Education requirements. However, in exceptional circumstances students may seek to enrol in one 6UOC Level I course as a substitute for two GE courses. This Level I course must be substantially different in nature to the mainstream courses in their degree.

## Objectives of the General Education Program

**The following objectives were approved by the Council of the University in December 1994 with minor changes in 2005:**

1. To provide a learning environment in which students acquire, develop, and deploy skills of rational thought and critical analysis.
2. To enable students to evaluate arguments and information.
3. To empower students to systematically challenge received traditions of knowledge, beliefs and values.
4. To enable students to acquire skills and competencies, including appropriate written and spoken communication skills.
5. To ensure that students examine the purposes and consequences of their education and experience at University, and to foster acceptance of professional and ethical action and the social responsibility of graduates.
6. To foster among students the competence and the confidence to contribute creatively and responsibly to the development of their society.
7. To provide structured opportunities for students from disparate disciplines to interact cooperatively within a learning situation.
8. To provide opportunities for students to explore discipline and paradigm bases other than those of their professional or major disciplinary specialisation through non-specialist courses offered in those other areas.
9. To provide an environment in which students are able to experience the benefits of moving beyond the knowledge boundaries of a single discipline and explore cross and interdisciplinary connections, and cross-cultural contexts.
10. To provide a learning environment and teaching methodology in which students can bring the approaches of a number of disciplines to bear on a complex problem or issue.

### Course Availability

The following list shows the General Education (GE) courses offered in 2007, the discipline area they belong to and the degree programs in which they can be included.

| Course      | Short Title                       | Discipline             | Bachelor degree |      |    |     |        |
|-------------|-----------------------------------|------------------------|-----------------|------|----|-----|--------|
|             |                                   |                        | BA              | BBus | BE | BSc | BoTech |
| ZGEN2005 •  | This Sporting Life                | Geography              | ✓               | ✓    | ✓  | ✓   | ✓      |
| ZGEN5002 •  | Literature and Film               | English                |                 | ✓    | ✓  | ✓   | ✓      |
| ZGEN2303 •  | Tactical Combat Radio Systems     | Electrical Engineering | ✓               | ✓    |    | ✓   |        |
| ZGEN2304 •  | Web Sites and Multimedia          | IT                     | ✓               | ✓    | ✓  |     | ✓      |
| ZGEN2400 •  | Chemical & Biological Warfare:    | Chemistry              | ✓               | ✓    | ✓  |     | ✓      |
| ZGEN2003 •  | The History and Science of Flight | Aviation               | ✓               | ✓    |    | ✓   |        |
| ZGEN2240 •  | Introduction to Military Ethics   | Interdisciplinary      | ✓               | ✓    | ✓  | ✓   | ✓      |
| ZGEN2001 •• | Engineering the Environment       | Engineering            | ✓               | ✓    |    | ✓   |        |
| ZGEN2002 •• | The Cockpit and Beyond            | Aviation               | ✓               | ✓    |    | ✓   |        |
| ZGEN2301 •• | Computer Games                    | IT                     | ✓               | ✓    | ✓  |     | ✓      |
| ZGEN2302 •• | The E-Warrior                     | IT                     |                 | ✓    | ✓  | ✓   | ✓      |
| ZGEN2401 •• | Astronomy                         | Physics                | ✓               | ✓    | ✓  |     | ✓      |
| ZGEN2402 •• | Introductory Meteorology          | Physics                | ✓               | ✓    | ✓  |     |        |
| ZGEN5114 •• | Persuasive Speaking & Writing     | English                |                 | ✓    | ✓  | ✓   | ✓      |

# MILITARY INFORMATION

## *Military Education and Training for Midshipmen and Officer Cadets*

'To Lead, to Excel'

### The Australian Defence Force Academy Charter

The charter of the Australian Defence Force Academy includes the requirement to provide midshipmen and officer cadets with:

- military education and training for the purpose of developing their professional abilities and the qualities of character and leadership that are appropriate to officers of the Defence Force, and
- a balanced and liberal university education within a military environment.

### The Australian Defence Force Academy Purpose

To serve Australia by providing the Australian Defence Force (ADF) with tertiary graduates who have the foundational attributes, intellect and skills required by an officer.

### The Australian Defence Force Academy Mission

Best leaders for the ADF.

### Our Learning Environment

We will create and foster a contemporary military education and training environment which engenders in the individual an ethos of service and builds:

Adaptability  
Determination  
Initiative  
Integrity  
Professionalism

through the Academy Values of, being honest, giving everyone a fair go, respecting others and doing our best.

### Standards of Behaviour

All people working and living at the Academy are expected to be honest and treat each other with respect.

As potential future leaders of Australian Servicemen and women, midshipmen and officer cadets are expected to demonstrate very high standards of behaviour in all facets of their work and life at the Academy.

The Academy values provide the framework in which they can demonstrate achievement of those standards.

In addition to demonstrating a strong commitment to their chosen military career, midshipmen and officer cadets must co-exist and cooperate with others regardless of gender, race or other differences. They will also be expected to show that they possess the attributes that will permit them to function effectively as leaders when they graduate from the Defence Force Academy. Physical and moral courage, loyalty, self discipline, honesty, fairness, confidence, a sense of responsibility and duty, and a sense of humour are foremost amongst these attributes.

In short, midshipmen and officer cadets are expected to demonstrate their suitability for leadership everywhere and at all times.

## The Military Environment

A military environment is maintained at the Defence Force Academy. Midshipmen and officer cadets are required to live, work and be led and managed in a military command and administrative structure which reflects the structures in which they will live and work after graduation. The purpose of the military environment is to provide the cadets with the appropriate atmosphere to develop the behaviours and attitudes required of members of the ADF. The military environment will also help to build their motivation for a long-term career in the ADF.

In this environment midshipmen and officer cadets are subject to the Defence Force Discipline Act 1982. They are expected to abide by all Defence regulations and instructions relevant to the Australian Defence Force and the Academy. This includes attending all scheduled academic studies program classes, obeying the lawful orders and directions of the Academy military staff, abiding by the Academy Standing Orders, treating other people at the Academy fairly and with respect, and conducting themselves in an appropriate manner at all times.

All midshipmen and officer cadets wear the uniform of the Service to which they belong, with minor Academy embellishments and the issue of items specific to the Academy's training needs. Parade drill, the observance of military customs and traditions including the paying of compliments to superiors by saluting and membership of the Academy Cadets Mess are other features of the military environment. In the Mess, cadets have the opportunity to participate in a range of formal social activities, such as dining-in nights, in which military traditions are observed.

At all times, midshipmen and officer cadets are expected to conduct themselves in a manner that will bring credit on themselves, the Academy and the Australian Defence Force. They will also represent the Academy and the Defence Force in a number of public ceremonies, notably those conducted at the Australian War Memorial commemoration services held on ANZAC Day and Remembrance Day. A number of parades are also held during the year at the Academy, with the Chief of the Defence Force Parade in February/March and the Graduation Parade in December being the most significant.

### Office of the Commandant

The Commandant has overall military responsibility for the Australian Defence Force Academy. The position of the Commandant is a rotational one and is occupied by a Navy Commodore, Army Brigadier or Air Force Air Commodore. All military staff, midshipmen and officer cadets are under his/her command.

The Commandant reports directly to the Commander, Australian Defence College and is directly responsible for the control and management of the Academy.

The Commandant exercises command through the Deputy Commandant. Resource management, contracting and corporate support issues are the responsibility of the Commandant and are managed through the Business Manager.

## Office of the Deputy Commandant

The Deputy Commandant is responsible for the command, military education, and training of the midshipmen and officer cadets. The Executive Officer – Cadets and the Chief Instructor report directly to the Deputy Commandant. The Deputy Commandant is responsible for administering command of the Academy during the Commandant's absence.

The Executive Officer is responsible for the day-to-day management and development of the midshipmen and officer cadets and other military personnel undertaking full-time tertiary study at the Academy.

There is no formal rank structure within the cadet body. However, a Cadet Leadership Team has been established for selected Year three cadets.

The positions are as follows:

- President of the Mess Committee;
- Deputy President of the Mess Committee;
- Administrative Co-ordinator;
- Sports Co-ordinator;
- Band Co-ordinator.

The selected cadets are responsible for the co-ordination of various activities and liaise with the Academy Executive on matters concerning the welfare and administration of the cadet body.

The Chief Instructor is responsible for the development, design, co-ordination and conduct of the Academy Military Education and Training Program as well as the co-ordination of Single-Service Training for midshipmen and officer cadets. All military staff at ADFA assist in the delivery of military training.

## Defence Support Group

The Defence Support Group (DSG) is the single point of contact for all DSG product lines delivered at the Academy. Its primary purpose is to provide clients with a single point for planning, briefings and problem resolution.

Most of the services and product lines delivered at the Academy are provided by civilian contractors. At the Academy, Serco Sodexho Defence Services is the primary Garrison Support Services (GSS) contractor. Services and product lines delivered by Serco include Catering, Transport, Clothing Store, Security, Waste Management, Pest Control, Cleaning and Grounds Maintenance.

Other services and product lines are provided by DSG include Pay and Administration (Orderly Room), Movements, Registry and Mail Room services.

## Officer Development

### Military Training

The three-year military training program equips midshipmen and officer cadets with the fundamental knowledge, skills and attitudes that junior officers in the Australian Defence Force require. This provides the basis for the individual Services to conduct further training and development when cadets leave the Academy. The military training program consists of two key components – Academy Military Education and Training Program and Single-Service Training.

## Academy Life

### The First Weeks

The first weeks at the Academy are a busy time for midshipmen and officer cadets as they are issued with clothing, have medical examinations, undertake military orientation and commence five weeks of military training. This period is known as the Year One Familiarisation Training (YOFT) and is intended to give cadets the basic military and interpersonal skills essential for their Service careers, and for living and working at the Defence Force Academy. It must be noted that resignation in the first five weeks of the course is not permitted except in exceptional circumstances and that leave restrictions do apply for this time period.

Military discipline, care of uniforms, self-discipline and strict routines are new experiences for most cadets. The development of high standards of dress, bearing, behaviour and attitude is the aim of the YOFT Period. In order to achieve and maintain these standards, cadets must quickly acquire skills in organising and managing their time, washing and ironing, polishing boots and shoes, making beds and cleaning rooms and facilities. Midshipmen and officer cadets can prepare for the first five weeks by being proficient in those tasks and by having a high level of physical fitness before arriving at the Academy.

## Academy Military Education and Training Program

The Academy Military Education and Training Program is carried out in 'blocks' at the beginning and end of the year and for eight hours per week during the academic sessions. There is significant emphasis on creating experience-based leadership opportunities in the training activities.

The Academy Military Education and Training Program includes a range of subjects:

Military Familiarisation assists midshipmen and officer cadets in making a smooth transition from civilian to military life. It provides introductory training in military protocol, ADFA discipline and regulations, uniform assembly and maintenance, and midshipmen and officer-cadet lifestyle.

Customs and Traditions forms part of a body of knowledge commonly referred to as General Service Knowledge. This incorporates information relating to Flags, Saluting, Colours and Standards, Honours and Awards.

Leadership and Management training provides midshipmen and officer cadets with opportunities to apply theory-based concepts whilst at ADFA and during Leadership Challenge Exercises. The key to the training is developing the qualities and attributes of a leader.

A graduate of ADFA is required to display the qualities of Adaptability, Initiative, Integrity, Determination and Professionalism.

Drill and Ceremonial training promotes reaction to command, self-discipline and teamwork through knowledge and practice of the customs and traditions of military ceremonies.

The Military Communication program aims to develop the skills necessary to be effective in oral and written communication. Training is also provided to introduce cadets to the style and forms of written communication used in the Defence organisation.



Equity Training provides midshipmen and officer cadets with the skills to live, study and develop in a healthy academic and social environment by teaching them how to treat people fairly and with respect in accordance with Australian Defence Force policies.

First Aid Training is provided to all midshipmen and officers cadets to ensure that a certified standard of first aid skill is obtained and maintained.

Military Law introduces midshipmen and officer cadets to the military law system and provides instruction on the Defence Force Discipline Act.

Physical and Recreational Training teaches fitness concepts and develops individual fitness components as well as injury prevention awareness. Sport and a high standard of physical fitness are important parts of Service life. Competitions in a wide range of sports are conducted at the Academy and teams are entered in many civilian competitions in Canberra.

Weapon Training is provided to qualify midshipmen and officer cadets on the F88 Austeyr rifle. Weapon proficiency is maintained by programmed instruction and testing. This module includes Field Craft training to prepare midshipmen and officer cadets for Leadership Challenge exercises.

Defence Studies, in conjunction with Strategic Studies, provides midshipmen and officer cadets with an understanding of the structure and operation of their Service and the ADF in general. Military knowledge is built by examining defence issues in local, regional and global contexts.

## Single-Service Training

Single-Service Training is conducted at the beginning, middle and end of the year for varying periods of time, and gives midshipmen and officer cadets the opportunity to experience and learn about their parent Service.

The individual Services are responsible for designing and implementing the syllabi for the conduct of Single-Service training which are outlined below:

### Naval Single-Service Training

Direct entry midshipmen undergo specific Naval training during their first year at ADFA, normally during July and November. In second and third year, midshipmen are introduced to life in the Royal Australian Navy through periods at sea and visits to shore establishments. During these visits the midshipmen will go to sea in a variety of ships where they work alongside sailors to gain an appreciation of shipboard life and work. Midshipmen in engineering also undertake periods of work experience during their naval training.

Navy also makes provision for Midshipmen to complete a degree at ADFA after undertaking 12 months initial Officer Training at HMAS Creswell and commencing their first two phases of their Primary Qualification Application course in the fleet.

### Army Single-Service Training

The Single-Service Training for Army officer cadets is conducted by the Royal Military College at Duntroon and takes them to the level of section commander. The training includes weapon handling, fieldcraft, navigation and tactics at section level.

## Air Force Single-Service Training

Air Force Single-Service Training is designed to allow officer cadets to complete the RAAF Junior Officers Initial Course equivalent during their time at the Academy.

The training includes general Service knowledge, ground defence training and air power knowledge. It also includes elements to motivate each officer cadet towards their chosen branch in the Air Force.

## Progress of Academy Programs

Midshipmen and officer cadets undertaking Arts, Business, Science or Technology programs are awarded their degrees after satisfactory completion of three years' academic and military studies. Cadets undertaking an Engineering degree follow a prescribed four-year program. Students of merit may be offered transfer to an honours program, providing their Service authorises a further twelve months of training.

After successfully completing three years at the Academy, all Army officer cadets undertake a year of military training at the Royal Military College at Duntroon, after which they are commissioned as Lieutenants. Most then take up their first appointment in an Army unit while others return to the Defence Force Academy for an honours year or the fourth year of an Engineering degree.

Midshipmen and Air Force officer cadets who undertake a fourth year of study do so as Advanced Students, without a break in their academic studies.

## Prizes and Awards

At the end of the third year at the Academy, all midshipmen and officer cadets who have met the military and academic requirements are awarded ADFA graduate status and a University of New South Wales degree.

The third-year midshipman or officer cadet who achieves the highest overall result in military subjects and academic studies and who exerts the most positive and effective influence on his/her peer group, will receive the Commander-in-Chief Medal for excellence in training. The most outstanding third-year midshipman, Army officer cadet and Air Force officer cadet each will be presented with a Chief of Defence Force Prize from their parent Service.

Outstanding individual performances in the various academic streams and individual subjects in all years are rewarded with other prizes which are paid for by public funds, University of New South Wales funds and donations. Prizes and awards are also presented for individual excellence in military subjects and are funded by private donations from individuals and organisations.

## Return of Service Obligation

On reaching Graduation Day at the end of Year Two studies at the Academy, seen as the 'employable point' of their careers, midshipmen and officer cadets attract a requirement to fulfil a 'Return of Service Obligation' equivalent to one year of service for every year spent under training, plus one additional year. At this 'employable point' midshipmen and officer cadets may not resign from the Service until they have discharged their Return of Service Obligation.

There is a financial penalty for midshipmen and officer cadets who seek discharge at their own request after this "employable point". They may in exceptional circumstances be permitted to resign, but will be required to reimburse the Commonwealth for the cost of their training and education. The amount to be reimbursed will be determined by the Minister for Defence.

## Fitness and Health

Sport and physical training play an important part in Service life. The primary aim of physical training at the Academy is to educate midshipmen and officer cadets in the values of maintaining a healthy lifestyle. During their stay at the Academy midshipmen and officer cadets are required to pass the relevant Single-Service Fitness Test. The minimum standards for midshipmen and officer cadets are as follows:

### Navy

|            | Male age less than 35 | Female less than 35 |
|------------|-----------------------|---------------------|
| Hang       | 25                    | 25                  |
| or         |                       |                     |
| Push-ups   | 25                    | 10                  |
| Sit-up     | 25                    | 25                  |
| 2.4 km Run | 13 mins               | 15 mins             |
| or         |                       |                     |
| 5 km Walk  | 42 mins               | 43 mins             |
| or         |                       |                     |
| 500 m Swim | 12 mins, 30 secs      | 13 mins, 30 secs    |

### Army

|            | Male less than 25 | Female less than 25 |
|------------|-------------------|---------------------|
| Level      | Pass              | Pass                |
| Push-up    | 40                | 21                  |
| Sit-up     | 70                | 70                  |
| 2.4 km Run | 11mins, 18 secs   | 13 mins, 30 secs    |

### RAAF

|            | Male less than 35 | Female less than 35 |
|------------|-------------------|---------------------|
| Hang       | 30                | 30                  |
| Sit-up     | 30                | 30                  |
| 2.4 km Run | 12 mins           | 13 mins             |
| or         |                   |                     |
| 5 km Walk  | 40 mins           | 41 mins             |

## Weekday Routine

The daily routine during the week consists of wake up at 0600 and roll call at 0605. Academic and military lessons begin at 0800. Before 0800 cadets are required to attend breakfast and to take part in scheduled Divisional activities such as parades, cleaning duties, flag raising duties and Divisional Officer hours. Academic and military lessons are divided into nine 50-minute periods from 0800 to 1900. (Please note, the timetable process may change.)

## Weekend Leave

At weekends cadets pursue their own activities unless they are involved in sporting commitments or the occasional military activity. Cadets are free to go on local leave within a 100-kilometre radius of the Academy. Approval must be obtained to travel outside this radius.

## Military Protocol

Military staff at the Defence Force Academy are drawn from the three Services of the Australian Defence Force. Although midshipmen and officer cadets join a single Service, the tri-Service nature of the Academy means that they must quickly learn the rank insignia of the three Services. Cadets learn the insignia early in the military training program.

## Saluting

The military salute has its origins in the middle ages when knights, upon meeting, raised their visors as a sign of friendship and trust. The hand salute was also a means of showing an open palm with no concealed weapons – again, a sign of trust. Today, the hand salute is an expression of mutual respect such that when a senior is saluted he or she is obliged to return the salute. The salute is a visible act of courtesy, not an act of servility. Midshipmen and officer cadets are required to salute all Service officers, whether in uniform or in civilian clothing.

## Dress and Grooming

During their first week at the Academy, new midshipmen and officer cadets will be issued with the uniforms of their Service, plus common items such as sports clothing.

During a working day cadets wear their single-Service uniforms. During free time they are permitted to wear civilian dress. The civilian dress standard is slightly higher than the community norm for students of that age group.

There is a variety of forms of Service uniforms and cadets may be expected to wear more than one type of uniform during the day. As such, they need to be well organised and accustomed to planning ahead.

## Support Services

### Chaplains

There are three Chaplains at the Academy, one from each Service, representing various denominations. The Catholic chaplain at Royal Military College is available for specifically Catholic issues.

The chaplains conduct workshops in Character Development (as part of the Military Training Program) and Character Guidance for all midshipmen and cadets. They also conduct a two-day exercise for midshipmen and officer cadets at the end of their second year at the Academy.

Spiritual and personal development is encouraged through worship services at the Australian Defence Force Academy, and on Sunday by worship at the ANZAC Memorial Chapel of St Paul in nearby Duntroon. Voluntary bible study, prayer and fellowship groups meet at the Academy on a daily basis.

The Chaplains seek to engage with cadets and staff in a proactive manner both at the Academy and in a variety of single-Service and field training and leisure environments. They provide a confidential pastoral and counselling ministry both during the working day and out of hours through an 'on-call' Chaplain.

## Medical and Dental

The Duntroon Health Centre (DHC) provides full medical services for all cadets and staff members.

Sick Parade times are 0730 – 0930 hrs Monday to Friday and 0900 – 1200 hrs Saturday and Sunday.

**Sick parade is to be utilised for URGENT cases ONLY**, that is illnesses or injuries less than 48 hours since onset or occurrence. **EMERGENCIES** will be attended to at any time.

The Physiotherapy Department is located within the DHC. Sick Parades are conducted Monday to Friday from 0730 to 0930hrs for injuries 48hrs old or less. Bookings are essential.

The Pharmacy is located at DHC and operates between the hours of 0730 to 1600hrs Monday to Friday. X-Ray

services are provided at DHC between the hours of 0830 and 1130 Monday to Friday and bookings are essential. More complex scans and procedures are outsourced, this requires a referral number which can be obtained from the accounts section.

The Canberra Dental Unit is located at the DHC. Their hours are Mon-Fri 8.00am till 3.30pm. Sick Parade is from 8.00 till 8.30am Mon-Fri.

## Psychology and Counselling Service

This service operates through three qualified psychologists and one support staff. The psychologists offer a confidential counselling service for midshipmen, officer cadets and staff who wish to refer themselves for counselling or support. Referrals are made for a wide variety of reasons, ranging from issues relating specifically to studies, career and vocational guidance, through to more personal concerns or difficulties.

In addition to individual counselling, the psychologists conduct workshops on study techniques and methods for reducing stress and anxiety. Courses are also taught on leadership dynamics, human behaviour, interviewing and counselling skills, alcohol and drug awareness, suicide awareness and prevention, mental health awareness and well being, operational and combat stress.

The psychologists also have an important role in assisting first-year midshipmen and officer cadets make the transition from civilian to military life and from secondary to tertiary education. This includes advice on approaching academic work and study techniques, subject choices in relation to students' abilities and vocational goals.

## Equity and Diversity

The Defence Force Academy is committed to promoting and fostering a culture of equity and diversity, and emphasises the importance of valuing fairness and difference as good leadership practice. Equity means a fair go for everyone and seeks to treat people on their merit. Diversity focuses on making the most of differences in people to ensure a more harmonious, productive and efficient work environment.

Commanders and managers at the Academy are required to provide a work environment free from discrimination, harassment, sexual offences and other unacceptable behaviour. To achieve this, the Academy operates under the Australian Defence Force policy of zero tolerance for unacceptable behaviour and the guidelines for dealing with and eliminating discrimination, harassment, sexual offences and unacceptable behaviour.

The Academy Equity Adviser network supports commanders and managers in implementing equity and diversity at the Academy and provides all personnel with support, information and options for the resolution of workplace equity and diversity issues.

## Living Arrangements

### Accommodation

Midshipmen and officer cadets are accommodated in comfortable, functional living quarters. Each person has a private room with facilities for studying. Four such rooms are grouped into a corridor with shared bathroom and laundry facilities. In addition to individual accommodation, each Division has a common recreation area with refrigerator, microwave oven, television, stereo and a computer terminal room. Cadet accommodation is inspected regularly by Divisional staff in order to ensure that cleanliness and neatness is maintained.

Midshipmen and officer cadets in their first and second year at the Academy are accommodated in mixed-Service, mixed-gender Divisions comprising approximately 47 cadets. During their third year, midshipmen and officer cadets live in a mixed gender, single-Service environment. The single-Service nature of third-year Squadrons assists cadets in developing greater familiarity with their parent Service and their transition to their first appointment as a Commissioned Officer.

In first and second year squadrons one room in each accommodation block is allocated as an office to the Divisional Senior Non-Commissioned Officer.

### Visitors

Visitors to the Academy are welcome provided they do not disrupt the study program of the host cadet or any other person. Only in exceptional circumstances will cadets be permitted to receive visitors during programmed working hours or sports periods. For reasons of welfare and security, visitors are not permitted to enter the accommodation blocks without appropriate authorisation from the Divisional Officer.

### Pay

Midshipmen and officer cadets are paid each Thursday fortnight directly into a nominated bank or credit union account. There are two Credit Unions located at the Academy. There is also a Multi-Card ATM facility which operates 24 hours a day.

All members of the Australian Defence Force pay tax, contributions to the Military Superannuation Benefits Scheme and charges for the rations and quarters provided. Ration and quarters charges are not made during periods of leave in excess of 72 hours or when cadets are in the field or at sea.

At March 2006 midshipmen and officer cadet pay scales were as follows:

- a. 1st Year                \$19, 204 Per Annum,
- b. 2nd Year               \$22, 897 Per Annum, and
- c. 3rd Year                \$28, 805 Per Annum.

A first-year cadet could expect deductions for meals, accommodation and utilities. The tax and superannuation deductions increase each year with the cadets' salary.

The Department of Defence pays the Commonwealth Supported Places (formerly HECS) levy for cadets' university studies at the Defence Force Academy.

### Leave

Midshipmen and officer cadets generally receive two periods of recreation leave each year. This may be subject to changes in accordance with training requirements. The two leave periods include: four to five weeks during the Christmas/New Year break and two weeks during the Semester break in July or mid-semester break in May or September. As Year One cadets are required to undertake Single Service Training during the July Break they are not able to proceed on leave.

Midshipmen and officer cadets receive two free trips to their nominated family address each year. Cadets are required to vacate their accommodation during the Christmas/New Year break to enable professional cleaning and refurbishment of the building.



During the first five weeks of the Year One Familiarisation Period, new cadets may be granted one day of leave. After the first five weeks, leave is generally restricted to weekends until July. Additional leave may be requested through the chain of command where special circumstances exist. First year cadets who are under 18 years old must return by midnight every night unless written permission has been obtained. Cadets' leave privileges are gradually increased over the three years.

The first opportunity for extended leave occurs at Easter and is usually of four days' duration. For this period cadets may apply for leave and free travel beyond the local area. Travel by own means i.e., driving is not permitted over this period beyond Melbourne and Sydney.

In addition to recreation leave, the two-week May Training Period provides an opportunity to undertake adventurous training, field study trips, Single-Service Training, military training, remedial academic courses or Engineering workshops. Midshipmen and officer cadets may go on leave during the May Training Period if they are not required for duty. Duty is defined as any activity at which a cadet's attendance has been programmed or ordered by the Commanding Officer. It includes sport, sports training and all academic and military activities.

## The Academy Cadets Mess

Adjacent to the cadet's accommodation is the Academy Cadets Mess, which is the largest Officers Mess in Australia and is designed to seat 1,000 people and cater for up to 1,200 cadets. The Mess comprises food preparation areas, kitchen, storage and freezer rooms, dining areas, bars, recreation rooms and a shop.

## Facilities and Services

### Indoor Sports Centre

The Indoor Sports Centre contains a 25-metre heated swimming pool, three squash courts, a multi-purpose indoor court, a weight training room, a cardio-vascular theatre and a boxer-cise room. There are also showers and change rooms. The Indoor Sports Centre is located adjacent to the Cadets Mess and is only a short walk from the accommodation blocks.

### Sports Grounds

Within the grounds of the Academy are playing fields for cricket, football, hockey and other sports. Tennis courts are located to the east of Building 21 and cadets may use the golf course at the Royal Military College, Duntroon.

### Boatshed and Boating

The Academy Boatshed is located on the shore of Lake Burley Griffin at Yarralumla. The facility houses rowing boats, sailing and racing dinghies, canoes, kayaks and a number of sailboards. The Boatshed has a ramp to the waters of Yarralumla Bay and is perfectly sited for all water sports. The Academy also operates a 24' Hunter Yacht, that is moored permanently on the Lake, and seven support craft for a variety of waterborne activities.

### Academy House

A building known as Academy House is located in the area bounded by the Academy Library, Information Communication Technology Services and the School of Information Technology and Electrical Engineering. Located in this building are the following establishments, which provide services to all Academy staff, midshipmen and officer cadets:

**Banking:** Two Credit Unions offer a wide range of banking needs and there is a 24-hour ATM facility.

**Bookshop:** The University Cooperative Bookshop is open Monday to Friday from 0900–1700hrs and stocks all academic textbooks, general books and stationery. A wide range of computer software is also available. Membership of the Co-op permits attractive discounts on most purchases, excluding magazines, cards and postage stamps.

**Coffee shop:** The ADFA Cafe offers hot meals to eat in or take away; snacks; hot and cold drinks; and confectionery. The ADFA Cafe is an area where cadets can relax either inside or outside the building.

**Hairdressers:** A hairdressing salon operates between 0830–1700hrs on weekdays and on Thursday nights by appointment.

## Motor Vehicles

Midshipmen and officer cadets may own and operate motor vehicles, including motor cycles. All vehicles must be registered with the Academy on arrival. Vehicles must be registered with the relevant State or Territory Motor Registry in accordance with Australian National Traffic Regulations. If your vehicle registration or driver's licence expires during your time at the Academy, you are required to transfer your registration or licence to the ACT.

Each cadet who has a vehicle registered at the Academy is allowed to park in the car parks available. Motor vehicles must be roadworthy, mechanically sound, registered and insured to at least third-party-property level or they cannot be driven, ridden or parked in the Academy grounds. In exceptional circumstances and depending upon the availability of spaces, cadets may be allowed to use a second car parking space for parking a second vehicle, e.g. a trailer.

The operation and parking of motor vehicles at the Academy are privileges, not rights. Such privileges may be revoked if a driver or owner breaches any of the traffic rules applicable to the Academy or contravenes any accepted practice of safe operation of a motor vehicle.

## Community & Other Activities

### General Sport

Participation in sporting activities at the Academy is intended to promote competitiveness, teamwork, leadership, strength, agility and endurance. Sport also provides midshipmen and officer cadets with opportunities to meet and socialise with members of other teams within the local community. However, Academy sports are not limited to team events: individual excellence in such sports as athletics, swimming, triathlon, martial arts, sailing and shooting is also encouraged.

Participation in sport is not compulsory, although involvement in at least one major sport each season is strongly encouraged. Major sports are those team sports in which the Academy is represented in local competitions and they also form the basis of internal competitions between squadrons. Subsidies of uniforms or equipment and assistance with compulsory costs and travel may be available for many sports.

The Lancaster Shield is presented to the squadron who has achieved the best results over a variety of competitions conducted throughout the year. The following sports are annually conducted for the shield: athletics, swimming, cross country running, tug-o-war, endurance challenge, the fitness excellence competition, lawn lap, obstacle course, debating and Academic scores.



## Sports Clubs

Sporting clubs at the Academy are formed under the control of the Chief Instructor and guidance from the Officer Commanding Physical and Recreation Training. Members of staff are appointed as supervisors of each club. Sporting clubs include:

In-line Hockey  
Rugby Union  
Netball  
Hockey  
Indoor Cricket  
Triathlon  
Touch Football  
Soccer  
Basketball  
Rowing  
Cricket  
Water Polo  
Sailing  
Volleyball  
Australian Rules Football

The Academy sends teams each week to participate in the various community sports competitions. Most participation occurs in Winter due to the long absence of cadets from the Academy during the Summer months. Cricket is played on a social basis during the Summer season.

## Voluntary Extra-Curricular Activities

A number of Voluntary Extra-Curricular Activities that provide cadets with interests outside normal activities and sports are established, depending on the amount of interest shown in them. They include:

Band  
Baseball  
Drill Team  
Debating  
Fencing  
Military Shooting  
Mountaineering  
Performing Arts  
Precision Drill Team  
Sailing  
Triathlon  
Yearbook  
Dragon Boating

## The Band, Pipes and Drums of the Academy

The Band, Pipes and Drums of the Australian Defence Force Academy is a military concert band under the administration and conduct of a member of the Australian Army Band Corps. The Band rehearses regularly and has occasional practice on weekends. Membership of the Band is voluntary with a commitment of 12 months. Midshipmen and officer cadets who wish to join are encouraged to supply their own instruments, although some are provided by the Academy.

There are bagpipe, percussion and woodwind sections of the Band. The Bagpipe is the only instrument that is taught from beginner level, with tuition provided by a civilian teacher.

The Band performs for all Academy parades and provides musical support for the Academy Production, concert evenings, presentation nights and Church services. The Band also performs outside the Academy occasionally, with a commitment during the academic year to providing a piper or bugler for the weekly closing of the Australian War Memorial.

**Current course and  
program information**  
is now available through the  
**UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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## The Foster Family Scheme

During the first few weeks, midshipmen and officer cadets from outside the Australian Capital Territory are invited to join the Foster Family Scheme. This scheme introduces cadets to serving and retired military officers and warrant officers living locally who will provide a home-away-from-home environment to assist in the settling-in process.

These families, who are all volunteers, also provide mentoring and an opportunity for one-on-one discussion about career options and other concerns. Cadets are encouraged to join the scheme.

## Charities

The Academy is involved in supporting a number of charities each year. These include Legacy, Red Cross, ANZAC Day badge selling and the Salvation Army Door Knock appeal. Individual cadets may be asked to provide support during these appeals.

## Community Participation

Cadets are encouraged to pursue personal interests outside the Academy and take an active role in the local community. Some are involved in local organisations such as scouting groups, local sporting teams, the Canberra Symphony Orchestra, bible study groups and the local animal shelter, to name a few.



# Postgraduate Coursework Programs

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# Understanding your UNSW@ADFA degree

There are various sets of rules that you should understand before enrolling in your courses. If you require assistance understanding these rules, please contact Student Administrative Services or the relevant school. This information applies to students who commence their study in 2007. Continuing students should refer to the handbook from the year they commenced study.

You should also read the *Information for All Students* on page 7 of this handbook.

## Faculty Regulations for Postgraduate Studies via Coursework

These rules apply to all postgraduate students who are studying via coursework regardless of the degree they are studying.

These rules can be found on the following page.

### Academic Rules

There are three sets of degree rules: Master, Graduate Diploma and Graduate Certificate. Your studies are bound by the rules of the relevant degree. These rules are on page 78.

### Program Description and Structure

These rules give a general overview of which courses a student must study in order to graduate. Some Program Rules detail specific courses while others, such as program rules for Masters programs are guidelines used in conjunction with Plan/Specialisation rules. If these rules direct you to contact the **Program Authority** you should, in the first instance, contact the school who is administering the using the information on the right of this page. These rules start at page 79.

### Plan/Specialisation Rules

These rules detail courses a student must complete in order to graduate under a specific plan. In most cases, students must understand these rules before enrolling to ensure the courses they complete will count towards their degree.

If these rules direct you to contact the **Plan Authority** or **Program Authority** you should, in the first instance, contact the school who is administering the plan/specialisation using the information on the right of this page. You will need to discuss your options with the Postgraduate Coursework Coordinator of that School. You can also visit: [www.unsw.adfa.edu.au/student/contact/schools.html](http://www.unsw.adfa.edu.au/student/contact/schools.html)

Not all postgraduate coursework degree have Plan/Specialisation rules.

## Contacts for guidance and information

### Student Administrative Services

Ph 02 6268 6000  
Fax 02 6268 8666  
[sas@adfa.edu.au](mailto:sas@adfa.edu.au)  
[www.unsw.adfa.edu.au/student](http://www.unsw.adfa.edu.au/student)

### School of Aeronautical, Civil and Mechanical Engineering (ACME)

Ph 02 6268 8335  
[pgcoord.acme@adfa.edu.au](mailto:pgcoord.acme@adfa.edu.au)  
[www.unsw.adfa.edu.au/acme](http://www.unsw.adfa.edu.au/acme)

### School of Business

02 6268 6098  
[studentadmin.sob@adfa.edu.au](mailto:studentadmin.sob@adfa.edu.au)  
[www.unsw.adfa.edu.au/sbus](http://www.unsw.adfa.edu.au/sbus)

### School of Humanities and Social Sciences (HASS)

02 6268 8867  
[pgcoord.hass@adfa.edu.au](mailto:pgcoord.hass@adfa.edu.au)  
[www.unsw.adfa.edu.au/hass](http://www.unsw.adfa.edu.au/hass)

### School of Information Technology and Electrical Engineering (ITEE)

02 6268 8580  
[pgcoord.itee@adfa.edu.au](mailto:pgcoord.itee@adfa.edu.au)  
[www.unsw.adfa.edu.au/itee](http://www.unsw.adfa.edu.au/itee)

### School of Physical, Environmental and Mathematical Sciences (PEMS)

02 6268 6278  
[pgcoord.pems@adfa.edu.au](mailto:pgcoord.pems@adfa.edu.au)  
[www.unsw.adfa.edu.au/pems](http://www.unsw.adfa.edu.au/pems)



# FACULTY REGULATIONS FOR POSTGRADUATE STUDY VIA COURSEWORK

These regulations apply to all postgraduate coursework degrees and are to be used in conjunction with Academic Rules and Program Information, which appears in the following section. All rules in this Handbook apply to each student who enters a postgraduate program in 2007. The rules remain applicable until the student exits their program, either by discontinuation or graduation. Students who entered a program in another year should consult the rules and regulations for that year.

For definitions of specific terms, please consult the Glossary within this handbook.

## 1 Meeting degree requirements

- 1.1 To be eligible to graduate, a student must comply with Faculty Regulations, Academic Rules and Program/Plan Rules.
- 1.2 Every student enrolled in a coursework program must complete courses as part of their degree. The requirements of a course will be outlined by its course convenor.
- 1.3 A student may not enrol in a course if they have not met the specified prerequisites.
- 1.4 Each course completed or granted as credit towards a program may be counted towards only one major/minor in that program.

## 2 Limitation on enrolment each semester

- 2.1 In any session, a student cannot enrol in more than 27 UOC without the approval of the Registrar's Nominee (Manager, Student Administrative Services).

## 3 Study required per UOC

- 3.1 25-30 hours of work, including face-to-face teaching sessions and private study time, is expected for 1 UOC per session (e.g. 150-180 hours of study is required for a 6UOC course).

## 4 Credit Cancellation Period

- 4.1 No units of credit shall count towards any award at postgraduate level if ten or more years have elapsed since a candidate accumulated the units of credit.

## 5 Multiple enrolments

- 5.1 No person shall be permitted to enrol in a course as part of a UNSW@ADFA program while simultaneously being enrolled in another program at any tertiary institution without the approval of the relevant Head/s of School.
- 5.2 The Registrar's Nominee may suspend any student who is found to be enrolled in multiple programs without approval.

## 6 Credit for previous study

- 6.1 Credit transfer to a maximum of 50% of UNSW@ADFA program requirements may be granted for completed or partially completed postgraduate awards in the same or related discipline from UNSW or another recognised tertiary institution, as follows:
  - a) In the same or related discipline, a maximum of 50% of UNSW@ADFA program requirements, and
  - b) In an unrelated discipline, up to a maximum of 25% of UNSW@ADFA program requirements.
- 6.2 All credit will be assessed on a course-by-course basis, taking into account:
  - a) The standing of the institution
  - b) The content and assessment of the course (i.e. the relevance of the completed course to the program in which credit is sought).
  - c) The level of the course (Masters/Graduate Diploma/Graduate Certificate) in relation to the level of program in which credit is sought
  - d) The workload of the course, including its equivalence to UNSW units of credit.
- 6.3 Credit will normally be granted only for courses at the same level.
- 6.4 Credit will only be granted at the approval of the relevant Head/s of School.
- 6.5 Credit will only be granted if a Credit Application form is submitted and approved within the credit cancellation period.
- 6.6 If a student believes their previous studies and/or work experience has given them the knowledge and skills taught within a core course, but they have not completed suitable studies at a recognised tertiary institution, they may seek approval from the relevant Head/s of School to substitute this course for one outside of their degree rules.
- 6.7 A student who has completed 24UOC towards a Graduate Diploma or Masters may be eligible to exit the program and be awarded a Graduate Certificate. This student may later return to the same Graduate Diploma or Masters and be granted up to 24UOC for the courses previously completed.

## 7 Articulation

- 7.1 Students who meet the requirements of a Graduate Diploma from UNSW@ADFA may seek permission to articulate with full credit into the Masters program of the same discipline.
- 7.2 Articulation and credit must be approved by the relevant Head/s of School.

## 8 Variation of program and course requirements

- 8.1 Upon sufficient cause being shown, the Presiding Member, Academic Board may, in special cases, vary the requirements of degree rules provided that any proposed variation shall be initiated by a recommendation from the relevant Head of School and the Registrar's Nominee.

# ACADEMIC RULES

## Masters by coursework

### 1 Entry Requirements

- 1.1 To gain entry into a Masters by coursework program an applicant must:
- a) Have met the requirements of a four year Bachelor degree or a Bachelor degree with Honours with a major in a same or related discipline from a recognised tertiary institution
- or
- b) Have met the requirements of a Graduate Diploma from UNSW in a same or related discipline or an equivalent qualification from a recognised tertiary institution
- or
- c) Have met the requirements of a three year Bachelor degree at pass level, which includes a major in a same or related discipline, from a recognised tertiary institution, and have completed at least three years relevant full-time work experience
- or
- d) Submit evidence of academic and/or professional qualifications and/or related work experience which is determined by the relevant Program Authority to be acceptable grounds for admission into the degree.

### 2 Enrolment and Progression

- 2.1 An application to enrol as a candidate for the degree shall be made on the prescribed form and lodged with Student Administrative Services by the advertised date.
- 2.2 A candidate for the degree must undertake courses and pass assessment as prescribed by UNSW.
- 2.3 The program of study shall total a minimum of 48 units of credit.
- 2.4 The Academic Standing of a candidate shall be reviewed at the end of each session. Movement between levels of academic standing is based on progress, measured by cumulative number of failures.

### 3 Fees

- 3.1 A candidate shall pay fees as determined by the UNSW Council.

## Graduate Diploma

### 1 Entry Requirements

- 1.1 To gain entry into a Graduate Diploma program an applicant must:
- a) Have met the requirements of a Bachelor degree at pass level in a same or related discipline from a recognised tertiary institution
- or
- b) Have met the requirements of a Graduate Certificate in a same or related discipline from UNSW or an equivalent qualification from a recognised tertiary institution

or

- c) Submit evidence of academic and/or professional qualifications and/or related work experience which is determined by the relevant Program Authority to be acceptable grounds for admission into the degree.

### 2 Enrolment and Progression

- 2.1 An application to enrol as a candidate for the degree shall be made on the prescribed form and lodged with Student Administrative Services by the advertised date.
- 2.2 A candidate for the degree must undertake courses and pass assessment as prescribed by UNSW.
- 2.3 The program of study shall total a minimum of 36 units of credit.
- 2.4 The Academic Standing of a candidate shall be reviewed at the end of each session. Movement between levels of academic standing is based on progress, measured by cumulative number of failures.

### 3 Fees

- 3.1 A candidate shall pay fees as determined by the UNSW Council.

## Graduate Certificate

### 1 Entry Requirements

- 1.1 To gain entry into a Graduate Certificate by coursework program an applicant must:
- a) Have met the requirements of a Bachelor degree in any discipline from a recognised tertiary institution
- or
- b) Shall submit evidence of academic and/or professional qualifications and/or related work experience which is determined, by the relevant Program Authority to be acceptable grounds for admission into the degree.

### 2 Enrolment and Progression

- 2.1 An application to enrol as a candidate for the Graduate Certificate shall be made on the prescribed form which shall be lodged with Student Administrative Services by the advertised date.
- 2.2 A candidate for the degree must undertake courses and pass assessment as prescribed by UNSW@ADFA.
- 2.3 The program of study shall total a minimum of 24 units of credit.
- 2.4 The Academic Standing of a candidate shall be reviewed at the end of each session. Movement between levels of academic standing is based on progress, measured by cumulative number of failures.
- 2.5 No Graduate Certificate at UNSW@ADFA is part of an articulated sequence of programs.

### 3 Fees

- 3.1 A candidate shall pay fees as determined by the UNSW Council.

# ARTS

## Program Overview

UNSW@ADFA offers a Graduate Diploma and Masters in Arts. Students are able to study these programs under the English and Cultural Studies specialisation. This program is run by the School of Humanities and Social Science which is a hub for discussion about culture, politics, ethics, history and literature.

## Graduate Diploma of Arts (GradDipArts)

### School of Humanities and Social Sciences

**Award:** 5855 – Graduate Diploma in Arts (GradDipArts)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 18UOC (full-time)

**UOC for award:** 36UOC

### Program Description:

The Graduate Diploma of Arts enables students to specialise in the GradDipArts in English and Cultural Studies.

### Program Objectives and Learning Outcomes:

The Arts program provides students with the opportunity to study cultural and literary expressions that shape and help interpret human perceptions and behaviour.

### Program Structure:

Students undertaking the Graduate Diploma in Arts must satisfy the core and elective course requirements specified in the particular plan in which they are enrolled. The elective options provide the flexibility to tailor the degree to meet individual needs and interests. Students are required to take 6 coursework units (36UOC) from the core and elective courses set out on in the following section.

An applicant wishing to enrol in the Graduate Certificate of Arts program in 2007 should first consult the Postgraduate Coursework Coordinator at HASS. See contact details on page 76.

## Specialisations available in the Graduate Diploma in Arts Program

### GradDipArts – English and Cultural Studies

#### School of Humanities and Social Sciences

#### Plan Description

The GradDipArts in English and Cultural Studies is designed for postgraduate scholars with undergraduate qualifications in a relevant social science or humanities discipline and/or appropriate professional experience who wish to gain a more comprehensive appreciation of literary texts, film and other means of communication and of the cultures which they represent. It provides the foundations for students wishing to proceed to more advanced study in the discipline and promotes important insights into the perceptions and behaviour of Australia and other nations and groups.

## Plan Structure

Students undertaking the GradDipArts in English and Cultural Studies are required to take 6 coursework units (36UOC) from the following core and elective courses.

### Students must complete at least two of the following core courses:

ZHSS8103 Nearest Neighbours: Asia-Pacific Literature, Culture and Communication (6UOC) ○

ZHSS8106 War and Memory: Representations of War and the Making of Cultural Myths (6UOC) •

ZHSS8109 Australian Literary Culture (6UOC) x

In addition, students must choose at least two courses from the following elective courses:

ZHSS8102 American Empire: American Culture in Context (6UOC) ○ ○

ZHSS8108 Out of Empire: British Literature and Culture (6UOC) x

ZHSS8115 Literary Theory and the History of Communication (6UOC) x

Students may select their other courses from the remaining core and elective courses identified in the Master of Arts in English and Cultural Studies.

They may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The ZHSS8122/8123 *Research Project – English* is not available to candidates for the Graduate Diploma.

## Master of Arts (MA)

### School of Humanities and Social Sciences

**Award:** 8175 – Master of Arts (MA coursework)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 48UOC

### Program Description:

The Master of Arts enables students to specialise in English and Cultural Studies.

### Program Objectives and Learning Outcomes:

The Arts program provides students with the opportunity to study the cultural and literary expressions that shape and help interpret human perceptions and behaviour.

### Program Structure:

Students undertaking the Master of Arts must satisfy the core and elective course requirements specified in the plan in which they are enrolled. The elective options provide the flexibility to tailor the degree to meet individual needs and interests. Students are required to take 8 coursework units (48UOC) from the core and elective courses.

An applicant wishing to enrol in the Master of Arts program in 2007 should first consult the Postgraduate Coursework Coordinator at HASS. See contact details on page 76.

## Specialisations available in the Master of Arts Program

### MA in English and Cultural Studies

School of Humanities and Social Sciences

#### Plan Description

The MA in English and Cultural Studies is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant social sciences or humanities discipline and/or extensive relevant professional experience who wish to gain a more comprehensive appreciation of literary texts, film and other means of communication and of the cultures which they represent.

It provides important insights into the cultural underpinnings that shape perceptions and action both within Australia and comparatively with Australia's regional neighbours and traditional international partners.

#### Plan Structure

Students undertaking the MA in English and Cultural Studies are required to take 8 coursework units (48UOC) from core and elective courses as detailed below. Each course is worth 6UOC.

#### Core Courses:

**Students must complete at least two of the following core courses:**

- ZHSS8103 Nearest Neighbours: Asia-Pacific Literature, Culture and Communication ○
- ZHSS8106 War and Memory: Representations of War and the Making of Cultural Myths •
- ZHSS8109 Australian Literary Culture x

#### Elective Courses:

In addition, students must choose at least two of the following elective courses:

- ZHSS8102 American Empire: American Culture in Context ○○
- ZHSS8108 Out of Empire: British Literature and Culture x
- ZHSS8115 Literary Theory and the History of Communication x

Students may choose their remaining courses from the following:

- ZHSS8112 Special Study x
- ZHSS8119 Academic Discourse I: Analysis and Writing (for international students) • •
- ZHSS8120 Academic Discourse II: Analysis and Writing (for international students) x

Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs, such as Defence Studies.

#### Research Project:

The option of ZHSS8122/ZHSS8123 *Research Project – English* (12UOC) is available to Masters students who attain a high credit average or better in four courses and is subject to the approval of the Head of School. The *Research Project – English* is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the *Research Project – English* may also take one course (6UOC) from a related coursework program.

## DEFENCE STUDIES

The Defence Studies Programs incorporates the awards of 9900 Master of Defence Studies; 5914 Graduate Diploma in Defence Studies; 7384 Graduate Certificate in Defence Studies.

Defence Studies is an inter-disciplinary program which brings scholarly insight and academic discipline to bear on a wide range of defence and security policy and planning issues. It provides high level understanding and advanced analytical skills in relation to the evolving strategic environment, particularly in the Asia-Pacific, the key factors that are shaping defence and security policy and decision making in the 21st century, and the development of military strategy and the conduct of operations.

The program meets the needs of advanced scholars seeking to master the principal concepts and issues affecting strategic and international security studies and to understand their practical planning implications. For Defence professionals, it offers the opportunity to broaden their knowledge of the policy and security environment in which they are working and to develop a comprehensive set of skills for analysing that environment and developing policy options.

The structure of the Defence Studies program provides students with the opportunity to tailor their degree to individual needs and interests. They may elect to specialise in specific areas of strategic and Defence studies or to complete a more broadly based qualification.

### Graduate Certificate in Defence Studies (GradCertDefStud)

**School:** School of Humanities and Social Sciences

**Award:** 7384 – Graduate Certificate in Defence Studies (GradCertDefStud)

**Duration:** Six months full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 24UOC

**This is an exit-only program. It will not be available to commencing students.**

### Graduate Diploma in Defence Studies (GradDipDefStud)

**School of Humanities and Social Sciences**

**Award:** 5914 – Graduate Diploma in Defence Studies (GradDipDefStud)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 18UOC (full-time)

**UOC for award:** 36UOC

#### Program Description:

The Graduate Diploma in Defence Studies is designed for postgraduate scholars and defence and foreign affairs professionals with undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to gain a more detailed understanding of the strategic environment, the key factors shaping defence and security policy and decision making, and the conduct of military operations.



### Program Objectives and Learning Outcomes:

It provides the foundations for students wishing to proceed to more advanced study in the discipline and promotes insights and skills relevant to policy development in related areas.

### Program Structure:

Students undertaking the Graduate Diploma in Defence Studies are required to take one keystone course (12UOC) and additional coursework totalling 24UOC from the courses set out under the Master of Defence Studies. As with the Masters, students may elect either to specialise in a particular area or to complete a more broadly based qualification.

Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The ZHSS8212 *Research Project - History* or ZHSS8400 *Research Project - Politics* is not available to candidates for the Graduate Diploma.

## Master of Defence Studies (MDefStud)

### School of Humanities and Social Sciences

**Award:** 9900 – Master of Defence Studies (MDefStud)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 48UOC

### Program Description:

The Master of Defence Studies is designed for postgraduate scholars and defence professionals with appropriate undergraduate qualifications in a relevant social science or humanities discipline and/or extensive relevant professional experience who wish to gain a comprehensive understanding of the strategic environment, the key factors shaping defence and security policy and decision making, and the conduct of military operations.

### Program Objectives and Learning Outcomes:

It provides comprehensive insights and analytical skills relevant to both higher level policy development and advanced postgraduate study.

### Program Structure:

Students undertaking the Master of Defence Studies have the flexibility to tailor their degree to meet their individual needs and interests. They are required to take two keystone courses (24UOC) and additional elective courses from the list below, for a total of 48UOC. Each elective course is worth 6UOC. While the courses are broadly grouped to reflect different aspects of the discipline, students may elect either to specialise in a particular area or to complete a more broadly based qualification.

### Keystone Courses

- ZHSS8420 Defending Australia: Developing Security Policy in a Changing World ○
- ZHSS8422 Asia-Pacific Security: Regional Security in the New Millennium ○○
- ZHSS8424 Foundations of Strategy and Military Affairs ○○

### Strategy and Military Affairs

- ZHSS8203 History of Pre-Nuclear Military Thought x
- ZHSS8204 Modern Naval History and Strategy ○○
- ZHSS8207 Case Studies in War x
- ZHSS8425 Strategy and Military Affairs – Special Studies ○○
- ZINT7303 Airpower Seminar Series x
- ZPEM8202 Principles of Geographic Information Analysis and Remote Sensing x
- ZPEM8203 Applications in Remote Sensing x
- ZPEM8206 Applications in Geographic Information Analysis x

### The Defence of Australia

- ZHSS8202 The History of Australian Defence and Foreign Policy ○
- ZHSS8411 Developing Strategic Policy and Planning in the 21st Century x
- ZHSS8419 Australian Homeland Security x
- ZHSS8421 Defending Australia – Special Studies ○○

### Regional Security Asia Pacific

- ZHSS8103 Nearest Neighbours: Asia-Pacific Literature and Culture ○
- ZHSS8405 Security Issues in Northeast Asia x
- ZHSS8413 Southeast Asia: Issues in Security Cooperation x
- ZHSS8423 Asia-Pacific Security: Special Studies x
- ZPEM8204 Strategic Geographical Issues in Australia's Neighbourhood x
- ZHSS8430 China's Security Policy and Military Modernisation •

### International Security

- ZHSS8403 Global Security ○
- ZHSS8404 Legal and Moral Problems of International Violence ○○
- ZHSS8415 Terrorism and Transnational Crime ○○
- ZHSS8416 Seeking the Information Edge: The Role of Modern Intelligence ○
- ZPEM8502 CBRNE - Fundamentals and Management ○○

### Cultural Awareness and Academic Skills

- ZHSS8102 American Empire: American Culture in Context ○○
- ZHSS8106 War and Memory: Representations of War and the Making of Cultural Myths •
- ZHSS8119 Academic Discourse I: Analysis and Writing (for International Students) • • •
- ZHSS8120 Academic Discourse II: Analysis and Writing (for International Students) x

Additional special study and elective courses may be offered on an opportunity basis. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs. Students may apply for recognition of approved professional education short courses by enrolling in ZHSS8001 *Professional Practice*.

### Research Project:

The option of undertaking a research project – ZHSS8212/8215 *Research Project - History* or ZHSS8400/8401 *Research Project - Politics* (12UOC) – is available to Masters students who attain a high credit average or better in courses worth 24UOC and is subject to the approval of the Head of School. The research project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. This project may be undertaken in a single session or as a full-year course. Students undertaking the Research Project may take a maximum of one course (6UOC) from a related coursework program.

## ENGINEERING SCIENCE

The Engineering Science Programs incorporate the following awards: 8569 Master of Engineering Science; 5889 Graduate Diploma in Engineering Science; 7387 Graduate Certificate in Engineering Science. The Engineering Science programs offer the opportunity to pursue graduate-level study in the traditional engineering discipline areas. In addition to a broad range of technical and professional engineering courses, there is the opportunity for students to blend that specialist expertise with related courses in the Science and Management Studies programs. The Engineering Science program is divided into six specialisations:

- Aerospace Engineering
- C4ISREW
- Civil Engineering
- Data Communications and Analysis
- Electrical Engineering
- Marine Engineering
- Project Management

Not all courses in the Engineering programs are available each year.

### Graduate Certificate in Engineering Science (GradCertEngSc)

**School of Information Technology and Electrical Engineering**

**Award:** 7387 – Graduate Certificate in Engineering Science (GradCertEngSc)

**Duration:** One session full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 24UOC

#### Program Description:

The Graduate Certificate in Engineering Science enables students to specialise in Electrical Engineering. The Graduate Certificate in Engineering Science is specially designed for students with an undergraduate degree or established profession in another field who wish to gain an understanding of Electrical Engineering.

#### Program Objectives and Learning Outcomes:

The certificate is intended to assist professionals in coming to terms with modern technology and its use. Mature students wishing to retrain may use the Graduate Certificate as the first step in a sequence of study to Graduate Diploma and Masters of Engineering Science qualifications.

#### Program Structure:

Students entering the program at the Graduate Certificate level are required to complete four foundation courses (24UOC) from those nominated by the School of Information Technology and Electrical Engineering. The range of courses offered will vary and students wishing to undertake a Graduate Certificate in Engineering Science should discuss the options with the Plan Authority.

### Specialisation available in Graduate Certificate in Engineering Science Program

#### GradCertEngSc in Electrical Engineering

**School of Information Technology and Electrical Engineering**

#### Plan Information

New admissions to the plan in 2007 will not be accepted. Admissions after 2007 will be subject to a review of the plan.

### Graduate Diploma in Engineering Science (GradDipEngSc)

**School of Aerospace, Civil and Mechanical Engineering  
School of Information Technology and Electrical Engineering**

**Award:** 5889 – Graduate Diploma in Engineering Science (GradDipEngSc)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** Up to a maximum of 24UOC (full-time)

**UOC for award:** 36UOC

#### Program Description:

The Graduate Diploma in Engineering Science is specially designed for students with undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an advanced understanding of C4ISREW, Civil Engineering, Data Communications and Analysis, Electrical Engineering, Marine Engineering, Project Management or Simulation and Experimentation.

#### Program Objectives and Learning Outcomes:

The diploma is intended to provide engineering professionals with professional academic qualifications. Mature students wishing to retrain may use the Graduate Diploma as the foundation for proceeding to a Master of Engineering Science degree.

#### Program Structure:

Students undertaking the Graduate Diploma – Engineering Science satisfy the core and elective course requirements in the particular plan in which they are enrolled. Students are required to take 6 coursework units (36UOC) for core and elective courses. Each course is worth 6UOC.

### Specialisations available in Graduate Diploma in Engineering Science Program

#### GradDipEngSc in C4ISREW

**School of Information Technology and Electrical Engineering**

#### Plan Description

The GradDipEngSc in C4ISREW is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of C4ISREW and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

## Plan Structure

Students undertaking the GradDipEngSc C4ISREW are required to take 6 coursework courses (36UOC). Students must complete two compulsory course and three elective courses from the list below. Not all elective courses will be available in a particular year.

### Compulsory

- ZITE8102 C3I Systems ■  
ZITE8115 Information Operations ○

### Electives

- ZITE8104 Computer Security ○  
ZITE8106 Cryptography x  
ZITE8110 Decision Support Systems x  
ZITE8119 Internetworking •  
ZITE8129 Multimedia and Virtual Environments ••  
ZITE8145 Soft Computing x  
ZITE8208 Digital Video Communications •  
ZITE8219 Satellite Communications ■ ■  
ZITE8221 Spaceborne Imaging Technology x  
ZITE8227 Digital Image Processing and Enhancement x  
ZITE8403 Decision Analysis ○

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Engineering Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

## GradDipEngSc in Civil Engineering

School of Aerospace, Civil and Mechanical Engineering (ACME)

### Plan Description

The diploma may be obtained in Civil Engineering.

### Plan Structure

Students undertaking the Graduate Diploma in Engineering are required to take 6 coursework courses (36UOC) from the courses set out under the respective Civil Engineering (and Project Management) and Electrical Engineering Masters programs (see page 84). As with the Masters, students may elect either to specialise in a particular area or to complete a more broadly based qualification.

Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The courses *ZACM8501 Project Report (Full Year)* and *ZACM8502 Project Report (Single Session)* are not available to candidates for the Graduate Diploma.

Students at the Graduate Diploma level are expected to possess the foundation knowledge relevant to the particular areas of engineering they are studying.

## GradDipEngSc in Data Communications and Analysis

School of Information Technology and Electrical Engineering

### Plan Description

The GradDipEngSc in Data Communications and Analysis designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant engineering discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of data communications and analysis and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

## Plan Structure

Students undertaking the GradDipEngSc in Data Communications and Analysis are required to take 6 coursework courses (36UOC) from the courses set out on below. Students must complete five elective courses from the list below. Not all elective courses will be available in a particular year.

### Electives

- ZITE8104 Computer Security ○  
ZITE8106 Cryptography x  
ZITE8119 Internetworking •  
ZITE8141 WAN Technologies ○○  
ZITE8203 Advanced Digital Signal Processing Techniques x  
ZITE8206 Digital Communications x  
ZITE8208 Digital Video Communications •  
ZITE8213 Mobile Communications •  
ZITE8214 Neural Networks x  
ZITE8219 Satellite Communications ■ ■  
ZITE8221 Spaceborne Imaging Technology x  
ZITE8227 Digital Image Processing and Enhancement x  
ZITE8228 Modern Signal Estimation and Filtering Techniques x

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Engineering Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

## GradDipEngSc in Electrical Engineering

School of Information Technology and Electrical Engineering

### Plan Description

The diploma may be obtained in Electrical Engineering.

### Plan Structure

Students undertaking the Graduate Diploma in Engineering are required to take 6 courses (36UOC) from the courses set out under the MEngSc in Electrical Engineering program plan information on page 86. As with the Masters, students may elect either to specialise in a particular area or to complete a more broadly based qualification.

Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

Students at the Graduate Diploma level are expected to possess the foundation knowledge relevant to the particular areas of engineering they are studying.

## GradDipEngSc in Marine Engineering

School of Aerospace, Civil and Mechanical Engineering

### Plan Description

The GradDip (Marine) is designed for students who wish to gain a diploma-level qualification in Marine Engineering. The plan articulates with the MEngSc (Marine) plan.

### Plan Structure

Students undertaking the Graduate Diploma in Marine Engineering are required to take six coursework courses (36UOC) from the courses set out under the MEngSc in Marine Engineering plan information on page 86. As with the Masters, students may elect to either specialise in a particular area or to complete a more broadly based qualification. To qualify for the Graduate Diploma in Marine Engineering, students must take the core courses *ZACM8320 Marine Engineering* and *ZACM8321 Naval Architecture*.



Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The courses ZACM8501 *Project Report (Full Year)* and ZACM8502 *Project Report (Single Session)* are not available to candidates for the Graduate Diploma. Not all elective courses will necessarily be available in a particular year.

Students at the Graduate Diploma level are expected to possess the foundation knowledge relevant to the particular areas of engineering they are studying.

## GradDipEngSc in Project Management

School of Aerospace, Civil and Mechanical Engineering

### Plan Description

The GradDip (Project Management) is designed for students who wish to gain a diploma-level qualification in Project Management. The plan articulates with the MEngSc (Project Management) plan.

### Plan Structure

Students undertaking the Graduate Diploma in Project Management are required to take six coursework courses (36UOC) from the courses set out under the MEngSc (Project Management) plan. As with the Masters, students may elect to either specialise in a particular area or to complete a more broadly based qualification.

#### All students must complete

ZACM8309 Project Management Body of Knowledge ○  
ZACM8324 Project Administration ■ ○○

#### Plus at least one of

ZACM8325 Systems Dynamics of Project Organisation ○  
ZACM8310 Project Systems Modelling ○○

#### Plus at least two of

ZACM8308 Facility and Property Management ○  
ZACM8312 Systems Dynamic Modelling ••  
ZACM8313 Source Selection in Projects ○  
ZACM8315 Special Elective 1 (Project Management) x  
ZACM8327 Maximum Entropy Analysis x  
ZBUS8101 Strategic Management ○ ○○  
ZBUS8105 Finance and Investment Appraisal ○  
ZITE8136 Software Project Management ○○  
ZITE8138 Systems Planning ○

Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The courses ZACM8501 *Project Report (Full Year)* and ZACM8502 *Project Report (Single Session)* are not available to candidates for the Graduate Diploma. Not all elective courses will necessarily be available in a particular year.

Students at the Graduate Diploma level are expected to possess the foundation knowledge relevant to the particular areas of engineering they are studying.

## GradDipEngSc in Simulation and Experimentation

School of Information Technology and Electrical Engineering

Students undertaking the Graduate Diploma of Science in Simulation and Experimentation are required to take 6 coursework courses (36UOC) from the courses set out below. Students must complete three compulsory courses and two elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

ZITE8412 Simulation ○  
ZITE8402 Concept Development, Experimentation and Wargaming ○○  
ZITE8403 Decision Analysis ○

#### Electives

ZITE8413 Advanced Simulation x  
ZITE8102 C3I Systems – Design, Management and Operation ■  
ZITE8104 Computer Security ○  
ZITE8129 Multimedia and Virtual Environments ••  
ZITE8134 Software Architecture •  
ZITE8143 Distributed Applications ••  
ZITE8111 Directed Studies in Information Technology 1 ○ ○○  
ZITE8112 Directed Studies in Information Technology 2 ○ ○○

Students may, with the approval of the Plan Authority, take one course (6UOC) from a related coursework program. The option of a research project is not available to students in the Graduate Diploma.

## Master of Engineering Science (MEngSc)

School of Aerospace, Civil and Mechanical Engineering  
School of Information Technology and Electrical Engineering

**Award:** 8569 – Master of Engineering Science (MEngSc)

**Duration:** One year full-time, or equivalent part-time

**UOC per session:** Up to a maximum of 24UOC (full-time)

**UOC for award:** 48UOC

### Program Description:

The Master of Engineering Science enables students to specialise in the following plans: Aerospace Engineering, C4ISREW, Civil Engineering, Data Communications and Analysis, Electrical Engineering, Marine Engineering or Project Management.

### Program Objectives and Learning Outcomes:

The Engineering Science program provides students with the opportunity to acquire high level understanding and advanced analytical skills in the key areas of: Aerospace Engineering; Civil Engineering; Electrical Engineering; Marine Engineering; Project Management and Simulation and Experimentation. Coverage of courses in this program spans the engineering disciplines and the management of projects frequently incorporating those engineering disciplines. There is strong emphasis on extending undergraduate skills and knowledge and vocational experiences to enable graduates to apply their high level understanding to real world complex engineering problems and their management.

### Program Structure:

Students undertaking the Master of Engineering Science program must satisfy the core and elective course requirements specified in the particular plan in which they are enrolled. The elective options provide the flexibility to tailor the degree to meet individual needs and requirements. Students are required to complete 8 coursework units (48UOC) from the core and elective courses set out under the plan information.

## Specialisations Available in the Master of Engineering Science

To undertake a Master of Engineering Science degree, students must meet the requirements of one of the specified plans of study.

### MEngSc in Aerospace Engineering

School of Aerospace, Civil and Mechanical Engineering

#### Plan Description

The Master of Engineering Science in Aerospace Engineering has been developed specifically to meet the professional development needs of aerospace engineers within the Australian Defence Force (ADF). It is designed for officers with appropriate undergraduate



qualifications in a relevant engineering discipline and/or extensive professional experience to develop an advanced appreciation of the principles and practice of aerospace engineering and the processes by which aerospace capabilities are developed and maintained.

### Plan Structure

Students undertaking the MEngSc in Aerospace Engineering are required to take 8 coursework courses (48UOC) from core and elective courses in accordance with the conditions set out below. Each course is worth 6UOC.

**Enrolment in this plan in 2007 will require the approval of the Head of School.**

#### Students are required to complete 4 core courses:

ZACM8305 Civilian and Military Airworthiness Requirements, Philosophies and Procedures ■ ■  
 ZBUS8302 Logistics ○ ■ ■  
 ZITE8226 Systems Engineering Practice ■ ○ ○  
 ZPEM8308 Reliability and Maintainability ○ ○

#### Of the four elective courses, two must be chosen from:

ZACM8302 Aero-Mechanical Systems • • ■ ■  
 ZACM8304 Aircraft Structural Repair Methodologies x  
 ZACM8307 Weapons Engineering x  
 ZACM8324 Project Administration ■ ○ ○  
 ZACM8327 Maximum Entropy Analysis x  
 ZBUS8105 Finance and Investment Appraisal ○  
 ZITE8215 Principles of Modern Communications and Information Systems x  
 ZITE8216 Principles of Software Engineering x  
 ZITE8217 Principles of Surveillance Technologies x  
 ZITE8219 Satellite Communications ■ ■

With the approval of the Plan Authority, students may take a research project – ZACM8501 *Project Report (Full year)* or ZACM8502 *Project Report (Single Session)* – in place of any two of the elective courses.

In addition to the 6 courses required for completion of the plan, students may take the optional course ZACM8306 *Professional Practice - Aerospace Engineering*.

Subject to the above conditions, students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

## MEngSc in C4ISREW

### School of Information Technology and Electrical Engineering

#### Plan Description

The MEngSc in C4ISREW is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant engineering discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of C4ISREW and to strengthen their skills in this area.

#### Plan Structure

Students undertaking the MEngSc in C4ISREW are required to take 8 coursework courses (48UOC). Students must complete two compulsory courses and four elective courses from the list below. Not all elective courses will be available in a particular year.

##### Compulsory

ZITE8102 C3I Systems ■  
 ZITE8115 Information Operations ○

##### Electives

ZITE8104 Computer Security ○  
 ZITE8106 Cryptography x  
 ZITE8110 Decision Support Systems x  
 ZITE8119 Internetworking •  
 ZITE8129 Multimedia and Virtual Environments • •

ZITE8203 Advanced Digital Signal Processing Techniques x  
 ZITE8204 Airborne Radar x  
 ZITE8206 Digital Communications x  
 ZITE8208 Digital Video Communications •  
 ZITE8213 Mobile Communications •  
 ZITE8219 Satellite Communications ■ ■  
 ZITE8221 Spaceborne Imaging Technology x  
 ZITE8227 Digital Image Processing and Enhancement x  
 ZITE8228 Modern Signal Estimation and Filtering Techniques x  
 ZITE8403 Decision Analysis ○

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Engineering Science plans or other coursework programs.

#### Research Project:

The option of a undertaking a project worth 12UOC (ZITE8299 *Project Report – Electrical Engineering* or enrolment for two sessions in ZITE8298 *Project Report – Electrical Engineering P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher-level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MEngSc in Civil Engineering

### School of Aerospace, Civil and Mechanical Engineering

#### Plan Description

The Master of Engineering Science in Civil Engineering is designed to provide postgraduate scholars and professional officers with appropriate undergraduate qualifications in a relevant engineering discipline and/or extensive professional experience with the opportunity to pursue more advanced studies in specific aspects of Civil Engineering.

The School of Aerospace, Civil and Mechanical Engineering has expertise in a range of areas including geotechnical and materials engineering, structural engineering, coastal engineering, blast and impulse effects on structures, and environmental engineering. Apart from the project management courses set out on page 87 in the MEngSc in Project Management, advanced courses in these technical areas of civil engineering are not presented on a regular basis. Students wishing to pursue a postgraduate coursework qualification in civil engineering should contact the School.

#### Plan Structure

Students undertaking the MEngSc in Civil Engineering are required to take 8 coursework courses (48UOC). At least six of these courses must be taken from those offered by the School of Aerospace, Civil and Mechanical Engineering. Each course is worth 6UOC. All 8 courses may be taken from the offerings of the School of Aerospace, Civil and Mechanical Engineering if so desired.

With the approval of the Plan Authority, students may take a research project – ZACM8501 *Project Report (Full Year)* or ZACM8502 *Project Report (Single Session)* – in place of any two courses.

Subject to the approval of the Program Authority, students may elect to take up to two additional courses (12UOC) from related coursework programs.

## MEngSc in Data Communications and Analysis

School of Information Technology and Electrical Engineering

### Plan Description

The MEngSc in Data Communications and Analysis is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant engineering discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of data communications and analysis and to strengthen their skills in this area.

### Plan Structure

Students undertaking the MEngSc in Data Communications and Analysis are required to take 8 coursework courses (48UOC) from the courses set out below. Students must complete six elective courses from the list below. Not all elective courses will be available in a particular year.

#### Electives

|          |   |
|----------|---|
| ZITE8104 | Computer Security ○                                 |
| ZITE8106 | Cryptography x                                      |
| ZITE8119 | Internetworking •                                   |
| ZITE8141 | WAN Technologies ○○                                 |
| ZITE8203 | Advanced Digital Signal Processing Techniques x     |
| ZITE8206 | Digital Communications x                            |
| ZITE8208 | Digital Video Communications •                      |
| ZITE8213 | Mobile Communications •                             |
| ZITE8214 | Neural Networks x                                   |
| ZITE8219 | Satellite Communications ■ ■                        |
| ZITE8221 | Spaceborne Imaging Technology x                     |
| ZITE8227 | Digital Image Processing and Enhancement x          |
| ZITE8228 | Modern Signal Estimation and Filtering Techniques x |

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Engineering Science plans or other coursework programs.

### Research Project:

The option of a undertaking a project worth 12UOC (ZITE8299 *Project Report – Electrical Engineering* or enrolment for two sessions in ZITE8298 *Project Report – Electrical Engineering P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher-level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MEngSc in Electrical Engineering

School of Information Technology and Electrical Engineering

### Plan Description

The Master of Engineering Science in Electrical Engineering meets the needs of postgraduate scholars and professional officers with appropriate undergraduate qualifications in a relevant engineering discipline and/or extensive professional experience seeking to develop an advanced appreciation of the principles of electrical engineering and their professional application.

Students undertaking the MEngSc in Electrical Engineering have the flexibility to tailor their degree to meet their individual needs and interests. While the courses are broadly grouped to reflect different aspects of the discipline, students may elect either to specialise in a particular area or to complete a more broadly based qualification.

### Plan Structure

Students are required to take 8 coursework courses (48UOC) from the courses set out below. Each course is worth 6UOC. The course groupings suggest the selection of course students might undertake should they wish to specialise in that area.

#### Communications:

|          |   |
|----------|---|
| ZITE8119 | Internetworking •   |
| ZITE8201 | Adaptive Antenna Arrays x                                     |
| ZITE8202 | Advanced Data Networks x                                      |
| ZITE8205 | Antennas x  |
| ZITE8206 | Digital Communications x                                      |
| ZITE8213 | Mobile Communications •                                       |
| ZITE8215 | Principles of Modern Communications and Information Systems x |

#### Signal Processing:

|          |   |
|----------|---|
| ZITE8105 | Computer Speech Processing x                        |
| ZITE8106 | Cryptography x                                      |
| ZITE8203 | Advanced Digital Signal Processing Techniques x     |
| ZITE8204 | Airborne Radar x                                    |
| ZITE8214 | Neural Networks x                                   |
| ZITE8228 | Modern Signal Estimation and Filtering Techniques x |

#### Image Processing:

|          |  |
|----------|--|
| ZITE8208 | Digital Video Communications •             |
| ZITE8217 | Principles of Surveillance Technologies x  |
| ZITE8221 | Spaceborne Imaging Technology x            |
| ZITE8227 | Digital Image Processing and Enhancement x |

#### Engineering Systems:

|          |                                      |
|----------|--------------------------------------|
| ZITE8102 | C3I Systems ■                        |
| ZITE8216 | Principles of Software Engineering x |
| ZITE8218 | Robotics ••                          |
| ZITE8220 | Software Engineering x               |
| ZITE8226 | Systems Engineering Practice ■ ○○    |

Special electives are made available when suitable situations arise.

The option of a undertaking a project worth 12UOC (ZITE8299 *Project Report – Electrical Engineering* or enrolment for two sessions in ZITE8298 *Project Report – Electrical Engineering P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher-level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

Subject to the approval of the Program Authority, students may elect to take up to two courses (12UOC) from related coursework programs.

## MEngSc in Marine Engineering

School of Aerospace, Civil and Mechanical Engineering

### Plan Description

The MEngSc (Marine) is designed for students from Department of Defence who wish to gain education at an appropriate postgraduate level in Marine Engineering.

### Plan Structure

Students undertaking the MEngSc in Marine Engineering are required to take eight coursework courses (48UOC) in accordance with the conditions set out below.

#### Students are required to complete 4 core courses:

|          |  |
|----------|--|
| ZACM8320 | Marine Engineering x                   |
| ZACM8321 | Naval Architecture x                   |
| ZACM8309 | Project Management Body of Knowledge ○ |
| ZITE8226 | Systems Engineering Practice ■ ○○      |

**Of the four elective courses, two must be chosen from:**

ZACM8322 Professional Practice – Marine Engineering x  
and courses offered under the MEngSc in Project Management (See below).

Note that not all elective courses will be available in a particular year.

With the approval of the Plan Authority, students may take a research project – ZACM8501 Project Report (Full Year) or ZACM8501 Project Report (Single Session) (12UOC) – in place of any two elective courses.

Subject to approval of the Program Authority, students may elect to take up to two courses (12UOC) from related coursework programs.

**MEngSc in Project Management****School of Aerospace, Civil and Mechanical Engineering****Plan Description**

The Master of Engineering Science in Project Management is designed to provide postgraduate scholars and professional officers with appropriate undergraduate qualifications in a relevant engineering discipline and/or extensive professional experience with a comprehensive study of the principles and processes required for the delivery of a successful project. It develops knowledge and analytical skills relevant to practical project management and advanced analysis of project management processes.

**Plan Structure**

Students undertaking the MEngSc in Project Management are required to take 8 coursework courses (48UOC) from core and elective courses in accordance with the conditions set out below. Each course is worth 6UOC.

**Students are required to complete 4 core courses:**

ZACM8309 Project Management Body of Knowledge ○  
ZACM8324 Project Administration ■ ○○  
ZACM8325 System Dynamics of Project Organisation ○  
ZACM8310 Project Systems Modelling ○○

**Of the four elective courses, at least two must be chosen from:**

ZACM8308 Facility and Property Management ○  
ZACM8312 Systems Dynamic Modelling ●●  
ZACM8313 Source Selection in Projects ○  
ZACM8315 Special Elective 1 (Project Management) x  
ZACM8327 Maximum Entropy Analysis x  
ZBUS8101 Strategic Management ○ ○○  
ZBUS8105 Finance and Investment Appraisal ○  
ZITE8136 Software Project Management ○○  
ZITE8138 Systems Planning ○

With the approval of the Plan Authority, students may take a research project – ZACM8501 Project Report (Full Year) or ZACM8502 Project Report (Single Session) (12UOC) – in place of any two of the elective courses.

Subject to the approval of the Program Authority, students may elect to take up to two courses (12UOC) from related coursework programs.

**MEngSc in Simulation and Experimentation****School of Information Technology and Electrical Engineering**

Students undertaking the Master of Science in Simulation and Experimentation are required to take 8 coursework courses (48UOC) from the courses set out below. Students must complete three compulsory courses and four elective courses from the list below. Not all elective courses will be available in a particular year.

**Compulsory**

ZITE8412 Simulation ○ ○○  
ZITE8402 Concept Development, Experimentation and Wargaming ○○  
ZITE8403 Decision Analysis ○

**Electives**

ZITE8413 Advanced Simulation x  
ZITE8102 C3I Systems – Design, Management and Operation ■  
ZITE8104 Computer Security ○  
ZITE8129 Multimedia and Virtual Environments ●●  
ZITE8134 Software Architecture ●  
ZITE8143 Distributed Applications ●●

Students may, with the approval of the Plan Authority, take two courses (12UOC) from a related coursework program. Students are encouraged to make use of the two courses ZITE8111 Directed Studies in Information Technology 1 and ZITE8112 Directed Studies in Information Technology 2 to undertake study of related topics in the context of simulation.

**Research Project**

The option of a 12UOC project (ZITE8199 Project – Information Technology, or enrolment for two sessions in ZITE8198 Project – Information Technology (Part Time)) is available to Masters students who obtain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher research qualification. Students undertaking the project are unable to take courses from other coursework programs.

**Current course and  
program information  
is now available through the  
UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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## MANAGEMENT STUDIES

The Graduate Management Studies Program incorporates the following awards: 8398 Master of Management Studies; 5823 Graduate Diploma in Management Studies; 7383 Graduate Certificate in Management Studies. The Graduate Management Studies Program addresses the decision-making processes and techniques by which private and public sector organisations make the most effective use of their resources. It draws on a variety of disciplines including economics, engineering, computer science and law and aims to develop skills in quantitative and qualitative analysis relevant to management issues.

The program provides students with the opportunity to acquire a high level understanding of the principles and practice of management and to develop expertise within specific areas of the discipline. Students may choose to study one of ten management specialisations:

- Administration
- Business Program Management
- Defence Capability Development & Acquisition
- Human Resource Management
- Equipment and Technology
- Governance
- Leadership
- Logistics
- Project Management
- Public Sector Management

The following sections detail information about these specialisations.

### Graduate Certificate in Management Studies (GradCertMgtStud)

#### School of Business

**Award:** 7383 – Graduate Certificate in Management (GradCertMgtStud)

**Duration:** One session full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 24UOC

#### Program Description:

The Graduate Certificate in Management Studies is designed for postgraduate scholars without relevant undergraduate qualifications or appropriate professional experience in management seeking an understanding of the principles and practice of management. It provides key foundations essential to successful management and gives students the opportunity to demonstrate a capacity to proceed to more advanced study in the discipline.

#### Program Objectives and Learning Outcomes:

The GradCertMgtStud forms the first step in a sequence of study to Graduate Diploma and Masters qualifications. The Certificate allows students with the relevant academic or professional background to acquire a qualification for advanced study in a more specialised aspect of the program without the need to complete all the requirements of a Graduate Diploma or Masters degree.

#### Program Structure:

Students undertaking the Graduate Certificate are required to complete 4 foundation courses (24UOC). The courses offer both a broad introduction to advanced studies in management and the foundations for undertaking a more specialised stream at either the Graduate Diploma or Masters level. The foundation courses are:

- ZBUS7101 Introduction to Management ○
- ZBUS7102 Introduction to Project Management ○○
- ZBUS7103 Economics for Managers ○
- ZITE7401 Introduction to Management Science ○○
- ZPEM7301 Introduction to Data Analysis ○○

*Note: Students who commence this program in 2007 will not be eligible to articulate into a Graduate Diploma or Masters upon completion. Students cannot use completed Graduate Certificate courses to gain credit towards Graduate Diploma or Masters programs.*

### Graduate Diploma in Management Studies (GradDipMgtStud)

#### School of Business

**Award:** 5823 – Graduate Diploma in Management Studies (GradDipMgtStud)

**Duration:** 1 year full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 36UOC

#### Program Description:

The Graduate Diploma in Management Studies is designed for postgraduate scholars and professional managers with undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to gain a more detailed understanding of the concepts and principles that underpin the effective management of resources of all kinds.

#### Program Objectives and Learning Outcomes:

The program provides knowledge and analytical skills relevant to the development of enhanced management practices and provides a foundation for students wishing to proceed to more advanced study in the discipline.

#### Program Structure:

Students undertaking the Graduate Diploma in Management Studies are required to take 6 coursework courses (36UOC) from the courses set out under the Master of Management Studies (see the following section).

Graduate Diploma candidates may choose courses which are part of a single Masters specialisation. Students are advised to do this if they intend to articulate subsequently into a Masters degree candidature within a particular specialisation, but this is not compulsory. Students at the Graduate Diploma level are expected to possess the foundation knowledge relevant to the particular areas of management they are studying.

Students may, with the approval of the Program Authority, take one course (6UOC) from a related coursework program. The research project is not available to candidates for the Graduate Diploma.



## Master of Management Studies (MMgtStud)

**School of Business**

**Award:** 8398 – Master of Management Studies (MMgtStud)

**Duration:** 1 year full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 48UOC

### Program Description:

The Master of Management Studies is designed for postgraduate scholars and professional managers with appropriate undergraduate qualifications in management or a related discipline and/or extensive relevant professional experience who wish to gain a more detailed understanding of the concepts and principles that underpin effective management and their application in specific areas of organisation and management.

### Program Objectives and Learning Outcomes:

The Master of Management Studies provides comprehensive insights and analytical skills relevant to the development of enhanced management practice and a foundation for more advanced postgraduate study. It enables students to specialise in the areas of General Management, Human Resource Management, Equipment and Technology Management, Project Management, and Defence Capability Development and Acquisition.

### Program Structure:

Students undertaking the Master of Management Studies are required to structure their studies according to a coherent plan and must fulfil the requirements of a specified plan of study. They must complete 8 coursework courses (48UOC) from core and elective courses.

The option of a undertaking a research project – ZBUS8501 *Research Project - Business* (6UOC) or ZBUS8502 *Research Project -Business* (12UOC) – is available to Master students who attain a distinction average or better in four or six courses (respective of their program structure) and is subject to the approval by the Head of School. A Research Project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher-level research qualification.

Before entering specialised plans, candidates are expected to possess relevant bodies of knowledge available in Foundation courses. In particular, foundation-level knowledge is required in areas covered in the courses: ZBUS7103 *Economics for Managers*, ZBUS7101 *Introduction to Management*, ZBUS7102 *Introduction to Project Management*, ZBUS7301 *Introduction to Data Analysis*. However, candidates entering these specialisations may self-assess in respect to whether they have appropriately covered this material in previous studies or through professional experience.

### Plans available in the Master of Management Studies

#### MMgtStud in Administration

**School of Business**

##### Plan Description

This plan provides managers with a high level understanding of general business concepts, principles and practices.

The plan includes fundamental business applications related to accounting, law and business skills. The general business orientation of this plan can be further augmented by the electives, particularly those in marketing and finance.

##### Plan Structure

To complete the requirements of the MMgtStud in Administration, students must complete:

ZBUS8101 Strategic Management ○ ○ ○  
ZBUS8104 Law for Managers ○ ○  
ZBUS8108 Accounting for Managers ○ ○  
ZINT8201 Critical Business Skills ○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

##### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

#### MMgtStud in Business Program Management

**School of Business**

##### Plan Description

This plan provides managers with high level understanding of the conceptual frameworks that underpin management at the program level. This plan is directed at managers who have established qualifications and experience in Project Management and who are looking for further career development as a Program Manager.

##### Plan Structure

To complete the requirements of the MMgtStud in Business Program Management, students must complete:

ZBUS8101 Strategic Management ○ ○ ○  
ZBUS8110 Business Risk Management ○ ○  
ZBUS8111 Advanced Project Management ○ ○  
ZBUS8303 Strategic Procurement ○ ○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

##### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Defence Capability Development and Acquisition

### School of Business

#### Plan Description

The Plan develops a thorough understanding of the managerial and technical skills and expertise relevant to planning and acquisition of complex military systems and procurement of other defence material.

#### Plan Structure

The plan is designed primarily to meet the requirements of the Australian Technical Service Officers Course (ATSOC); some courses may have quotas and are also taught at times appropriate to ATSOC needs.-

To complete the requirements of the MMgtStud in Defence Capability Development and Acquisition, non-ATSOC students must complete:

ZBUS8101 Strategic Management ○ ○○

ZBUS8302 Logistics ○ ■■

ZBUS8303 Strategic Procurement ○○

ZINT8326 Project Management ○

ZITE7203 Communications and Information Systems •

ZITE7205 Fundamentals of Surveillance Technologies ••

ZITE8226 Systems Engineering Practice ■ ○○

plus one course out of:

ZACM8303 Aerospace Vehicle Technologies ••

ZACM8326 Vehicles and Mobility ••

#### Australian Technical Staff Officers' Course (ATSOC)

The Australian Technical Staff Officers' Course (ATSOC) is an Australian Army course, conducted at UNSW@ADFA and designed to prepare students to take up technical staff appointments within the Australian Defence Organisation. The twelve month, full-time program requires students to complete a specific program within the Graduate Management Studies program at Masters level, the Defence Capability Development and Acquisition plan.

Candidates are nominated by Defence for the Australian Technical Staff Officers' Course (ATSOC) and must meet UNSW@ADFA entry requirements. In addition to completing the award program, students undertake technical staff training not offered by UNSW@ADFA and a domestic and international visit program.

Students attending the Australian Technical Staff Officers Course are required to complete the following program of academic study.

ZBUS8302 Logistics ○ ■■

ZBUS8401 Team Project - Technology Management ••

ZINT8301 Firepower and Protection •

ZINT8326 Project Management ○

ZITE7203 Communications & Information Systems •

ZITE7205 Fundamentals of Surveillance Technologies ••

ZITE8226 Systems Engineering Practice ■ ○○

plus one course out of:

ZACM8303 Aerospace Vehicle Technologies ••

ZACM8326 Vehicles and Mobility ••

The Military Technology course ZINT8301 *Firepower and Protection* is only available to ATSOC students or other Australian Defence Organisation personnel on approval from the Director ATSOC.

## MMgtStud in Equipment and Technology

### School of Business

#### Plan Description

This plan examines managerial aspects of managing in an environment where equipment or technology are critical resources. It is designed for managers without a background in engineering or information technology. This plan enables business managers to efficiently and effectively acquire, finance and utilise capital assets to achieve the strategic objectives of the organisation.

#### Plan Structure

To complete the requirements of the MMgtStud in Equipment and Technology, students must complete:

ZBUS8101 Strategic Management ○ ○○

ZBUS8301 Technology and Innovation ○

ZBUS8302 Logistics ○ ■■

ZBUS8303 Strategic Procurement ••

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

#### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Governance

### School of Business

#### Plan Description

This plan enables managers to understand, develop, and implement policy and monitor systems to enable organisations to act in furtherance of the public good and the rule of law. This plan enables a manager to make decisions about governance based on an understanding of the traditions, institutions and processes that determine how power is exercised, how citizens are given a voice, and how decisions are made on issues of public concern.

#### Plan Structure

To complete the requirements of the MMgtStud in Governance, students must complete:

ZBUS8101 Strategic Management ○ ○○

ZBUS8108 Accounting for Managers ○○

ZBUS8109 Business Law ○

ZBUS8110 Business Risk Management ○○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

#### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Human Resource Management

School of Business

### Plan Description

This plan examines the practical and theoretical aspects of the effective use of human resources in order to enhance organisational performance through the continuum from operational outcomes to the strategic level of the organisation. The plan develops an understanding of the relationship between human resources and strategic business outcomes with an appreciation of organisational and wider legal and social constraints.

### Plan Structure

To complete the requirements of the MMgtStud in Human Resource Management, students must complete:

ZBUS8101 Strategic Management ○ ○○  
 ZBUS8103 Human Resource Management ○○  
 ZBUS8109 Business Law ○  
 ZBUS8203 Change Management ○○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Leadership

School of Business

### Plan Description

This plan examines the conceptual frameworks, research and practices underpinning leading people and organisations particularly through change. The plan is aimed at managers in key leadership roles in dynamic environments where interaction with people and influencing people is paramount to achieving organisational outcomes.

### Plan Structure

To complete the requirements of the MMgtStud in Leadership, students must complete:

ZBUS8101 Strategic Management ○ ○○  
 ZBUS8102 Organisational Behaviour ○  
 ZBUS8201 Leadership ○○  
 ZBUS8203 Change Management ○○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Logistics

School of Business

### Plan Description

This plan examines the practical and theoretical aspects of managing and controlling flows of resources from the source to the marketplace. It has Defence applications in managing flows of people, resources and information into an operational environment. Taught from a managerial perspective, this plan equips managers to integrate logistics applications into an organisation while improving performance and minimising cost.

### Plan Structure

To complete the requirements of the MMgtStud in Logistics, students must complete:

ZBUS8101 Strategic Management ○ ○○  
 ZBUS8108 Accounting for Managers ○○  
 ZBUS8302 Logistics ○ ■■  
 ZBUS8303 Strategic Procurement ○○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

## MMgtStud in Project Management

School of Business

### Plan Description

The Plan offers a comprehensive understanding of the principles and processes that underpin effective project management.

### Plan Structure

To complete the requirements of the MMgtStud in Project Management, students must complete:

ZACM8309 Project Management Body of Knowledge ○  
 ZACM8324 Project Administration ■ ○○  
 ZACM8325 System Dynamics of Project Organisation ○  
 ZBUS8101 Strategic Management ○ ○○

plus any two of the following:

ZACM8308 Facilities and Property Management ○  
 ZACM8310 Project Systems Modelling ○○  
 ZACM8313 Source Selection in Projects ○  
 ZBUS8105 Finance and Investment Appraisal ○  
 ZITE8136 Software Project Management ○○

and any two other Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

### Foundation Knowledge

Candidates are expected to possess bodies of knowledge available in a number of foundation courses. In particular, foundation-level knowledge is required in areas covered in the courses ZBUS7102 *Introduction to Project Management* and ZPEM7301 *Introduction to Data Analysis*.

## MMgtStud in Public Sector Management

### School of Business

#### Plan Description

This plan enables managers to understand and manage in a dynamic public sector environment where effective and efficient governance and resource management and meeting accountability requirements is critical. It also provides an appreciation of developments in Australia and internationally in public sector management to enable managers to participate in current debate and understand how current issues are redefining the public sector manager's role.

#### Plan Structure

To complete the requirements of the MMgtStud in Public Sector Management, students must complete:

ZBUS8101 Strategic Management ○ ○○

ZBUS8106 Public Sector Management ○

ZBUS8107 Public Sector Financial Management ○

ZBUS8202 Public Sector Human Resource Management ○○

and any four other GradDip/Masters level courses in the Management Studies program. Students may, with the approval of the Program Authority, take up to two courses (12UOC) from related coursework programs.

#### Foundation Knowledge

Candidates without previous degree studies in business or management areas will need to demonstrate that they have appropriate foundation knowledge to proceed with postgraduate studies. Our Graduate Certificate courses provide the foundation knowledge required for studies in this plan. For more information about these courses, please see the Course Catalogue and/or contact the School of Business.

**Current course and program information**  
is now available through the  
**UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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## SCIENCE

The Science Programs incorporate the following awards: 8562 Master of Science; 5882 Graduate Diploma in Science; 7382 Graduate Certificate in Science.

The Science program is being developed to provide students with the opportunity to acquire high level understanding and advanced analytical and professional skills in key areas of the science disciplines. There is a significant emphasis on integrating the various disciplinary approaches that can be applied to particular discipline areas and on students acquiring both the concepts which underpin an area of scientific enquiry and an understanding of how they are translated into practical applications.

The development of several major specialisations within the Science program is being considered. Currently, specialisations are available, drawing upon the strengths of the University's current postgraduate coursework programs in Science. The specialisations are:

- C4ISREW
- Defence Operations Research
- ICT Management
- Information Technology
- Information Technology – Enterprise Architecture
- Operations Research and Statistics
- Software Development
- Systems Network Administration
- Web Technologies

## Graduate Certificate in Science (GradCertSc)

### School of Information Technology and Electrical Engineering

**Award:** 7382 – Graduate Certificate in Science (GradCertSc)

**Duration:** One session full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 24UOC

#### Program Description:

The Graduate Certificate in Science enables students to specialise in the following plans of Defence Operations Research, Information Technology, Information Technology – Enterprise Architecture, and Operations Research and Statistics.

#### Program Objectives and Learning Outcomes:

The Graduate Certificate in Science is designed for postgraduate scholars with an undergraduate degree or established profession in another field who wish to gain an understanding of the principles of science.

#### Program Structure:

All students must study four courses in accordance with the rules for the relevant plan.



## Specialisations available in the Graduate Certificate in Science Program

### GradCertSc in Defence Operations Research

School of Information Technology and Electrical Engineering

#### Plan Description

*The GradCertScience in Defence Operations Research is only available to participants in DSTO's Continuing Education Initiative.*

This plan is designed for students with an undergraduate degree or established profession in another field who wish to gain an understanding of decision making, analysis and operations research techniques relevant to researchers in the Defence sector.

The GradCertScience in Defence Operations Research forms the first step in a sequence of study to Graduate Diploma and Masters qualifications in the discipline.

#### Plan Structure

The following core and elective courses are available to students in the GradCertScience in Defence Operations Research:

##### Compulsory courses

- EEET5107 Systems Engineering for Complex Problem Solving (University of South Australia)  
ZITE8404 Introduction to Defence Operations Research ○○

##### Core courses

- ZITE8412 Simulation ○  
ZITE8401 Analysis of Military Systems ○○  
ZITE8402 Concept Development, Experimentation and Wargaming ○○  
ZITE8403 Decision Analysis ○  
ZITE8405 Optimisation Techniques ○  
ZITE8411 Warfare Modelling and Analysis x

##### Elective courses

- AERO2311 Risk and Technology Decisions (RMIT University)  
DEFSCI7001 Decision-making in Real Environments (University of Adelaide)  
DEFSCI7003 Artificial Intelligence (University of Adelaide)  
DEFSCI7013 Knowledge Representation (University of Adelaide)  
EEET5048 Contemporary Systems Thinking (University of South Australia)  
ZPEM7301 Introduction to Data Analysis ○○  
ZPEM8301 Statistical Trials Analysis ○

Students undertaking the GradCertScience in Defence Operations Research are required to complete four courses (24UOC) from the above lists as follows:

- Both courses from the above list of compulsory courses
- One course from the above list of core courses
- One course from the above lists of core and elective courses.

Note: Students who commence this program in 2007 will not be eligible to articulate into a Graduate Diploma or Masters upon completion. Students cannot use completed Graduate Certificate courses to gain credit towards Graduate Diploma or Masters programs.

### GradCertSc in Information Technology

School of Information Technology and Electrical Engineering

#### Plan Description

The GradCertScience in Information Technology is designed for postgraduate scholars with an undergraduate degree or established profession in another field who wish to gain an understanding of the principles of information technology. The certificate assists professionals to understand and be able to employ information technology in their own environment.

The GradCertScience in Information Technology forms the first step in a sequence of study to Graduate Diploma and Masters qualifications and potentially to the Doctorate of Information Technology. The certificate also allows students with the relevant academic or professional background to acquire a qualification for advanced study in a more specialised aspect of the program without the need to complete all the requirements of a Graduate Diploma or Masters degree.

#### Plan Structure

Students entering the Information Technology stream at the Graduate Certificate level are required to complete four foundation courses (24UOC) from those set out below. Course choices are important for students seeking the foundations to proceed to higher level qualifications in the discipline and must be approved by the Plan Authority.

##### The available foundation courses are:

- ZITE7101 Introduction to Data Networks ○○  
ZITE7102 Introduction to Database Systems ○○  
ZITE7103 Introduction to Programming ○  
ZITE7104 Introduction to Telecommunications ○  
ZITE7105 Introduction to the Web ○  
ZITE7106 Systems Analysis and Design ○○

Note: Students who commence this program in 2007 will not be eligible to articulate into a Graduate Diploma or Masters upon completion. Students cannot use completed Graduate Certificate courses to gain credit towards Graduate Diploma or Masters programs.

### GradCertSc in Information Technology – Enterprise Architecture

School of Information Technology and Electrical Engineering

#### Plan Description

The IT–Enterprise Architecture plan in the Master of Science is designed to provide a comprehensive understanding of enterprise architecture. Students may progress through the Graduate Certificate, Graduate Diploma and MSc in Information Technology – Enterprise Architecture.

#### Plan Structure

Students undertaking the GradCertScience in IT–Enterprise Architecture are required to take 24UOC from core and elective courses in accordance with the conditions set out below.

##### Core Courses:

Students must complete the following courses:

- ZITE7102 Introduction to Database Systems ○○  
ZITE7104 Introduction to Telecommunications ○  
ZITE7403 Introduction to Concept Development, Experimentation and Wargaming ○○

##### Elective courses:

Students may choose their remaining course from the following elective courses:

- ZITE7101 Introduction to Data Networks ○○  
ZITE7105 Introduction to the Web ○

- ZITE7106 Systems Analysis and Design ○○  
 ZITE7203 Communications and Information Systems •  
 ZITE7205 Fundamentals of Surveillance Technologies ••

Note: Students who commence this program in 2007 will not be eligible to articulate into a Graduate Diploma or Masters upon completion. Students cannot use completed Graduate Certificate courses to gain credit towards Graduate Diploma or Masters programs.

## GradCertSc in Operations Research and Statistics

School of Information Technology and Electrical Engineering

### Plan Description

The GradCertScience in Operations Research and Statistics is designed for students with an undergraduate degree or established profession in another field who wish to gain an understanding of the principles and practice of operations research and statistical analysis and to develop skills in analysis, problem solving and decision making. The certificate assists professionals to understand and be able to employ operations research and statistical analysis skills in their own environment.

The GradCertScience in Operations Research and Statistics forms the first step in a sequence of study to Graduate Diploma and Masters qualifications in the discipline. The certificate also allows students with the relevant academic or professional background to acquire a qualification for advanced study in a more specialised aspect of the program without the need to complete all the requirements of a Graduate Diploma or Masters degree.

### Plan Structure

Students entering the Operations Research and Statistics stream at the Graduate Certificate level are required to complete the following four foundation courses (24UOC):

- ZITE7103 Introduction to Programming ○  
 ZITE7401 Introduction to Management Science ○○  
 ZITE7402 Introduction to Simulation ○  
 ZPEM7301 Introduction to Data Analysis ○○

Note: Students who commence this program in 2007 will not be eligible to articulate into a Graduate Diploma or Masters upon completion. Students cannot use completed Graduate Certificate courses to gain credit towards Graduate Diploma or Masters programs.

## Graduate Diploma in Science (GradDipSc)

School of Information Technology and Electrical Engineering

**Award:** 5882 – Graduate Diploma in Science (GradDipSc)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 18UOC (full-time)

**UOC for award:** 36UOC

### Program Description:

The Graduate Diploma of Science enables students to specialise in the following plans of C4ISREW, Defence Operations Research, ICT Management, Information Technology, Information Technology – Enterprise Architecture (IT – Enterprise Architecture), Operations Research and Statistics, Software Development, Systems Network Administration, Web Technologies

### Program Objectives and Learning Outcomes:

The Graduate Diploma of Science is designed for postgraduate scholars with undergraduate qualifications in a relevant discipline and/or appropriate professional experience.

### Program Structure:

Six courses chosen in accord with the rules for the relevant plan, with the exception of the Defence Operations Research plan where eight courses are required.

## Specialisations available in the Graduate Diploma of Science Program

### GradDipSc in C4ISREW

School of Information Technology and Electrical Engineering

### Plan Description

The GradDipSc in C4ISREW is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of C4ISREW and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in C4ISREW are required to take 6 coursework courses (36UOC) from the courses set out below. Students must complete two compulsory course and three elective courses from the list below. Not all elective courses will be available in a particular year.

### Compulsory

- ZITE8102 C3I Systems ■  
 ZITE8115 Information Operations ○

### Electives

- ZITE8104 Computer Security ○  
 ZITE8106 Cryptography x  
 ZITE8110 Decision Support Systems x  
 ZITE8119 Internetworking •  
 ZITE8129 Multimedia and Virtual Environments ••  
 ZITE8145 Soft Computing x  
 ZITE8208 Digital Video Communications •  
 ZITE8219 Satellite Communications ■ ■  
 ZITE8221 Spaceborne Imaging Technology x  
 ZITE8227 Digital Image Processing and Enhancement x  
 ZITE8403 Decision Analysis ○

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Science plans or other coursework programs. The option of undertaking a research project is not available to candidates for the Graduate Diploma.

### GradDipSc in Defence Operations Research

School of Information Technology and Electrical Engineering

### Plan Description

*The GradDipSc in Defence Operations Research is only available to participants in DSTO's Continuing Education Initiative.* It is designed for postgraduate scholars with undergraduate qualifications in a relevant science discipline and/or extensive professional experience, to provide a comprehensive understanding of decision making, analysis and operations research techniques relevant to researchers in the Defence sector.

## Plan Structure

The following core and elective courses are available to students in the GradDipSc in Defence Operations Research:

### Compulsory courses

- EEET5107 Systems Engineering for Complex Problem Solving (University of South Australia)  
 EEET5108 Research Methods in a Multidisciplinary Environment (University of South Australia)  
 ZITE8403 Decision Analysis ○  
 ZITE8404 Introduction to Defence Operations Research ○○

### Core courses

- ZITE8412 Simulation ○  
 ZITE8401 Analysis of Military Systems ○○  
 ZITE8402 Concept Development, Experimentation and Wargaming ○○  
 ZITE8405 Optimisation Techniques ○  
 ZITE8411 Warfare Modelling and Analysis x

### Elective courses

- AERO2311 Risk and Technology Decisions (RMIT University)  
 EEET5048 Contemporary Systems Thinking (University of South Australia)  
 DEFSCI7001 Decision-making in Real Environments (University of Adelaide)  
 DEFSCI7003 Artificial Intelligence (University of Adelaide)  
 DEFSCI7013 Knowledge Representation (University of Adelaide)  
 ZPEM7301 Introduction to Data Analysis ○○  
 ZPEM8301 Statistical Trials Analysis ○

Students undertaking the GradDipSc in Defence Operations Research are required to complete eight courses (48UOC) from the above lists as follows:

- All four courses from the above list of compulsory courses
- Two courses from the above list of core courses
- Two courses from the above lists of core and elective courses.

## GradDipSc in ICT Management

**School of Information Technology and Electrical Engineering**

### Plan Description

The GradDipSc in ICT Management is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of ICT management and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in ICT Management are required to take 6 coursework courses (36UOC). Students must complete four compulsory courses and two elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

- ZITE8116 Information Systems Policy and Strategy ○○  
 ZITE8136 Software Project Management ○○  
 ZITE8138 Systems Planning ○  
 ZITE8144 Information and Communication Technology Processes ●●

### Electives

- ZITE8104 Computer Security ○  
 ZITE8110 Decision Support Systems x  
 ZITE8114 Electronic Business ○○  
 ZITE8117 Integrating Information Systems Technologies ○  
 ZITE8118 Integrating the Enterprise and IS Functions ○○  
 ZITE8226 Systems Engineering Practice ■ ○○

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

## GradDipSc in Information Technology

**School of Information Technology and Electrical Engineering**

### Plan Description

The GradDipSc in Information Technology is designed for postgraduate scholars with undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles that shape information technology and their implementation through the design, development and application phases. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in Information Technology are required to take six coursework courses (36UOC) from the courses outlined under the MSc in Information Technology (see page 98). They may select the combination of courses most appropriate to their individual needs.

They may, with the approval of the Plan Authority, take one course (6UOC) from a related coursework program. The option of undertaking a research project is not available to candidates for the Graduate Diploma.

## GradDipSc in Information Technology – Enterprise Architecture

**School of Information Technology and Electrical Engineering**

### Plan Description

The IT–Enterprise Architecture plan in the Graduate Diploma of Science is designed to provide a comprehensive understanding of enterprise architecture.

### Plan Structure

Students undertaking the GradDipSc in IT–Enterprise Architecture are required to take courses worth 36UOC. There are five specified courses and one elective course. Each course is worth 6UOC.

#### Core Courses:

Students must complete the following courses:

- ZITE8102 C3I Systems ■  
 ZITE8116 Information Systems Policy and Strategy ○○  
 ZITE8117 Integrating Information Systems Technologies ○  
 ZITE8118 Integrating the Enterprise and Information Systems Functions ○○  
 ZITE8226 Systems Engineering Practice ■ ○○



Students must also choose one course from the list of elective courses outlined under the MSc in Information Technology – Enterprise Architecture on page 99. The option of taking one course from a related coursework program is not normally available to students in the GradDipSc in IT – Enterprise Architecture.

## GradDipSc in Operations Research and Statistics

School of Information Technology and Electrical Engineering

### Plan Description

The GradDipSc in Operations Research and Statistics is designed for postgraduate scholars with undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practice of operations research and statistical analysis and to develop their skills in analysis, problem solving and decision making. The diploma provides an advanced qualification for professional analysts, modellers and statisticians and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in Operations Research and Statistics are required to take 6 coursework courses (36UOC) from the courses outlined under the MSc in Operations Research and Statistics (see page 99). Diploma students may select the combination of courses most appropriate to their individual needs but must include at least one course from each of the Operations Research and Statistical Analysis groups.

Students may, with the approval of the Plan Authority, take one course (6UOC) from a related coursework program. ZITE8199 *Project – Information Technology* is not available to candidates for the Graduate Diploma.

## GradDipSc in Simulation and Experimentation

School of Information Technology and Electrical Engineering

Students undertaking the Graduate Diploma of Science in Simulation and Experimentation are required to take 6 coursework courses (36UOC) from the courses set out below. Students must complete three compulsory courses and two elective courses from the list below. Not all elective courses will be available in a particular year.

### Compulsory

- ZITE8412 Simulation ○
- ZITE8402 Concept Development, Experimentation and Wargaming ○○
- ZITE8403 Decision Analysis ○

### Electives

- ZITE8413 Advanced Simulation x
- ZITE8102 C3I Systems – Design, Management and Operation ■
- ZITE8104 Computer Security ○
- ZITE8129 Multimedia and Virtual Environments ••
- ZITE8134 Software Architecture •
- ZITE8143 Distributed Applications ••
- ZITE8111 Directed Studies in Information Technology 1 ○ ○○
- ZITE8112 Directed Studies in Information Technology 2 ○ ○○

Students may, with the approval of the Plan Authority, take one course (6UOC) from a related coursework program. The option of a research project is not available to students in the Graduate Diploma.

## GradDipSc in Software Development

School of Information Technology and Electrical Engineering

### Plan Description

The GradDipSc in Software Development is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of software development and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in Software Development are required to take 6 coursework courses (36UOC). Students must complete one compulsory course and four elective courses from the list below. Not all elective courses will be available in a particular year.

### Compulsory

- ZITE8108 Data Structures and Algorithms ○○

### Electives

- ZITE8101 Advanced Java Programming ••
- ZITE8103 Computer Graphics x
- ZITE8129 Multimedia and Virtual Environments ••
- ZITE8131 Object Oriented Analysis and Design ••
- ZITE8132 Object Oriented Programming x
- ZITE8134 Software Architectures •
- ZITE8140 User Interface Construction •
- ZITE8143 Distributed Applications ••
- ZITE8145 Soft Computing x

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

## GradDipSc in Systems Network Administration

School of Information Technology and Electrical Engineering

### Plan Description

The GradDipSc in Systems and Network Administration is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of systems and network administration and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

### Plan Structure

Students undertaking the GradDipSc in Systems and Network Administration are required to take 6 coursework courses (36UOC). Students must complete three compulsory courses and three elective courses from the list below. Not all elective courses will be available in a particular year.

### Compulsory

- ZITE8119 Internetworking •
- ZITE8133 Operating Systems •
- ZITE8137 System and Network Administration ○



**Electives**

|          |  |
|----------|--|
| ZITE8104 | Computer Security ○                        |
| ZITE8106 | Cryptography x                             |
| ZITE8126 | XML Technologies ○○                        |
| ZITE8130 | Network Management and Troubleshooting x   |
| ZITE8139 | Telecommunications Design and Management x |
| ZITE8141 | WAN Technologies ○○                        |
| ZITE8143 | Distributed Applications ••                |
| ZITE8219 | Satellite Communications ■■                |

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

**GradDipSc in Web Technologies**

**School of Information Technology and Electrical Engineering**

**Plan Description**

The GradDipSc in Web Technologies is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or appropriate professional experience who wish to develop an enhanced understanding of the principles and practices of web technologies and to strengthen their skills in this area. The diploma provides advanced professional qualifications and the foundations for students wishing to proceed to higher levels of study in the discipline.

**Plan Structure**

Students undertaking the GradDipSc in Web Technologies are required to take 6 coursework courses (36UOC). Students must complete six elective courses from the list below. Not all elective courses will be available in a particular year.

**Electives**

|          |  |
|----------|--|
| ZITE8101 | Advanced Java Programming ••                   |
| ZITE8114 | Electronic Business ○○                         |
| ZITE8117 | Integrating Information Systems Technologies ○ |
| ZITE8126 | XML Technologies ○○                            |
| ZITE8129 | Multimedia and Virtual Environments ••         |
| ZITE8140 | User Interface Construction •                  |
| ZITE8142 | Web Design x                                   |
| ZITE8143 | Distributed Applications ••                    |
| ZITE8145 | Soft Computing x                               |

Students may, with the approval of the Plan Authority, take up to one course (6UOC) from other Master of Science plans or other coursework programs. The option of undertaking a research project is not available to candidates of the Graduate Diploma.

**Master in Science (MSc)**

**School of Information Technology and Electrical Engineering  
School of Physical, Environmental and Mathematical Sciences**

**Award:** 8562 – Master of Science (MSc)

**Duration:** One year full-time or part-time equivalent

**UOC per session:** 24 UOC (full-time)

**UOC for award:** 48 UOC

**Program Description:**

The Master of Science enables students to specialise in the following plans: C4ISREW, Defence Operations Research, ICT Management, Information Technology, Information Technology – Enterprise Architecture (IT – Enterprise Architecture), Operations Research and Statistics, Software Development, Systems Network Administration and Web Technologies.

The generic Master of Science in Information Technology offers students a free choice from a wide range of electives. The other plans offer more targeted plans of study for students wishing to gain expertise in these areas.

**Program Objectives and Learning Outcomes:**

The program aims to allow students to develop a high level understanding of the principles that shape information technology and their implementation through the design, development and application phases.

**Program Structure:**

Students undertaking the program are required to undertake 8 courses in accord with the rules for the relevant plan as listed below.

**Specialisations available in the Master in Science Program****MSc in C4ISREW**

**School of Information Technology and Electrical Engineering**

**Plan Description**

The MSc in C4ISREW is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant science discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of C4ISREW and to strengthen their skills in this area.

**Plan Structure**

Students undertaking the MSc in C4ISREW are required to take 8 coursework courses (48UOC) from the courses set out below. Students must complete two compulsory courses and four elective courses from the list below. Not all elective courses will be available in a particular year.

**Compulsory**

|          |                          |
|----------|--------------------------|
| ZITE8102 | C3I Systems ■            |
| ZITE8115 | Information Operations ○ |

**Electives**

|          |  |
|----------|--|
| ZITE8104 | Computer Security ○                        |
| ZITE8106 | Cryptography x                             |
| ZITE8110 | Decision Support Systems x                 |
| ZITE8119 | Internetworking •                          |
| ZITE8129 | Multimedia and Virtual Environments ••     |
| ZITE8145 | Soft Computing x                           |
| ZITE8208 | Digital Video Communications ○             |
| ZITE8219 | Satellite Communications ■■                |
| ZITE8221 | Spaceborne Imaging Technology x            |
| ZITE8227 | Digital Image Processing and Enhancement x |
| ZITE8403 | Decision Analysis ○                        |

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Science plans or other coursework programs.

**Research Project:**

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Defence Operations Research

School of Information Technology and Electrical Engineering

### Plan Description

**The MSc in Defence Operations Research is only available to participants in DSTO's Continuing Education Initiative.** It is designed for postgraduate scholars with undergraduate qualifications in a relevant science discipline and/or extensive professional experience, to provide a comprehensive understanding of decision making, analysis and operations research techniques relevant to researchers in the Defence sector.

### Plan Structure

Students undertaking the MSc in Defence Operations Research are required to meet all of the requirements for the GradDipSc in Defence Operations Research. In addition they are required to complete a research project equivalent to one session of full-time study.

## MSc in ICT Management

School of Information Technology and Electrical Engineering

### Plan Description

The MSc in ICT Management is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of ICT management and to strengthen their skills in this area.

### Plan Structure

Students undertaking the MSc in ICT Management are required to take 8 coursework courses (48UOC) from the courses set out below. Students must complete four compulsory courses and two elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

- ZITE8116 Information Systems Policy and Strategy ○○
- ZITE8136 Software Project Management ○○
- ZITE8138 Systems Planning ○
- ZITE8144 Information and Communication Technology Processes ●●

#### Electives

- ZITE8104 Computer Security ○
- ZITE8110 Decision Support Systems x
- ZITE8114 Electronic Business ○○
- ZITE8117 Integrating Information Systems Technologies ○
- ZITE8118 Integrating the Enterprise and IS Functions ○○
- ZITE8226 Systems Engineering Practice ■ ○○

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Science plans or other coursework programs.

### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Information Technology

School of Information Technology and Electrical Engineering

### Plan Description

The MSc in Information Technology is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant science discipline and/or extensive professional experience who wish to develop a high level understanding of the principles that shape information technology and their implementation through the design, development and application phases. The courses incorporate the most recent advances in the discipline, providing IT professionals with the opportunity to upgrade and extend their qualifications and experience.

### Plan Structure

Students undertaking the MSc in Information Technology are required to take 8 coursework courses (48UOC) from the courses set out below. Students may select the combination of courses most appropriate to their individual needs.

#### Software Development

- ZITE8101 Advanced Java Programming ●●
- ZITE8103 Computer Graphics x
- ZITE8108 Data Structures and Algorithms ○○
- ZITE8131 Object Oriented Analysis and Design ●●
- ZITE8132 Object Oriented Programming x
- ZITE8134 Software Architecture ●
- ZITE8135 Software Engineering and ADA x
- ZITE8140 User Interface Construction ●
- ZITE8220 Software Engineering x
- ZITE8216 Principles of Software Engineering x
- ZITE8410 Soft Systems Methodologies ●●

#### Web Technologies

- ZITE8101 Advanced Java Programming ●●
- ZITE8109 Databases and E-Commerce Transaction Management x
- ZITE8114 Electronic Business ○○
- ZITE8126 XML Technologies ○○
- ZITE8129 Multimedia and Virtual Environments ●●
- ZITE8140 User Interface Construction ●
- ZITE8142 Web Design x

#### Information Technology Systems Planning

- ZITE8116 Information Systems Policy and Strategy ○○
- ZITE8117 Integrating Information Systems Technologies ○
- ZITE8118 Integrating the Enterprise and IS Functions ○○
- ZITE8136 Software Project Management ○○
- ZITE8138 Systems Planning ○

#### IT Communications and Internetworking

- ZITE8104 Computer Security ○
- ZITE8106 Cryptography x
- ZITE8119 Internetworking ●
- ZITE8130 Network Management and Troubleshooting x
- ZITE8137 Systems and Network Administration ○
- ZITE8139 Telecommunications Design and Management x
- ZITE8141 WAN Technologies ○○
- ZITE8219 Satellite Communications ■ ■

#### Other IT Courses

- ZITE8102 C3I Systems ■
- ZITE8105 Computer Speech Processing x
- ZITE8111 Directed Studies in Information Technology 1 ○ ○○
- ZITE8110 Decision Support Systems x
- ZITE8112 Directed Studies in Information Technology 2 ○ ○○
- ZITE8115 Information Operations ○
- ZITE8120 IT Special Topic 1 ●
- ZITE8121 IT Special Topic 2 ●
- ZITE8122 IT Special Topic 3 ●●
- ZITE8123 IT Special Topic 4 ●●
- ZITE8133 Operating Systems ●
- ZITE8199 Project - Information Technology (12UOC) ○ ○○
- ZITE8208 Digital Video Communications ●
- ZITE8214 Neural Networks x
- ZITE8221 Spaceborne Imaging Technology x

- ZITE8901 Case Studies and Information Technology •  
 ZITE8902 Professional Practices ••  
 ZITE8903 Research Methods in Information Technology •  
 ZPEM8202 Principles of Geographic Information Analysis and Remote Sensing x

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from related coursework programs.

### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Information Technology – Enterprise Architecture

School of Information Technology and Electrical Engineering

### Plan Description

The IT–Enterprise Architecture plan in the Master of Science is designed to provide a comprehensive understanding of enterprise architecture.

### Plan Structure

Students undertaking the MSc in IT–Enterprise Architecture are required to take 48UOC from core and elective courses in accordance with the conditions set out on below. Each course is worth 6UOC.

#### Core courses:

- ZITE8102 C3I Systems ■  
 ZITE8116 Information Systems Policy and Strategy ○○  
 ZITE8117 Integrating Information Systems Technologies ○  
 ZITE8118 Integrating the Enterprise and Information Systems Functions ○○  
 ZITE8226 Systems Engineering Practice ■ ○○

#### Elective courses:

Students may choose their remaining three courses from the following elective courses:

- ZACM8324 Project Administration ■ ○○  
 ZACM8325 System Dynamics of Project Organisation ○  
 ZBUS8103 Human Resource Management ○○  
 ZBUS8104 Law for Managers ○○  
 ZBUS8105 Finance and Investment Appraisal ○  
 ZBUS8101 Strategic Management ○ ○○  
 ZBUS8303 Strategic Procurement ○○  
 ZITE8104 Computer Security ○  
 ZITE8115 Information Operations ○  
 ZITE8119 Internetworking •  
 ZITE8126 XML Technologies ○○  
 ZITE8129 Multimedia and Virtual Environments ••  
 ZITE8134 Software Architecture •  
 ZITE8136 Software Project Management ○○  
 ZITE8138 Systems Planning ○  
 ZITE8139 Telecommunications Design and Management x  
 ZITE8141 WAN Technologies ○○  
 ZITE8402 Concept Development, Experimentation and Wargaming ○○

Suitable *Special Topics* (ZITE8120, ZITE8121, ZITE8122, ZITE8123) and *Directed Studies* courses (ZITE8111, ZITE8112) may be available from time to time. They may be chosen as elective courses in this plan, subject to the approval of the Program Authority.

The option of taking up to two courses from related coursework programs is not normally available to students in the MSc in IT–Enterprise Architecture.

## MSc in Operations Research and Statistics

School of Information Technology and Electrical Engineering

### Plan Description

The MSc in Operations Research and Statistics is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant science discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practice of operations research and statistical analysis and to strengthen their skills in analysis, problem solving and decision making. Its consideration of a wide range of analytical and quantitative techniques makes it suitable to both the professional analyst and to the student wishing to develop or employ those skills in higher level research.

### Plan Structure

Students undertaking the MSc in Operations Research and Statistics are required to take eight coursework courses (48UOC) from the courses set out below. The courses are broadly grouped as Operations Research and Statistical Analysis. Masters students may select the combination of courses most appropriate to their individual needs but must include at least two courses from each of the groups.

#### Operations Research

- ZITE8128 Modern Heuristic Techniques x  
 ZITE8403 Decision Analysis ○  
 ZITE8404 Introduction to Defence Operations Research ••  
 ZITE8405 Optimisation Techniques ○  
 ZITE8410 Soft Systems Methodologies ••  
 ZPEM8501 Weapons Assessment x

#### Statistical Analysis

- ZACM8327 Maximum Entropy Analysis x  
 ZITE8406 OR Special Topic •  
 ZPEM8301 Statistical Trials Analysis ○  
 ZPEM8308 Reliability and Maintainability ○○  
 ZPEM8304 Statistical Forecasting x  
 ZPEM8307 Financial Mathematics x

#### Other OR&S Courses

- ZITE8198 Project – Information Technology P/T ○ ○○  
 ZITE8199 Project - Information Technology ○ ○○  
 ZITE8406/9 OR Special Topic •••

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from related coursework programs.

### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project may take a maximum of one course (6UOC) from other coursework programs.



## MSc in Simulation and Experimentation

### School of Information Technology and Electrical Engineering

Students undertaking the Master of Science in Simulation and Experimentation are required to take 8 coursework courses (48UOC). Students must complete three core courses and five elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

- ZITE8412 Simulation ○  
 ZITE8402 Concept Development, Experimentation and Wargaming ○○  
 ZITE8403 Decision Analysis ○

#### Electives

- ZITE8413 Advanced Simulation x  
 ZITE8102 C3I Systems ■  
 ZITE8104 Computer Security ○  
 ZITE8129 Multimedia and Virtual Environments ●●  
 ZITE8134 Software Architecture •  
 ZITE8143 Distributed Applications ●●  
 ZITE8111 Directed Studies in Information Technology 1 ○ ○○  
 ZITE8112 Directed Studies in Information Technology 2 ○ ○○

Students may, with the approval of the Plan Authority, take two courses (12UOC) from a related coursework program. Students are encouraged to make use of the two courses ZITE8111 Directed Studies in Information Technology 1 and ZITE8112 Directed Studies in Information Technology 2 to undertake study of related topics in the context of simulation.

#### Research Project

The option of undertaking a 12UOC project (ZITE8199 Project – Information Technology, or enrolment for two sessions in ZITE8198 Project – Information Technology (Part Time) ) is available to Masters students who obtain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Software Development

### School of Information Technology and Electrical Engineering

#### Plan Description

The MSc in Software Development is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of software development and to strengthen their skills in this area.

#### Plan Structure

Students undertaking the MSc in Software Development are required to take 8 coursework courses (48UOC) from the courses set out below. Students must complete one compulsory course and five elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

- ZITE8108 Data Structures and Algorithms ○○

#### Electives

- ZITE8101 Advanced Java Programming ●●  
 ZITE8103 Computer Graphics x  
 ZITE8129 Multimedia and Virtual Environments ●●  
 ZITE8131 Object Oriented Analysis and Design ●●  
 ZITE8132 Object Oriented Programming x  
 ZITE8134 Software Architectures •  
 ZITE8140 User Interface Construction •  
 ZITE8143 Distributed Applications ●●  
 ZITE8145 Soft Computing x

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Science plans or other coursework programs.

#### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 Project – Information Technology or enrolment for two sessions in ZITE8198 Project – Information Technology P/T) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Systems and Network

### Administration

#### School of Information Technology and Electrical Engineering

#### Plan Description

The MSc in Systems and Network Administration is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of systems and network administration and to strengthen their skills in this area.

#### Plan Structure

Students undertaking the MSc in Systems and Network Administration are required to take 8 coursework courses (48UOC). Students must complete three compulsory courses and five elective courses from the list below. Not all elective courses will be available in a particular year.

#### Compulsory

- ZITE8119 Internetworking •  
 ZITE8133 Operating Systems •  
 ZITE8137 System and Network Administration ○

#### Electives

- ZITE8104 Computer Security ○  
 ZITE8106 Cryptography x  
 ZITE8126 Languages of the Web ○○  
 ZITE8130 Network Management and Troubleshooting x  
 ZITE8139 Telecommunications Design and Management x  
 ZITE8141 WAN Technologies ○○  
 ZITE8143 Distributed Applications ●●  
 ZITE8219 Satellite Communications ■ ■

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Science plans or other coursework programs.



### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.

## MSc in Web Technologies

### School of Information Technology and Electrical Engineering

#### Plan Description

The MSc in Web Technologies is designed for postgraduate scholars with appropriate undergraduate qualifications in a relevant discipline and/or extensive professional experience who wish to develop a high level understanding of the principles and practices of web technologies and to strengthen their skills in this area.

#### Plan Structure

Students undertaking the MSc in Web Technologies are required to take 8 coursework courses (48UOC). Students must complete six elective courses from the list below. Not all elective courses will be available in a particular year.

#### Electives

- ZITE8101 Advanced Java Programming ••
- ZITE8114 Electronic Business ○○
- ZITE8117 Integrating Information Systems Technologies •
- ZITE8126 XML Technologies ○○
- ZITE8129 Multimedia and Virtual Environments ••
- ZITE8140 User Interface Construction •
- ZITE8142 Web Design x
- ZITE8143 Distributed Applications ••
- ZITE8145 Soft Computing x

Students may, with the approval of the Plan Authority, take up to two courses (12UOC) from other Master of Science plans or other coursework programs.

### Research Project:

The option of undertaking a research project worth 12UOC (ZITE8199 *Project – Information Technology* or enrolment for two sessions in ZITE8198 *Project – Information Technology P/T*) is available to Masters students who attain a high credit average or better in four courses and is subject to approval of the Plan Authority. The project is recommended for those with a strong interest in pursuing original research in a particular area or intending to undertake a higher level research qualification. Students undertaking the project are unable to take courses from other coursework programs.



# Postgraduate Research Programs

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# The UNSW@ADFA Research Community

UNSW@ADFA is a research-intensive institution which offers a supportive and stimulating environment for postgraduate research. It has a wide range of postgraduate research programs open to all eligible students and particularly welcomes international students. Academic staff work closely with industry, commerce and public research bodies in Australia and overseas to ensure that our programs remain relevant in an ever changing environment. More than 300 staff and students on campus are engaged in research: 170 academic staff, supported by 30 specialist research staff and 120 research students. Research at UNSW@ADFA is recognised by its publications output and the significant external research funding attracted each year. In 2004, it was ranked by Thomson ISI (the International Citation Agency) in the top 1% in Engineering based on citations of publications in the period 1998-2002.

Research degree programs can be undertaken in all five Schools. Information about School research interests and possible supervisors is available from the UNSW@ADFA Research and Research Training website (see across) and individual School webpages. Research programs are open to all eligible students, including those from overseas. There is financial support available for successful applicants, including scholarships which cover fees only, stipend only (in the form of a living allowance), or in certain cases, fees and stipend.

Research degrees require the preparation and submission of a thesis embodying the results of an original investigation or design or, in the case of the Masters by Research, a combination of research and coursework or research only. Research programs are available at PhD and Masters level with provision, under certain circumstances, for transfer between the two. Opportunities for PhD and Masters by Research study range across the humanities, science and engineering disciplines.

**All students should read the *Information for All Students* section on page 7. Please read through your program rules before you commence study and contact the relevant school or support unit if you require any assistance.**

## Contacts for guidance and information

### Student Administrative Services

Ph 02 6268 6000  
Fax 02 6268 8666  
sas@adfa.edu.au  
www.unsw.adfa.edu.au/student

### School of Aeronautical, Civil and Mechanical Engineering (ACME)

Ph 02 6268 8335  
pgrcoord.acme@adfa.edu.au  
www.unsw.adfa.edu.au/acme

### School of Business

02 6268 6098  
pgrcoord.sob@adfa.edu.au  
www.unsw.adfa.edu.au/sbus

### School of Humanities and Social Sciences (HASS)

02 6268 8867  
pgrcoord.hass@adfa.edu.au  
www.unsw.adfa.edu.au/hass

### School of Information Technology and Electrical Engineering (ITEE)

02 6268 8580  
pgrcoord.itee@adfa.edu.au  
www.unsw.adfa.edu.au/itee

### School of Physical, Environmental and Mathematical Sciences (PEMS)

02 6268 6278  
pgrcoord.pems@adfa.edu.au  
www.unsw.adfa.edu.au/pems

### Research and Research Training Office

02 6268 8112  
pgrcoord.pems@adfa.edu.au  
www.unsw.adfa.edu.au/units/research



# MASTER OF PHILOSOPHY (MPHIL)

## Award/s: Master of Philosophy (MPhil)

School of Aerospace, Civil and Mechanical Engineering (2227); School of Humanities and Social Sciences (2225); School of Business (2226); School of Information Technology and Electrical Engineering (2228); School of Physical, Environmental and Mathematical Sciences (2229)

**Duration:** One and half years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 72UOC

## Program Description:

The Master of Philosophy is a research degree with an examinable coursework component, taken over three sessions and comprising 72 Units of Credit. A thesis, awarded 48 Units of Credit, embodies the result of an original investigation, design or engineering development. A program of advanced study, comprising 24 Units of Credit of coursework, makes up the remainder of the program. The coursework component will normally comprise four courses selected from the Coursework Masters offerings for the relevant discipline. Candidates may undertake interdisciplinary studies subject to approval. Subject to the approval of the program authority, candidates may enrol in postgraduate courses from other tertiary institutions.

Before enrolment an applicant should submit an intended program for approval by the School controlling the research discipline for the degree. The School will ensure that the coursework component is relevant to, or complements, the research component, and that the candidate satisfies pre-requisite requirements for the study.

**Admission Guidelines:** A candidate for registration for the degree of Master of Philosophy should hold a relevant Bachelor's degree, usually at Honours level, from The University of New South Wales or from another approved University. Applications for admission should be made to the Manager, Student Administrative Services, UNSW@ADFA on the prescribed form at least one calendar month before the commencement of the Session in which registration is to begin.

**Period of Candidature:** The normal period is three academic sessions (full time) and six academic sessions (part time) from the date of enrolment. Subject to feasibility of supervision, research may be undertaken during Summer Session. The maximum period of registration is five academic sessions (full time) and ten academic sessions (part time). In special cases, extensions may be granted.

The degree provides the opportunity to complete a research program with associated coursework in one calendar year.

The Summer Session need not be the last in the program. Coursework is not usually available in the Summer Session. Research may only be undertaken during the Summer Session if suitable supervision can be arranged.

## Academic Rules:

1. The degree of Master of Philosophy by research may be awarded by the Council on the recommendation of the Higher Degree Committee of the Faculty of Engineering, or the Research Committee of the University College, ADFA, (hereinafter collectively referred to as the Committee) to a candidate who has demonstrated ability to undertake research by the submission of a thesis (48UOC) embodying the results of an original investigation, and who has satisfied the advanced postgraduate coursework requirements (24UOC) of the degree.

## 2 Qualifications

- 2.1 A candidate for the degree shall have been awarded an appropriate degree of Bachelor in the relevant discipline from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee, usually an Honours level.
- 2.2 In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.
- 2.3 If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

## 3 Enrolment

- 3.1 An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar or the Manager, Student Administrative Services, UNSW@ADFA at least one calendar month before the commencement of the session in which enrolment is to begin.
- 3.2 In every case before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School controlling the relevant discipline and the applicant on the research area, supervision arrangements, provision of adequate facilities and the coursework to be undertaken, and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.
- 3.3 The candidate shall be enrolled as either a full-time or part-time student.
- 3.4 A full-time candidate will present the thesis for examination no earlier than the equivalent of 3 sessions and no later than 5 sessions from the date of enrolment; a part-time candidate will present the thesis for examination no earlier than 6 sessions and no later than 10 sessions from the date of enrolment, except with the approval of the Committee.
- 3.5 The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated or as an external student not in attendance at the University except for periods as may be prescribed by the Committee.
- 3.6 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
- 3.7 The research shall be supervised by at least two supervisors who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.
- 3.8 Schools may, at their discretion, appoint a Management Panel (which might include members from outside the school) to provide administrative support to the candidate and the supervisors. In addition to administrative matters, the panel could have responsibility for progress review and

examination of the candidate's work, assistance with appointment of examiners and consultation with the candidate at other critical times. The Management Panel should not include any supervisor of the research.

- 3.9 There is an expectation that coursework be completed as soon as feasible within the MPhil program.

#### 4 Progression

The progress of the candidate shall be considered by the Higher Degree Committee following report from the School, in accordance with the procedures established within the Faculty or at University College and previously noted by the Committee.

- (i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be after one session. This review will focus on both the viability of the research proposal, and evidence of satisfactory commencement of the research.
- (ii) Progress in the program will require that 24 Units of Credit of approved coursework are undertaken during candidature, and that all courses are passed at the first attempt. As a result of failure in any part of the coursework component, the Committee, advised by the School, may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed each session.

#### 5 Thesis

- 5.1 On completing both the program of research and all coursework, a candidate shall submit a thesis embodying the results of the investigation. The thesis would not normally exceed 40,000 words (or equivalent length).
- 5.2 The candidate shall give in writing to the Registrar or the Manager, Student Administrative Services one month's notice of intention to submit the thesis.
- 5.3 The thesis shall present an account of the candidate's own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied about the candidate's part in the joint research, and the candidate submits an individual thesis.
- 5.4 Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.
- 5.5 The University has the right to retain the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium. The University may protect Intellectual Property by restricting circulation of the thesis for a limited period (usually not exceeding 2 years).
- 5.6 An electronic version of the thesis shall be submitted to the library on completion of all work and corrections.

#### 6 Examination

- 6.1 There shall be no fewer than two examiners of the thesis, appointed by the committee acting on advice of the school, one of whom should be external to the university unless the committee resolves otherwise, and neither of whom should be supervisors of the research.

- 6.2 The entire examination process may include both the examination of the thesis and the option of a concurrent oral defence.
- 6.3 At the conclusion of the examination of the thesis each examiner shall submit a concise report on the thesis to the Committee, and shall recommend to the Committee that:
  - (a) The thesis is satisfactory.
  - (b) The thesis is satisfactory subject to minor corrections as listed being made to the satisfaction of the Head of School.
  - (c) The thesis requires further work on matters detailed in the report. Should performance in this further work be to the satisfaction of the Higher Degree Committee, the thesis would be satisfactory.
  - (d) The thesis is not satisfactory in its present form and further work as described in the report is required. The revised thesis should be subject to re-examination.
  - (e) The thesis is not satisfactory and does not demonstrate that resubmission would be likely to alter that assessment.
- 6.4 Concurrently with examination of the thesis, the Committee has the option, on advice from the School, to convene an Oral Defence Panel (the Panel), comprising no less than 3 and no more than 5 panel members, including the two examiners and, where appropriate, members of the Management Panel, or any members who may otherwise be selected by the Committee. The Panel will conduct an oral defence by the candidate of the work reported in the thesis, at which the examiners' questions, and those of other members of the Panel, shall be put to the candidate. In special circumstances, the Committee may recommend that the oral defence be conducted by an appropriate alternative means, (e.g. a telephone link with the external examiner, or less usually the candidate). Following the defence, the Panel will prepare a short report for the Committee, and recommend either that the oral defence was satisfactory, or that it was unsatisfactory.
- 6.5 The School shall report to the Committee satisfactory completion of any further work required by the Committee on the recommendation of the examiners and the Oral Defence Panel.
- 6.6 The Committee shall, after consideration of the examiners' reports and the results of the oral defence, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate be not awarded the degree the Committee shall determine whether or not the candidate should be permitted to resubmit the thesis after a further period of study and/or research. When an oral defence of the thesis has taken place, the Committee may also determine whether a supplementary oral defence of the thesis is required.

#### 7 Fees

A candidate shall pay such fees as may be determined from time to time by the Council.

**For information on the length of theses and the preparation and submission of project reports, please see the Preparation and Submission of Project Reports and Theses for Higher Degrees section at the end of this chapter.**

# MASTER OF ARTS (RESEARCH) (MA)

## School of Humanities and Social Sciences

**Award:** 2405 – Master of Arts (Research) (MA)

**Duration:** Maximum of three sessions full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 72UOC

### Program Description:

The Master of Arts (Research) program is a research degree comprising either a research thesis of substantial length, or four courses and a research thesis. The degree may be completed in a minimum of three sessions (full-time). It is designed to provide the option of formal coursework research training for students wishing to engage in serious research on a project that can be completed in a shorter time than the PhD. Clear indication of potential to undertake research is required, either through a relevant Honours Bachelor degree or equivalent, or through a period of professional work following a relevant undergraduate degree.

### Academic Rules:

1. The degree of Master of Arts (Research) may be awarded by the Council on the recommendation of the Research Committee of the University College to a candidate who has demonstrated ability to undertake research by submission of a thesis of 50,000-60,000 words embodying the results of original research or by a thesis of a minimum of 30,000-40,000 words combined with the satisfactory completion of a program of coursework study, consisting of 4 courses of 6 units of credit each.

### 2 Qualifications

- 2.1 A candidate for the degree shall:
  - (a) have been awarded an appropriate degree of Bachelor with Honours from The University of New South Wales at a standard not below Honours Class 2 or a qualification considered equivalent from another university or tertiary institution; or
  - (b) have been awarded an appropriate award of Graduate Diploma at an average of Credit from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution; or
  - (c) have had at least two years professional experience of a kind acceptable to the Research Committee AND have been awarded an appropriate degree of Bachelor from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution, and
    - (i) satisfy the Research Committee that the qualification is at a level and of a character indicating research potential; or
    - (ii) submit other evidence satisfying the Research Committee of their research potential.
- 2.2 In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Research Committee may be permitted to enrol for the degree.
- 2.3 If the Research Committee is not satisfied with the qualifications submitted by an applicant it may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment.

### 3 Enrolment

- 3.1 An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with the Registrar at least one calendar month before the commencement of the session in which enrolment is to begin or, where applicable, by the advertised closing date.
  - 3.2 In every case, before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School and the applicant on the topic area, supervision arrangements, provision of adequate facilities and any coursework to be prescribed and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.
  - 3.3 The candidate shall be enrolled as either a full-time or part-time student.
  - 3.4 To qualify for the award of the degree a candidate shall undertake such formal courses and pass such assessment as prescribed; either
    - (i) Obtain 24 units of credit in approved coursework and 48 units of credit through the submission of a thesis (30,000–40,000 words) demonstrating the capacity to conduct, under supervision, an original investigation on an approved topic; or
    - (ii) Submit a research thesis of 50,000–60,000 words in length.
  - 3.5 A full-time candidate will present the thesis for examination no earlier than 1.5 years and no later than 3 years from the date of enrolment and a part-time candidate will present the thesis for examination no earlier than 2 years and no later than 4 years from the date of enrolment. In special cases a variation of these times may be granted by the Committee.
  - 3.6 The candidate may undertake the research as an internal student i.e. at a campus, or other research facility, with which the University is associated, or an external student not in attendance at the University except for periods as may be prescribed by the University.
  - 3.7 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
  - 3.8 The research shall be supervised by a supervisor or supervisors who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.
- ### 4 Progression
- 4.1 The progress of candidates undertaking research shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.
    - (i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be during the second year of study, or immediately following a period of prescribed coursework. This review will focus on the viability of the research proposal.



- (ii) Progress in the program will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

## 5 Thesis

- 5.1 On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.
- 5.2 The candidate shall give in writing to Student Administrative Services two months' notice of intention to submit the thesis.
- 5.3 The thesis shall present an account of the candidate's own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied as to the candidate's part in the joint research.
- 5.4 The candidate may also submit any work previously published whether or not such work is related to the thesis.
- 5.5 Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.
- 5.6 The University has the right to retain the three copies of the thesis submitted for examination and is free to allow it to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

## 6 Examination

- 6.1 There shall be no fewer than two examiners of the thesis or project report, at least one of whom shall be external to the University unless the Committee is satisfied that this is not practicable.
- 6.2 At the conclusion of the examination each examiner shall submit to the committee a concise report on the thesis and shall recommend to the Committee that:
  - (a) The thesis merits the award of the degree.
  - (b) The thesis merits the award of the degree subject to minor corrections as listed being made to the satisfaction of the Head of the School.
  - (c) The thesis requires further work on matters detailed in the report. Should performance in this further work be to the satisfaction of the Research Committee, the thesis would merit the award of the degree.
  - (d) The thesis does not merit the award of the degree in its present form and further work as described in the report is required. The revised thesis should be subject to re-examination.
  - (e) The thesis does not merit the award of the degree and does not demonstrate that resubmission would be likely to achieve that merit.
- 6.3 If the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to re-present the same thesis and submit for further examination as determined by the Committee within a period specified by it but not exceeding eighteen months.
- 6.4 The Committee shall, after consideration of the examiners' reports and the results of any further examination, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate not be awarded the degree, the Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further period of study and/or research.

# MASTER OF ENGINEERING (RESEARCH) (ME)

**School of Aerospace, Civil and Mechanical Engineering  
School of Information Technology and Electrical Engineering**

**Award/s:** Master of Engineering (ME) [Aerospace 2693; Civil 2651; 2663 Electrical; 2691 Mechanical]

**Duration:** Two years full-time or part-time equivalent

**UOC per session:** 24UOC

**UOC for award:** 96UOC

## Program Description:

This program is designed primarily as training in a program of advanced study and research. The candidate learns the fundamentals of research and acquires new techniques. The program may include formal coursework which is normally intended to prepare the candidate for work on the thesis. The candidate must undertake an original investigation but this would normally be more limited in scope and degree of originality than is required for a doctorate. Although originality is to be encouraged as much as possible, the work will be closely supervised in the early problem formulation stages and whenever a new technique is being used. Most Masters research programs require a minimum three academic sessions (i.e. 1.5 years) of full-time study and the preparation of a thesis. The length of a Masters research thesis normally should not exceed 60,000 words of text.

## Academic Rules:

1. The degree of Master of Engineering by research may be awarded by the Council on the recommendation of the Research Committee of the University College (hereinafter referred to as the Committee) to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.
- 2 **Qualifications**
  - 2.1 A candidate for the degree shall have been awarded at a standard not below Honours Class 2 an appropriate degree of Bachelor from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution.
  - 2.2 In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.
  - 2.3 If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such examination or carry out such work as the Committee may prescribe.
- 3 **Enrolment**
  - 3.1 An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with Student Administrative Services at least one calendar month before the commencement of the session in which enrolment is to begin or, where applicable, by the advertised starting date.
  - 3.2 In every case, before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School and the applicant on the topic area, supervision arrangements, provision of adequate facilities and any coursework to be prescribed and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.



- 3.3 The candidate shall be enrolled as either a full-time or a part-time student.
- 3.4 A full-time candidate will present the thesis for examination no earlier than 1.5 years and no later than 3 years from the date of enrolment; a part-time candidate will present the thesis for examination no earlier than 2 years and no later than 5 years from the date of enrolment, except with the approval of the Committee.
- 3.5 The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated, or as an external student not in attendance at the University except for periods as may be prescribed by the Committee.
- 3.6 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
- 3.7 The research shall be supervised by a supervisor or supervisors who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.

#### 4 Progression

The progress of the candidate shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.

- (i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be during the second year of study, or immediately following a period of prescribed coursework. This review will focus on the viability of the research proposal.
- (ii) Progress in the course will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

#### 5 Thesis

- 5.1 On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.
- 5.2 The candidate shall give in writing to Student Administrative Services two months' notice of intention to submit the thesis.
- 5.3 The thesis shall present an account of the candidate's own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied about the extent of the candidate's part in the joint research.
- 5.4 The candidate may also submit any work previously published whether or not such work is related to the thesis.

- 5.5 Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.
- 5.6 The University has the right to retain the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

#### 6 Examination

- 6.1 There shall be no fewer than two examiners of the thesis, appointed by the Committee, at least one of whom shall be external to the University unless the Committee is satisfied that this is not practicable.
- 6.2 At the conclusion of the examination each examiner shall submit to the Committee a concise report on the merits of the thesis and shall recommend to the Committee that:
  - (a) The thesis merits the award of the degree.
  - (b) The thesis merits the award of the degree subject to minor corrections as listed being made to the satisfaction of the Head of the School.
  - (c) The thesis requires further work on matters detailed in my report. Should performance in this further work be to the satisfaction of the Research Committee, the thesis would merit the award of the degree.
  - (d) The thesis does not merit the award of the degree in its present form and further work as described in my report is required. The revised thesis should be subject to re-examination.
  - (e) The thesis does not merit the award of the degree and does not demonstrate that resubmission would be likely to achieve that merit.
- 6.3 If the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to re-present the same thesis and submit to further examination as determined by the Committee within a period specified by it but not exceeding eighteen months.
- 6.4 The Committee shall, after consideration of the examiners' reports and the results of any further examination, recommend whether or not the candidate may be awarded the degree. If it is decided that the candidate not be awarded the degree the Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further period of study and/or research.

#### 7 Fees

**A candidate shall pay such fees as may be determined from time to time by the Council.**

**For information on the length of theses and the preparation and submission of project reports, please see the Preparation and Submission of Project Reports and Theses for Higher Degrees section at the end of this chapter.**

# MASTER OF SCIENCE (RESEARCH) (MSc)

**School of Information Technology and Electrical Engineering  
School of Physical, Environmental and Mathematical Sciences**

**Award/s: Master of Science (MSc)**

Chemistry 2911; Computer Science 2925; Geography 2041; Oceanography 2042 ; Mathematics and Statistics 2921; Physics 2931

**Duration:** Two years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

## Program Description:

This program is designed primarily as training in a program of advanced study and research. The candidate learns the fundamentals of research and acquires new techniques. The program may include formal coursework which is normally intended to prepare the candidate for work on the thesis. The candidate must undertake an original investigation but this would normally be more limited in scope and degree of originality than is required for a doctorate. Although originality is to be encouraged as much as possible, the work will be closely supervised in the early problem formulation stages and whenever a new technique is being used. Most Masters research programs require a minimum three academic sessions (i.e. 1.5 years) of full-time study and the preparation of a thesis. The length of a Masters research thesis normally should not exceed 60,000 words of text.

## Academic Rules:

1. The degree of Master of Science by research may be awarded by the Council on the recommendation of the Research Committee of the University College (hereinafter referred to as the Committee) to a candidate who has demonstrated ability to undertake research by the submission of a thesis embodying the results of an original investigation.

## 2 Qualifications

- 2.1 A candidate for the degree shall have been awarded at a standard not below Honours Class 2 an appropriate degree of Bachelor from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution.
- 2.2 In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.
- 2.3 If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such examination or carry out such work as the Committee may prescribe.

## 3 Enrolment

- 3.1 An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with Student Administrative Services at least one calendar month before the commencement of the session in which enrolment is to begin or, where applicable, by the advertised starting date.

- 3.2 In every case, before making the offer of a place the Committee shall be satisfied that initial agreement has been reached between the School and the applicant on the topic area, supervision arrangements, provision of adequate facilities and any coursework to be prescribed and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.
- 3.3 The candidate shall be enrolled as either a full-time or a part-time student.
- 3.4 A full-time candidate will present the thesis for examination no earlier than 1.5 years and no later than 3 years from the date of enrolment; a part-time candidate will present the thesis for examination no earlier than 2 years and no later than 5 years from the date of enrolment, except with the approval of the Committee.
- 3.5 The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated, or as an external student not in attendance at the University except for periods as may be prescribed by the Committee.
- 3.6 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
- 3.7 The research shall be supervised by a supervisor or supervisors who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.

## 4 Progression

- The progress of the candidate shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.
- (i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be during the second year of study, or immediately following a period of prescribed coursework. This review will focus on the viability of the research proposal.
  - (ii) Progress in the course will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

## 5 Thesis

- 5.1 On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.
- 5.2 The candidate shall give in writing to Student Administrative Services two months' notice of intention to submit the thesis.
- 5.3 The thesis shall present an account of the candidate's own research. In special cases work done conjointly with other persons may be accepted, provided the Committee is satisfied about the extent of the candidate's part in the joint research.

- 5.4 The candidate may also submit any work previously published whether or not such work is related to the thesis.
- 5.5 Three copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.
- 5.6 The University has the right to retain the three copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

## 6 Examination

- 6.1 There shall be no fewer than two examiners of the thesis, appointed by the Committee, at least one of whom shall be external to the University unless the Committee is satisfied that this is not practicable.
- 6.2 At the conclusion of the examination each examiner shall submit to the Committee a concise report on the merits of the thesis and shall recommend to the Committee that:
- The thesis merits the award of the degree.
  - The thesis merits the award of the degree subject to minor corrections as listed being made to the satisfaction of the Head of the School.
  - The thesis requires further work on matters detailed in my report. Should performance in this further work be to the satisfaction of the Research Committee, the thesis would merit the award of the degree.
  - The thesis does not merit the award of the degree in its present form and further work as described in my report is required. The revised thesis should be subject to re-examination.
  - The thesis does not merit the award of the degree and does not demonstrate that resubmission would be likely to achieve that merit.
- 6.3 If the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to re-present the same thesis and submit to further examination as determined by the Committee within a period specified by it but not exceeding eighteen months.
- 6.4 The Committee shall, after consideration of the examiners' reports and the results of any further examination, recommend whether or not the candidate may be awarded the degree.  
If it is decided that the candidate not be awarded the degree the Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further period of study and/or research.

## 7 Fees

A candidate shall pay such fees as may be determined from time to time by the Council.

**For information on the length of theses and the preparation and submission of project reports, please see the** Preparation and Submission of Project Reports and Theses for Higher Degrees section at the end of this chapter.

# DOCTOR OF PHILOSOPHY (PHD)

## Award/s: Doctor of Philosophy (PhD)

ACME: Aerospace Engineering (1663) Mechanical Engineering (1661) Civil Engineering (1631); SOB: Business (Economics and Management) (1541); ITEE: Computer Science (1885) Electrical Engineering (1643); HASS: History (1241) English (1201) Indonesian (1203) Politics (1321); PEMS: Mathematics and Statistics (1881) Physics (1892) Chemistry (1871) Geography (1081) Oceanography (1082)

**Duration:** Three years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

## Program Description:

The Doctoral degree is formal recognition of successful research experience. The candidate must make a distinct and original contribution to knowledge. Considerably more original work is required for a Doctorate than for a Masters research degree. The nature and level of supervision will evolve over the duration of the candidature. The work will be more closely supervised in the early stages. In the later stages, however, the candidate must be allowed increasing scope to exercise initiatives and demonstrate originality.

In the latter part of the program the candidate should be able to work alone and be guided rather than directed by the supervisor. The degree of Doctor of Philosophy requires a minimum of three years full-time study and preparation of a thesis. The length of a doctoral thesis normally should not exceed 100,000 words of text.

## Academic Rules:

- The degree of Doctor of Philosophy may be awarded by the Council on the recommendation of the Research Committee of the University College (hereinafter referred to as the Committee) to a candidate who has made an original and significant contribution to knowledge.

## 2 Qualifications

- A candidate for the degree shall have been awarded an appropriate degree of Bachelor with Honours from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Committee.
- In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the Committee may be permitted to enrol for the degree.
- If the Committee is not satisfied with the qualifications submitted by an applicant the Committee may require the applicant to undergo such assessment or carry out such work as the Committee may prescribe, before permitting enrolment as a candidate for the degree.

## 3 Enrolment

- An application to enrol as a candidate for the degree shall be lodged with Student Administrative Services at least one calendar month before the commencement of the session in which enrolment is to begin or, where applicable, by the advertised closing date.
- In every case before making the offer of a place the Committee shall be satisfied that agreement has been reached between the School and the applicant on the topic area, supervision arrangements, provision of adequate facilities and any coursework to be prescribed and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.



- 3.3 An approved candidate shall be enrolled either as a full-time or a part-time student.
- 3.4 A full-time candidate will present the thesis for examination no earlier than three years and no later than five years from the date of enrolment; a part-time candidate will present the thesis for examination no earlier than four years and no later than six years from the date of enrolment, except with the approval of the Committee.
- 3.5 The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated, or as an external student not in attendance at the University except for periods as may be prescribed by the Committee.
- 3.6 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Committee. In such instances the Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.
- 3.7 The research shall be supervised by a supervisor and where possible a co-supervisor who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.

#### 4 Progression

The progress of the candidate shall be considered by the Committee following report from the School in accordance with the procedures established within the School and previously noted by the Committee.

- (i) The research proposal will be reviewed as soon as feasible after enrolment. For a full-time student this will normally be during the second year of study, or immediately following a period of prescribed coursework. This review will focus on the viability of the research proposal.
- (ii) Progress in the course will be reviewed within twelve months of the first review. As a result of either review the Committee may cancel enrolment or take such other action as it considers appropriate. Thereafter, the progress of the candidate will be reviewed annually.

#### 5 Thesis

- 5.1 On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.
- 5.2 The candidate shall give in writing to Student Administrative Services two months' notice of intention to submit the thesis.
- 5.3 The thesis shall comply with the following requirements:
  - (a) it must be an original and significant contribution to knowledge of the subject;
  - (b) the greater proportion of the work described must have been completed subsequent to enrolment for the degree;
  - (c) it must be written in English except that a candidate in the Faculty of Arts and Social Sciences may be required by the Committee to write a thesis in an appropriate foreign language;
  - (d) it must reach a satisfactory standard of expression and presentation;

- (e) it must consist of an account of the candidate's own research but in special cases work done conjointly with other persons may be accepted provided the Committee is satisfied about the extent of the candidate's part in the joint research.
- 5.4 The candidate may not submit as the main content of the thesis any work or material which has previously been submitted for a university degree or other similar award but may submit any work previously published whether or not such work is related to the thesis.
- 5.5 Four copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees. (See later entry in this section.)
- 5.6 It shall be understood that the University has the right to retain the four copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

#### 6 Examination

- 6.1 There shall be no fewer than three examiners of the thesis, appointed by the Committee, at least two of whom shall be external to the University.
- 6.2 At the conclusion of the examination each examiner shall submit to the Committee a concise report on the thesis and shall recommend to the Committee one of the following:
  - (a) the thesis merits the award of the degree.
  - (b) the thesis merits the award of the degree subject to minor corrections as listed being made to the satisfaction of the Head of School.
  - (c) the thesis requires further work on matters detailed in the report. Should performance in this further work be to the satisfaction of the Research Committee, the thesis would merit the award of the degree.
  - (d) the thesis does not merit the award of the degree in its present form and further work as described in the report is required. The revised thesis should be subject to re-examination.
  - (e) the thesis does not merit the award of the degree and does not demonstrate that resubmission would be likely to achieve that merit.
- 6.3 if the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Committee, the Committee may permit the candidate to submit the thesis for re-examination as determined by the Committee within a period determined by it but not exceeding eighteen months.
- 6.4 after consideration of the examiners' reports and the results of any further examination of the thesis, the Committee may require the candidate to submit to written or oral examination before recommending whether or not the candidate be awarded the degree. If it is decided that the candidate not be awarded the degree the Committee shall determine whether or not the candidate be permitted to resubmit the thesis after a further period of study and/or research.

#### 7 Fees

A candidate shall pay such fees as may be determined from time to time by the Council.

Following examination and before graduation, a final hard-bound copy of the thesis is to be provided for lodgement by Student Administrative Services in the Academy Library.

#### Length of Theses

The length of a doctoral thesis normally should not exceed 100,000 words of text and masters research thesis should not exceed 75,000 words.



# COMBINED COURSEWORK/ RESEARCH PROGRAMS

## Academic Rules

### – Combined MPhil degrees

The rules for the award of the Masters by coursework component of the combined degree program are those that apply to existing Masters by coursework programs. The rules for the degree of Master of Arts, Master of Defence Studies, Master of Engineering Science, Master of Management Studies or Master of Science are identical. Please refer to the rules for Masters by coursework programs in the previous chapter of this handbook.

The rules for the award of the Master of Philosophy component of the combined degree program are those that apply to existing Masters of Philosophy program, except that Advanced Standing for the coursework component will be granted on successful completion of the coursework program. The rules governing enrolment, progression, the thesis and the examination progress remain unchanged. Please refer to the rules for Masters of Philosophy at the beginning of this chapter.

1. Candidates shall complete the 48UOC coursework component of the combined degree (the Masters by coursework) prior to commencing the research component of the MPhil.
2. While undertaking the coursework component of the combined degree, candidates shall be subject to the same rules as those applying to the appropriate Masters by coursework. If there is any inconsistency between the rules covering the combined program and the rules covering the coursework degree, the rules covering the combined program shall take precedence.
3. The coursework component must be completed, with an average mark of at least 70%, before a candidate may progress to the research component. Admission to the research component is at the discretion of the Head of School in which the research is proposed to be undertaken.
4. While undertaking the research component of the combined degree, candidates shall be subject to the same rules as those applying to the Master of Philosophy. With Advanced Standing for the coursework component of the MPhil, however, a full-time candidate will present the thesis for examination no earlier than the equivalent of 2 sessions and no later than 4 sessions from the date of enrolment, and a part-time candidate will present the thesis for examination no earlier than the equivalent of 4 sessions and no later than 8 sessions from the date of enrolment, except with the approval of the UNSW@ADFA Research Committee. If there is any inconsistency between the rules covering the combined program and the rules covering the coursework degree, the rules covering the combined program shall take precedence.
5. Candidates shall be eligible for admission to the coursework Masters degree (including nominated plans of study) upon completion of all requirements for the award of that degree.

## Master of Arts/Master of Philosophy

### School of Humanities and Social Sciences

**Award/s:** 8691 – Masters of Arts (MA 8175)/  
Master of Philosophy (MPhil HASS2225)

**Duration:** 2 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

### Program Description:

This combined degree program provides students with a structured two-year full-time of part-time equivalent program of study leading to the award of two Masters degrees, a Masters by coursework in Arts, Engineering Science, Defence Studies, Management Studies or Science, and the Master of Philosophy.

### Program Objectives and Learning Outcomes:

The program provides a unique opportunity for graduate students to attain both a coursework and a research qualification to strengthen their existing knowledge and skills while also defining a pathway to further study, particularly higher-level research.

## Master of Defence Studies/ Master of Philosophy

### School of Humanities and Social Sciences

**Award/s:** 8692 – Masters of Defence Studies (MDefStud 9900)/ Master of Philosophy (MPhil HASS 2225)

**Duration:** 2 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

### Program Description:

This combined degree program provides students with a structured two-year full-time of part-time equivalent program of study leading to the award of two Masters degrees, a Masters by coursework in Arts, Engineering Science, Defence Studies, Management Studies or Science, and the Master of Philosophy.

### Program Objectives and Learning Outcomes:

The program provides a unique opportunity for graduate students to attain both a coursework and a research qualification to strengthen their existing knowledge and skills while also defining a pathway to further study, particularly higher-level research.

## Master of Engineering Science/ Master of Philosophy

### School of Aerospace, Mechanical and Civil Engineering School of Information Technology and Electrical Engineering

**Award/s:** 8693 – Master of Engineering Science (MEngSc 8569)/ Master of Philosophy (MPhil ACME/ITEE 2225)

**Duration:** 2 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

### Program Description:

This combined degree program provides students with a structured two-year full-time of part-time equivalent program of study leading to the award of two Masters degrees, a Masters by coursework in Arts, Engineering

Science, Defence Studies, Management Studies or Science, and the Master of Philosophy.

### Program Objectives and Learning Outcomes:

The program provides a unique opportunity for graduate students to attain both a coursework and a research qualification to strengthen their existing knowledge and skills while also defining a pathway to further study, particularly higher-level research.

## Master of Science/Master of Philosophy

**School of Information Technology and Electrical Engineering  
School of Physical, Environmental and Mathematical Science**

**Awards:** 8694 – Master of Science (Msc 8562)/ Master of Philosophy (MPhil ITEE/PEMS 2225)

**Duration:** 2 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

### Program Description:

This combined degree program provides students with a structured two-year full-time or part-time equivalent program of study leading to the award of two Masters degrees, a Masters by coursework in Arts, Engineering Science, Defence Studies, Management Studies or Science, and the Master of Philosophy.

### Program Objectives and Learning Outcomes:

The program provides a unique opportunity for graduate students to attain both a coursework and a research qualification to strengthen their existing knowledge and skills while also defining a pathway to further study, particularly higher-level research.

## Master of Management Studies/ Master of Philosophy

**School of Business**

**Awards:** 8695 – Master of Management Studies (MMgtStud 8398)/ Master of Philosophy (MPhil SOB 2225)

**Duration:** 2 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 96UOC

### Program Description:

This combined degree program provides students with a structured two-year full-time or part-time equivalent program of study leading to the award of two Masters degrees, a Masters by coursework in Arts, Engineering Science, Defence Studies, Management Studies or Science, and the Master of Philosophy.

### Program Objectives and Learning Outcomes:

The program provides a unique opportunity for graduate students to attain both a coursework and a research qualification to strengthen their existing knowledge and skills while also defining a pathway to further study, particularly higher-level research.

## Doctor of Information (DIT)

**School of Information Technology and Electrical Engineering**

**Award/s:** 9920 – Doctor of Information Technology (DIT)

**Duration:** 3 years full-time or part-time equivalent

**UOC per session:** 24UOC (full-time)

**UOC for award:** 144UOC

### Program Description:

The DIT degree provides an opportunity to combine a doctoral thesis with the coursework component of an IT-related Master of Science. It allows research into an area of interest developed within the coursework, leading to a significant contribution to professional practice in information technology.

### Program Objectives and Learning Outcomes:

The DIT Program allows students to undertake a coursework program of study followed by research into an area of interest developed within the coursework, leading to a significant contribution to professional practice in information technology.

### Program Structure:

The degree consists of one half coursework (equivalent to three sessions full time) and one half research (equivalent to three sessions full time) which may be taken in an area encountered by the student while undertaking coursework. All coursework must be completed before the commencement of the dissertation.

The coursework component of the degree begins with enrolment in an IT-related Master of Science.

### Academic Rules:

1. The degree of Doctor of Information Technology may be awarded by the Council to a candidate who has satisfactorily completed a program of coursework and research.
- 2 **Qualifications**
  - 2.1 A candidate for the degree shall have been awarded an appropriate degree of Bachelor with Honours or Master by formal coursework from The University of New South Wales or a qualification considered equivalent from another university or tertiary institution at a level acceptable to the Postgraduate Coursework Education Committee of the University College (hereinafter referred to as the PCEC). In addition, a candidate shall have a minimum of three years of relevant professional experience.
  - 2.2 In exceptional cases an applicant who submits evidence of such other academic and professional qualifications as may be approved by the PCEC may be permitted to enrol for the degree.
  - 2.3 If the PCEC is not satisfied with the qualifications submitted by an applicant the PCEC may require the applicant to undergo such assessment or carry out such work as the PCEC may prescribe, before permitting enrolment.
- 3 **Enrolment and Progression**
  - 3.1 An application to enrol as a candidate for the degree shall be made on the prescribed form which shall be lodged with Student Administrative Services by the advertised date.
  - 3.2 A candidate for the degree shall undertake such courses and pass such assessment as prescribed.
  - 3.3 The program of study shall comprise a coursework stage and a research stage.  
The coursework stage shall total a minimum of 72

units of credit. If a candidate's average mark on completion of 48 units of credit of coursework is less than 70%, the candidate shall be awarded a MSc in Information Technology and shall not be permitted to continue as a candidate for the DIT.

The coursework stage must be completed, with an average mark of at least 70%, before a candidate may progress to the research stage.

- 3.4 During the coursework stage, the progress of a candidate shall be reviewed at the end of each main session by the PCEC under the Academic Standing scheme. Movement between levels of academic standing is based on progress, measured by cumulative number of failures. As a result of its review the PCEC may change the academic standing of a student or cancel enrolment.

- 3.5 During the research stage, the progress of the candidate shall be considered by the Research Committee following reporting from the School in accordance with the procedures established within the School and previously noted by the Research Committee.

On enrolment in the research stage, the Research Committee shall be satisfied that initial agreement has been reached between the School and the candidate on the research area, supervision arrangements, and provision of adequate facilities and that these are in accordance with the provisions of the guidelines for promoting postgraduate study within the University.

The research proposal will be reviewed as soon as feasible after enrolment in the research stage. This review will focus on the viability of the research proposal.

Progress will be reviewed within six months of the first review for a full time student, and within twelve months of the first review for a part-time student. As a result of either review the Research Committee may cancel enrolment or take such other action as it considers appropriate.

Thereafter, the progress of the candidate will be reviewed every six months for a full-time student, and every twelve months for a part-time student.

- 3.6 A full-time candidate will present the thesis for examination no earlier than three years and no later than five years from the date of enrolment and a part-time candidate will present the thesis for examination no earlier than four years and no later than six years from the date of enrolment, except with the approval of the Research Committee.
- 3.7 The candidate may undertake the research as an internal student i.e. at a campus, teaching hospital, or other research facility with which the University is associated, or as an external student not in attendance at the University except for periods as may be prescribed by the Research Committee.
- 3.8 An internal candidate will normally carry out the research on a campus or at a teaching or research facility of the University except that the Research Committee may permit a candidate to spend a period in the field, within another institution or elsewhere away from the University provided that the work can be supervised in a manner satisfactory to the Research Committee. In such instances the Research Committee shall be satisfied that the location and period of time away from the University are necessary to the research program.

- 3.9 The research shall be supervised by a supervisor or supervisors who are members of the academic staff of the School or under other appropriate supervision arrangements approved by the Research Committee. Normally an external candidate within another organisation or institution will have a co-supervisor at that institution.

#### 4 Thesis

- 4.1 On completing the program of study a candidate shall submit a thesis embodying the results of the investigation.

- 4.2 The candidate shall give in writing to Student Administrative Services two months' notice of intention to submit the thesis.

- 4.3 The thesis shall comply with the following requirements:

it must be an original and significant contribution to knowledge of the subject;

the greater proportion of the work described must have been completed subsequent to enrolment for the degree;

it must be written in English;

it must reach a satisfactory standard of expression and presentation;

it must consist of an account of the candidate's own research, but in special cases work done conjointly with other persons may be accepted, provided the Research Committee is satisfied on the candidate's part in the joint research.

- 4.4 The candidate may not submit as the main content of the thesis any work or material which has previously been submitted for a university degree or other similar award but may submit any work previously published whether or not such work is related to the thesis.

- 4.5 Four copies of the thesis shall be presented in a form which complies with the requirements of the University for the preparation and submission of theses for higher degrees.

- (6) It shall be understood that the University has the right to retain the four copies of the thesis submitted for examination and is free to allow the thesis to be consulted or borrowed. Subject to the provisions of the *Copyright Act, 1968*, the University may issue the thesis in whole or in part, in photostat or microfilm or other copying medium.

#### 5 Examination

- 5.1 There shall be no fewer than three examiners of the thesis, appointed by the Research Committee, at least two of whom shall be external to the University.

- 5.2 At the conclusion of the examination each examiner shall submit to the Research Committee a concise report on the thesis and shall recommend to the Research Committee one of the following:

- (a) The thesis be noted as satisfactory.
- (b) The thesis be noted as satisfactory subject to minor corrections as listed being made to the satisfaction of the Head of School.

- (c) The thesis requires further work on matters detailed in my report. Should performance in this further work be to the satisfaction of the Research Committee, the thesis would be noted as satisfactory.
  - (d) The thesis be noted as unsatisfactory in its present form and further work as described in my report is required. The revised thesis should be subject to re-examination.
  - (e) The thesis be noted as unsatisfactory and does not demonstrate that resubmission would be likely to achieve a satisfactory response.
- 5.3 If the performance in the further work recommended under (2)(c) above is not to the satisfaction of the Research Committee, the Research Committee may permit the candidate to submit the thesis for re-examination as determined by the Research Committee within a period determined by it but not exceeding eighteen months.
- 5.4 The Committee shall, after consideration of the examiners' reports, any further reports on the thesis, the results of any further examination and of the prescribed course of study, recommend whether or not the candidate be awarded the degree. If it is decided that the candidate be not awarded the degree the Committee shall determine whether or not the candidate may resubmit the thesis after a further period of study and/or research.
- 5.5 If it is determined that the candidate not be awarded the degree and not be permitted to resubmit the thesis after a further period of study and/or research, and the candidate completed at least 8 courses during the coursework stage of the degree, the candidate will be awarded a Master of Science in Information Technology.
- 6 Fees**
- A candidate shall pay such fees as may be determined from time to time by the Council.

### **Articulation from the Master of Science to the Doctor of Information Technology**

A candidate who has completed the requirements for an IT-related Master of Science at the University of New South Wales or another recognised tertiary institution, is eligible to apply for articulated entry into the Doctor of Information Technology (provided their average mark in the MSc was 70% or better and they have a minimum of three years of relevant professional experience) within four years of completion of the MSc requirements. After completing four more courses and provided their overall average mark is still at least 70%, students may enrol in the DIT dissertation.

Note that during their postgraduate coursework studies, candidates are required to complete the courses ZITE8901 *Case Studies in Information Technology*, ZITE8902 *Professional Practices*, and ZITE8903 *Research Methods*.

The topic of the dissertation will commonly be a development of at least one course. The topic will be nominated by the candidate and approved by the Research Committee of UNSW@ADFA. The dissertation must amount to an original contribution to a field of study, and be of publishable quality. It will be assessed by not less than three examiners appointed by the Research Committee. Assessment is as for other final research degrees. A final result of non-award of the DIT will lead to a MSc being conferred on the candidate if they have completed at least eight courses.

**Current course and program information**  
is now available through the  
**UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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### **Entry to the Doctor of Information Technology by a Holder of a Masters Degree**

Students who have been awarded a coursework Masters degree in a related discipline from the University of New South Wales or another recognised tertiary institution are eligible to apply for entry into the Doctor of Information Technology (provided their average mark in the Masters degree was 70% or better and they have a minimum of three years of relevant professional experience), within four years of completion of the Masters degree requirements and may apply for credit for up to 6 courses.

### **Length of Theses**

The length of a doctoral thesis normally should not exceed 100,000 words of text and that of a masters research thesis 75,000.



# PREPARATION AND SUBMISSION OF PROJECT REPORTS AND THESES FOR HIGHER DEGREES

Please note that a guide on the process for submission of theses for higher degrees is accessible on the Student Gateway. The guide details the processes for submission, revisions and re-examination and contains advice regarding the forms required for submission of a thesis.

The following rules outline the **requirements** for project report and thesis submission for higher degrees.

Candidates are required to give two months notice, in writing, of the expected date on which the thesis will be submitted.

1. Every candidate for the degree of Master by Research is required to submit **3 paper copies** of the thesis for examination to Research and Research Training Office. Every candidate for the degree of Doctor is required to submit **4 paper copies** of the thesis for examination.

These may be submitted in temporary binding such that the thesis can be forwarded to examiners without the possibility of disarrangement. This temporary binding shall preferably be in spiral-bound format. Theses stapled or presented in a ring-binder folder will not be accepted. At the completion of the examination and prior to graduation every candidate who has satisfied requirements for the award of the degree will submit a final bound paper copy and a digital copy to Student Administrative Services for deposit and preservation in the University Library [see 13]. School procedures may also require students to submit a final bound copy to the School.

2. All copies shall contain in the preliminary pages, preceding the Table of Contents, an Abstract of not more than 350 words which shall indicate the problem investigated, the procedures followed, the general results obtained and the major conclusions reached, but shall not contain any illustrative matter.
3. All copies will include the following statement:

## Originality Statement

*'I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at UNSW or any other educational institution, except where due acknowledgment is made in the thesis. Any contribution made to the research by others, with whom I have worked at UNSW or elsewhere, is explicitly acknowledged in the thesis. I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.'*

4. The following statements will be agreed to during the digital submission process and will be included in the Library deposit copy.

## (a) Copyright Statement

*'I hereby grant to The University of New South Wales or its agents the right to archive and to make available my thesis or dissertation in whole or part in the University libraries in all forms of media, now or hereafter known, subject to the provisions of the Copyright Act 1968. I retain all proprietary rights, such as patent rights. I also retain the right to use in*

*future works (such as articles or books) all or part of this thesis or dissertation.*

I also authorise University Microfilms to use the abstract of my thesis in Dissertations Abstract International (this is applicable to doctoral theses only)

I have either used no substantial portions of copyright material in my thesis or I have obtained permission to use copyright material; where permission has not been granted I have applied/will apply for a partial restriction of the digital copy of my thesis or dissertation.'

## (b) Authenticity Statement

*'I certify that the Library deposit digital copy is a direct equivalent of the final officially approved version of my thesis. No emendation of content has occurred and if there are any minor variations in formatting, they are the result of the conversion to digital format.'*

5. All copies shall contain a title page showing the title, author's name, degree and year of submission.
6. All copies shall be in either 1.5 or double-spaced typescript. Font size shall be not less than 11-point (and 10-point for footnotes) in a legible font and printed using a high quality laser printer or equivalent.
7. For paper copies the size of the paper shall be International Standards Organisation paper size A4 (297 mm x 210mm). The paper used shall be of good quality and sufficiently opaque for normal reading. Faded, dirty or faint copies will not be accepted. A page may be printed on both sides as long as this does not interfere with the readability of the thesis. Pages shall be numbered consecutively. The margins on each sheet shall be not less than 40 mm on the left-hand side, 20 mm on the right-hand, 30 mm at the top and 20 mm at the bottom.
8. Diagrams, charts and tables should be presented in the text where possible. Large diagrams or charts may be folded and included in the text and arranged so as to open out. Visual records submitted in a text-based thesis may also be included. Other material submitted with the thesis must be marked with the candidate's name so that it can be linked readily with the thesis.

All additional material submitted with the paper copies shall be digitised, where possible, and submitted as an attachment to the digital Library deposit copy.

9. Where the work presented for examination contains artefacts, such as a film, sculpture or painting, which remain the possession of the candidate, a full visual documentary record of the work shall be submitted in an appropriate format. All the work presented in the exhibition of work must be fully catalogued. The catalogue must contain visual documentation of work in progress; overall views of the final presentation and of each individual piece showing the entire work. For three-dimensional work, slides or other visual media, several views of the work are required. The visual documentary record shall be digitised, where possible, and submitted as an attachment to the digital Library deposit copy.
10. Where the work contains large-scale drawings these may be presented separately only with the supervisor's permission. They shall be of International Standards Organisation paper size A1 (841 mm x 594 mm) and shall have a margin of at least 40 mm on the left-hand side to permit binding. They shall be bound together on the left-hand side and shall have a clear sheet of drawing paper on top and underneath. On the top sheet shall be printed the words 'The University of New South Wales .....

of .... Degree' and the title of the thesis with the year of submission printed underneath. On the bottom right-hand corner shall be printed the name of the candidate. Drawings and graphics may be originals on cartridge paper or black and white prints. Where they are computer generated they must be printed using a high resolution laser printer or equivalent. They should be suitably coloured where appropriate and extra work may be added in ink to original drawings. The drawings shall be digitised, where possible, and submitted as an attachment to the digital Library deposit copy.

11. Where all or part of the thesis is based upon work which the candidate has had accepted for publication, details of all publications must be clearly stated.
12. Any variation to the requirements in (6-10) shall be approved by the supervisor in consultation with the University Librarian, College of Fine Arts Librarian or ADFA Librarian, as appropriate.
13. **LIBRARY DEPOSIT COPIES:** One paper bound copy and one digital copy of every thesis, which has satisfied University requirements for the award of the degree, must be deposited in the University Library at the conclusion of the examination and prior to the candidate being awarded the degree. An electronic version of a candidate's thesis is to be deposited by the Library on to the Australian Digital Theses (ADT) Database (<http://adt.caul.edu.au/>). The aim of the ADT is to establish a database of digital versions of theses produced by the postgraduate research students at Australian universities. The theses will be available worldwide via the Web. The idea behind the program is to promote and provide the International Community with access to Australian research to the international community.
  - a). The electronic version of the thesis must be the same as the final version of the hard copy thesis deposited in the Library, except for minor changes resulting from the change in thesis format from hard copy to an electronic version.
  - b). The electronic version of the thesis is stored on the UNSW server in Portable Document Format (PDF) with appropriate document security.
  - c). World-wide access to the electronic version is the ideal, but in certain circumstances access can be restricted to:
    - (i) UNSW@ADFA campus only;
    - (ii) restrict all access for specified period; and,
    - (iii) selected files can be completely restricted (copyright, libel, etc.).

Further information can be obtained from the UNSW@ADFA ADT Co-ordinator (Christine Fulton, Cataloguing Librarian, Tel: +61 2 6268 8102 or email: [c.fulton@adfa.edu.au](mailto:c.fulton@adfa.edu.au)).

The Library paper deposit copy shall be bound in accordance with the requirements given below. Acid free permanent paper, which will ensure preservation of the thesis for a minimum of 300 years, is recommended. A list of bookbinders, each of which is aware of the University's requirements, may be obtained from Student Administrative Services.

The Library deposit paper copy is to be bound in boards covered with buckram and shall be lettered on the spine as follows:

- (a) at the bottom and across – UNSW; or if the volume is too thin for this – UNSW may be printed vertically
- (b) 70 mm from the bottom and across, with the degree and year of submission of the thesis, for example – PhD 2004

- (c) evenly spaced between the degree and year and the top of the spine the name of the candidate, initials first and then the surname, reading upwards in one line. No further lettering or any decoration is required on the spine or anywhere on the binding. In the binding of theses which include mounted photographs, folded graphs, etc. leaves at the spine shall be packed to ensure even thickness of the volume. All loose material shall be inserted in a pocket in the back inside cover of the volume binding or bound into a dummy volume of the same dimensions and the same lettering as the text volume.

#### Number of Theses Required

1. Degrees and program codes for which candidates are required to submit 4 copies of a thesis to Student Administrative Services :
  - Doctor of Philosophy 1000—1990
  - Master of Philosophy 2225—2229
  - Doctor of Information Technology—9920
2. Degrees and program codes for which candidates are required to submit 3 copies of a thesis to Student Administrative Services:
  - Master of Arts —  
by thesis only or by coursework and thesis — 2405
  - Master of Science—by thesis 2041—2931
  - Master of Engineering—by thesis 2651—2691
3. Degrees and program codes for which candidates may be required to submit 2 copies of a research project, project report or sub-thesis to a Head of School (any variation to this requirement will be advised by Head of School):
  - Master of Arts 8172/8175
  - Master of Defence Studies 9900/9902/9904
  - Master of Engineering Science 8668/8568/8569
  - Master of Management Studies 8396/8398
  - Master of Science in Information Technology 8565/8562

#### Note:

This schedule may be varied from time to time as the University adds new programs, deletes old ones or amends the conditions of existing degrees.

### Policy with respect to the Use of Higher Degree, Research Projects and Theses

The University holds that the deposit copies of a thesis submitted for a higher degree and retained in the Library should be retained not only for record purposes but also, within copyright privileges of the author, should be public property and accessible for consultation at the discretion of the University Librarian. As digital theses are freely available to the public, candidates must obtain permission for use of copyright material and sign off accordingly. Otherwise such material will need to be restricted. The University also recognises that there may be other exceptional circumstances requiring restrictions on copying or conditions of use of paper copies, and restrictions or partial restrictions of digital copies. Another option is that digital theses may be restricted to the UNSW campus domain. It is expected that restricted digital theses will still be submitted with metadata, such as the abstract, being publicly available. There may be exceptional circumstances when even the metadata will not be made available.

Requests for restriction of access to a thesis for a period of up to two years must be made in writing to Student Administrative Services prior to deposit of the final copies in the Library. Requests for a longer period of restriction may be considered in exceptional circumstances if accompanied by a letter of support from the supervisor or Head of School.

# Course Catalogue

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# Using the UNSW@ADFA Course Catalogue

## Code prefix

The letters at the start of a course code show which school is running the course. General Education and Interdisciplinary courses, which are run by all schools, are distinguished by a separate prefix.

**ZACMXXXX**—Course offered by ACME

**ZBUSXXXX**—Course offered by SOB

**ZGENXXXX**—UG General Education course

**ZHSSXXXX**—Course offered by HASS

**ZINTXXXX**—Interdisciplinary course

**ZITEXXXX**—Course offered by ITEE

**ZPEMXXXX**—Offered by PEMS

## Code suffix

With the exception of General Education and Interdisciplinary courses, the numbers at the end of a course code indicate the level of a course.

### Undergraduate

**ZXXX1000**—Level 1 or 1st Year UG course

**ZXXX2000**—Lever 2 or 2nd Year UG course

**ZXXX3000**—Level 3, Upper Level or 3rd Year UG course

**ZXXX4000**—Level 4 or Honours UG course

### Postgraduate

**ZXXX7000**—Graduate Certificate or Foundation Level course

**ZXXX8000**—Graduate Diploma or Masters Level course

**ZXXX9000**—Research course

If a course description includes a **prerequisite**, you cannot enrol in the course until you have completed the specified course/s (or equivalent).

If a course description includes an **exclusion**, it means you cannot enrol in the course if you have already completed the specified course/s (or equivalent).

If a course has a **co-requisite**, you can enrol in the course, but will not be eligible to graduate until you have also completed the specified course/s (or equivalent).

Some courses may indicate that you require **School Approval** before your enrolment is confirmed. You will need to complete an Enrolment Variation form, available from SAS, if this is the case.

## Contacts for guidance and information

### Student Administrative Services

Ph 02 6268 6000  
Fax 02 6268 8666  
sas@adfa.edu.au  
www.unsw.adfa.edu.au/student

### School of Aeronautical, Civil and Mechanical Engineering (ACME)

Ph 02 6268 8335  
studentadmin.acme@adfa.edu.au  
www.unsw.adfa.edu.au/acme

### School of Business

02 6268 6098  
studentadmin.sob@adfa.edu.au  
www.unsw.adfa.edu.au/sbus

### School of Humanities and Social Sciences (HASS)

02 6268 8867  
studentadmin.hass@adfa.edu.au  
www.unsw.adfa.edu.au/hass

### School of Information Technology and Electrical Engineering (ITEE)

02 6268 8580  
studentadmin.itee@adfa.edu.au  
www.unsw.adfa.edu.au/itee

### School of Physical, Environmental and Mathematical Sciences (PEMS)

02 6268 6278  
studentadmin.pems@adfa.edu.au  
www.unsw.adfa.edu.au/pems



# SCHOOL OF AEROSPACE, CIVIL AND MECHANICAL ENGINEERING

## ZACM1010

### Engineering Graphical Communications

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW3

S2 on-campus

Staff Contact: Dr F Irons

Engineering drawing is a language of graphical communication and design synthesis. Students will be able to both interpret and construct formal engineering drawings in accordance with the Australian Standards. Students will become familiar with how an engineering drawing is developed through checking, reading and control of engineering drawings. Students are assessed on their understanding of engineering drawings by the development and practice of sketching, isometric, orthographic, perspective, sectioning and assembly drawings. Problems in three-dimensional geometry are also taught to students. Finally, an introduction to Computer Aided Drawing (CAD), including computer based data analysis and presentation, is provided to the students.

## ZACM1020

### Statics

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW3

S1 on-campus

Staff Contact: Dr A Webb

An Introduction to Newtonian Mechanics with applications to stationary particles, rigid bodies, beams and frames. Force vectors, particle equilibrium force system resultants and rigid body equilibrium. Application of these principles to the analysis of statically determinate frames. Internal forces in structural members, shear force and bending moment diagrams. Dry friction, distributed forces, centres of gravity of solids, centroids of areas, lines and volumes. Second moments of area.

## ZACM1040

### Dynamics

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW3

S2 on-campus

Staff Contact: Dr N Mudford

This course is designed to develop an understanding of dynamics and problem solving skills as a basis for further study in engineering. The following topics will be treated: kinematics and kinetics of the plane motion of particles and rigid bodies; equations of motion; work, energy, impulse and momentum.

## ZACM1050

### Introduction to Aeronautical Engineering & Workshop Practice

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Dr F Irons

This course provides an introduction to Aeronautical Engineering through case studies that illustrate the importance of some aspects of engineering: history, engineering science, safety, economics and technology transfer, ethics and professionalism. Students are taught various skills in Workshop Practice during the mid-session break.

## ZACM1051

### Introduction to Flight

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S2 on-campus

Staff Contact: Dr A Neely

This course introduces the student to the fundamentals of aerodynamics and flight mechanics. The following topics will be treated: Basic aircraft components; Properties of liquids and gases; The International Standard Atmosphere and its descriptive elements; Altimetry and airspeed; Fluid flow - boundary layers, laminar and turbulent flow; Subsonic and supersonic flow - Shock waves and Mach Number; Bernoulli's equation and dynamic pressure; Air resistance - form drag and skin friction; Aerodynamic lift and airfoils - stagnation point, pressure coefficient, centre of pressure and pitching moments; Wing characteristics - downwash and induced drag; Introduction to propulsion, propellers, turbojets and rockets.

## ZACM1250

### Civil Engineering Practice

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Dr F Irons

Aims to introduce new students to the profession and practice of civil engineering by providing an historical and technical perspective of the impact of civil engineering and building on society, trade, commerce and infrastructure development through the ages. The course details the development of the various branches of the profession and provides a background to contemporary issues such as professional responsibilities and ethics, sustainable development and environmental management, workplace democracy and occupational health and safety. The course incorporates a field trip and construction experience during the May recess.

## ZACM1450

### Introduction to the Profession of Mechanical Engineering & Workshop Practice

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Dr F Irons

This course provides an introduction to the Profession of Engineering through case studies that illustrate the importance of some aspects of engineering: history, engineering science, safety, economics and technology transfer, ethics and professionalism. Students are taught various skills in Workshop Practice during the mid-session break.

## ZACM1850

### History and Science of Aviation

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Mr R Lewis

This course provides an introduction to flight. The basic science of flight will be presented and used to develop an understanding of the key historical developments in Aviation technology.

**ZACM1851****Introduction to Aviation - A Systems Approach****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Ms S Burdekin**

This course is an introduction to aviation as a system with the aircraft, aircrew, flying operations and air traffic services management as major components of the aviation system, incorporating flight mechanics and aircraft handling. Basic human factors and systemic safety issues involving aircraft accident case studies will be covered as well as classification and use of civil and military airspace. Aspects of flight separation, aircraft performance and basic meteorology will also be covered. The main theme throughout this subject will be aviation regulations and safety.

**ZACM1901****Engineering Research 1A****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW6****S1 on-campus****Staff Contact: Dr W Smith**

This course introduces the students to Engineering research. It comprises lectures and seminars introducing techniques and topics for research. The students will still be attending lectures and May break activities for the introductory engineering courses and Statics. To compensate for their research activities they will be excused some tutorial sessions and an item of assessment in each of those courses. Assessment for the research component will be in the form of critiques of research seminars attended.

**ZACM1902****Engineering Research 1B****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW6****S2 on-campus****Staff Contact: Dr W Smith**

Students will undertake group work projects under the guidance of a supervisor. Assessment will be in the form of the product of their group work and a write-up of the processes involved. The course replaces two standard first year Engineering courses, Engineering Graphical Communications and Dynamics and, together with the group work, a specified subset of these courses must be attended and assessment completed.

**ZACM2010****Design 1****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: Dr W Smith**

Students are introduced to design principles and processes, and engineering report writing. An innovative design project (Warman Design and Build Competition) is also attempted by the students as a group effort.

**ZACM2020****Materials Science****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr S O'Byrne****Prerequisite/s: ZPEM1103**

Crystalline lattices, cast and wrought structures. Phase transformations. Plastic deformation and annealing, hot and cold working, strengthening mechanisms. Metallurgy of steels, equilibrium and non-equilibrium transformations. Alloying, hardenability and heat treatment. Non-ferrous metallurgy. Aluminium alloys, heat-treatable and non-heat-treatable alloys, age hardening. Copper-based alloys, brasses and bronzes. Welding metallurgy, fusion zone and heat affected zone. Weldability of steels, aluminium alloys. Mechanical behaviour. Tension, compression, impact, fatigue, creep. Ductile and brittle fracture. Corrosion mechanisms and processes.

**ZACM2021****Mechanics of Solids A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr O Kayali****Prerequisite/s: ZACM1020**

An introductory course in the behaviour and analysis of solid objects under various loadings. The course introduces the fundamental concepts of stress and strain to quantify the behaviour of solid objects. The course extends the work done in the course ZACM1020 Statics to enable more detailed behaviour of solids to be presented.

**ZACM2022****Mechanics of Solids B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr O Kayali****Prerequisite/s: ZACM1020**

This course covers the following topics; bending of beams, deflection of beams, beams with non-rectangular and asymmetric cross-sections, Euler buckling of columns and Castigliano's theorems.

**ZACM2030****Thermofluids****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Prof J Lai****Prerequisite/s: ZACM1020 and ZACM1040**

This course examines the role of thermodynamics and fluid mechanics in engineering. It develops an understanding of the basic properties of fluids, fluid statics, simple analysis of fluid motion, the laws of thermodynamic, and the application of control volume techniques to engineering problems.

**ZACM2031****Thermodynamic Cycles****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr R Boyce**

This course extends the development of thermodynamic cycle analysis commenced in ZACM2030 Thermofluids. The 2nd Law of Thermodynamics is introduced and, in conjunction with the other Laws, is applied to the analysis of power cycles. Power cycles represent the thermodynamic behaviour of machines such as compressors, pumps and engines.

**ZACM2032****Real and Inviscid Flows****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr H Kleine Dr J Young**

System behaviour is best described by an appropriate set of non-dimensional combinations of the variables on which it depends. The dimensional analysis technique, elucidated here, allows systematic discovery of such parameter sets. Potential flow theory provides solutions for flows for which viscosity is assumed zero. This theory is developed here to explain and quantify airfoil lift and pitching movement. Unfortunately, viscosity cannot always be ignored as it strongly influences real flows via phenomena such as boundary layer separation. Viscosity's role in laminar and turbulent flow is examined to explain the gap between potential flow theory prediction and experimental observation.

**ZACM2040****Aircraft Performance and Stability****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr M Garratt****Prerequisite/s: ZACM1051**

This course considers the forces acting on an aircraft and the consequence of those forces both in equilibrium and in the unsteady case. This course will explore aircraft performance in various equilibrium flight conditions such as level flight, climbing, turning, and gliding. The mathematical basis for aircraft static stability will be introduced including derivation of the contribution of various aircraft components to overall stability. Aircraft dynamic behaviour will be explained using a qualitative approach. Basic aircraft handling and flying qualities will be introduced.

**ZACM2041****Introduction to Vibration****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr M Tahtali****Prerequisite/s: ZACM1040**

Mostly single degree of freedom systems will be considered. System modelling and linearisation using free body diagrams and energy methods. The solution to the free vibration of undamped and damped systems. Forced response to harmonic, rotating unbalance and base excitations. The response to generalised forcing functions. Steady state vibration analysis, vibration isolation methods and alternative models for damping. Vibration measurement techniques, the base excitation problem. Multiple degree of freedom systems will be introduced. The matrix notation, state vector formulation and the modelling of lumped parameter systems will be shown leading to the eigenvalue problem and modal analysis.

**ZACM2211****Engineering Surveying****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Barker**

Historical aspects. Elementary error theory. Surveying instrumentation and methods including levels, theodolites, electronic distance measurement, total stations, satellite position fixing, horizontal and vertical control and detail surveys. Introduction to MGA projections and introduction to GIS. This course incorporates a survey camp during the May break.

**ZACM2221****Geotechnical Engineering & Engineering Construction****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW7****S2 on-campus****Staff Contact: Assoc Prof S Lo****Prerequisite/s: ZACM1020**

This is an omnibus course comprising of two units: Geotechnical Engineering 1 and Engineering Construction. Both components must be passed. Geotechnical Engineering- Introduction to engineering geology. Effective stress principle. Drained and undrained conditions. Water and seepage in soils. Introduction to shear strength of soils. Introduction to one-dimensional consolidation and settlement analysis. Engineering Construction: The civil engineering industry. Interface between design and construction. Compressed air and water system. Material moving system. Earthworks, Concrete, steel, timber and masonry construction. Foundation construction. Maritime construction.

**ZACM2230****Fluid Engineering****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr S O'Byrne**

Studies of laminar and turbulent flow, boundary layers, lift and drag, dimensional analysis and modelling. Fluid resistance and the flow of real fluids. Friction and minor losses in single pipelines. Introduction to compressible flow.

**ZACM2250****Environmental Engineering Fundamentals****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: School Office**

An introduction to the science of environmental engineering. Fundamentals of chemistry, microbiology, dispersion of pollutants, single species kinetics and interacting species. Unit operations.

**ZACM2440****Mechanics of Machines****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr M Tahtali****Prerequisite/s: ZACM1040**

In this course kinematics and kinetics of mechanisms will be investigated along with the effects of inertia and external loads. The problem of balancing of rotating and reciprocating masses, whirling of shafts and basic rotor dynamics will also be covered.

**ZACM2820****Introduction to Aircraft Structures****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Neely****Prerequisite/s: ZACM1020 and ZACM1040**

This course will introduce the student to the fundamental concepts of aircraft structures. Aircraft structural requirements will be examined including fuselage and wing loadings and a range of suitable designs will be discussed. The course will review a number of topics including: mechanical properties of a range of aircraft structural materials; fracture behaviour, fatigue and corrosion in metals; introduction to composite materials; load bearing characteristics of aircraft structures-bending shear and torsion and also manufacturing, joining and assembly methods. Historical case studies and a number of practical demonstrations will be used throughout the course to illustrate the concepts.

**ZACM2830****Aviation Aerodynamics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: Dr R Boyce****Prerequisite/s: ZACM1051**

This course builds upon the aerodynamics introduced in Introduction to Flight and focuses on the factors relevant to aircraft operations. The following topics will be treated: the equations of continuity, momentum and energy applied to fluid flow; airfoil and wing performance in subsonic and supersonic flight including drag divergence, wave drag, wing planform, aspect ratio and lift augmentation; primary and secondary effects of aircraft controls; aircraft force balance and trim; aerodynamic and mass balancing of control surfaces; effects and factors which influence flow separation; auto rotation and spins; shock stall and the area rule.

**ZACM2840****Aircraft Performance for Aviators****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Neely****Prerequisite/s: ZACM1051****Corequisite/s: ZACM2040**

This course deals with aircraft performance from the pilot's perspective and dovetails with ZACM2040 'Aircraft Performance and Stability'. The following topics are treated: Power, thrust and the Froude efficiency; Wing loading and power loading; Cruise flight strategies - effects of wind, altitude and wing loading; Strategies for maximum rate and maximum gradient climbs - High performance climbs; Descent performance and phases; Takeoff and landing speeds and distances; Manoeuvring flight - pull up and level turns, turn performance diagram; energy methods. Take off and landing - initial climb, approach and flare.

**ZACM2850****Aircraft Systems for Aviators****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Mr R Lewis**

General arrangement of aircraft systems. Purpose of aircraft systems. Design of mechanical type aircraft systems. Overview of non-mechanical type aircraft systems. Design of systems integration. Propulsion technologies including pistonprops, turbojets, turbofans and turboprops. Fundamentals of gas turbine

technology. Advanced gas turbines. The characteristics and operation of power plants in terms of efficiency and performance and typical applications.

**ZACM2851****Aviation Safety****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Ms S Burdekin****Prerequisite/s: ZACM1851**

Using a systems approach, this course will deal with the various elements which influence safety in aviation including aircrew, aircraft, maintenance, management operations and airspace with an emphasis on human performance. The focus of the course is human factors in aviation, which is the study of the relationship between the safety and efficiency of an aviation system and the people, tasks, environment and technology making up that system. This incorporates: human behaviour; information processing; time management and situational awareness; judgement; decision making; the senses; human error; automation; risk management; safety culture; and emergency planning. A number of aircraft incidents and accidents will be analysed to illustrate key concepts in flight safety. Industry practitioners will deliver guest lectures and local field trips to aviation safety related civil and military organisations are planned.

**ZACM2901****Engineering Research 2A****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW6****S1 on-campus****Staff Contact: Dr W Smith**

Students will undertake a problem-based learning or research project on a nominated topic in a specific discipline area that is commensurate with study at Year 2 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member and their research team. A supervisor, who will work closely with the student, and a co-supervisor, will manage each project. The research project will replace courses equating to 6UOC from the current session within the relevant degree program. The student together with supervisors and course coordinators of the replaced courses will negotiate as to how much of the formal coursework is to be completed although this will not be more than 50%. The remainder of the time is available for undertaking the research project. Final assessment will be based on a written paper and an oral presentation, the mark being combined with the formal coursework assessment with appropriate weighting.

**ZACM2902****Engineering Research 2B****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW6****S2 on-campus****Staff Contact: Dr W Smith**

Students will undertake a problem-based learning or research project on a nominated topic in a specific discipline area that is commensurate with study at Year 2 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member and their research team. A supervisor, who will work closely with the student, and a co-supervisor, will manage each project. The research project will replace courses equating to 6UOC from the current session within the relevant degree program. The student together with supervisors and course coordinators of the replaced courses will negotiate as to how much of the formal coursework



is to be completed although this will not be more than 50%. The remainder of the time is available for undertaking the research project. Final assessment will be based on a written paper and an oral presentation, the mark being combined with the formal coursework assessment with appropriate weighting.

### **ZACM3010**

#### **Aircraft Design 2**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr R Heslehurst**

**Prerequisite/s: ZACM2010**

Initial discussion covers aircraft design philosophies, design standards and regulations. In-depth coverage of design specification development. Instruction in design report writing and technical presentations. Aircraft conceptual design development is covered including development of fixed wing aircraft using initial sizing parameters, estimate of maximum take-off weight, wing loading, power loading, aerodynamic coefficients and physical dimensions. A discussion follows on special features of the aircraft and how these issues impact on performance and operational requirements. Students commence the aerospace design and build project during this course.

### **ZACM3011**

#### **Component Design**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr T Ray**

Students are exposed to the principles of machinery and component design: example topics include springs, bearings, gears, linkages, brakes and clutches, standard hardware, fasteners, tapers. Studies considering what components do, how they do it, how they were made, and possible forms are undertaken. Various design philosophies, such as safe life, fail safe, damage tolerance are discussed.

### **ZACM3020**

#### **Engineering Materials**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: A/Prof S Yeomans Dr K Shankar**

**Prerequisite/s: ZACM2020**

This course deals with engineering materials in aerospace and mechanical engineering. Topics include aluminium aerospace alloys, high strength steels, tool and die steels, stainless steels, cast irons, and exotic metals. Other topics cover quality assurance in welded fabrication and materials selection, design and maintenance for corrosion, protection. The other major topics deal with composites and adhesive materials including fibres, matrices and core materials, composite fabrication methods and techniques and cost estimation. Other topics include composites in the environment, composite and adhesive materials testing and certification and CMC and MMC development and application.

### **ZACM3021**

#### **Structural Mechanics 1**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr K Shankar**

**Prerequisite/s: ZACM2022**

This course introduces the students to application of the concepts of Solid Mechanics to Aeronautical and Mechanical Engineering structures. Course Contents: The course will start with a revision of the basic concepts of solid mechanics and treat topics such as bending of indeterminate beams and beams with unsymmetrical cross sections, stresses due to torsion and transverse loading of thin walled and semi-monocoque structures, thin and thick-walled pressure vessels.

### **ZACM3030**

#### **Gas Turbines**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr A Neely**

**Prerequisite/s: ZACM2030 and ZACM2031**

This course is designed to enable the student to develop an understanding of the operation of gas turbines for civil, marine and aircraft applications with an emphasis on aero propulsion. Both ideal and real operating cycles are examined and tools for the thermodynamic analysis of these cycles are developed to enable calculation of gas turbine performance. Many examples from actual installed gas turbines are discussed.

### **ZACM3031**

#### **Subsonic Finite Wing Theory**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr N Mudford**

**Prerequisite/s: ZACM2032**

The finite span of a real aircraft wing creates three dimensional flow effects, such as downwash, which reduce the wing's total lift and increase its drag from that expected from direct application of airfoil (infinite span wing) behaviour. Prandtl's classic and general lifting line theories are presented to obtain lift and drag estimates for finite wings in incompressible flow. This theory is extended to panel methods applicable to straight and swept finite wings and to blade element theory applicable to propellers.

### **ZACM3032**

#### **Rotary Wing Aerodynamics**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW2**

**S2 on-campus**

**Staff Contact: Mr M Garratt**

**Prerequisite/s: ZACM2032**

This course provides students with the theoretical tools necessary to make basic predictions of helicopter aerodynamics. Basic helicopter configurations, such as co-axial, tandem and autogiro, are compared. The course starts with the actuator disc theory and moves on to more sophisticated blade element techniques. Both vertical and forward flight is considered. The special cases of autorotation and flight in ground effect are examined.

**ZACM3040****Flight Dynamics and Control****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr A Sreenatha****Prerequisite/s: ZACM2040 and ZACM3041**

This course is designed to develop an understanding of the dynamics and control of aircraft. The equations of motion governing the aircraft dynamics and their transfer functions are formulated. Based upon this, the time response and the frequency response of the aircraft are discussed. The short period and phugoid motions in longitudinal dynamics, dutch roll, roll and spiral motions in lateral dynamics, and methods to improve these motions based upon feedback control are discussed. Different autopilots employed in the Flight control system of an aircraft are treated.

**ZACM3041****Introduction to Control****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr A Sreenatha****Prerequisite/s: ZACM1040**

This course provides an introduction to the theory of automatic control systems. The course will enable students to predict system behaviour analytically and design effective feedback control systems that will meet performance specifications in spite of uncertainties in the model. The concepts of feedback, transfer functions, frequency response and the s-plane will be developed. Students will be introduced to a broad range of control design tools including mathematical modelling of system components, block diagram manipulation, linearisation of non-linear models, inverse Laplace transform methods, root locus diagrams and Bode plots. Students will study practical controllers such as the PID controller.

**ZACM3060****Engineering Management 1****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr E Wilson**

An introduction to the project management body of knowledge. Resource planning and financial management. Work breakdown structures. Sequencing tasks and scheduling resources. Quality and risk assessment. Engineering contracts and legal procedures. Professional responsibilities of the engineer including ethics, duty of care, legal liabilities, understanding of social and cultural issues. The development and nature of project teams. Role of the engineer in team activities and as a leader and manager. Case studies on Defence leadership of project teams and project management.

**ZACM3210****Structural Design 1A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Barker****Prerequisite/s: ZACM2022**

Design philosophy and design processes. Considerations of main construction materials. Codes of practice and their role. Types of loads and their combinations. Design of simple steel structures including: design for tension, bending and compression. Design of connections. Steel design detailing. Timber design and construction including characteristics of structural timber, design

procedures, design of timber beams and columns and design of tension members. Connections in timber. Examples and case studies.

**ZACM3211****Structural Design 1B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr O Kayali****Prerequisite/s: ZACM2022**

Design methods and concepts for reinforced concrete. Limit states philosophy in design. Use of codes and standards. Loads and load combinations. Strength of rectangular sections in bending. Analysis and design of flanged sections. Shear strength and shear and torsion reinforcement. Design of continuous beams. Design of one-way slabs. Deflection of beams. Bond and anchorage. Methods of detailing. Introduction to masonry design.

**ZACM3212****Environmental Engineering Applications****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Webb****Prerequisite/s: ZACM2250**

Applications of the science of environmental engineering. Studies of jets, wakes and plumes, surface water pollution, soil and groundwater contamination, air pollution and noise pollution.

**ZACM3213****Geometric Design of Transport Systems****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Barker****Prerequisite/s: ZACM2211**

This course covers the geometric design of rural roads, airfields and railways and basic considerations for over the shore operations. Topics include survey requirements, horizontal and vertical alignment theory; road, airfield and railway design standards; route planning, design of the final alignment, ports and tide calculations and digital information systems.

**ZACM3220****Civil Engineering Materials A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof S Yeomans****Prerequisite/s: ZACM2020**

Metals as engineering materials. Steels, aluminium alloys and other metals used in engineering construction. Design against brittle fracture and fatigue in structures. Fracture mechanics and structural assessment. Welding in structural engineering. Standards, quality assurance, testing and inspection. Corrosion environments and corrosion protection systems. Timber materials and engineering considerations.

**ZACM3221****Civil Engineering Materials B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr O Kayali****Prerequisite/s: ZACM2020**

Concrete making materials and their influences on fresh and hardened concrete. Portland cement, aggregates, admixtures. Studies of the workability and consistency of concrete, variability, durability and permeability. Properties of concrete and use of non-destructive testing. Role of concrete materials in the design and construction processes.

**ZACM3222****Geotechnical Engineering 2A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr C Gnanendran****Prerequisite/s: ZACM2221**

Application of the effective stress principle in geotechnical engineering. Shear strength of soils. Principles of triaxial testing. Lateral earth pressure theory and design of simple gravity retaining structures. Influence of seepage on ability of retaining structures. Ground investigation.

**ZACM3223****Geotechnical Engineering 2B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof S Lo**

Stress analysis in geotechnical engineering. One-dimensional consolidation theory. Settlement of shallow foundation and bearing capacity theory. Design of shallow footings and introduction to slope stability.

**ZACM3224****Structural Analysis 1A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Horoschun****Prerequisite/s: ZACM2022**

Types of structures and loads. Analysis of statically determinate structures. Analysis of plane trusses. Internal loads in structural members. Shear force and bending moment diagrams for beams and frames. Statically determinate cable and arch structures. Influence lines. Deflections of beams, frames and trusses. Use of force method.

**ZACM3225****Structural Analysis 1B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr G Horoschun****Prerequisite/s: ZACM2022**

Slope-deflection method and moment distribution. Truss, beam and frame analysis using the stiffness methods. An introduction to structural dynamics.

**ZACM3230****Hydraulics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: School Office****Prerequisite/s: ZACM2230**

Pipe friction, pipe networks, combined turbo-machine and pipe systems. Open channels including friction losses, energy, momentum, gradually varied flow and rapidly varied flow. Studies of flow measurement and unsteady flow. Water wave theory and wave transformation.

**ZACM3410****Design 2****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr T Ray****Prerequisite/s: ZACM2010**

Conceptual design of systems and subsystems, design as a constructive systematic integrative process. Introduction to design process models. Decision-based design: selection. Design process planning and management. Communication of design information. Relevant project based domain topics. Major design project covering specification development to concept selection.

**ZACM3430****Refrigeration****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr R Boyce****Prerequisite/s: ZACM2031**

Following on from Thermodynamic Cycles (ZACM2031), which deals primarily with power cycles, this course commences with the analysis of thermodynamic cycles whose purpose is the transfer of heat. Such cycles represent the thermodynamic behaviour of refrigerators and heat pumps. Additionally, the course examines the thermodynamic behaviour of gas mixtures, and relates the results to the air stream mixing and humidification inherent in air conditioning systems. Finally, the thermodynamics of gaseous combustion are studied in order to understand how heat is produced by the burning of fuels.

**ZACM3431****Viscous Flows****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr H Kleine****Prerequisite/s: ZACM2030 and ZACM2230 or ZACM2032**

This course aims at developing an understanding of the physical mechanisms underlying friction effects in a fluid flow and at introducing some basic tools to calculate/estimate the consequences of viscosity in a fluid. The following topics will be treated: laminar and turbulent boundary layers; viscous flows in pipes; different forms of drag on immersed bodies; flow separation.

**ZACM3433****Compressible Flow****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr N Mudford****Prerequisite/s: ZACM3031**

At flight speeds beyond 30% of the speed of sound, compressibility must be considered in order to accurately describe the behaviour of aircraft. This course first considers the general nature of isentropic expansion and compression of gases in subsonic and supersonic flows. Non-isentropic compression by shock waves in supersonic flow is then considered and discussed. Prandtl-Meyer expansions, shock expansion theory and the method of characteristics are also covered. These studies lead on to the explanation and quantification of the behaviour of airfoils, finite wings, slender bodies and aircraft in compressible subsonic, transonic and supersonic flows.

**ZACM3440****Dynamics of Mechanical Systems****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr A Sreenatha****Prerequisite/s: ZACM2041**

This course presents the application of control theory to some basic mechanical systems. In addition, concepts of vibration analysis such as Modal Analysis will be introduced for both discrete systems and continuous systems. The equivalence of continuous and discrete systems modelling will be brought out by typical examples. Important concepts like mode shapes and their orthogonal properties with respect to mass and stiffness matrices will be introduced for both continuous and discrete systems.

**ZACM3450****Instrumentation****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: Dr M Harrap****Prerequisite/s: ZITE2002**

Many engineering activities require the use of instrumentation. This may involve ensuring a bolt is tensioned to the correct torque, a machine is not vibrating excessively, the temperature in the tailpipe of a gas turbine is not exceeding the design limits or determining the extension of a hydraulic ram in a robotic arm. The aim of this course is to provide an experience that will lead students to a deep understanding of the fundamentals of Engineering Instrumentation. This course provides an opportunity to learn the basic principles and application of instrumentation. Students will be given a number of lectures outlining background theory, tutorials and a practical construction project.

**ZACM3650****Aero Project and Practical Experience****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr J Young**

The project takes the form of a minor piece of research or investigation, a feasibility study, or a literature review. Project management techniques will be adopted and assessed in the implementation of the project. Satisfactory completion of the Practical Engineering Experience Requirement, viz rule 6 of the Rules governing the award of the degree of Bachelor of Technology.

**ZACM3850****Advanced Aviation Safety****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW4****S1 on-campus****Staff Contact: Ms S Burdekin****Prerequisite/s: ZACM2851**

The focus of this course will be on systems safety management programs. Topics will cover the role of proactive safety systems including: crew resource management, safety culture, operational reporting systems, safety audits, attitudinal and behavioural assessment and other metrics. The course will cover accident prevention strategies, risk management and safety program evaluation methodology. Case studies will be used to illustrate safety concepts.

**ZACM3851****Aviation Project****School of Aerospace, Civil and Mechanical Engineering****UOC9 HPW18****S1 on-campus, S2 on-campus****Staff Contact: Ms S Burdekin**

This project will take the form of a minor piece of research or investigation, feasibility study, or a literature review.

**ZACM3852****Basic Flying Theory****School of Aerospace, Civil and Mechanical Engineering****UOC12 HPW18****S1 on-campus, S2 on-campus****Staff Contact: Ms S Burdekin**

This course provides the background knowledge to prepare students for ADF flying training. The following topics are treated: aircraft systems, airmanship, air traffic control, cockpit systems and navigation, Morse code, gas turbine engines.

**ZACM3853****Flying Training****School of Aerospace, Civil and Mechanical Engineering****UOC24 HPW20****S1 on-campus, S2 on-campus****Staff Contact: Ms S Burdekin**

Basic and advanced flying training to ADF 'wings' standard. This training is provided by the ADF.

**ZACM3860****Aviation Resource Management****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW4****S1 on-campus, S2 on-campus****Staff Contact: Mr R Lewis**

The student is introduced to Australian Defence Force and civil aviation activities at an operational level. Issues include engineering and maintenance, technical crew planning and scheduling, airport and airfield planning for military and civil operations, operations control issues, emergency procedure management, accident investigation and despatch reliability management.



**ZACM3901****Engineering Research 3A****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Dr W Smith**

Students will undertake a problem-based learning or research project on a nominated topic in a specific discipline area that is commensurate with study at Year 3 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member and their research team. A supervisor, who will work closely with the student, and a co-supervisor, will manage each project. The research project will replace courses equating to 6UOC from the current session within the relevant degree program. The student together with supervisors and course coordinators of the replaced courses will negotiate as to how much of the formal coursework is to be completed although this will not be more than 50%. The remainder of the time is available for undertaking the research project. Final assessment will be based on a written paper and an oral presentation, the mark being combined with the formal coursework assessment with appropriate weighting.

**ZACM3902****Engineering Research 3B****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW6****S2 on-campus****Staff Contact: Dr W Smith**

Students will undertake a problem-based learning or research project on a nominated topic in a specific discipline area that is commensurate with study at Year 3 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member and their research team. A supervisor, who will work closely with the student, and a co-supervisor, will manage each project. The research project will replace courses equating to 6UOC from the current session within the relevant degree program. The student together with supervisors and course coordinators of the replaced courses will negotiate as to how much of the formal coursework is to be completed although this will not be more than 50%. The remainder of the time is available for undertaking the research project. Final assessment will be based on a written paper and an oral presentation, the mark being combined with the formal coursework assessment with appropriate weighting. For Students completing the BTech(AeroCDF), the research project will replace courses equating to 6UOC from the current session part of which will be ZACM3650 Aero Project and Practical Experience (the practical experience component must still be completed).

**ZACM4010****Aircraft Design 3****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr R Heslehurst****Prerequisite/s: ZACM3010**

Students will learn how to develop estimates of the detailed aerodynamic aircraft parameters. This will allow them to construct aircraft performance charts and stability and control plots for a given design. The integration of the aircraft with on-board systems and major components will be covered in detail. The course will emphasise the continuation of the aerospace design and build project.

**ZACM4011****Aircraft Design 4****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr R Heslehurst****Prerequisite/s: ZACM4010**

Exposure to an understanding of military and civilian airworthiness and certification requirements in aircraft design. Study in detail the construction of the V-n diagrams, and damage tolerant and fatigue design concepts. Aircraft design optimisation and trade studies are then considered. Aircraft costing and scheduling estimates are developed and compared across like types of aircraft. Maintainability and reliability design approaches are discussed in some detail and integrated into a design. The aerospace design and build project is concluded during the course. Students introduced to the complexities of helicopter and V/STOL vehicle design.

**ZACM4020****Computational Structures****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr M Tahtali****Prerequisite/s: ZINT1001, ZACM2021, ZACM2022**

This course will be an introduction to Finite Element Stress (FEM) analysis. The theory section will consist of the application of Energy Methods, Variational Methods and Weighted Residual Methods to structural analysis. The students will be experimenting with modern FEM techniques during assisted computer sessions each week.

**ZACM4021****Structural Mechanics 2****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr K Shankar****Prerequisite/s: ZACM3021**

This course presents advanced concepts in Structural Mechanics as applied to Aeronautical and Mechanical Engineering. Course Contents: The course will comprise topics such as modes of failure in metallic structures, strength and failure criteria, stress concentrations, stresses around cracks, fracture mechanics, crack initiation, crack propagation, fatigue in metallic structures, and determination of residual strength and residual life of structures.

**ZACM4030****Heat Transfer****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr N Mudford****Prerequisite/s: ZACM2032 or ZACM2230**

This course examines the three heat transfer mechanisms - conduction, convection and electromagnetic radiation. Solutions are obtained for one dimensional steady heat conduction through composite, plain and tubular walls, including with internal heat generation. Analytic and numerical solution techniques for non-steady conduction are also studied. The Reynolds' analogy is introduced to link forced convective heat transfer with momentum transfer in laminar and turbulent boundary layers. Free convection, in which heat transfer itself induces its own buoyant flow is then considered. The radiative emission characteristics of black and grey bodies are examined and radiative heat transfer between such bodies is analysed.

**ZACM4050****Aeronautical Engineering: Project, Thesis and Practical Experience****School of Aerospace, Civil and Mechanical Engineering****UOC15 HPW8****S1 on-campus, S2 on-campus****Staff Contact: Dr R Boyce**

The project takes the form of a minor piece of research or investigation, a major feasibility study or design, or a comprehensive literature review. Project management techniques are adopted and assessed in the implementation of the project. Satisfactory completion of the Practical Engineering Experience Requirement (see rule 6 of the Rules governing the award of the degree of Bachelor of Engineering.)

**ZACM4051****Maintenance Management and Repair****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr E Wilson**

This course introduces students to maintenance management principles and techniques, including: maintenance strategies, repair/replacement decision making, condition monitoring, maintenance management information systems. Logistics engineering is introduced through the following aspects: logistics concepts, statistics of reliability, availability, maintainability, reparability, life-cycle costing, logistic support analysis, and supply support factors. Practical issues in maintenance and repair of structures and systems and details of maintenance scheduling activities are considered. Advanced methods of maintenance and repair are discussed.

**ZACM4210****Structural Design 2A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Barker****Prerequisite/s: ZACM3210**

Design of steel members to resist individual and combined actions. Assessment of second order effects. Stability of building frames. Design of steel connections. Structural steel detailing. Torsion of structural members. Wind and earthquake loading on structures. Design of simple building frames. Fatigue effects. Use of Design Capacity Tables. Computer analysis and design of steel structures.

**ZACM4211****Structural Design 2B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr G Horoschun****Prerequisite/s: ZACM3211**

Design of two-way slabs by the various Australian Code recognised methods. Design of short columns and slender columns. Design of footings. Design for durability. Design for serviceability. Introduction to pre-stressed concrete analysis and design. Design for earthquake occurrence.

**ZACM4220****Pavement Engineering****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr C Gnanendran****Prerequisite/s: ZACM3222 and ZACM3223**

Study of the best use of natural materials for road and airfield pavement construction. Issues in site investigation and field testing for pavements, and bituminous materials and their testing. Rigid and flexible roads and airfield pavements. Pavement drainage. Structural design of unsealed and sealed pavements. Pavement evaluation and maintenance and an introduction to pavement management.

**ZACM4223****Geotechnical Engineering 3****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof S Lo****Prerequisite/s: ZACM3223**

Non-linear stress strain behaviour. Limit state design in geotechnics. Slope stability and retaining systems, deep foundations, ground improvement and soft soil engineering.

**ZACM4224****Structural Analysis 2****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: TBA**

Plastic analysis of structures. Stability of bars and frames. Non-linear analysis of structures. Introduction to finite element methods.

**ZACM4231****Water Resources****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr A Webb**

Studies of hydrological processes in surface and groundwater, precipitation, runoff, evapotranspiration, infiltration, recharge and discharge. Practical applications of hydrology. Principles of water resources assessment, design, development, monitoring and equitable management.

**ZACM4250****Environmental Engineering Practice****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Webb**

Engineering solutions to environmental problems. Studies of wastewater and water treatment unit processes and systems, air pollution management, contamination investigation and monitoring. Considerations of environmental management, economics, legislation and environmental impact assessment, particularly in Defence.

**ZACM4252****Civil Engineering: Thesis & Seminar & Practical Experience****School of Aerospace, Civil and Mechanical Engineering****UOC12 HPW12****S1 on-campus, S2 on-campus****Staff Contact: Dr C Gnanendran**

The thesis project takes the form of a minor piece of research or investigation, a feasibility study, or a literature review. A staff member is nominated as supervisor to provide guidance and general supervision. Results will be presented both as a written thesis and as an oral seminar presented to staff and students of the School. For description of practical experience requirements see Rules governing the award of the degree of Bachelor of Engineering. Includes a requirement for seminar attendance (equivalent to 8 x 1 hour sessions), including research seminars (4), professional meetings (2) and academic seminars on leadership (2).

**ZACM4253****Integrated Design & Practical Experience****School of Aerospace, Civil and Mechanical Engineering****UOC12 HPW11****S1 on-campus, S2 on-campus****Staff Contact: Mr G Barker Mr G Horoschun**

Design of structures using a range of materials including steel, reinforced and/or pre-stressed concrete, and/or timber. Design of communication systems including roads, railways, ports and airfields, and associated works. Investigation and preparation of feasibility reports. Tasking of associated professions including geomatic, geotechnical and/or environmental investigations. For description of practical experience requirements see Rules governing the award of the degree of Bachelor of Engineering. Included is a requirement for seminar attendance (equivalent to 8 x 1 hour sessions), including for example research seminars (4), professional meetings (2) and academic seminars on leadership (2).

**ZACM4260****Engineering Management 2A****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr G Barker**

Studies of the modelling project scope. Considerations of requirements engineering, specification design, tender documents and tender evaluation. Contract types and their administration. Procurement management, contract claims and dispute resolution options. Parliament interest in projects and Government financial control.

**ZACM4261****Engineering Management 2B****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr A White**

Studies of horizontal construction planning and control. Lightweight vertical construction and design for climate. Construction details and specifications and contract documentation. Design coordination, design visualisation and project coordination information management systems. Occupational health and safety. Expatriate construction projects. Issue of standards, regulation, licensing.

**ZACM4410****Design 3****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr T Ray****Prerequisite/s: ZACM3410**

Detail design of systems and subsystems, design as a constructive systematic integrative process. Decision-based design: compromise. Design process planning and management. Communication of design information. Relevant project based domain topics. Major design project covering concept selection to tender.

**ZACM4411****Design 4****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr T Ray****Prerequisite/s: ZACM3410**

Design as a forensic, repair activity. Trouble shooting at the machine level, failure analysis. Comparison of alternative designs and assemblies. Design for manufacture and maintenance. Adaptive and variant design. Code based design and non-code based design. Standards and their use. Example domain topics include: fracture, wear, vibration, joints, human factors.

**ZACM4430****Turbomachines****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr H Kleine**

This course will introduce the working principles of fluid machines such as pumps and turbines and aims at developing an understanding, from a fluid-mechanics point of view, how these devices work. The course will cover various types of turbomachines such as axial turbines, compressors, pumps and fans, as well as radial flow turbines and centrifugal pumps, turbines and compressors.

**ZACM4450****Mechanical Engineering Project Thesis & Practical Experience****School of Aerospace, Civil and Mechanical Engineering****UOC15 HPW8****S1 on-campus, S2 on-campus****Staff Contact: Dr R Boyce**

The project takes the form of a minor piece of research or investigation, a major feasibility study or design, or a comprehensive literature review. Project management techniques are adopted and assessed in the implementation of the project. Satisfactory completion of the Practical Engineering Experience Requirement (see rule 6 of the Rules governing the award of the degree of Bachelor of Engineering.)

**ZACM4900****Acoustic Noise****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Prof J Lai**

Physical acoustics: The wave equation, solution of the wave equation, comparison with vibration having finite degrees of freedom. Sound: sound pressure level, psychological response to sound, threshold of hearing and threshold of pain, maximum permissible levels of sound exposure. Noise attenuation and control. Noise: statistical properties of noise, response of systems to noise, correlation functions and transfer, frequency response functions. Machinery noise: generation of vibration in machines, acceptable levels and methods of control. Radiation of sound from vibrating machinery.

**ZACM4901****Advanced Design****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Overview of current design science research. Concurrent engineering, systems engineering. Design as a multidisciplinary activity. Mathematical modelling in design. Design space exploration and representation. Optimisation theory and practice in design. Artificial intelligence/expert systems. Taguchi methods for robust design. Cost/benefit trade studies, design decision making.

**ZACM4902****Aeroelasticity****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Review theory of vibration. Application of vibration analysis to structures. Examine the forces on an aircraft, the accompanying motion and response of the structure. Develop aeroelasticity phenomenon theories.

**ZACM4903****Analysis of Structural Vibration****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Vibration analysis through experiment and simulation: review of basic linear structural vibration theory, lumped parameter formulation of vibration problems in matrix equations, theory and practice of experimental modal testing, finite element modelling of structural vibrations.

**ZACM4904****Applied Optics****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC3 HPW2****Not offered in 2007****Staff Contact: Dr H Kleine**

The first part of the course will cover the basic principles of imaging and the functions of basic elements. In the subsequent parts, different types of the most frequently used measurement techniques will be introduced. Density-sensitive methods such as shadow, schlieren and interferometry techniques (including

holographic interferometry) will be discussed in great detail, followed by an introduction to laser-based diagnostics such as Planar Laser Induced Fluorescence (PLIF). In the final part, methods that rely mostly on post-processing of optical records, such as Particle Image Velocimetry (PIV) and Speckle Photography will be described. This course is strongly recommended to all students pursuing a thesis with optical measurement techniques content.

**ZACM4905****Blast Design****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC3 HPW2****S2 on-campus****Staff Contact: Mr G Barker**

History of explosives use in engineering. Studies of types and properties of explosives, initiation systems, quantity distance procedures. Quarry blasting and explosive demolition. Blast waves and interactions, blast loads on structures, blast analysis and structural design. Survivability of structures.

**ZACM4906****Blast and Dynamic Analysis****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC3 HPW2****Not offered in 2007****Staff Contact: Mr G Horoschun****Prerequisite/s: ZACM4905**

Use of computer programs to assess external and internal blast loads. Assessment of structures against attack and ground shock. Earthquake analysis and design, wind induced vibrations. Floor vibrations induced by machine and footfall.

**ZACM4907****Chaos and Non-linear Dynamics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Linear and non-linear oscillators. Trajectories in phase space. Stability and bifurcation of maps. Strange attractors. Subharmonic cascade. Poincare sections. Fourier spectrum. Lyapunov exponents. Fractal properties. Examples of dynamical chaos and engineering applications.

**ZACM4908****Coastal Engineering****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZACM3060**

Studies of linear and nonlinear wave theories, wave transformation, wave force, energy and power. Wave prediction, tides, coastal currents and sediment transport. Coastal protection methods. Structures in coastal zone.



**ZACM4909****Composite Mechanics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

This course will introduce the student to the mathematical treatment of classical laminated plate theory and its application to determination of laminate properties, structural analysis and design of fibre reinforced laminated composite structures.

**ZACM4910****Contaminated Site Investigations and Remediation****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZACM3212**

Contaminated site regulatory framework in Australia. Preliminary site investigations, land use history, likely contaminants. Detailed site assessment, drilling, sampling, chemical compatibilities, sampling design and QA/QC. Health and safety management, action levels, personal protective equipment. Site remediation, landfill disposal, bioremediation, separate phase recovery. Advanced methods. Contaminated site excursion.

**ZACM4911****Control Theory****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr A Sreenatha**

Analysis and design of control systems using Transfer Function Approach; State Space Analysis, controllability, observability, canonical forms, pole placement, optimal control, observers, Kalman Filters, Lyapunov stability analysis, introduction to digital control.

**ZACM4912****Durability of Concrete and Concrete Structures****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Factors essential to enhancement of durability of concrete and concrete structures, designing for durability according to macro and micro climatic conditions. Role of supplementary cementitious materials, superplasticisers, corrosion inhibitors, polymers, fibres and reinforcement treatments in the design of high performance concrete structures. Design and use of high strength lightweight concrete for offshore and gravity structures.

**ZACM4913****Engineering Applications of Computational Fluid Dynamics****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC3 HPW2****Not offered in 2007****Staff Contact: Mr J Young**

Hands-on introduction to Computational Fluid Dynamics (CFD) using MATLAB and FLUENT. Advantages and disadvantages of CFD as an engineering tool. Various types of flows (steady/unsteady, laminar/turbulent, subsonic/supersonic, incompressible/compressible, inviscid/viscous), effect of solution strategies and boundary conditions. Panel methods, finite difference methods.

Sources and effects of numerical error. Numerical stability. Grid generation.

**ZACM4914****Foundations for Light Structures****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Design considerations of foundations for light structures. Shrink-swell behaviour of reactive soils. Slab foundations on reactive soils. Foundations subject to uplift. Foundations on soft soil.

**ZACM4915****Geosynthetics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: Dr C Gnanendran****Prerequisite/s: ZACM3222**

Use of geosynthetics (i.e. geotextiles, geogrids, geocomposites and geomembranes) in geotechnical and geo-environmental engineering practice. Properties and test methods for geosynthetics functions and mechanisms, designing for separation, filtration, drainage and reinforcement. Introduction to design and construction of reinforced soil structures.

**ZACM4916****Impact Mechanics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

One-dimensional elastic stress waves in long uniform rods, theory and applications. Plane impulsive motion of rigid bodies and structures. Impact of a solid on to a liquid surface, ricochet. Liquid impact against a rigid surface, lined cavity charge explosives. Elastic-plastic stress waves in bars. High speed forming. Hyper-velocity impact.

**ZACM4917****Marine Engineering****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Ship Propulsion and Platforms.

**ZACM4918****Missile Design****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: Dr J Milthorpe**

Aerodynamics and dynamics of slender bodies and wings. Spin and fin stabilisation of projectiles, trajectories and manoeuvre capabilities. Layout, structure, control, propulsion and their integration with other systems.

**ZACM4919****Naval Architecture****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Introduction to the principles of naval architecture. Ship design process. Types of vessels. Flotation and trim. Hull form generation. Transverse stability and subdivision. Ship structures. Resistance and powering. Propulsions. Ocean climate. Ship motions. Manoeuvrability and Control. Weight estimation.

**ZACM4920****Non-Destructive Inspection****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr K Shankar**

Introduction to the theory and application of major non destructive techniques employed for inspection of structural components in the aircraft industry. Use of NDI in manufacturing and in maintenance. Familiarisation with practice of NDI techniques.

**ZACM4921****Occasional Elective 1****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus, S2 on-campus****Staff Contact: Dr W Smith**

The syllabus may change from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZACM4922****Occasional Elective 2****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC3 HPW2****S1 on-campus****Staff Contact: Dr W Smith**

The syllabus may change from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZACM4923****Orbital Mechanics****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

A vector mechanical two-body treatment of ballistic missile and spacecraft trajectories. Orbital determination of in plane and out of plane orbital changes. Position and velocity as a function of time and rendezvous. Vehicle accuracy and launch errors.

**ZACM4924****Pre-stressed Concrete****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Principles of pre-stressed concrete, material properties, methods of pre-stressing, flexural behaviour. Full and partial pre-stressing. Design of beams for serviceability. Deflections. Cable profiles.

**ZACM4925****Rapid Action Repair****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office**

Define the principles and requirements of rapid action repair. Review aircraft structural design analysis methods and damage assessment techniques. Develop repair design schemes to structures and systems based on technician skills and the availability of materials and equipment. Determine repair application methods.

**ZACM4926****Risk Analysis****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZACM3060**

The study of risks and hazards. Use of probability and statistics. Assessment of uncertainties and the use of reliability index and simulation. Applications of risk assessment in decision making and in general engineering.

**ZACM4927****Rotorcraft Performance****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: Dr J Milthorpe****Prerequisite/s: ZACM3032**

This course enables the student to examine the performance of rotorcraft in hover, forward and climbing flight. The class will be introduced to simple methods for estimating the performance of rotors and engines in the presence of a helicopter fuselage and other rotors. Considerations of equilibrium will then be employed to calculate control settings and actuator forces for trim in hover, forward and climbing flight at various centre-of-gravity locations for a real helicopter.

**ZACM4928****Advanced Rotorcraft Engineering****School of Aerospace, Civil and Mechanical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Mr M Garratt****Prerequisite/s: ZACM3032**

In this course students will be exposed to a number of topics in rotorcraft engineering. The course begins by building a linearised model of helicopter dynamics and proceeds to derive useful conclusions regarding the stability augmentation and flight control system design. Students will be introduced to rotorcraft flight test engineering, including the use of dimensional analysis to reduce data and standardise test results. The design regulations

pertaining to helicopter design will be overviewed with particular emphasis on design for crash worthiness. Design considerations relating to rotor induced vibration, ground resonance and fatigue safe life will also be discussed.

#### **ZACM4929**

##### **Structural Joining Methods**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC3 HPW2**

**Not offered in 2007**

**Staff Contact: School Office**

**Corequisite/s: ZACM2021 and ZACM2022**

Theory of load transferring structural joints. Detailed analysis of mechanically fastened, welded and adhesively bonded joints. Joint design, fundamentals and practices. Joint structural analysis. Durability and environmental effects.

#### **ZACM8302**

##### **Aero-Mechanical Systems**

**School of Aerospace, Civil and Mechanical Engineering**

**Enrolment requires school approval**

**UOC6**

**S2 on-campus, S2 Intensive Delivery (RAAF Retention Scheme)**

**Staff Contact: Dr A Neely**

General arrangements of aircraft systems. Purpose of various aircraft systems. Design of mechanical draft systems. Overview of non-mechanical aircraft systems. Systems integration. Aircraft power plant applications, with emphasis on gas turbines. Ideal and real operating cycles and cycle calculations. Gas turbine combustion processes. Thermodynamic performance and propulsive efficiency of jet engines.

#### **ZACM8303**

##### **Aerospace Vehicle Technologies**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC6 HPW4**

**S2 on-campus**

**Staff Contact: Dr R Heslehurst**

This course aims to introduce students to the principles of aerospace vehicle design and operations. The course content is introductory in nature and covers the fundamental aspects of aerospace engineering and operations. The course studies specifically the aeroplane as a total system, the basic aircraft components and their functions are discussed. The application of aerospace principles (aerodynamics, thermodynamics and performance) are covered in determining the behaviours of an aeroplane. Astronautics principles are also introduced.

#### **ZACM8304**

##### **Aircraft Structural Repair Methodologies**

**School of Aerospace, Civil and Mechanical Engineering**

**Enrolment requires school approval**

**UOC6 HPW30**

**Not offered in 2007**

**Staff Contact: School Office**

Define the principles and requirements of structural and systems repair. Review aircraft structural design analysis methods and damage assessment techniques. Develop repair design schemes to structures and systems based on technical skills and the availability of materials and equipment. Determine repair fabrication methods. Theory of load transfer in structural joints. Review of joining methods (mechanical fasteners, welding and adhesive bonding). Joint design fundamentals and practices. Joint structural analysis, durability and environmental effects.

#### **ZACM8305**

##### **Civilian and Military Airworthiness Requirements, Philosophies and Procedures**

**School of Aerospace, Civil and Mechanical Engineering**

**Enrolment requires school approval**

**UOC6 HPW30**

**S2 Intensive Delivery (RAAF Retention Scheme)**

**Staff Contact: Dr R Heslehurst**

A historical background of both civilian and military airworthiness requirements, including contrasts. Overview of the civilian and military airworthiness philosophies. Details of ADF airworthiness procedures and the certification process. Case studies.

#### **ZACM8306**

##### **Professional Practice - Aerospace Engineering**

**School of Aerospace, Civil and Mechanical Engineering**

**Enrolment requires school approval**

**UOC6**

**S1 on-campus, S2 on-campus**

**Staff Contact: Dr W Smith**

An essay in approved form to explore issues related to the professional practice of aerospace engineering. Successful completion of Engineer Officer - Basic Course plus at least one of the following professional development courses is required: Engineer Officer - Electronics Ground, Electronics Avionics, Aeronautical, or Armament Specialist Course.

#### **ZACM8307**

##### **Weapons Engineering**

**School of Aerospace, Civil and Mechanical Engineering**

**Enrolment requires school approval**

**UOC6**

**Not offered in 2007**

**Staff Contact: Dr J Milthorpe**

Explosives. Effect of blast, fragmentation and shaped charge warheads. Kinetic energy penetrators. Propellant charges. Fuses, initiators, detonators and safe/arm devices. Dynamics of unguided weapons: fin and spin stabilisation. Missile guidance techniques. Physics and accuracy of missile sensors, and effect on guidance. Advanced guidance and sensor systems. Prediction techniques for missile aerodynamics. Propulsion, Storage, maintenance, transport and launch considerations.

#### **ZACM8308**

##### **Facility and Property Management**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC6 HPW3**

**S1 distance**

**Staff Contact: Mr A White**

This course focuses on the procurement, management and disposal of Defence facilities. The course structure includes: organisation design and evaluation procedures and their translation to facilities; location theory, dynamic simulation and virtual reality. Facility procurement strategies, finance, delivery, conversion and disposal are modelled on a comparative basis. Information systems to support the management of the physical and logical configuration. Policy development process and facility procurement process. Overview of building design, construction and management phases.

**ZACM8309****Project Management Body of Knowledge****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: Mr A White**

This course focuses on the distinctive nature of project management in Defence, the public sector generally and higher corporate levels of the private sector where the project manager is orchestrating (rather than controlling) a political, bureaucratic, technical and contractual environment. The course ranges broadly across key facets of project management, such as quality management, configuration management, risk management and contract management.

**ZACM8310****Project Systems Modelling****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: Dr W Smith****Prerequisite/s: ZACM8309**

This course enjoins aspects of Systems Engineering with information Systems required to support major Defence Projects. The topics are covered in depth and students apply high end commercial software when processing assignments. Topics include: Systems Engineering, Configuration Management, Strategic and Technical Risk Management, Project Performance Measurement and Influence Diagrams for Project Risk Modelling.

**ZACM8312****System Dynamics Modelling****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: Dr W Smith****Prerequisite/s: ZACM8325.**

Systems Dynamics is a science that has its origins in engineering control theory, although systems concepts cross most disciplines. System Dynamics is the rigorous study of organisational problems, from a holistic or systemic perspective, where there is dynamic behaviour (quantities changing over time) and where feedback impacts significantly on system behaviour. It provides the framework and rules for qualitative description, exploration and analysis of such systems in terms of their processes, information, boundaries and strategies, thereby facilitating quantitative computer simulation modelling and analysis to assist understanding of system structure and control. This course focuses on the application of system dynamics modelling in strategic and corporate environments, with an emphasis on Defence. However, the course has wide applicability across technical, environmental and social systems. This course will run for full Saturdays on the first 5 of 7 weeks of the session; thereafter students will meet in syndicates at times of their choosing.

**ZACM8313****Source Selection in Projects****School of Aerospace, Civil and Mechanical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: Mr A White**

This course focuses on the pre-contract activities generally known as Source Selection within a Defence material context. Physical systems, logical systems and Software, require different Requirements Engineering methodologies. The resulting specifications provide the foundation for the tendering process. The management of the tender process occurs within a legal

and regulatory framework. The evaluation of tenders goes beyond traditional multiple criteria decision analysis to include risk. The evaluation results provide the foundation for structured negotiations. The data management required to support all phases of Source Selection is significant. Commercial software dedicated to the various aspects of Source Selection will be analysed. The tendering process occurs within a political environment which must be recognised and accounted.

**ZACM8315****Special Elective 1: Project Management****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW3****Not offered in 2007****Staff Contact: Mr W Smith****Prerequisite/s: ZACM8309**

Special electives are given by members of staff and external lecturers or visitors on a topic of immediate relevance. Alternatively, a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZACM8316****Special Elective 2****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus, S2 on-campus****Staff Contact: Dr W Smith**

Special electives are given by members of staff and external lecturers or visitors on a topic of immediate relevance. Alternatively, a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZACM8317****Special Elective 3****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus, S2 on-campus****Staff Contact: Dr W Smith**

Special electives are given by members of staff and external lecturers or visitors on a topic of immediate relevance. Alternatively, a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZACM8318****Special Elective 4****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6****Not offered in 2007****Staff Contact: Dr W Smith**

Special electives are given by members of staff and external lecturers or visitors on a topic of immediate relevance. Alternatively, a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.



**ZACM8319****Special Elective 5**

**School of Aerospace, Civil and Mechanical Engineering**  
**UOC12**

**TBA**

**Staff Contact: School Office**

Special electives are given by members of staff and external lecturers or visitors on a topic of immediate relevance. Alternatively, a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZACM8320****Marine Engineering**

**School of Aerospace, Civil and Mechanical Engineering**  
**UOC6**

**Not offered in 2007**

**Staff Contact: Dr W Smith**

Module 1: Propulsions systems; marine diesels; marine gas turbines; electric propulsion; propulsion plant selection; propulsion power transmission. Module 2: Auxiliary equipment; hydraulics; air compressors; refrigeration and air-conditions; sewage and oily waste; fuel, lube oil and ballast transfer.

**ZACM8321****Naval Architecture**

**School of Aerospace, Civil and Mechanical Engineering**  
**UOC6**

**Not offered in 2007**

**Staff Contact: Dr W Smith**

Introduction to the principles of naval architecture. Topics covered include: ship design process; types of vessels; flotation and trim; hull form generation; transverse stability and subdivision; the inclining experiment; ship structures; resistance and powering; propulsions; ocean climate; ship motions; manoeuvrability and control; and weight estimation.

**ZACM8322****Professional Practice - Marine Engineering**

**School of Aerospace, Civil and Mechanical Engineering**  
**Enrolment requires school approval**

**UOC6**

**Not offered in 2007**

**Staff Contact: Dr W Smith**

This course will help students to know how to carry out the tasks of a member of the Marine Engineering discipline in a professional manner.

**ZACM8324****Project Administration**

**School of Aerospace, Civil and Mechanical Engineering**  
**UOC6 HPW3**

**S2 distance, S2 on-campus, S1 Intensive Delivery (RAAF Retention Scheme)**

**Staff Contact: Mr E Wilson**

This capstone project management course analyses the environment within which complex projects are defined and delivered, including organisational, political, financial and legal aspects: detail and dynamic complexity of projects are analysed through case studies, building appreciation of reasons for projects succeeding or failing and how major projects might be better managed. The demands of Parliament and Government with respect to corporate governance and impositions on the management of major projects. Economic and financial considerations in the determination of project viability are analysed. The law underpinning contracts is canvassed together

with the design of forms of agreement, remedies available and options for dispute resolution.

**ZACM8325****System Dynamics of Project Organisation**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC6 HPW3**

**S1 on-campus, S1 distance**

**Staff Contact: Dr A McLucas**

"Systemic Failure" became a familiar summation for project disasters of the 20th century, from bridge collapses to hospital demolition. This course focuses on understanding the "systemic" in complex projects, to minimise risk of failure. This unit provides a foundation in general systems theory and then focuses on systems thinking competencies relevant to the project organisation, addressing methodologies and tools such as soft systems methodology, cognitive mapping, causal loop and influence diagrams and system archetypes. These methodologies provide insight into the capability maturity of project delivering organisations. In Session 1, this course will run for full Saturdays on the first 5 of 7 weeks of sessions; thereafter students will meet in syndicates at times of their choosing.

**ZACM8326****Vehicles and Mobility**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC6 HPW4**

**S2 on-campus**

**Staff Contact: Dr W Smith**

This course provides the technical factors that affect military vehicle design, including armoured fighting vehicles. Topics include vehicle design, fabrication, mechanics, propulsion, handling, power supply systems and key aspects of associated project management. Terra-mechanics, mobility, counter-mobility and reliability are also addressed.

**ZACM8327****Maximum Entropy Analysis**

**School of Aerospace, Civil and Mechanical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: Dr R Niven**

**Prerequisite/s: ZPEM1302 or ZPEM1304 or equivalent**

This course is based on the concept of entropy, one of the most fundamental discoveries of human thought, and the application of Jaynes' "maximum entropy method" to determine the "most probable state" of a system composed of individual entities. Course participants will learn - in theory and application - the tremendous power of Jaynes' method for the analysis of engineering, scientific and human systems. To do this, it is first necessary to understand the concept of probability, and to appreciate the probabilistic basis of entropy. Topics include: Concept of probability, information theory, plausible reasoning, sampling theory. Orthodox and Bayesian statistical methods. Concept of entropy, Shannon entropy, cross-entropy, maximum entropy methods, Jaynes relations, fluctuation theory. Systems analysis: thermodynamics, Carnot efficiency, energy analysis, life cycle analysis, ecological indices. Other applications in fluid and solid mechanics, transport, logistics, commerce, social systems (topics will be selected based on students' interests). Non-Shannon entropies, inverse methods, transient processes.

**ZACM8501****Project Report (Full Year)****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC6****S1 Intensive Delivery, S2 Intensive Delivery****Staff Contact: Dr W Smith**

Research project on a topic of relevance to the program undertaken plus report in an approved form. Students must earn 6UOC per session for a total of two sessions.

**ZACM8502****Project Report (Single Session)****School of Aerospace, Civil and Mechanical Engineering****Enrolment requires school approval****UOC12 HPW6****S1 on-campus, S2 on-campus****Staff Contact: Dr W Smith**

Research project on a topic of relevance to the program undertaken plus report in approved form. Students must earn 12UOC in a single session.

**Current course and  
program information  
is now available through the  
UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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## SCHOOL OF BUSINESS

**ZBUS1101****Organisational Behaviour****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

The course introduces explanations of individual and group behaviour in the organisational setting and examines organisational processes. Drawing on the organisational setting, it seeks to build an understanding of how concepts may be organised into models and theories and uses a case study approach to show how such models may be applied to managerial practice, thus reinforcing work in the integrating core of the degree. Specific areas of study may include, at an introductory level, perception, motivation and stress; team effectiveness, decision-making, power and conflict, and leadership; and organisational structure, design, culture and change.

**ZBUS1102****Introduction to Economics****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

The course introduces the main principles of economics and briefly reviews the development of ideas in the discipline. It provides a foundation understanding of the economic environment in which organisations conduct business with particular reference to market forces, international trade and the role of government. Building on work in the integrating core, students will learn how economics models individual, firm and social behaviour, and how economic thinking has changed. Specific topics for study include individual and market demand; opportunity cost, profit and supply; price determination; comparative advantage and trade; an overview of the macroeconomy; and the economic impact of government.

**ZBUS1103****Introduction to Accounting and Finance****School of Business****UOC6 HPW3****S1 on-campus****Staff Contact: School Admin Officer**

The course provides the foundations for understanding how financial data are captured by accounting systems and basic tools of financial analysis. Both corporate and government accounting systems are considered, which, together with a presentation of essential accounting concepts, provide a valuable foundation for work in economics as well as general business. Topics covered include financial statements and their elements, records of transaction processing, cash versus accrual accounting, national income and balance of payments accounts and discounted cash flow analysis. Tools covered in the integrating core are applied.

**ZBUS1104****Integrating Core 1 - Business Research and Statistics****School of Business****UOC6 HPW3****S1 on-campus****Staff Contact: School Admin Officer****Prerequisite/s: Enrolment in Bbus program 4405**

The course is the first of three, one at each level, comprising the Integrating Core in the degree. This three-course spine aims to systematically develop questioning, thinking and problem-solving skills in a way designed to be of particular relevance in business environments. Integrating Core 1 aims first to set the scene for the whole degree, providing students with perspectives and an

overview of what a good tertiary education in business should achieve. It then shows students how to understand, frame and model problems, to express themselves effectively in writing, and to develop a basic competence in quantitative analysis. Its purpose is to create generic intellectual skills which may be applied to enhance understanding and performance in other courses in the degree. Students work together on some assignments to develop team skills.

### **ZBUS1901**

#### **Critical Analysis in Business Research**

##### **School of Business**

##### **Enrolment requires school approval**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: Enrolment in the relevant CDF program**

This course introduces students in the CDF Students Program to business research methodology through the critical analysis of published research studies. Students learn how to locate relevant research, how to reason logically, how to design a research study, how to analyse statistical data and how to critically evaluate the logical and statistical reasoning of other business and social science researchers. The skills developed may be applied to any situation in which research methods and findings must be critically analysed and evaluated.

### **ZBUS2001**

#### **Quantitative Methods in Economics and Management**

##### **School of Business**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: Enrolment in program 4400 or 4410 and ZBUS1101 or ZBUS1102**

##### **Corequisite/s: ZBUS1103**

This course introduces students to quantitative methods, particularly statistical methods, as used in economics and management, and to the sources and quantitative and statistical uses of economic and managerial data. Stress is placed on understanding and applications of concepts, and no mathematical prerequisite is required.

### **ZBUS2101**

#### **Business Law**

##### **School of Business**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: For BBus students, any 3 Foundation Core courses. For BA/BSc students, ZBUS1101.**

This course aims to provide a general understanding of legal processes and public law, and gives particular emphasis to introducing contract law. The purpose of the course is to equip students with sufficient understanding of the legal system and contract law to work effectively in the acquisition and procurement processes of large organisations (including Defence) and to understand the legal underpinnings and implications of business decisions. Acquiring a basic understanding of the legal approach to argument reinforces work in the integrating core to develop a questioning mind equipped to engage effectively in problem-solving activities.

### **ZBUS2102**

#### **Project Management**

##### **School of Business**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: For BBus students, any 3 Foundation Core courses. For BA/BSc students, ZBUS1101.**

This course identifies the components of project management and its associated management tools and procedures. Topics covered may include: project selection, project environment, initiation and organisation, planning and overview modelling, scheduling, budgeting, resource allocations, risk management, communication and monitoring, control and evaluation, reporting, auditing and project termination.

### **ZBUS2103**

#### **Human Resource Management**

##### **School of Business**

##### **UOC6 HPW3**

##### **S2 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: For BBus students, any 3 Foundation Core courses, including ZBUS1101. For BA/BSc students, ZBUS1101.**

This course introduces students to the theory and practice of Human Resource Management. It examines, as an important aspect of the management function, the management of people in the work place.

### **ZBUS2104**

#### **Integrating Core 2 - Evidence Based Decision Making**

##### **School of Business**

##### **Enrolment requires school approval**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: Enrolment in BBus Program 4405 and ZBUS1104**

This course focuses on decision-making and problem-solving, and analytical tools valuable in addressing questions which students learned to formulate in ZBUS1104 Integrating Core 1. The questions, problems and decisions are set up to be of particular relevance to a business and organisational environment and group exercises may be used to build team learning skills.

### **ZBUS2200**

#### **Production, Prices and Trade**

##### **School of Business**

##### **UOC6 HPW3**

##### **S1 on-campus**

##### **Staff Contact: School Admin Officer**

##### **Prerequisite/s: For BBus students, any 3 Foundation Core including ZBUS1102. For BA/BSc students, ZBUS1102.**

##### **Prerequisite/s or Corequisite/s: For BA/BSc students ZBUS1103.**

This course covers the foundations of modern microeconomic theory at an intermediate level and applies the principles and analytical framework of modern microeconomics to international trade.

**ZBUS2202****Growth and Fluctuations in Open Economies****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s: ZBUS2200**

This course covers the foundations of modern, open-economy macroeconomic theory and policy at an intermediate level.

**ZBUS2203****The Making of Economic Policy****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s: ZBUS2200**

This course deals with the process of economic policy making and analyses the rationales for, and implications of, economic policies in open economies. Topics covered may include rationales for government activity and intervention; critiques of the size and economic role of government; public versus private ownership; production and provision; regulation and deregulation; competition and industry policy; implications of economic policy for economic welfare, and for security, defence and defence industry.

**ZBUS2204****Asia-Pacific Economic Development****School of Business****UOC6 HPW3****S1 on-campus****Staff Contact: School Admin Officer****Prerequisite/s: ZBUS2200**

This course offers analysis of the process of economic development illustrated by case studies from the experience of selected East Asian and Pacific countries. Topics covered may include capital formation and skill building; financial linkages and liberalisation; international trade and investment; institution building and transformation; industrialisation and trade; the role of economic policy.

**ZBUS2205****Applied Economics****School of Business****UOC6 HPW3****S1 on-campus****Staff Contact: School Admin Officer****Prerequisite/s: ZBUS2200**

This course offers the opportunity for students to explore how recent developments in economic analysis can be brought to bear on intra- and inter-organisational issues. It explains the strategic behaviour of people and organisations in a variety of contexts, using the tools of applied game theory and information economics. The emphasis of the course is on clear conceptual thinking and useful, relevant applications rather than technical analysis. The course aims to make students conversant with the principles of strategic thinking, allowing them to explain the strategic behaviour of people and organisations and apply strategic principles to their own decision making.

**ZBUS2301****Management Accounting****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

**Prerequisite/s: For BBus students, any 3 Foundation Core courses including ZBUS1103. For BA/BSc students, ZBUS1101 and ZBUS1103.**

This course develops an understanding of management accounting with a view to equipping students with the ability to address costing and budgeting issues in a complex organisational environment. Acquisition of the tools of management accounting is presented as a means of assisting in the effective and efficient control of organisational resources.

Management accounting is compared and contrasted with financial accounting; a range of conceptual and measurement issues around costing is explored; various approaches to budgeting are considered; the impact of human factors is addressed; and methods of managing quantities (for example in inventories) are presented.

**ZBUS2302****Leadership****School of Business****UOC6 HPW3****S1 on-campus****Staff Contact: School Admin Officer**

**Prerequisite/s: For BBus students, any 3 Foundation Core courses including ZBUS1101. For BA/BSc students ZBUS1101.**

**Prerequisite/s or Corequisite/s: For BA/BSc students ZBUS1103.**

This course considers leadership as a management activity and provides a critical analysis of the assumption underlying the concept of leadership.

The course provides a conceptual integration of students' previous leadership experiences with leadership theory and research. Both simple and complex organisations are examined. Topics covered may include: approaches to leadership; leadership skills (interpersonal skills, self-management, negotiation, networking); power and authority; rules, sanctions and incentives; inner values; ethics; gender differences (women in organisations); leadership development and training.

**ZBUS2303****Logistics Management****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

**Prerequisite/s: For BBus students, any 3 Foundation Core courses. For BA/BSc students, ZBUS1101.**

**Prerequisite/s or Corequisite/s: For BA/BSc students ZBUS1103.**

This course examines and applies management tools and principles to supply and distribution problems associated with the flow of materials and products through organisations and the supply chain to the end customer.



**ZBUS2401****Finance****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s:** For BBus students, all 4 Foundation Core courses. For BA/BSc students, ZBUS1101 or ZBUS1102 and ZBUS1103.

This course deals with investment evaluation and finance. Standard investment appraisal techniques are introduced, and a range of issues in financial analysis are covered.

Topics covered may include evaluation under conditions of risk and uncertainty for public and private enterprises. Financial topics covered include standard techniques such as discounted cash flow, financial statement analysis, capital asset pricing, security evaluation, optimal capital structure, and sources of capital from financial institutions in Australia.

**ZBUS2801****Leadership and Management****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s:** 36 units of credit at Level 1.**Excluded:** Students enrolled in program 4405 or completed ZBUS1101

This course offers an introduction to management and leadership principles to provide a common career foundation in these areas for all undergraduate students.

The course is divided into two components, management and leadership, and students may take either separately (each worth 3UOC) or both (6UOC). The management component covers the core elements of organisational behaviour at individual, group and organisational levels, and the essentials of managing human resources, projects and corporate strategy. In the leadership component, leaders of all kinds are studied from a variety of perspectives: as visionaries, social architects, relationship builders, and agents of change and transformation. Leaders' effectiveness is linked to personal characteristics including charisma, emotional intelligence and courage.

**ZBUS2802****Leadership and Management (Leadership)****School of Business****Enrolment requires school approval****UOC3 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s:** 36 units of credit at Level 1.**Excluded:** Students enrolled in program 4405

This course comprises the leadership component of ZBUS2801 Leadership and Management. This course is taught in the second half of the session.

**ZBUS2803****Leadership and Management (Management)****School of Business****Enrolment requires school approval****UOC3 HPW3****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s:** 36 units of credit at Level 1.**Excluded:** Students enrolled in program 4405

This course comprises the management component of ZBUS2801 Leadership and Management. This course is taught in the first half of the session.

**ZBUS2902****Research Project in Business 1****School of Business****Enrolment requires school approval****UOC6 HPW2****S2 on-campus****Staff Contact: School Admin Officer**

Students will undertake a research project on a nominated topic in a specific discipline that is commensurate with Year 2 study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or members. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic in approximately week 4 of the session, and final assessment will be based on a written paper and oral presentation.

**ZBUS3104****Integrating Core 3 - Organisation Theory and Management****School of Business****UOC6 HPW4****S2 on-campus****Staff Contact: School Admin Officer****Prerequisite/s:** Enrolment in BBus Program 4405 and ZBUS2104

This course builds on skills of problem definition, analysis and decision-making developed in Integrating Core 1 and 2 to show how solutions might be implemented in business and organisational settings. An emphasis on decision-taking is carried through from Integrating Core 2 and earlier work on analysis is applied to learning to evaluate potential and actual outcomes. Study in this course draws on theories of leadership, negotiation, organisational change and strategy. It considers the formulation and application of business strategy and its implementation in an environment of continuous change.

**Note/s:** This course is taught in the first half of the session.

**ZBUS3901****Research Project in Business 2****School of Business****Enrolment requires school approval****UOC6 HPW2****S1 on-campus****Staff Contact: School Admin Officer**

Students will undertake a research project on a nominated topic in a specific discipline area that is commensurate with Year 3 study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or members. A supervisor, who will work closely with the student, will manage each project. The research project will be

chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic in approximately week 4 of the session, and final assessment will be based on a written paper and oral presentation.

**ZBUS3902****Research Project in Business 3****School of Business****Enrolment requires school approval****UOC6 HPW2****S2 on-campus****Staff Contact: School Admin Officer**

Students will undertake a research project on a nominated topic in a specific discipline area that is commensurate with Year 3 study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or members. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic in approximately week 4 of the session, and final assessment will be based on a written paper and oral presentation. In appropriate cases, approval may be sought to combine Research Project in Business 3 with Research Project in Business 2 to form a single, year-long project.

**ZBUS4201****Economics 4 (Honours) Full-Time****School of Business****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

Candidates are required to produce a thesis of about 15,000 words on a topic chosen in consultation with the Head of School from areas in which the School has relevant supervision expertise. They also undertake coursework related to the research process and the subject area in which the research topic falls. The thesis attracts 75% of the mark for the year and coursework 25%.

**ZBUS4202****Economics 4 (Honours) Part-Time****School of Business****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

Content requirements are the same as for full-time Honours but students may take longer than one year to complete the program.

**ZBUS4203****Economics 4 (Combined Honours) Full-Time****School of Business****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Economics and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZBUS4204****Economics 4 (Combined Honours) Part-Time****School of Business****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Economics and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZBUS4301****Management 4 (Honours) Full-Time****School of Business****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

Candidates are required to produce a thesis of about 15,000 words on a topic chosen in consultation with the Head of School from areas in which the School has relevant supervision expertise. They also undertake coursework related to the research process and the subject area in which the research topic falls. The thesis attracts 75% of the mark for the year and coursework 25%.

**ZBUS4302****Management 4 (Honours) Part-Time****School of Business****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

Content requirements are the same as for full-time Honours but students may take longer than one year to complete the program.

**ZBUS4303****Management 4 (Combined Honours) Full-Time****School of Business****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Management and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZBUS4304****Management 4 (Combined Honours) Part-Time****School of Business****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Admin Officer**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Management and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZBUS7101****Introduction to Management****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course offers a general introduction to the field of management appropriate to the needs of students who have not undertaken formal study in the area before. It introduces management theories, providing opportunities for students to explore concepts and apply them to their own experiences.

**ZBUS7102****Introduction to Project Management****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course identifies and analyses the components of project management, the associated management tools and procedures and the roles and responsibilities of project managers. Project Management is a critical discipline within engineering and this course provides a useful adjunct to the courses offered in Project Management by other schools, by approaching project management from the perspective of a business manager who may not be an engineer.

**ZBUS7103****Economics for Managers****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

The course is an introduction to economics with a special focus on the managerial applications. Topics covered may include the operation of markets generally in the Australian context, business decision making, the role of government in the economic environment, the determinates of system-wide levels of economic activity and the drivers of change in major economic aggregates.

**ZBUS8101****Strategic Management****School of Business****UOC6 HPW3****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

The objective of this course is to investigate the role of strategy in achieving organisational success in commercial and public sector environments. It examines the nature of organisational objectives, capabilities and strategies and, in particular, the role of corporate and business strategies as determinants of superior performance. This course also introduces sustainable management, which is an area of growing importance.

**ZBUS8102****Organisational Behaviour****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course analyses the behaviour of individuals and groups within organisational structures and the interactions that occur between the individual, the group and the organisation. Students will analyse the relationships between patterns of human behaviour and management concepts and practices, and will develop the conceptual framework required to assess the effectiveness and efficiency of those practices.

**ZBUS8103****Human Resource Management****School of Business****UOC6 HPW3****S1 on-campus (school consent req) S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course examines the theory and practice of human resources management. It provides students with an appreciation of the role of human resources within an organisation, and studies the manner in which the management of people in the workplace affects organisational performance.

**ZBUS8104****Legal Process and Procedure****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course is designed to provide an introduction to the Australian legal system, statutory interpretation and the use of precedent in case law. This course is an opportunity to explore legal approaches to current and sensitive issues.

**ZBUS8105****Finance and Investment Appraisal****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course introduces investment decision making techniques. It focuses on corporate finance from an investor's perspective. It also provides an explanation of financing options, including how financial markets operate and the main instruments of financial markets.

**ZBUS8106****Public Sector Management****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

The course provides an examination of the system of rules, institutions and practices through which the Australian system of representative government and public administration is constituted and functions. Main concerns are the roles and relative powers of the three branches of government, the practices of responsible government and the federal system and the intergovernmental relations. Particular emphasis is placed on exploring the role of public administrative systems within the wider political and democratic frameworks in which they function. The course examines theory and practice of public administration and management at all levels in the Australian federation, with particular reference to the administrator's role in the effective development and implementation of public policy.

**ZBUS8107****Public Sector Financial Management****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course covers the changes that have occurred in recent years in public sector financial management in Australia including the move to an outcome/outputs framework, devolved banking, the introduction of accrual accounting and the enhanced role of auditing. It also examines key areas of costing and budgeting and some of the critical areas of management accounting that are fundamental to good financial management.

**ZBUS8108****Accounting for Managers****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

An introduction to accounting and its terminology and how accounting information is used for decision making in a business environment. This course does not require an existing accounting knowledge. It covers key accounting concepts but applies them to real situations that are designed to give students confidence in using accounting information in the workplace.

**ZBUS8109****Business Law****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course provides an introduction to key areas of business law such as contract law, intellectual property, managing commercial practices and trade practices law. It is intended for managers who are not lawyers, so a prior knowledge of law is not required. However, students will be offered the opportunity to undertake some background pre-reading to enhance their understanding of the Australian legal system.

**ZBUS8110****Business Risk Management****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

Businesses operate in risky environments. The aim of this course is to provide knowledge and understanding about how to assess and manage risks and to determine probabilities of risk. It includes risk analysis techniques, crisis planning, managing program and project risk, and contingency planning.

**ZBUS8111****Advanced Project Management****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course is designed to introduce concepts to manage complex projects that involve technical uncertainty and ambiguity and the means to implement them. Topics include: portfolio and program management, risk management, governance, and advanced planning/scheduling techniques. It includes known advanced project management techniques as well newer cutting edge techniques. Enrolment in this course assumes the completion of introductory project management courses or a good knowledge of project management foundations.

**ZBUS8201****Leadership****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course develops an understanding of leadership as a holistic process that involves influencing people both inside and outside the organisation. The dynamics of interpersonal influence processes are investigated, with particular attention given to the broader conceptualisation of leadership style, such as

‘transformational’ and ‘transactional’ leadership.

**ZBUS8202****Public Sector Human Resource Management****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course examines human resource management in the Australian public sector. The analysis considers the theoretical framework of human resource management in the Australian Public Service and the realities of management in practice.

**ZBUS8203****Change Management****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

The course introduces students to a broad range of current change literature including the problems and key issues relating to managing change in organisations. Key topics include metaphors for understanding change, theories of planned change, the role of the change agent, diagnosis, responses to change, the process of planned change, interventions (techno-structural, strategic, cross-cultural), managing and leading change, current issues and challenges.

**ZBUS8204****Marketing****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

The course offers a comprehensive survey of the vocabulary, concepts, and techniques of marketing. The course develops a systematic approach for examining the successful delivery of product, place, promotion, pricing, positioning, and service, with the end goals of creating product value and customer satisfaction. The course aims to integrate marketing analysis and research plans, information on consumer behaviour, target segments, strategy development, brand management, global marketing, and social responsibility. The course is designed for managers in both profit and non-profit organisations and examines marketing across a variety of industries and institutions.

**ZBUS8205****Business Ethics****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

The purpose of this course is to strengthen your ability to anticipate, critically analyse and appropriately respond to some of the critical ethical and social challenges that confront managers in a global economy. This course provides a framework for analysing and evaluating the beliefs and values that underlie ethical controversies. You will examine the strong influence of cultural traditions and dominant beliefs on our attitudes towards business and discuss the relevance of traditional ethical theories (such as utilitarianism, rights and contract theories) to business decisions. This course examines the contextual, organisational and managerial issues associated with managers operating in a global environment both in the private and public sector environments. In considering the public sector the course will assess the different approaches to stakeholder management and encourage critical evaluation of different perspectives on efficiency, sustainability, stakeholder management, devolution, ethical codes of behaviour, government regulatory failure, whistle blowing and administrative appeals.



**ZBUS8206****Public Law****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course provides an opportunity to gain an understanding of constitutional law, and the legal structures behind our system of government. It explores administrative law, the role of delegated legislation and administrative tribunals. International laws will also be introduced, including their relevance for the Australian Defence Force.

**ZBUS8301****Technology and Innovation****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course offers perspectives on the management of technological innovation as the basis for analysing the strategic role of technological investment in competition and the achievement of organisational goals. Assessment includes a significant research-based component in the area.

**ZBUS8302****Logistics****School of Business****UOC6 HPW3****S1 on-campus, S1 distance, S2 Intensive Delivery (RAAF Retention Scheme)****Staff Contact: School Admin Officer**

In this course students examine the basic concepts and techniques of logistics management within the framework of an integrated logistics system. Various civilian and military applications are considered.

**ZBUS8303****Strategic Procurement****School of Business****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

This course offers analysis of the process of capability development and strategic procurement, with special reference to the public sector. It may be expected that defence procurement will receive particular attention. Assessment may include a significant research-based component.

**ZBUS8304****Case Studies in Technology Management****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

This course offers perspectives on the practice of technology management through case studies drawn from a variety of organisational contexts. The case studies address some of the issues covered by more general analysis of principles and processes in other components of the equipment and technology plan.

**ZBUS8305****Professional Practice****School of Business****UOC6****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Enrolment requires School approval.****Staff Contact: School Admin Officer**

This course requires students to reflect on their role as a professional and to submit an essay in an approved form to explore issues related to their professional practice in the management. To be eligible to enrol in this course a student must already have completed at least 12 days of approved professional education short courses.

This course may only be used for credit at the Graduate Diploma and Masters levels.

**ZBUS8401****Team Project: Technology Management****School of Business****UOC6 HPW3****S2 on-campus****Staff Contact: School Admin Officer**

This course is restricted to members of the Australian Technical Staff Officers' Course (ATSOC). It has the objective of testing students' ability to undertake a technology management based project that draws on Australian and international defence capability and technology management experience. Projects are undertaken by small groups of students, each of which will be required to set up a task, prepare a project plan, collect data, conduct experiments and interviews (as appropriate), analyse results, formulate recommendations, prepare a report and present findings. Students are expected to demonstrate project management and teamwork skills in achieving group outcomes.

**ZBUS8501****Research Project - Business****School of Business****Enrolment requires school approval****UOC6****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

Students who achieve a distinction average over a minimum of four (4) Masters level courses may apply to the Head of School to undertake a research project over one session of approximately 6,000 words in a discipline area that is central to their study program. The project will provide an opportunity for students to research an area that has practical relevance to their workplace environment. Approval will be subject to the School being able to provide appropriate resources.

**ZBUS8502****Research Project - Business****School of Business****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Admin Officer**

Students who achieve a distinction average over a minimum of six (6) Masters level courses may apply to the Head of School to undertake a research project over two sessions of approximately 12,000 words in a discipline area that is central to their study program. The project will provide an opportunity for students to research an area that has practical relevance to their workplace environment. Approval will be subject to the School being able to provide appropriate resources.

# GENERAL EDUCATION COURSES

## ZGEN2001

### Engineering the Environment

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S2 on-campus

Staff Contact: School Office

**Prerequisite/s:** See page 66 of this Handbook.

Since prehistoric times humans have endeavoured to improve their lot by changing the natural environment - river courses have been altered, mountains moved, seas turned to land. The course will examine the benefits and effects of major engineering activities. Topics will be selected from civil engineering marvels of the ancient world, including engineering disasters, impact of public health engineering, the political power of water, protecting the coast, power generation, mechanisation and agriculture and developments in materials and technology.

## ZGEN2002

### The Cockpit and Beyond

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S2 on-campus

Staff Contact: Ms S Burdekin

**Prerequisite/s:** See page 66 of this Handbook.

This course is an introduction to aviation as a system. It looks at the aircraft, aircrew, flying operations and air traffic management as major components of the aviation system with a focus on human factors, human performance limitations and an introduction to systemic safety issues involving aircraft accident case studies.

## ZGEN2003

### The History and Science of Flight

School of Aerospace, Civil and Mechanical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Mr R Lewis

**Prerequisite/s:** See page 66 of this Handbook.

Today most passengers take aircraft for granted. Outside the aircraft, only metres from where they sit, a battle rages between thrust, drag, lift and gravity as the rarefied atmosphere races over wings at 800 km/h. Cocooned from this battle, inside an air-conditioned, soundproofed fuselage, the passengers are preoccupied by the quality of food and the in-flight movie; some have even pulled down window shades so that they are not disturbed by the outside world. The aim of this course is to create within its audience, an appetite to understand how and why modern aircraft fly with such grace and apparent ease. To achieve that aim the class will look at the blood, sweat, tears, science and engineering that have led to the evolution of the modern aircraft. After taking this course, you will never again lower the window shade...

## ZGEN2005

### This Sporting Life... Mapping Sports in Australia

School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

S1 on-campus

Staff Contact: Dr A Griffin

**Prerequisite/s:** See page 66 of this Handbook.

**Excluded:** ZPEM1201 or ZPEM1202

Sports are key ingredients of Australian cultural identity. Per capita, Australia produces more Olympians than any other country. Why is this the case? We are also keen spectators of sport, although our sport of choice varies depending on where we live (ask a

Sydney-sider and a Melbournian which football code they're most keen for!). What other differences might we find in sport spectatorship and participation?!? This course explores the geography of Australian sport through the process of creating an Atlas of Australian Sport. In this course, you will have the chance to learn about how geographers think about the world, how sports are connected to Australian geographies, and how atlases communicate information about a topic. You will have a chance to explore the geography of Australian sport in-depth by researching and creating one atlas page on a topic of your choice related to the geography of Australian sport.

## ZGEN2201

### Australian Literature and Film

School of Humanities and Social Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: School Office

**Prerequisite/s:** See page 66 of this Handbook.

A comparative study of recent and contemporary Australian literature and film.

## ZGEN2204

### Issues in Modern Australian Literature and Film

School of Humanities and Social Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: School Office

**Prerequisite/s:** See page 66 of this Handbook.

The structure and content of this course will become available when it is offered again in the near future.

## ZGEN2210

### Terrorism and the International Order: Past, Present and Future

School of Humanities and Social Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: School Office

**Prerequisite/s:** See page 66 of this Handbook.

This course takes as its starting point the events of September 11, 2001 and proceeds to analyse a number of issues thrown up by those events. What is terrorism and has it been changed by September 11? How has September 11 affected the international order? How should liberal democracies deal with terrorism while maintaining their basic freedoms? Can the international system and international law be re-shaped better to deal with such events? Utilising a range of media and teaching resources this course will examine contemporary and historical terrorism and counter-terrorism in order to address these and related issues.

## ZGEN2230

### Australia in the Twentieth Century

School of Humanities and Social Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: School Office

**Prerequisite/s:** See page 66 of this Handbook.

This course will analyse the social, political, cultural and economic forces that have determined twentieth-century Australian history. It will examine the impact of important events on Australia such as Australian Federalism, reactions to the Great War, Federal-State financial relationships, the Great Depression, the Second World War, the Australian film industry, women in Australia, the economic boom of post World War 2 and the Whitlam, Hawke and Keating years.

**ZGEN2231****An Introduction to Australian Military History****School of Humanities and Social Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This course provides an introduction to Australian military history. It considers the 19th century origins of the Australian military, the involvement of defence policy, and the ways in which that history has been presented and interpreted by historians, film-makers and mythologies.

**ZGEN2240****Introduction to Military Ethics****School of Humanities and Social Sciences****UOC3 HPW2****S1 on-campus****Staff Contact: Dr S Coleman****Prerequisite/s: See page 66 of this Handbook.**

A changing military environment and developments in wider society combine to make new and increasingly complex ethical demands on Australian Defence Force officers. This course introduces students to ethical theory and debate, develops skills in applying ethics, and analyses various forms of ethical discourse. A novel, film or play will be chosen each year as a stimulus to class discussion. A number of issues will be considered from military and other contexts. Studying ethics may not make you a better person, but it will encourage self-awareness, clarity, and ability to engage in ethical dialogue with others inside and outside the military.

**ZGEN2241****Why Politics Matters****School of Humanities and Social Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This course will explore the impacts of politics upon our everyday lives as we go about our business as citizens, as members of the ADF, and as professional scientists and engineers. What are our political obligations as citizens, and can we trust politicians? How is defence policy made? Why does government regulation of professional activities constantly increase? Students will thus be introduced in a practical way to the mechanics, limitations and frustrations of the Australian political system.

**ZGEN2242****Understanding Indonesia: Stories of nation and stories of dissent****School of Humanities and Social Sciences****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This subject introduces the major stories of the Indonesian nation and how these stories inform elements of Indonesian national identity. Films, short-stories, extracts of novels are the course's raw materials and will explore such themes as: the anti-colonial struggle; war, revolution and national liberation; the 1965 coup, Indonesian communism, the Army and 'national salvation'; poverty; ethnicity, racism and the 'problem' of the Chinese; controlling Islam; domesticating and controlling women. The subject also explores what is silenced and marginalised by these dominant stories, e.g. the various separatisms that occurred in Indonesia since 1945.

**ZGEN2301****Computer Games****School of Information Technology and Electrical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Dr M Barlow****Prerequisite/s: See page 66 of this Handbook.**

This course is available to students undertaking an Arts, Business or Engineering degree. Computer Games are a multi-billion dollar industry - larger than the Hollywood film industry in revenue. Modern computer games are also sophisticated software products delivered by large teams of technical experts. The course uses computer games as a lens on many of the major topics in computer science. Those topics include 3D graphics, artificial intelligence, networking, user interfaces, simulation, and hardware (e.g. the consoles). Further, the course addresses "serious games" - the use of games for education, training and experimentation, particularly by the military. Practical work will include the focussed play and evaluation of a number of games, together with content creation for games.

**ZGEN2302****The E-Warrior****School of Information Technology and Electrical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Mr M Ford****Prerequisite/s: See page 66 of this Handbook.**

This course is available to students undertaking a Business, Engineering or Science degree. Information Technology (IT) influences every aspect of modern warfare. This subject aims to familiarise students with the role that IT plays in modern warfare. Topics include: introduction to command and control, concepts in military operations, modern battlefield technologies, the role of IT in military training and analysis, and challenges arising from the use of such technologies on the modern battlefield.

**ZGEN2303****Tactical Combat Radio Systems****School of Information Technology and Electrical Engineering****UOC3 HPW2****S1 on-campus****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This course, which is available to students undertaking an Arts, Business or Science degree, assumes no prior knowledge of electronics and uses only a minimum of mathematics. Reliable and secure communications is a necessity in any successful military operation. The military history books are filled with examples of major operations failing because of a breakdown in communications. A tactical combat radio system, such as the Army's RAVEN system, is much more than just a ruggedised version of a civilian two-way radio. It is required to operate in a hostile environment where the enemy will try to intercept and disrupt radio communications and deny the field commander the co-ordination of the available forces. Both technical and operational measures need to be employed that minimise the likelihood of enemy detection and that allow information to be transferred in spite of enemy jamming. In this course the basic principles of telegraphy, telephony and radio communications will be covered with an emphasis on communications in a hostile environment. The mode of operation of the RAVEN HF and VHF sets will be described along with an introduction to secure communications techniques including encryption, frequency hopping and spread spectrum modulation. Operational procedures designed to minimise the interception of friendly transmissions or reduce the effectiveness of enemy jamming by the use of directional antennas, control of transmitter power and the use of advanced digital techniques will be discussed. Communications is of prime importance to personnel at all levels in all three services. Whilst it

is unlikely that you will be called upon to operate a combat radio in your service career it is certain that you will be in command of those that do. This course will provide an insight into the concepts and capabilities of such a radio system.

### ZGEN2304

#### Web Sites and Multimedia

#### School of Information Technology and Electrical Engineering

UOC3 HPW2

S1 on-campus

Staff Contact: Mr T Turner

Prerequisite/s: See page 66 of this Handbook.

This course is available to students undertaking an Arts, Business or Engineering degree. Students will be guided in developing the skills to create simple web pages, digital animation, and to digitally manipulate sound and video. These skills will be reinforced through the assessable production of a web site that hosts a digital animation and a digital video created by the students. All software used in the course is available free and so students can continue developing their skills long after the course is complete.

### ZGEN2400

#### Chemical and Biological Warfare: Defence and Disarmament

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

S1 on-campus

Staff Contact: Assoc Prof G Collins

Prerequisite/s: See page 66 of this Handbook.

This course examines the issues of chemical and biological warfare. These include the modes of action and toxicology of chemical and biological weapons and measures for defence against them. It also examines issues relating to the international disarmament treaties banning such weapons such as the Chemical Weapons Convention of 1997 and the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (BTWC) of 1972. The course includes the examination of case studies where important social and medical issues have arisen through the inappropriate control of chemical weapons.

### ZGEN2401

#### Astronomy

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

S2 on-campus

Staff Contact: Dr G Robinson

Prerequisite/s: See page 66 of this Handbook.

The first half of this course looks at the Solar System, combining historical observations with results from recent planetary and cometary probes. After studying the powerhouse of the Solar System, the Sun, we examine the terrestrial planets, then the outer ice and gas giants and then the debris of the Solar System - comets, meteorites and asteroids. Finally, we try to fit all these objects in with current theories on the Solar Systems formation and evolution and with the recent discoveries of planets around other stars. In the second half of the course we learn how a star is formed, its life and its eventual demise. This includes a study of the characteristics of white dwarfs, neutron stars and black holes. Next we see the place of the Sun in the Milky Way and compare our galaxy with other types of galaxies. We also consider current cosmological theories about the beginning of the Universe, the Big Bang, and try to see where we fit into the grand scheme of the cosmos and with other possible life forms.

### ZGEN2402

#### Introductory Meteorology

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

S2 on-campus

Staff Contact: Dr A Drake

Prerequisite/s: See page 66 of this Handbook.

Excluded: ZPEM2506, ZPEM2511, ZPEM2512, ZPEM3527, ZPEM4505

The course will examine the familiar synoptic chart used by weather forecasters, with the twin aims of learning how to interpret it and of understanding what it represents. Students will learn how the atmosphere changes with altitude, how wind arises, why clouds and precipitation form, and what causes storms. We will examine some specific weather systems, learn to recognise them on charts and see how meteorologists detect and predict them.

### ZGEN2403

#### Chemistry and Life

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: School Office

Prerequisite/s: See page 66 of this Handbook.

How our knowledge of chemistry has developed and its applications to the life sciences. Risk benefit analysis and the various types of laws needed to govern the use of water, pharmaceuticals, fuels and air purity. Trace-elements in the human body as well as their essentiality and toxicity; organic substances and life; general nutritional needs, including vitamins. The subject also touches on diet, diabetes, cancer and coronary heart disease in relation to health and nutrition; food preservation, storage and transport for the Defence Force; forensic science; and the justice system with particular emphasis on problems of interpretation.

### ZGEN2410

#### The Marine Environment

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: Dr A Kiss

Prerequisite/s: See page 66 of this Handbook.

The physical environment of the oceans and its impact on society. A discussion of the structure and motion of the oceans and the interaction with the atmosphere, as well as the ocean's role in weather, climate, and economics.

### ZGEN2411

#### Marine Resources

#### School of Physical, Environmental and Mathematical Sciences

UOC3 HPW2

Not offered in 2007

Staff Contact: Dr A Kiss

Prerequisite/s: See page 66 of this Handbook.

A discussion of resources of the oceans. These include fisheries, fossil fuels, desalination, mariculture and energy sources such as tides, waves and ocean thermal energy. The environmental importance of coastal regions, estuaries and coral reefs. Threats to the marine environment from human activities, marine pollution, over fishing, change in land use and coastal and offshore engineering.



**ZGEN2420****The World of Mathematics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This course is designed to introduce students to the ideas and use of mathematics, the history of the subject and some of the personalities involved. (Only elementary mathematical ability will be assumed).

**ZGEN2421****Lies, Damned Lies and Statistics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

Mark Twain once said, 'Get your facts first and then you can distort 'em as much as you please'. This course is about how to spot misleading statistics and how to draw correct conclusions from data. It is not a course in doing statistics, but rather in statistical literacy or how to make sure you don't have the wool pulled over your eyes. This is a vital skill because any decision maker, whether corporate manager or military officer, needs to base decisions on statistical information - for example about the reliability of equipment or the effectiveness of new weaponry.

**ZGEN5001****Creative Writing****School of Humanities and Social Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: Dr K Barnes****Prerequisite/s: See page 66 of this Handbook.**

This course aims to increase student skills in writing vivid, effective prose and to improve their critical awareness when reading and writing. Students will examine several model texts, then undertake a series of written exercises in a range of prose genres, such as journalism, autobiography, fiction, television and film writing.

**ZGEN5002****Literature and Film****School of Humanities and Social Sciences****UOC3 HPW2****S1 on-campus****Staff Contact: Dr H Neilson****Prerequisite/s: See page 66 of this Handbook.**

This course offers a comparative study of literature, mainly fiction and its interpretation in contemporary film. Students will examine the different demands and emphasis of each medium, including the role of the narrative and visual images in storytelling. They will learn some of the critical language appropriate to each medium and develop their own critical responses to text and film.

**Current course and  
program information  
is now available through the  
UNSW Online Handbook:**

[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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**ZGEN5113****Australia and the Asia Pacific Region****School of Humanities and Social Sciences****UOC3 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: See page 66 of this Handbook.**

This course examines Australia's role in the Asia Pacific region, with an emphasis on the challenges of the region's changing strategic realities. Australia's defence and foreign policy responses to major developments - the political instabilities in the region, the rise of China, and the changing strategic focus of the USA - will be explored. The course will examine the various options open to Australia in its attempts to become a more significant player in the region. It will look, in particular, at whether Australia must reassess its relationship with the USA in order to expand its regional role.

**ZGEN5114****Persuasive Speaking and Writing****School of Humanities and Social Sciences****UOC3 HPW2****S2 on-campus****Staff Contact: Dr K Barnes****Prerequisite/s: See page 66 of this Handbook.**

This course aims to build student skills and confidence in using language for the purposes of argument and persuasion. Historic and classic speeches (such as the St Chrispin Day speech of Shakespeare's Henry V) will be studied through the media of written text and film. Students will acquire more sophisticated language skills and employ them in writing and delivering speeches of their own. The course will include some skills traditionally associated with persuasive speaking such as arts of memorisation.

# SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

## ZHSS1101

### English 1A: Writing the Present, Imagining the Future

School of Humanities and Social Sciences

UOC6 HPW3

S1 on-campus

Staff Contact: Assoc Prof S Lever

This course explores contemporary writing and media. Understanding the present and speculation about the future are its dual emphases. You will study science fiction and fantasy, poems, film, newspapers and television. You will learn how to critically evaluate a range of material from the newspaper article and television news, to the essay, the story and the poem. You will develop an appreciation of the accepted conventions associated with each form, and the ways that these conventions organise our understanding of the material and engage different audiences. You will develop your skills in creative and critical writing. The course will include such works as George Orwell's *1984* (book and film), Iain M Banks's *The State of the Art* and an anthology of poems.

## ZHSS1102

### English 1B: The Experience of War in Fiction and Film

School of Humanities and Social Sciences

UOC6 HPW3

S2 on-campus

Staff Contact: Mr J Doyle

This course focuses on the various ways that the experience of war has been represented in a range of art forms, including poetry, the play, the novel and film. Works include such classic depictions of war as Shakespeare's *Henry V*, Remarque's *All Quiet on the Western Front*, a selection of poetry from Homer to the present, and classic war films. These works raise important questions about ethics, nationalism, politics and love. You will develop your critical reading skills and your capacity to write analytically about literary texts and film.

## ZHSS1201

### History 1A: The Age of Revolutions 1788-1918

School of Humanities and Social Sciences

UOC6 HPW3

S1 on-campus

Staff Contact: Dr L Bowman

The 'Age of Revolutions, 1788-1918' traces a number of key themes in world history throughout the 'long nineteenth century'. The course begins with 'first contact' in Australia and revolution in France and ends with the calamitous disruptions of modernism and World War One. Poised toward the end of the age of exploration, early scientific and industrial revolutions, 1788 marks the beginning of rapid global transformation. Disparities both globally and locally in wealth, power, knowledge and welfare grew at an alarming rate from 1788 until 1918. This process triggered not only revolutions, but new ideologies, lifestyles, imperial expansion, and ways of making war. By 1918 the old powers, empires, social systems, and philosophies had exhausted themselves and a new order was emerging. Issues including cultural transformations, social reform, nationalism, imperialism and industrialisation are examined within this context using, where applicable, the Australian experience as a common reference point.

## ZHSS1202

### History 1B: Age of Extremes 1918-1991

School of Humanities and Social Sciences

UOC6 HPW3

S2 on-campus

Staff Contact: Dr C Stockings

The period 1918-91 represents an 'Age of Extremes' born from the ruins of the World War One. By 1918, the old power systems had crumbled and new dynamics, power-brokers, and ideologies took centre stage. This course will investigate the global impacts of American-style capitalism, varieties of fascisms, and Soviet-style socialism. Europe's shifting role in world affairs will be set in the context of the continuing rise of global nationalism. In line with the theme of extremes, the course begins with the Bolshevik revolution and ends with the collapse of the communist utopian experiment. The age of extremes was dominated by warring ideologies, conflict and Cold War confrontation. At the same time, it experienced a global explosion of rich popular culture expressed in music and movies, fashion and fads. Beneath the dominant cultures grew subversive alternatives expressive of generational change. Again, as for History 1A, Australia will be used where appropriate as a reference point for global developments.

## ZHSS1301

### Indonesian 1A

School of Humanities and Social Sciences

UOC6 HPW6

S1 on-campus

Staff Contact: Dr M Sakai

This is the first session of a study of elementary Indonesian language and culture. Students are expected to attend at least one contact hour every day for Level 1 Indonesian courses.

## ZHSS1302

### Indonesian 1B

School of Humanities and Social Sciences

UOC6 HPW6

S2 on-campus

Staff Contact: Dr M Sakai

Prerequisite/s: ZHSS1301

This is the second session of elementary Indonesian language and culture. It builds on the entry level course Indonesian 1A.

## ZHSS1303

### Intermediate Indonesian 1C

School of Humanities and Social Sciences

UOC6 HPW5

S1 on-campus

Staff Contact: Mr P Tickell

Indonesian 1C is an intermediate level course intended for students with a pass in year 12 Indonesian or its equivalent. The course places emphasis on active oral and written competence in the Indonesian language as well as an understanding of Indonesian cultures and societies. It makes use of a variety of authentic Indonesian written and audio-visual materials.

## ZHSS1304

### Intermediate Indonesian 1D

School of Humanities and Social Sciences

UOC6 HPW5

S2 on-campus

Staff Contact: Mr P Tickell

Prerequisite/s: ZHSS1303

This course is the second-session continuation of Indonesian 1C and focuses on active oral and written competence in

the Indonesian language, as well as on an understanding of Indonesian cultures and societies.

#### **ZHSS1401**

##### **Politics 1A**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: School Office**

This course introduces students to the study of politics by focussing on Australian politics at the national level. The course is in three sections. The first explores the nature of politics. The second introduces the major actors and institutions of the Australian political system, including the Constitution and the federal system, the Parliament and the executive, the electoral system, political parties and interest groups. The third section focuses on a number of key issues, both to understand the issues themselves in more depth and to see how they illuminate the operation of the political system.

**Assumed Knowledge:** Year 11 and 12 English or English as a Second Language

#### **ZHSS1402**

##### **Politics 1B**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: School Office**

This course is designed to introduce students to the study of world politics. It addresses the broad historical context, a range of theoretical perspectives, the core institutions and some critical issues of contemporary world politics. Three themes run through the course. The first concerns the question of agency. What role do states and other actors play in world politics? The second theme asks questions about order and justice. What are the major organising principles and ethical dilemmas of world politics? The third theme relates to questions of change and continuity. What are the enduring features and transformative forces of world politics?

#### **ZHSS2001**

**Introduction to Research in Humanities & Social Sciences**

**School of Humanities and Social Sciences**

**Enrolment requires school approval**

**UOC6 HPW2**

**S1 on-campus**

**Staff Contact: School Office**

This course will introduce students to methods and problems of research in one of the disciplines of English, History or Politics. Students will undertake a research project related to the content of English 1B, History 1B or Politics 1B, as appropriate. In addition, students will participate in periodic seminar discussions focussed on major theoretical issues and perspectives in the Humanities and Social Sciences. Final assessment will be based on a research essay and a briefer reflective essay on a theoretical issue.

#### **ZHSS2002**

**Introduction to Strategic Studies**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**S1 on-campus, S2 on-campus**

**Staff Contact: Dr C Fernandes**

**Prerequisite/s:** 36 units of credit at Level 1.

**Exclusion:** BBus Program.

Strategy may be defined as the means by which states and other organised groups use force or the threat of force to obtain their objectives. This course introduces students to the main concepts

underlying this definition at the theoretical level and by the use of practical examples. Varieties of strategy, conventional armed forces, guerrilla forces and terror to achieve aims will be discussed. The place of Australia in the world will be a reference point. The course will also explore the determinants of land, naval, and air strategies and how these strategies have been integrated by various powers over the last century.

#### **ZHSS2101**

**The English Renaissance:**

**Literature of the Sixteenth and Seventeenth Century**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: Mr J Doyle**

**Prerequisite/s:** ZHSS1101 or ZHSS1102

This course focuses on the evolution of literary, dramatic and some cultural works from about 1520 to the 1680s: the literature of the period of Henry VIII; the 'Golden Age' of Elizabeth I; the early Stuarts, James I and Charles I; the Civil War and Commonwealth periods of the mid-seventeenth century; and the Restoration from 1660-1688. The course covers a period of enormous social change and incorporates some fundamental questions about what the past means to us, how we understand the past, and how we read works from the past. It explores works from various social, cultural and theoretical perspectives.

#### **ZHSS2102**

**Dream and Disillusionment:**

**Twentieth Century American Literature**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: Dr H Neilson**

**Prerequisite/s:** ZHSS1101 or ZHSS1102

This course examines works by writers from a variety of ethnic backgrounds including Anglo-American, Native American, African-American, Japanese-American. The question of what it meant to be 'an American' in the twentieth century will be explored from a range of perspectives, against a background of the history, culture and politics of the United States in the twentieth century.

#### **ZHSS2104**

**Studies in the Media**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Mr J Doyle**

**Prerequisite/s:** ZHSS1101 or ZHSS1102

This course studies some of the theories and practices of communications and media, with an emphasis on the connections between visual and written works and criticism. The course will consist of selected theoretical readings integrated with two or three broad modules of practical analysis chosen from such generic or thematic topics as: 'classic' Hollywood; writing for TV; journalism; news photographs; science fiction; documentaries; the sitcom; sports writing; Asian film; and special studies.

#### **ZHSS2105**

**Modernism and After**

**School of Humanities and Social Sciences**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: Dr K Barnes**

**Prerequisite/s:** ZHSS1101 or ZHSS1102

This course covers some of the major works of the Modernist period, 1900-1920, and of the further development and reaction

that followed it in the 1920's and 1930's. The literary works on the course are read against a background of preceding and contemporary literary, political and artistic movements.

### ZHSS2106

#### The Century's Corpse

##### School of Humanities and Social Sciences

UOC6 HPW5

Not offered in 2007

Staff Contact: Prof P Eggert

This course explores a number of themes through a study of novels and non-fiction prose from the last two decades of the nineteenth century: horror as a response to modern city life, the advent of Freudian psychology, the 'woman question' (late nineteenth-century feminism), and the emergence of detective fiction.

### ZHSS2108

#### American Renaissance and After

##### School of Humanities and Social Sciences

UOC6 HPW3

S2 on-campus

Staff Contact: Dr H Neilson

Prerequisite/s: ZHSS1101 or ZHSS1102

This course is designed to familiarise students with some of the most significant and influential authors and works of American literature of the nineteenth century. The course will enhance students' knowledge of the history, culture and politics of the United States in the nineteenth century.

### ZHSS2109

#### Romanticism and Revolution

##### School of Humanities and Social Sciences

UOC6 HPW3

S1 on-campus

Staff Contact: Dr K Barnes

Prerequisite/s: ZHSS1101 or ZHSS1102

This course is a study of Romanticism which selects from the works of such poets as Blake, Wordsworth, Coleridge, Byron and Keats, and also prose works that might include works of American Romanticism, the Gothic novel, the writings of Mary Shelley, Dorothy Wordsworth and the Bronte sisters. The course will consider the development of Romantic ideas and aesthetics in relation to the social and political upheavals of the period.

### ZHSS2110

#### Modern Drama

##### School of Humanities and Social Sciences

UOC6 HPW3

S2 on-campus

Staff Contact: Prof P Eggert

Prerequisite/s: ZHSS1101 or ZHSS1102

Beginning with the modern revival drama in the late nineteenth century, this course investigates some of the most significant approaches to stage drama up to the present time. Examples of naturalism, realism, anti-realism, absurdist drama and political drama will be included. Students will be encouraged to think about performance aspects of the works studied.

### ZHSS2111

#### Australian War Literature

##### School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: School Office

Prerequisite/s: ZHSS1101 or ZHSS1102

This course comprises a study of various works, including novels, poetry, personal memoirs and films which focus on the depiction of warfare in Australian society. Themes explored include the mythology of ANZAC, representations of the soldier, of the enemy and of violence, together with the place of love and mateship in war.

### ZHSS2112

#### Creative Writing and Reading

##### School of Humanities and Social Sciences

UOC6 HPW3

S1 on-campus

Staff Contact: Dr K Barnes

Prerequisite/s: ZHSS1101 or ZHSS1102

This course includes a detailed examination of the formal aspects of poetry. Students will examine the constraints and freedoms of poetic form and undertake the task of writing poetry in a range of forms. Examples of narrative style will be examined and part of the course will focus on the work of contemporary short fiction writers. Students will write several stories of their own in order to develop their understanding of narrative technique. The course may also include reading and writing in other genres, such as memoir.

### ZHSS2116

#### Australian Drama, Film and Television

##### School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: Assoc Prof S Lever

Prerequisite/s: ZHSS1101 or ZHSS1102

This course examines contemporary Australian stage drama and its relationship to Australian film and television drama. It begins with the post-war period, reads works from the beginning of television transmissions in 1956 and encompasses the major developments in film during the 1970s and in recent years. Particular attention will be given to the ongoing relationship of the three media, their different production conditions and assumed audiences.

### ZHSS2119

#### Post-Colonial Literature (including Travel Literature)

##### School of Humanities and Social Sciences

UOC6 HPW3

S2 on-campus

Staff Contact: Assoc Prof S Lever

Prerequisite/s: ZHSS1101 or ZHSS1102

This course selects from first-contact narratives of the Pacific, later narratives of the colonial period including early ethnographic work, and travel writing from a variety of countries from the Romantic period to the postmodern. Concepts deriving from postcolonial criticism and theory, and other sources, are explored.



**ZHSS2120****Heroism, Banditry and Manhood****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Prof P Eggert****Prerequisite/s: ZHSS1101 or ZHSS1102**

Growing up demands compromise. Incipient revolt normally gives way to conventionality and domesticity. But what happens when it doesn't? Literature is full of such cases: but why? This course looks historically at the problem via imaginative explorations of outlawry, heroism and crises in manhood in the nineteenth and twentieth centuries.

**ZHSS2121****Classic Literary Texts****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Dr H Neilson****Prerequisite/s: ZHSS1101 or ZHSS1102**

In this course students will be introduced to some of the major works of Western culture, works that have been characterised as 'canonical' texts. The concept of 'canonicity' will be explored through a selection of material that may include the Old and New Testament and works from the Greco-Roman tradition, modern European classics in translation, and major works of English literature.

**ZHSS2123****Contemporary Literary Theory and Criticism****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Mr J Doyle****Prerequisite/s: ZHSS1101 or ZHSS1102**

This course will introduce students to some significant critical theories of the late twentieth century, and to associated notions of cultural and literary canonicity. We will consider a range of debates about the place and role of literary criticism such as structuralism and post-structuralism, feminism, new historicism, and ethics, through their application to a number of key cultural texts, including fiction and poetry from the Western literary tradition.

**ZHSS2131****The Hollywood Cut: Classical Novels and Film****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr H Neilson****Prerequisite/s: ZHSS1101 or ZHSS1102**

This course examines the rise of the novel in the eighteenth century, its great flowering in the Victorian period, and its adaptations into film in the twentieth century. Novels by such authors as Daniel Defoe, Jane Austen, George Eliot, Thomas Hardy, E.M. Forster, Virginia Woolf and George Orwell will be studied in the course.

**ZHSS2133****Contemporary Australian Literature****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Assoc Prof S Lever**

This course examines the range of Australian writing published since Federation. It begins with a consideration of the place of the traditional literary genres of poetry and the novel, then proceeds to look at the rise of autobiographical writing and writing for the stage, television and film since the 1970s. The course will examine some of the contextual influences on the changing status of literary genres in Australia.

**ZHSS2134****Special Studies (English) I****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2135****Special Studies(English) II****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2201****East Asia: Between Tradition and Modernity****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Assoc Prof S Lone****Prerequisite/s: ZHSS1201 or ZHSS1202**

The aim of this subject is to understand the impact on nineteenth century China and Japan of growing immersion in an industrial world economy dominated by the Western imperialist powers. In particular, it looks at the ideas of 'tradition' and 'modernity' in East Asia and the reasons why China and Japan responded in such contrasting ways to the challenge of 'Western' culture.

**ZHSS2202****Modern Australia: Politics and Culture****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr F Cain****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course explores the major themes in Australian political, cultural and economic history in the twentieth century. Topics include relationships between external events and domestic politics, the changing political consequences of Federal-State financial arrangements, the significance of wars in the expansion of Commonwealth powers, the reforms of the Whitlam era, the changing roles of women in Australian society, and the role of the Australian film industry in the evolution of a distinctive Australian culture.

**ZHSS2203****Naval History and Sea Power in the Twentieth Century****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Dr L Reeve****Prerequisite/s: ZHSS1201 or ZHSS1202**

We will study navies and sea power, on the international stage, c.1890 to the present, especially navies as a vital part of the wider context of twentieth-century history. The emphasis will be on strategic and grand strategic, rather than tactical themes, although these will feature in case studies (e.g. the Battle of the Atlantic). Topics will include Mahan and the classical maritime strategists, the world wars at sea, sea power and the British empire, the Cold War, the Falklands War, current issues and the future of sea power, naval command, and the personal experience of naval warfare.

**ZHSS2204****Rise of Modern Navies and Sea Power****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr L Reeve****Prerequisite/s: ZHSS1201 or ZHSS1202**

We will study navies and sea power from the age of discovery to the age of steam in the context of European political, economic and imperial history. We will explore the ideas of influential strategists such as Mahan through their historical writings. Topics will include the gunpowder revolution at sea, privateering and piracy, the rise of state navies, strategy and tactics, naval command from Drake to Nelson, life at sea and the experience of naval warfare from the Spanish Armada to Trafalgar and beyond, and the role of sea power in major wars, trade, empire, and international law.

**ZHSS2206****Social Change in East Asia****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007 on-campus****Staff Contact: Assoc Prof S Lone****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course charts the social and ideological changes in Japan and China over the twentieth century. The focus is on such themes as the rise of militarism, the reaction to capitalism, ideas of democracy, nationalism and individual rights. The intention is to understand how the states and peoples of present-day East Asia have come to view themselves and their position within a globalised culture.

**ZHSS2207****Soviet History****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Dr L Bowman****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course tracks the dramatic rise and fall of the Soviet utopian experiment from 1917 to 1991. Revolution, wars, famine, purges, economic upheavals and cultural subversions dot the treacherous landscape of Soviet history. We will investigate both the issues and the actors of the Soviet past. Finally, the course will survey Russia's ongoing crisis of political, national, cultural and military identity.

**ZHSS2209****The Making of Contemporary Society****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr L Bowman****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course will investigate the people, events and issues that have shaped contemporary society from 1950 to the present. Music reverberates throughout the course as a signpost of change. Pivotal themes are race relations, sexuality and gender in Australia, the United States, and the United Kingdom. We will also examine the impact of the Vietnam War, post-war immigration, and the technology explosion. Students will take a critical look at the importance of iconic figures such as Malcolm X, the Rolling Stones, Germaine Greer, Marilyn Monroe, Cold Chisel and Midnight Oil.

**ZHSS2210****The Origins of Modern War****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Prof J Grey****Prerequisite/s: ZHSS1201 or ZHSS1202**

The course emphasises the changing nature of warfare and the forces employed in it, discussing such topics as the emergence of professional standing armies, the growth of centralised bureaucratic power, the development of staff systems and of professionalism, problems of reform, and the influence of wider political, social and economic factors.

**ZHSS2211****The Second World War****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Ms D Lackerstein****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course will give students an understanding of the greatest conflict in history through a broad coverage of its military, social, political, economic and moral aspects. The course traces the major campaigns and key turning points of the military war and deals with the impact of the war on the home fronts and under German occupation. Students will be introduced to the moral issues raised by this world conflict and the differing historical interpretations of them: the barbarisation of warfare, the Final Solution, the dropping of the first atomic bomb and the trials that ended the war.

**ZHSS2212****Australian Military History 1788 to the Present****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: School Office****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course is designed to provide students with an understanding of the impact of war, the military, and defence issues generally on the development of Australian society over the two hundred years of European settlement, with an emphasis upon the period since 1899. While not neglecting the pre-Federation period, the focus of the course is on substantive issues arising from involvement in Australia's wars in the twentieth century and the periods of peace between them.

**ZHSS2214****The History of Indonesian Defence Policy****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course will examine the history of Indonesia's defence and security-related foreign policies, and activities since independence. Issues discussed will include: the colonial legacy and occupation, the indivisibility of internal and external threat; the absorption of West Papua, confrontation with Malaysia, and the invasion of East Timor; the strategy of Total People's Defence; maritime security; the history of relationships with China, the United States and Australia; and the imperatives of, and impediments to, regional security cooperation.

**ZHSS2216****US Military History: a survey from colonial times to the present****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Prof J Grey**

This course will provide students with a basic grounding in the military history of the United States, the current global superpower and Australia's key strategic partner. Following consideration of the colonial origins of the American military and early colonial military experience, the course will examine the evolution of the American way of war across the 18th-20th centuries. Attention will focus on the development of the US armed forces, the growth of national security machinery, the role of the military in westward expansion and the creation of an American empire, the military as a vehicle for social engineering, the marriage of American technology with American war making, and the political economy of the US military, amongst others. It will conclude with consideration of developments since the September 11 attacks.

**ZHSS2217****Genocide: Crime of Crimes****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Ms D Lackerstein****Prerequisite/s: ZHSS1201 or ZHSS1202**

The phenomenon of genocide has been called 'the crime of crimes'. This course seeks to give the student an understanding of the history of genocide in the modern world. The main focus of the course is on the twentieth century and on the Jewish Holocaust during the Second World War. The course also takes a comparative approach by examining genocides, the origins of the concept and contemporary debates surrounding its definition and prevention. Students will explore issues such as: the link between genocide and war; motivation of perpetrators; the moral dilemmas of victims and bystanders; and how the definition of genocide as a crime in international law affects the policy of modern states. Students will also examine the most recent historical arguments about genocide, including the question of colonial genocide.

**ZHSS2218****Special Studies (History) I****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2219****Special Studies (History) II****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2220****Australian Colonial History: The founding of a new society****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Dr F Cain****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course will trace the history of the six Australian colonies during the nineteenth century and examine the nature of the social and political relations during that settlement and its impact on the Aboriginal people. Further analysis will be given to how the Australians perceived their role in the context of the 19th Century British Empire; the evolution of pastoral and manufacturing industries and the importance of economic protectionism; the development of the Australian social classes; the emergence of political structures; the nature of urban development; and the progress towards the establishment of the Australian federation.

**ZHSS2221****Ireland and Britain: 1879-1998****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Dr D Blaazer****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course examines the relationship between politics and violence in conflicts over nationality and identity in Ireland since the late nineteenth century. After identifying the historical basis of the conflicts between Ireland's divergent religious, national, cultural and political traditions, we will examine the development of the conflicts from the emergence of a powerful constitutional nationalist movement after 1879, to the Good Friday Agreement of 1998, which appears to have laid the basis for a lasting peace. Throughout, we will focus on understanding why political groups have sometimes adopted and sometimes abandoned the use of violence to further their aims. In doing so we will encounter some of the key themes of modern history, including relationships between: religion, nationality and identity; colonialism and post-colonialism; terrorism and counter-terrorism; economic development and under-development; and the role of the international community in the internal affairs of sovereign states.

**ZHSS2223****Indian Society****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Assoc Prof S Lone****Prerequisite/s: ZHSS1201 or ZHSS1202**

A survey of Indian political and social change starting from the creation of a single dominant government under the Mughals in the seventeenth century and continuing to the present. Topics and themes to be covered include: the nature of rule over a polytheistic, multi-lingual society by an Islamic warrior elite; the importance of Indian co-operation in the short era of British dominion; the realities of romanticised British life under the Raj; the strength historically of Indian commerce both in the bazaar

and across the Indian Ocean; Gandhian nationalism and non-violence; the post-1945 principle of non-alignment; the rise of the world's largest middle class in the late twentieth century; and the appeal overseas of Indian culture from the 1960s-1990s. Tutorials will look at such things as the world-view of Hinduism; the use of architecture to display power in the Taj Mahal and the creation of New Delhi; women, costume and identity; and the recurring cultural motifs of Bollywood cinema.

**ZHSS2224****Rise and Fall of Imperial Germany**

School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: Prof D Lovell

Prerequisite/s: ZHSS1101 or ZHSS1102

This course examines the rise of the state of Prussia from the 18th Century on the unification of Germany and the creation and destruction of the German Empire, in a broader context of 18th to early 20th century European history. It examines the history of the German states, the unification of Germany and the internal and external development and influence of German military, economic and cultural power using the organising theme of 'German problem'.

**ZHSS2225****Rise and Fall of Nazi Germany**

School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: Prof D Lovell

Prerequisite/s: ZHSS1101 or ZHSS1102

This course examines the rise of National Socialism in the framework of the failure of Germany's first republic (the Weimar Republic) and the creation and destruction of the Nazi dictatorship, in the broader context of Nazism's significance for 20th Century history. It traces the nature of National Socialism and the characteristics of its rule both inside Germany and in its attempts to dominate Europe and the world.

**ZHSS2301****Indonesian 2A**

School of Humanities and Social Sciences

UOC6 HPW5

S1 on-campus

Staff Contact: Mr P Tickell

Prerequisite/s: ZHSS1302

This is the first session of an intermediate level of a study of Indonesian language and culture which focuses on oral competence in Indonesian as well as providing an understanding of Indonesian cultures and society. Students are expected to attend at least one contact hour per day.

**ZHSS2302****Indonesian 2B**

School of Humanities and Social Sciences

UOC6 HPW5

S2 on-campus

Staff Contact: Mr P Tickell

Prerequisite/s: ZHSS2301

This is the second session of an intermediate-level study of Indonesian language and culture which focuses on oral competence in Indonesian as well as providing an understanding of Indonesian cultures and society.

**ZHSS2303****Advanced Indonesian 2C**

School of Humanities and Social Sciences

UOC12 HPW6

S1 on-campus

Staff Contact: Ms M Nurhayati

Prerequisite/s: ZHSS1304

This is the first session of an advanced-level Indonesian language course for students who have completed Indonesian 1C and 1D or equivalent. The course emphasises advanced levels of oral and written competence in the Indonesian language as well as an understanding of Indonesian cultures and societies. The course makes use of authentic Indonesian language materials from the press, literature and mass media.

**ZHSS2304****Advanced Indonesian 2D**

School of Humanities and Social Sciences

UOC12 HPW6

S2 on-campus

Staff Contact: Dr E Jurriens

Prerequisite/s: ZHSS2303

This course is the second session continuation of Indonesian 2C, which further develops advanced levels of oral and written competence in the Indonesian language and an understanding of Indonesian cultures and societies.

**ZHSS2305****Special Studies (Indonesian) I**

School of Humanities and Social Sciences

Enrolment requires school approval

UOC6 HPW3

S1 on-campus

Staff Contact: School Office

Prerequisite/s: School consent required

Please contact the School Office for further information.

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**ZHSS2306****Special Studies (Indonesian) II****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2401****Japan: From Warmonger to Peacekeeper****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Assoc Prof A George Mulgan****Prerequisite/s: ZHSS1401 or ZHSS1402**

How does a country infamous for its imperialist aggression in the first half of the 20th century transform itself into a global civilian state? This course examines the policies, concepts and processes behind the remaking of Japan's international image. It evaluates the constitutional legacy of WWII, Japan's experience of American occupation, and the rhetoric and reality of Japanese pacifism. The course questions whether the limits to Japan's military power, its predilection for chequebook diplomacy and its non-military security contributions make it an international anomaly. Japan's alternative security futures are also assessed by examining its desire to be a 'normal' state and the resurgence of Japanese nationalism.

**ZHSS2402****Political Cultures in Asia and the Pacific****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr J Walker****Prerequisite/s: ZHSS1401 or ZHSS1402**

This course introduces students to the analysis of culture as a source of social and political action and understanding, exploring relationships between political forms and culture in Asia and the Pacific. The unit will draw examples from India, Indonesia, Malaysia, Japan and the Pacific. This Politics course may be taken as part of the Indonesian-Malay studies minor.

**ZHSS2403****Politics of China****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr J Zhang****Prerequisite/s: ZHSS1401 or ZHSS1402**

This course introduces the structure and working of the political system of China. It examines the working through of China's revolution before and since 1949. The course includes such topics as the role of the Communist Party, and other formal and informal political groups. It examines political leadership in China, the role of the military, political dissent and opposition, the significance of Marxism-Leninism-Mao Zedong Thought, the tensions between capitalism and socialism, the prospects for change, and the values and interests involved in policy-making and social control.

**ZHSS2404****Politics of the USA****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Mr M Mackerras****Prerequisite/s: ZHSS1401 or ZHSS1402**

The USA is the world's most important power and its longest continuous democracy, but its current President was elected by less than 30 per cent of its voters. At his first election in 2000 he even received fewer votes than his main opponent! Furthermore, 'the land of the free' imprisons its people at a per capita rate six times that of the world's second most imprisoning democracy. This course explains why these things are so and consists of an examination of the American Constitution, the federal system, the Supreme Court and executive-legislative relations. Attention is also given to major current controversies in the United States.

**ZHSS2407****War and Politics****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZHSS1401 or ZHSS1402**

The way that war is defined or declared is an inherently political process because it reflects underlying assumptions and overarching agendas concerned with human nature, rational choice, ethics, social attitudes or even civilisation values. In turn, these claims inform debates about the just cause or conduct, management, resolution or elimination of war. War seems endemic in human history but it has also undergone radical transformation. How will war in the twenty-first century be shaped by technology, tribalism, globalisation and democratisation? Drawing upon both classical and contemporary debates, this course will examine the complex relationship between war and politics.

**ZHSS2408****Civil-Military Relations in the Asia-Pacific Region****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZHSS1401 or ZHSS1402**

How do states control their armed forces in order to prevent military intervention in domestic politics? The Asia Pacific Region provides two models of successful civilian control over the military: liberal democratic states where the armed forces do not play a political role and communist states where the military plays a highly political role. Elsewhere in the region the pattern is mixed. Several states have experienced repeated military intervention followed by a return to civilian rule while other states remain firmly under military control. This course examines these varying patterns of civil-military relations and military intervention in selected countries from the Asia Pacific Region.

**ZHSS2410****Modern Political Ideologies****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Prof D Lovell**

Politics may appear to be simply a struggle between different interests for 'who gets what', but ideas are important. During the twentieth century millions of people supported, and died in the name of, fascism and communism. Such ideologies may be finished and everybody may nowadays be a democrat, yet people differ over what is just and free. Ideas ground political

institutions; they guide policies; and they shape political struggles. This course investigates the foundational ideologies of modern politics - liberalism, conservatism and socialism - and explores the ideologies that contend with democratic systems, including feminism, multiculturalism and environmentalism.

**ZHSS2411****Political Change in Indonesia****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZHSS1201 or ZHSS1202**

This course explores the processes through which political regimes in Indonesia were established and maintained, and the means through which they were overthrown. The course will pay particular attention to Indonesian political cultures, political identities, the relationship between economic and political development and decay, the coercive powers of the state, and the role of dissenters. This course may be taken as part of the Indonesian-Malay studies minor.

**ZHSS2412****Politics of Australian Security****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Prof S Woodman****Prerequisite/s: ZHSS1401 or ZHSS1402**

This course will examine current and future issues facing Australian national security planners. It will cover the major challenges relating to Australian foreign and defence policy, as well as broader issues relating to homeland security.

**ZHSS2414****Regional Security Issues****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Prof J Cotton****Prerequisite/s: ZHSS1401 or ZHSS1402**

The regional security environment is rapidly changing. Where once, we looked chiefly to territorial disputes between states, we are now aware of the many other ways in which security may be threatened. These include concerns over environmental degradation, access to fresh water, drug and arms trafficking, terrorism, and issues of governance and corruption. The countries of our region are affected by many of these problems, but they have also begun to cooperate on issues of security concern through bodies such as ASEAN. This course examines the many challenges to regional security, and the responses to them.

**ZHSS2415****Politics of International Law****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course will survey international law, focusing on world order issues of legal and political importance. The major principles and concepts of international law will be surveyed as well as the functions and processes of international legal rules. The course will address specific legal problems found in world politics such as human rights, war, terrorism, environmental regulation and economic development. Particular attention will be given to the structure and processes of international and regional organisations, most especially the role, function and utility of the United Nations.

**ZHSS2416****The Comparative Politics of Southeast Asia: Political Transition and Political Change****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Prof C Thayer**

The Politics of Southeast Asia is a broad survey course of the eleven political systems making up the Southeast Asian region: Brunei, Burma (Myanmar), Cambodia, East Timor, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Vietnam. The focus is on the contemporary period. The course critically evaluates various frameworks that are employed by political scientists to understand the political process: democratic, electoral democracy, semi-democratic, semi-authoritarian, authoritarian pluralist, Leninist and military regime. Then the course examines in detail constitutional structures, the process of political change and transition, leadership, opposition, civil society, the political role of the military, political Islam, corruption and crony capitalism, and political violence and armed separatism.

**ZHSS2417****Ethnopolitics****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr G Mount**

This course examines the relationship between 'ethnicity' (broadly defined) and politics. Students will be introduced to the conceptual debates within the multidisciplinary field of ethnic studies and will be required to critically assess the political dynamics of specific case studies. Part I examines definitional debates about ethnicity and nationalism and considers the relationship between theory and policy. Part II compares and contrasts various political and social contexts where ethnic cleavages have become sources of conflict and those where communal differences have not lead to conflict. In particular the claim that democracy and civil society offer some insurance against ethnic conflict will be scrutinised. Part III examines the international politics of ethnic conflict. Many contemporary ethnic conflicts have their origins in the legacies of imperialism. Modern forces such as globalisation have exacerbated or ameliorated the conditions for ethnic conflict. Part IV surveys strategies for the management, resolution and reconciliation between ethnic communities.

**ZHSS2418****Plagues and Politics****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZHSS1401 or ZHSS1402**

Infectious disease threats to human health are a constant source of dread for individuals and governments. Whether one contemplates the fourteenth century Black Death in Europe or the latter-day prospect of a global influenza outbreak, pathogenic micro-organisms appear to exercise a powerful influence over civilised humankind. This course explores the political significance of particular infectious diseases throughout history (for example, smallpox, bubonic plagues, cholera and influenza) as well as the contemporary challenges for international health governance and economic development posed by new diseases such as AIDS, SARS and multidrug-resistant TB. The course also assesses the implications of national and international security of infectious disease threats arising either through natural processes or as a result of human agency (for example, biological weapons).

**ZHSS2420****Special Studies (Politics) II****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: Prof D Lovell****Prerequisite/s: School consent required**

Please contact the School Office for further information.

**ZHSS2501****Contemporary Muslim Identity in Indonesia and Beyond****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus****Staff Contact: Dr M Sakai****Prerequisite/s: Any two of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1401 or ZHSS1402**

The course examines transformations in contemporary Muslim communities around the world with a focus on Indonesia. It will introduce students to Muslim religious belief and practices and their historical development in Indonesia. It will also explore the status of women and the relations between Muslim organisations and the state, and highlight activities of trans-national Muslim communities in the world. This course may be taken as part of a minor or major in History or Politics, or as part of the Indonesian-Malay studies Minor.

**ZHSS2502****Becoming Indonesian: Regional, National and Global Identities****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Mr P Tickell****Prerequisite/s: Any two of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1401 or ZHSS1402**

This course explores the interplay between regional, national and global "identities" (i.e. how people perceive themselves and their group affiliations) in Indonesia in the twentieth and twenty-first centuries. In particular it looks at the emergence of a dominant, yet in many ways minority national culture and polity in Indonesia in the 20th Century, the way this culture/polity is linked to European colonialism, its antecedents within Indonesian culture and politics, its appropriation of regional cultures, its creation of "tradition", its expression in literature and the arts, its complex relationship with Islam and pan-Islamic identities, and the influences of modern technologies on identities, in particular radio, television, and the internet. This course may be taken as part of a major or minor in History or Politics with the permission of the Head of School, or as a part of the minor in Indonesian-Malay Studies.

**ZHSS2503****State Systems in Pre-Colonial Southeast Asia****School of Humanities and Social Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr J Walker****Prerequisite/s: Any two of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1401 or ZHSS1402**

This course focuses on processes of state formation in southeast Asia, on the nature of the pre-colonial state and on relations between states and non-state forms of organisation and identity, e.g., tribes, with a particular focus on the Malay peninsula and Indonesian archipelago. This course may be taken as part of a major or minor in Politics or as part of the Indonesian-Malay studies minor. It may be taken as part of a major or minor in History with the permission of the Head of School.

**ZHSS2600****Practical Ethics for the 21st Century****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Dr S Coleman****Prerequisite/s: Any two of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1401 or ZHSS1402**

Constant changes in both the global environment in the 21st Century and the expectations placed upon the military combine to make new and increasingly complex ethical demands upon officers of the Australian Defence Force. This course introduces students to ethical theory and debate with reference to various issues they will face as future officers in the military and as citizens of Australia. Topics to be discussed in the course will be selected by the studies and may include discussion of topics such as cloning, euthanasia, the environment, global poverty, terrorism, capital punishment, privacy and ethical issues for the military.

**ZHSS2902****Humanities & Social Sciences Research Project 1****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****S2 on-campus****Staff Contact: School Office**

Students will undertake a research project on a nominated topic in a specific discipline area commensurate with their year of study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZHSS3301****Indonesian 3A****School of Humanities and Social Sciences****UOC12 HPW6****S1 on-campus****Staff Contact: Ms M Nurhayati****Prerequisite/s: ZHSS2302**

This is the first session of an advanced Indonesian course, which focuses on oral competence in Indonesian as well as providing an understanding of Indonesian cultures and society. Students are expected to read and respond to authentic Indonesian materials. They should develop advanced language skills as well as a good understanding of the topics covered in class. Students are expected to attend at least one contact hour per day.

**ZHSS3302****Indonesian 3B****School of Humanities and Social Sciences****UOC12 HPW6****S2 on-campus****Staff Contact: Dr E Jurriens****Prerequisite/s: ZHSS3301**

This is the second session of an advanced Indonesian course, which focuses on oral competence in Indonesian as well as providing an understanding of Indonesian cultures and society. Students are expected to read and respond to authentic Indonesian materials. They should develop advanced language skills as well as a good understanding of the topics covered in class. Students are expected to attend at least one contact hour per day.

**ZHSS3303****Reading Course in Indonesian I****School of Humanities and Social Sciences****UOC6 HPW3****S1 on-campus****Staff Contact: Dr E Jurriens****Prerequisite/s: ZHSS2304**

This reading course consists of reading and translating the Indonesian texts on contemporary Indonesian society and culture, followed by discussions in the Indonesian language. Readings will be organised in line with the key themes relating to Indonesian society and culture. Medium of instructions will be Indonesian.

**ZHSS3304****Reading Course in Indonesian II****School of Humanities and Social Sciences****UOC6 HPW3****S2 on-campus****Staff Contact: Dr E Jurriens****Prerequisite/s: ZHSS3303**

This reading course consists of reading and translating the Indonesian texts on contemporary Indonesian society and culture, followed by discussions in the Indonesian language. Readings will be organised in line with the key themes relating to Indonesian society and culture. Medium of instructions will be Indonesian.

**ZHSS3901****Humanities and Social Sciences Research Project 2****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****S1 on-campus****Staff Contact: School Office**

Students will undertake a research project on a nominated topic in a specific discipline area commensurate with their study at Year 3 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZHSS3902****Humanities and Social Sciences Research Project 3****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****S2 on-campus****Staff Contact: School Office**

Students will undertake a research project on a nominated topic in a specific discipline area commensurate with their study at Year 3 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZHSS4191****English 4 (Honours) Full-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC24 HPW4****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in English at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

**ZHSS4192****English 4 (Honours) Part-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12 HPW2****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in English at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

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**ZHSS4201****History 4 (Honours) Full-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC24 HPW4****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in History at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

**ZHSS4202****History 4 (Honours) Part-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12 HPW2****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in History at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

**ZHSS4491****Politics 4 (Honours) Full-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC24 HPW4****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in Politics at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

**ZHSS4492****Politics 4 (Honours) Part-Time****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12 HPW2****S1 on-campus, S2 on-campus****Staff Contact: School Office****Prerequisite/s: Completion of a major in Politics at Credit level or better.**

Students will complete a thesis of approximately 15,000 words, together with advanced coursework to be determined by the Head of School.

**ZHSS8001****Professional Practice****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6****S1 on-campus, S1 distance****Staff Contact: School Office**

Research project on a topic of relevance to the program undertaken plus report in approved form.

**ZHSS8102****American Empire****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus, S2 distance****Staff Contact: Dr H Neilson**

The roles of religion, ancestry, race and politics in the formation of contemporary American cultural identity are examined in this course, which ranges over nineteenth- and twentieth-century literary and cinematic forms.

**ZHSS8103****Nearest Neighbours: Asia-Pacific Literature and Culture****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus, S1 distance****Staff Contact: Dr S Gleeson-White**

The course ranges over selected literary and cinematic works of cultures of the Asia-Pacific region including those works generated or affected by contact with the West. Concepts such as homeland, community, Asian-ness and Orientalism will be examined. Focus on specific countries of the region will change from year to year, and may include travel writing and early ethnographic writing about first and later contacts between Europeans and local cultures.

**ZHSS8106****War and Memory****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus****Staff Contact: Mr J Doyle**

The course analyses the ways in which cultural forms such as novels, plays, essays, poetry, film and memorials represent the experience of war and, in doing so, transform it. It goes on to examine the various effects of these transformations in the personal, cultural and political spheres. From year to year, different wars and cultures may be chosen as the primary focus, and the course may range from the so-called home front during the war in question to its cultural aftermath.

**ZHSS8108****Out of Empire: British and Literature Culture****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007**

This course examines the achievements of and tensions within a selected period of British cultural life, with emphasis on its literary forms in context. Literary modernism of the early twentieth century, fiction and film since the 1960s, and Victorian fiction and autobiography are among the areas offered in this course, from year to year.

**ZHSS8109****Australian Literary Culture****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course explores a variety of genres in Australian writing with a view to examining the formation of key ideas and images in Australian culture and society. Special attention will be given in 2005 to Robbery Under Arms, versions of the Ned Kelly myth and narratives of social justice and freedom in contemporary Australia.

**ZHSS8112****Special Study****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

Please contact the School Office for more information.

**ZHSS8115****Literary Theory and the History of Communication****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Mr J Doyle Prof P Eggert**

This course provides an introduction to literary theory, textual scholarship and the history of the book. The course ranges widely from the empirical to the theoretic, selecting from topics such as orality vs literacy, writing systems, book-production and reading practices, the emerging writing and reading practices of electronic textuality, to concepts such as authorship, authenticity, text, work and document. Some of the most influential literary, cultural and editorial theories of the last half-century will be dealt with.

**ZHSS8119****Academic Discourse I: Analysis and Writing (for international students)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****S1 on-campus, S2 on-campus****Staff Contact: Ms J Gibson**

Designed primarily for international students, this course aims to enable students to study academic discourse and to develop the language skills necessary to read effectively and write appropriately in an academic context. The course will develop note-taking, paraphrasing and summary writing skills. Students will critically evaluate a reading specific to their particular disciplines, write a critical review and practise sentence and paragraph construction to develop their essay writing skills. Attention will also be paid to grammatical features, identified in the diagnostic test, which enable writers to convey meaning with greater precision.

**ZHSS8120****Academic Discourse II: Analysis and Writing****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Ms F Cotton**

Designed primarily for international students, this course aims to enable students to study academic discourse and to develop the language skills necessary to read effectively and write appropriately in an academic context.

**ZHSS8122****Research Project - English (Single Session)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: Prof D Lovell**

Research project on a topic of relevance to the program undertaken, plus report in approved form.

**ZHSS8123****Research Project - English (Full Year)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance****Staff Contact: Prof D Lovell**

Research project on a topic of relevance to the program undertaken plus report in approved form.

**ZHSS8201****Contemporary Warfare****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This subject deals with conventional warfare as it has developed in the half century or so since the end of the Second World War. Its basic focus is the operational level of war, and it examines aspects of the subject to include guerrilla warfare and low intensity conflict, the evolution of combined arms warfare, amphibious operations, expeditionary warfare and warfare in littoral environments, conventional mobile operations and issues of higher command and decision making, amongst others. It deals with a mixture of thematic issues and specific case studies, grouped around seminar-based instruction.

**ZHSS8202****The History of Australian Defence and Foreign Policy****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus, S1 distance****Staff Contact: Dr F Cain**

This course in the history of defence and foreign policy in Australia examines not only how defence and foreign policy is formed and carried out by political leaders, governments and the official departments, but also the responses to those policies by the Australian people. The course deals with central defence and foreign policy issues in the 20th Century and early 21st century including the breaking of ties with Britain, the US alliance and connections with Asia. Such issues are examined against changes in the economy, political change, industrial development and trading relationships.

**ZHSS8203****History of Pre-Nuclear Military Thought****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

The course surveys the development of western military theory from the mid-eighteenth to the mid-twentieth centuries by looking at the works of a number of writers. Their work is placed in the context of the prevailing theory and practice of the time, and their influence or lack of influence is assessed. While it might seem at first glance that these writers have no relevance to contemporary defence problems, least of all in Australia, a closer examination of pre-nuclear theorists shows that the questions they have grappled with have been remarkably constant, and that a study of those questions in their historical context can help sharpen and clarify an assessment of contemporary issues.

**ZHSS8204****Modern Naval History and Strategy****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus, S2 distance****Staff Contact: Dr L Reeve**

We will study navies and sea power in the modern world, from the 1890s to the present, concentrating on various thematic issues. The approach will be international, including Australia and the Asia-Pacific. Themes will include how far classical arguments for sea power remain valid, how far there are naturally naval and continental powers and national naval strategic traditions, how far navies have special capabilities, and modern naval and maritime strategic ideas. Other topics will include naval command and commanders, naval tactics, amphibious and joint warfare, sea power and grand strategy, and contemporary circumstances and the future of sea power.

**ZHSS8205****Occasional Elective****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****TBA****Staff Contact: School Office****ZHSS8207****Case Studies in War****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course investigates command, strategic and tactical decision-making in various wars. Emphasis will be placed on wars of the 20th Century (the Boer War, the First World War, the Second World War, the Korean War, the Vietnam War and more contemporary conflicts). Some case studies, however, may be drawn from the 19th Century or from earlier periods. A feature of this course is that students can expect to be involved with political, strategic and tactical decision making in the form of role-play. The wars to be studied will vary from year to year according to staff availability.

**ZHSS8212****Research Project - History (Single Session)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: Prof D Lovell**

Research project on a topic of relevance to the program undertaken plus report in approved form.

**ZHSS8423****Asia-Pacific Security - Special Study****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Prof J Cotton****Prerequisite/s: ZHSS8422**

This course builds on ZHSS8422 Asia-Pacific Security: Regional Security in the New Millennium. It offers students the opportunity to undertake in-depth study into a specific aspect of Asia-Pacific security through a combination of tailored seminars and an extended research paper of 6000-8000 words. The area/s in which

work may be undertaken in a particular session are nominated by the School. Completion of ZHSS8422 is a pre-requisite.

**ZHSS8215****Research Project - History (Full Year)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance****Staff Contact: Prof D Lovell**

Research project on a topic of relevance to the program undertaken plus report in approved form.

**ZHSS8400****Research Project - Politics (Single Session)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Office**

Research project on a topic of relevance to the program undertaken, plus report in approved form.

**ZHSS8401****Research Project - Politics (Full Year)****School of Humanities and Social Sciences****Enrolment requires school approval****UOC12****S1 on-campus, S1 distance****Staff Contact: Prof D Lovell**

Research project on a topic of relevance to the program undertaken, plus report in approved form.

**ZHSS8403****Global Security****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus, S1 distance****Staff Contact: Dr C Enemark**

This course considers the nature of security and security studies in the context of global politics. Attention is given to contending theoretical perspectives, the role of strategic culture in defining interests, globalisation, the changing nature of deadly conflict, the dilemmas of weak states, the growing desperation of the world's poor, and ethnic conflict. The course also takes a particular interest in non-military transitional threats such as environmental degradation, human migration, infectious diseases and other issues that influence how security is understood.

**ZHSS8404****Legal and Moral Problems of International Violence****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus, S2 distance****Staff Contact: Dr S Coleman**

Most states, most of the time, seek to justify their use of violence against other states, using both legal and moral arguments. The course first examines the much-disputed relationship between law, morality and politics. It then explores topics such as: just war and self-defence; armed intervention with other states (from assassination to humanitarian intervention); laws of armed conflict; terrorists, irregulars and mercenaries; regulation of weapons of war; use of force by the United Nations; and enforcement of law by international courts. The course also asks whether individuals, civilian and military, can conscientiously object to violence by their state.

**ZHSS8405****Security Issues in Northeast Asia****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Assoc Prof A George Mulgan**

The purpose of this course is to examine in depth the contemporary strategic dynamics of the Northeast Asian region. The course will examine the nature and regional impact of the security policies and roles of the four major powers whose interests intersect in Northeast Asia, the implications for regional security of recent developments in America's bilateral alliances with Japan and South Korea and in US relations with China, the interaction between two aspiring regional hegemonies (China and Japan), and possible sources of tension and conflict. The potential consequences of US-sponsored missile defence programs and the management of territorial disputes will be considered.

**ZHSS8406****Occasional Option****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6 HPW2****TBA****Staff Contact: School Office****ZHSS8409****Asia-Pacific Security: The Dynamics of Change****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course examines the key elements shaping the Asia-Pacific security environment in the early 21st century. It blends an understanding of the principal themes and trends that are influencing the progress of the region as a whole with detailed insights into particular nations and the strategic issues most likely to impact on its future direction and stability. Students will be encouraged to explore the main issues in depth and to identify the relationships between them and their practical implications for policy makers. Particular attention is given to analysing security flashpoints and to the new security challenges.

**ZHSS8410****Australian Defence Policy: Concepts and Challenges****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course provides an in-depth understanding of the dynamics of Australia's strategic and defence policy and the challenges that it is facing in both determining priorities and bridging the gap between desired ends and available means. It examines how the current policies have evolved, the factors that will determine their future shape, and the options available for resolving current and prospective dilemmas. Attention is given to the balance between defence of Australia tasks and broader security commitments, to the tools for producing sustainable capacity (personnel, equipment and national support), and to the complexities of managing security relations with others.

**ZHSS8411****Developing Strategic Policy in the Twenty-First Century****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Prof S Woodman**

This course examines the challenges that strategic defence planners are facing in the new security environment and illuminates the key judgements they must make in developing an effective policy response. It analyses the changing dimensions of security, the shape of future conflict, and the policy tools for managing these developments. Strategies for responding to these changes are considered together with their implications for capability development and operational planning. Emphasis is given to the challenges facing middle and smaller powers and to an understanding of how all the different elements might contribute to preparing a major strategic policy review.

**ZHSS8413****Southeast Asia: Issues in Security Cooperation****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Prof C Thayer**

Why do nations cooperate to ensure their security? Do they do so because it is in their national interest? Or do they do so because they place a value on cooperation as an end in itself? Are security regimes more enduring than security communities in providing a framework for regional order? The course reviews the major traditional and non-traditional security challenges to regional order in Southeast Asia. The course also critically evaluates contemporary security cooperation under the auspices of the ASEAN Regional Forum, the United States and other concerned countries. The course concludes with a crisis exercise in which participants role play.

**ZHSS8415****Terrorism and Transnational Crime****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus, S2 distance****Staff Contact: Mr A McFarlane**

This course examines the relationship between globalisation, terrorism and transnational crime. It takes a practical view of the effects of the rise of terrorism and the transnational crime on Australian democracy and Australian security.

**ZHSS8416****Seeking the Information Edge: The Role of Modern Intelligence****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus, S1 distance****Staff Contact: Dr C Fernandes**

This course promotes an understanding and awareness of the key challenges facing intelligence policy in the new strategic environment. Its framework is broader than defence, encompassing the wide range of security challenges now confronting nations. It aims to promote a whole of government understanding and approach to the role of modern intelligence in the 21st century in providing accurate, timely and relevant information to support decision makers.



**ZHSS8419****Australian Homeland Security****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Assoc Prof A Bergin**

This course will provide the framework for analysing Australian homeland security. The course will cover such issues as the nature of terrorism and asymmetric warfare, biological, chemical and nuclear terrorism, critical infrastructure protection, cyber-security, the organisation of homeland security in Australia, consequence management, and the role of defence in homeland security. The course will examine the threats, actors and organisational structures and resources required to protect the Australian homeland from the new terror threats and to minimise any damage. The course will involve contributions from the intelligence community, health professionals, and first responders.

**ZHSS8420****Defending Australia: Developing Security Policy in a Changing World****School of Humanities and Social Sciences****UOC12 HPW4****S1 on-campus, S1 distance****Staff Contact: Prof S Woodman**

This course provides a comprehensive understanding of Australia's defence and foreign policy and develops insight and skills relevant to responding to current and prospective challenges. It traces the evolution of policy, identifies its fundamental elements, and reviews the international and domestic imperatives shaping its future. Australia's strategic relationships are considered in depth as are the factors shaping defence capability and operations. Particular attention is given to contemporary planning challenges including regional and alliance engagement, stability operations, homeland security, and capability planning amid uncertainty. Specific issue studies introduce students to Australian decision making processes and the dynamics of policy in action.

**ZHSS8421****Defending Australia: Special Study****School of Humanities and Social Sciences****UOC6 HPW2****S2 on-campus, S2 distance****Staff Contact: Prof S Woodman****Prerequisite/s: ZHSS8420**

This course builds on ZHSS8420 Defending Australia: Developing Security Policy in a Changing World. It offers students the opportunity to undertake in-depth study into a specific aspect of Australian defence and/or foreign policy through a combination of tailored seminars and an extended research paper of 6000-8000 words. The area/s in which work be undertaken in a particular session are nominated by the School. Completion of ZHSS8420 is a pre-requisite.

**ZHSS8422****Asia-Pacific Security: Regional Security in the New Millennium****School of Humanities and Social Sciences****UOC12 HPW4****S2 on-campus, S2 distance****Staff Contact: Prof J Cotton**

This course provides an in-depth analysis of the players, the processes and the issues shaping Asia-Pacific Security. Stretching from the major powers of Northeast Asia to the micro-states of the Pacific, it explores the changing dimensions of the security debate, the factors shaping national perspectives and capabilities, and the effectiveness of the different tools of engagement. Individual country studies complement the analysis of critical themes including the impact of strategic culture, the balance between traditional and non-traditional security challenges, the

role of multilateral institutions, and the exercise of U.S. hegemony. Studying potential flashpoints tests the intersection of these dynamics.

**ZHSS8423****Asia-Pacific Security: Special Studies****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Prof J Cotton****Prerequisite/s: ZHSS8422**

This course builds on ZHSS8422 Asia-Pacific Security: regional security in the new millennium. It offers students the opportunity to undertake in-depth study into a specific aspect of Asia-Pacific security through a combination of tailored seminars and an extended research paper of 6000-8000 words. The area/s in which work may be undertaken in a particular session are nominated by the School. Completion of ZHSS8422 is a prerequisite.

**ZHSS8424****Foundations of Strategy and Military Affairs****School of Humanities and Social Sciences****UOC12 HPW4****S2 distance****Staff Contact: Dr C Fernandes**

This course provides a grounding in the fundamentals of strategy, the development of modern strategic thought from Machiavelli to the present, including thinking about airpower and seapower, and developments in conventional warfare and military activity since 1945, with an emphasis on the period since 1975. It will provide students with an enhanced understanding of the context in which military activity occurs, and provides the link between understanding policy and decision-making at whole of government level, and the outcomes on the ground, at sea and in the air.

**ZHSS8425****Foundations of Strategy and Military Affairs: Special Study****School of Humanities and Social Sciences****UOC6 HPW4****S2 on-campus, S2 distance****Staff Contact: School Office****Prerequisite/s: ZHSS8424**

This course builds on ZHSS8424 Foundations of Strategy and Military Affairs. It offers students the opportunity to undertake in-depth study into a specific aspect of strategic and military affairs through a combination of tailored seminars and an extended research paper of 6000-8000 words. The areas in which work may be undertaken are nominated by the School. Completion of ZHSS8424 is a prerequisite.

**ZHSS8430****China's Security Policy and Military Modernisation****School of Humanities and Social Sciences****UOC6 HPW2****S1 on-campus****Staff Contact: Dr J Zhang**

This course introduces students to China's security policy and the post-Mao military modernisation program. China's security concerns, its evolving security strategy and rapidly growing military capacity will be assessed. Particular attention will be paid to the current academic and policy debate on China's growing military power and evolving strategic policies. The course will explore shifts in the People's Liberation Army's threat perceptions, strategic doctrine, force structure, civil-military relations, military technology and defence industry. China's strategic culture and its impact on military thinking will also be assessed.

# INTERDISCIPLINARY COURSES

## ZINT1001

### Engineering Computational Methods 1

School of Physical, Environmental and Mathematical Sciences

UOC3 HPW3

S2 on-campus

Staff Contact: Dr S Barry

The solution of practical engineering problems utilising: solutions sources, analytical tools, numerical tools, formal solution approaches, algebraic equations, vector and matrix operations, graphical techniques. Topics from a range of engineering disciplines will draw from mathematical techniques such as differentiation, integration, special functions, statistical description of data, random numbers, sorting, function optimisation, Taylor's series, ordinary differential equations. The course will be presented jointly by two schools - ACME and PEMS.

## ZINT2504

### Introduction to Electrical and Mechanical Plant

School of Aerospace, Civil and Mechanical Eng

UOC3 HPW3

S2 on-campus

Staff Contact: Dr W Smith

Electrical Plant: Introduction to single and three-phase power systems; generation transmission and distribution. Measurement of real, apparent and imaginary power in AC circuits, power factor correction. Electrical machines; introduction to DC, single and three-phase motor characteristics and applications. Electrical safety. Mechanical Plant: Introduction to heat, thermodynamics, gases. Introduction to refrigeration, air conditioning, waste disposal. Plant and equipment, refrigeration and air conditioning systems, boilers, chillers, diesel/petrol/other fuel engines, sewerage plant, garbage compactors, recycling crushers (quarry), civil engineering plant.

## ZINT2505

### Custom and Change in Melanesia

School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: Ms N Baker

Australia considers the Southwest Pacific of vital strategic importance and the ADF is playing an active role in what is seen as an increasingly unstable region. This course will provide students with an understanding of the cultures and causes of tension in West Papua, Papua New Guinea, the Solomon Islands, Vanuatu and Fiji. It will begin with the geography and settlement of the region, and then discuss the development of Indigenous social structures, modes of production and exchange, and attitudes to power, force, and dispute resolution in each of these areas. It then deals with the impact of colonisation and the importation of alien social, economic, and political ideas, before exploring the ways in which the different communities of Melanesia are navigating a world of accelerated change. This course may be taken as part of a major or minor in History or Geography.

## ZINT2506

### Foundations of Academic Writing

School of Humanities and Social Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: Ms J Gibson

This course develops students' academic writing and research skills. Students will critically analyse academic texts in order to learn about the ways in which academic writers communicate their arguments for different audiences in different disciplines. They will research for and write a range of different text types, such as a critical review and an essay or a report. They will use content from their own disciplines wherever possible, and apply particular linguistic strategies to improve their writing, strengthen their argument and express their meaning more clearly.

## ZINT3001

### Aircraft Systems & Avionics

School of Aerospace, Civil and Mechanical Eng

UOC3 HPW2

S2 on-campus

Staff Contact: Mr R Lewis

Prerequisite/s: ZACM1051

A description of the evolution of aircraft systems and avionics will provide the student with the rationales employed in the arrangement and purpose of various aircraft systems and avionics. An overview of the design and function of both mechanical and non-mechanical aircraft systems will introduce the student to the integrated systems of transport-type and fighter-type aircraft.

## ZINT4001

### Systems Engineering & Risk Management and Safety

School of Aerospace, Civil and Mechanical Eng

UOC3 HPW2

S1 on-campus

Staff Contact: Dr J Milthorpe

This course is designed to develop an understanding of Systems Engineering, Risk Management and safety in engineering. The following topics will be treated: systems engineering process and systems engineering management, assessment of hazard and risk in engineering projects, hazards to the environment, third parties, staff and the project, contribution of engineering knowledge and engineering theory to analysis of Engineering System Risk and Safety.

## ZINT7101

### Airpower Essay

School of Aerospace, Civil and Mechanical Eng

UOC6

S1 on-campus, S2 on-campus

Staff Contact: School Office

The Airpower Essay (taken in place of one Group A course) is available only to students at the ADF's Aerospace Centre undertaking the Graduate Certificate in Defence Studies in Airpower. It comprises an extended essay of c.12,500 words on an Airpower topic. The project topic is determined by special consultation between the Aerospace Centre, UC staff and the student. The Airpower Essay is to be undertaken in Session 1.

**ZINT7501****Airpower Project****School of Aerospace, Civil and Mechanical Eng****UOC6****S1 on-campus, S2 on-campus****Staff Contact: School Office**

This Project is available only to students at the ADF's Aerospace Centre undertaking the Graduate Diploma in Defence Studies in Airpower. The Airpower Project (taken in place of two Group B courses) is on an Airpower topic determined by special consultation between the Aerospace Centre, UC staff and the student. The Airpower Project should be c. 25,000 words in length and is to be taken over two sessions, Session 1 and Session 2.

**ZINT8001****Airpower Seminar Series****School of Humanities and Social Sciences****Enrolment requires school approval****UOC6****Not offered in 2007****Staff Contact: School Office**

This course examines the development and application of Airpower in considerable depth. There is a particular emphasis on how Airpower has evolved during the major conflicts of the 20th century. Seminar topics include Airpower and National Strategy, Airpower and 1914-1918, Control of Airpower, Battle of Britain, Area v. Precision Bombing in WW2, Japanese Airpower in WW2, Airpower and Vietnam, the Gulf War, Bosnia, Kosovo, and the Principles of War.

**ZINT8103****Research Methods in the Humanities and Social Sciences (UC6)****School of Humanities and Social Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course introduces students to the methods and pitfalls of attempts to study social and cultural life systematically. It stresses the diversity of the products of social and cultural life, and explores some of the different methods that have been developed to deal with explaining them. It focuses on three disciplines - Literature, History and Politics - that are particularly sensitive to the methodological foundations of their studies, and which have a long record of debate over methodological issues.

**ZINT8104****Research Methods in Humanities and Social Sciences (UC8)****School of Humanities and Social Sciences****UOC8 HPW2****Not offered in 2007****Staff Contact: School Office**

This course introduces students to the methods and pitfalls of attempts to study social and cultural life systematically. It stresses the diversity of the products of social and cultural life, and explores some of the different methods that have been developed to deal with explaining them. It focuses on three disciplines - Literature, History and Politics - that are particularly sensitive to the methodological foundations of their studies, and which have a long record of debate over methodological issues.

**Current course and program information**  
is now available through the  
**UNSW Online Handbook:**  
[www.handbook.unsw.edu.au](http://www.handbook.unsw.edu.au)

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**ZINT8201****Critical Business Skills****School of Business****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

An introduction to business case analysis, writing a business proposal and communicating business outcomes to different audiences. This course also examines the evaluation of business information, selecting appropriate sources and targeting your audience. It draws on material that links to all of the key aspects of managing a business.

**ZINT8301****Firepower and Protection****School of Aerospace, Civil and Mechanical Eng****UOC6 HPW12****S1 on-campus****Staff Contact: Mr G Barker**

This course provides an overview of the technical factors that affect the military use of explosives and propellants, armour materials, guns, guided weapons and light weapons. Topics include military ballistics, gun design, gun fire control, warhead design (including guided weapons), terminal effects and the penetration of armour. This course is restricted to ATSOC members.

**ZINT8326****Project Management****School of Business****Enrolment requires school approval****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Admin Officer**

This course covers all aspects of managing a project such as project definition and scoping, cost and quality planning, managing the risk, financial and legal aspects of the project, and completing the project. The course is designed principally to meet the requirements of ATSOC and, particularly for ATSOC students, is designed to provide an important foundation to ZBUS8401 Team Project - Technology Management.

# SCHOOL OF INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

## ZITE1001

### Computer Tools for Engineers

#### School of Information Technology and Electrical Engineering

##### UOC3 HPW3

##### S1 on-campus

##### Staff Contact: Dr D Cornforth

This course will prepare first-year engineering students to use the computer and computer programming as tools for use in their engineering course and future employment. Students will gain: an awareness of what a computing system consists of and broadly how a computer works; an introductory knowledge of some computing packages that will be useful for studies; an introductory knowledge of the structured approach to problem solving using a computer; a working familiarity with the engineering language/environment MATLAB, and the ability to employ it for problem solving.

## ZITE1101

### Introduction to Computer Science

#### School of Information Technology and Electrical Engineering

##### UOC6 HPW5

##### S1 on-campus

##### Staff Contact: Dr H Larkin

This course introduces students to computer science and computer programming, assuming no prior knowledge. Students will know about computers and what you can do with them, will understand how programming fits within computer systems development, and will be able to develop algorithms and express them in programs. Topics include computer architecture and systems, data representation, systems development life cycles, problem solving, algorithm development, introduction to programming in Java. Laboratory sessions will help students to develop practical skills with computer applications, problem solving, and programming.

## ZITE1102

### Programming Fundamentals

#### School of Information Technology and Electrical Engineering

##### UOC6 HPW5

##### S2 on-campus

##### Staff Contact: Dr D Cornforth

##### Prerequisite/s: ZITE1101

Programming Fundamentals builds on Introduction to Computer Science, concentrating on computer programming in an object oriented paradigm. Students will know how to analyse a problem and design a program, and will be able to implement programs in Java. Topics include algorithms, classes and objects, OO design, control structures, applets, data structures, searching and sorting, recursion, rounding error in calculations and Matlab.

## ZITE1201

### Circuits and Systems 1

#### School of Information Technology and Electrical Engineering

##### UOC3 HPW3

##### S1 on-campus

##### Staff Contact: Dr V Ougrinovski

Resistance and Ohm's Law; Kirchhoff's voltage and current laws; power; simple DC circuits; superposition; Thevenin's theorem; Norton's theorem; node and mesh analysis; dependent sources; electrical measurements; RMS voltages and currents; capacitance

and inductance; impedance and admittance; phasors; simple AC circuits; transformers.

## ZITE1202

### Digital Systems 1

#### School of Information Technology and Electrical Engineering

##### UOC3 HPW3

##### S1 on-campus

##### Staff Contact: Assoc Prof I Godara

This course explores the differences between analogue and digital signals; number systems and conversions; Binary arithmetic; Complement notation for negative numbers; Error detection and error correction codes; AND, OR and NOT operations; Formulation of Boolean expressions; Boolean theorems; Minimisation of Boolean expressions; Karnaugh maps for up to 6 variables; Analysis of sequential circuits; Stable and unstable states; Introduction to flip flops; algorithmic state machine approach to the description of digital circuits, analysis of synchronous sequential circuits, design of synchronous sequential circuits.

## ZITE1203

### Digital Systems 2

#### School of Information Technology and Electrical Engineering

##### UOC3 HPW3

##### S2 on-campus

##### Staff Contact: Dr M Pickering

Interfacing with the analogue world; Digital-to-Analogue conversion; Analogue-to-Digital conversion; Memory devices; Programmable logic devices; Storage devices; Data organisation; Arithmetic/Logic Unit; Synchronous System Design; Schmitt trigger devices. An introduction to the electrical engineering profession, the role of the electrical engineer in society and in the services; the relationship of electrical engineering to the sciences; engineering ethics; equal employment opportunity and related issues of equity; confidentiality and privacy; occupational health and safety; industrial democracy.

## ZITE1204

### Electronics 1

#### School of Information Technology and Electrical Engineering

##### UOC3 HPW3

##### S2 on-campus

##### Staff Contact: Dr G Milford

Introduction to intrinsic and doped semiconductors; Formation and characteristics of a PN junction diode; Zener and avalanche breakdown. Diode rectifier and simple filter circuits. Regulated power supplies using Zener diodes. Basic construction and characteristics of bipolar junction transistors (BJT); biasing circuits and Q-point selection. DC and graphical analysis of single stage, small signal, low frequency amplifier circuits. Introduction to electronic CAD tools (PSPICE). Operational amplifiers; ideal and non-ideal performance; introduction to filter and wave shaping circuit applications. Choosing electronic components.

## ZITE1290

### Electrical Engineering Research 1A

#### School of Information Technology and Electrical Engineering

##### Enrolment in the relevant CDF program

##### UOC6 HPW6

##### S1 on-campus

##### Staff Contact: Dr G Milford

This course is available to students in the BE(ElecCDF) program. Students will be required to attend specialist School seminars on at least six occasions during the Session. In addition, students will attend lectures and undertake assessment relating to the material outlined for ZITE1201 and ZITE1202.



**ZITE1291****Electrical Engineering Research 1B****School of Information Technology and Electrical Engineering****Enrolment in the relevant CDF program****UOC6 HPW6****S2 on-campus****Staff Contact: Dr G Milford**

This course is available to students in the BE (ElecCDF) program. Students will be required to undertake a comprehensive literature review chosen from a list of topics selected or approved by the Head of School. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the literature review and preparation of the written literature review and seminar. Late in the Session each student will be required to lead a seminar attended by other students and members of staff. Evidence of sufficient progress may be required from time to time. The literature review, which will have a nominal length of 2000 words, is to be presented not later than the first day of the examination period. Literature reviews must be presented both typed and in electronic form. In addition, students will attend lectures and undertake assessment relating to the material outlined for ZITE1203 and ZITE1204.

**ZITE1301****Introduction to Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Dr R Stocker**

Students will engage in the challenge of solving organisational problems arising from the interface of people with policies and technology. The final aim of the course, which will be lead by IS Academics with extensive professional expertise in the IS industry, is to introduce and develop an awareness of the breadth of the IS discipline. This will be done through learning about the Systems Development Life Cycle, the role of the IS Professional in solving organisational problems, and Systems Theory. Successful students will wholly engage in the Self-Directed Learning activities which combine scientific structure and methodology with the creativity and communication skills of the Humanities. The course helps students become better learners and leaders through developing strengths. High marks will come mainly from good teamwork and strong individual contributions. The course is about the challenge of work in real life as well as developing life-long skills. Students will also undertake some computer-based training in basic software literacy and some rudimentary programming activities. Students will keep a weekly learning log on the web in place of an assigned textbook.

**ZITE1302****Information Systems in Organisations****School of Information Technology and Electrical Engineering****UOC6 HPW5****S2 on-campus****Staff Contact: School Office****Prerequisite/s: ZITE1301**

Information Systems in Organisations builds upon Introduction to Information Systems, to increase students' knowledge of specific tools and techniques that can be used to design and construct large Information Systems. Students will learn how to use systems thinking to make decisions in order to solve real-life, information-based problems, with an emphasis upon Defence applications. Topics include basic concepts in system theory, business analysis, system design; computer operations, including architecture, operating systems, software, databases, and networks; applications in organisations, including enterprise-wide systems, decision support systems, e-learning, intelligent systems; issues, including computer security and ethics.

**ZITE1901****Introduction to Research in Information Technology****School of Information Technology and Electrical Engineering****Enrolment in the relevant CDF program****UOC6 HPW3****S2 on-campus****Staff Contact: Dr G Milford**

This course is available to students in the BSc (CDF) or BA (CDF) program. The course aims to provide students with an understanding of basic frameworks in research. The course covers research techniques for gathering information and evaluating research carried out by others. Students will be presented with classic papers in their discipline and will have the opportunity to explore how they were successful. Students will be exposed to current research areas within the School, and will debate issues related to their field. The course will include survey methods and instruments, field study, experimentation, data collection and analysis. The course will involve a combination of lectures, presentations by students, and evaluation of research topics in the wider discipline.

**ZITE2001****Managing Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Dr A McLucas**

This course introduces students to the theory and practice of managing the information resources used in organisations. It covers the management of the risks associated with the use of software, hardware and networking components of information systems; ensuring performance in support of business processes and conformity with business practices. Topics include ICT governance at the local level, advantages and disadvantages of options for ICT infrastructure within enterprise architectures, service level agreements, local procurement issues, security and continuity.

**ZITE2002****Principles of Electrical and Electronics Technology****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr X Jia**

An application based course covering the following topics. DC circuit analysis, DC measurements, DC power sources. Introduction to AC circuit analysis, single and three phase. AC measurements. AC power systems. Concept of transducers. Operational amplifiers (Op-Amps), examples of Op-Amp circuits. Basic principles of digital electronics, analogue-to-digital and digital-to-analogue converters. Magnetic fields and circuits, electrical, magnetic and mechanical interaction. Transformers. DC machines, commutation, control. Principles of AC synchronous and induction motors.

**ZITE2003****Avionics for Aviators****School of Information Technology and Electrical Engineering****UOC3 HPW2****S2 on-campus****Staff Contact: Mr C Benson**

The student is introduced to the role of avionics systems in modern aircraft. The course sets out to describe the role of avionics in: flight control systems; self contained and external navigation aids: voice and data communications systems. The issues relating to the human-machine-interface are covered and the use of modern avionics buses and their applications to avionics integration are discussed.

**ZITE2102****Computer Technology****School of Information Technology and Electrical Engineering****UOC6 HPW5****S2 on-campus****Staff Contact: Dr W Zhu****Prerequisite/s: ZITE1102**

This course presents details of the range of computing and data networking technologies available and how they can be applied. Topics to be covered include: computer architectures computer system configurations from embedded to super-computers, operating systems functions and components, system administration tasks, data networking infrastructure alternatives, data networking protocol families, network design, configuration and administration, and distributed application architecture alternatives including client-server and peer-to-peer.

**ZITE2103****Data Structures and Representation****School of Information Technology and Electrical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Dr L Brown****Prerequisite/s: ZITE1102**

This course further explores the representation of data in computer systems, from both data-centric and algorithm-centric perspectives. Data-centric topics may include relational data representation and databases, hierarchical data representation and XML, and knowledge representation and reasoning, with an emphasis on system design. Advanced data structures studied may include hash tables and tree structures. The study of applications concentrates particularly on the issues of problem representation, and on search methods for constraint satisfaction and optimisation.

**ZITE2201****Advanced Programming for Engineers****School of Information Technology and Electrical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Dr D Essam****Prerequisite/s: ZITE1001 and ZITE1205**

Good software is versatile, efficient and reliable. This course teaches advanced concepts and techniques in problem solving by computer in order to enable the student to tackle sophisticated programming problems, and do it well. The course has three key streams - algorithms, programming paradigms, and data structures. In the area of algorithms, analysis of the complexity & efficiency of a solution is taught, as well as several key techniques including searching, sorting, recursion, and hashing. In the area of programming paradigms, the theory and practice of Object Oriented, Event Driven, and Concurrent programming is taught - equipping the student to tackle a far wider range of problems. The data structures stream addresses the classic area of dynamic memory management - linked lists, queues, stacks, and trees - enabling students to write programs that are responsive, at runtime, to the size and type of the problem.

**ZITE2202****Circuits and Systems 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof L Godara**

Natural response of RL and RC circuits; forced response of RL and RC circuits; complete response of RLC circuits; sinusoidal steady state and phasor analysis revisited; AC node and mesh analysis;

mutual inductance; op-amps and op-amp amplifiers; two-port networks; computer aided circuit analysis and design.

**ZITE2203****Digital Systems 3****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr C Harb**

Manufacturing integrated circuits; Resistor-Transistor Logic (RTL); Diode-Transistor Logic (DTL); Transistor- Transistor Logic (TTL); Metal-Oxide-Semiconductor Field-Effect Transistors (MOSFETs); MOSFET logic; Interfacing different logic families; Tri-state outputs. The design and development of digital computers and/or systems. Topics can include: Computer organisation, comparative architecture of CPUs viewed from CISC and RISC design philosophies; the parallel computer data bus, handshaking, control, data flow; memories and memory organisation; peripherals; serial data buses (e.g. Ethernet); machine level programming, machine code, assembly language; massively parallel computers.

**ZITE2204****Electronics 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof L Godara**

Features and consequences of the electronic band structure: electron and hole carriers, effective mass, carrier mobility, direct and indirect band gaps, generation and recombination processes, the Hall effect and its applications. Sources of semiconductor noise. Quantitative theory of PN junction devices; space charge capacitance, diffusion capacitance and switching effects. Heterostructures, the metal-semiconductor barrier, ohmic contacts. Basic construction and characteristics of field-effect transistors (JFET and MOSFET); biasing circuits and Q-point selection. Introduction to FET and BJT (hybrid-pi) small signal models, low frequency analysis of small signal amplifiers, regulated power supplies.

**ZITE2205****Electronics Design Laboratory 1****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr A Lambert**

This course comprises a series of electronic circuit analysis and design exercises which students undertake both individually and in small groups. Initially students are required to complete the design and calculate component values for a number of analogue and digital circuits that perform relatively simple and well defined task. The circuits are designed, constructed and tested by each student. Students then form groups and undertake the analysis, design, construction and testing of more complex electronic systems that are designed to meet specified performance targets. This course provides students with the opportunity to consolidate theoretical material from other courses.

**ZITE2206****Signals and Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof L Godara**

Laplace transforms; partial fraction expansions; simple and multiple poles and zeros; convolution; linear system impulse response and transfer function; Bode diagrams; active filters; Fourier series and Fourier transform; properties of the Fourier transform; Fourier spectrum and power spectrum; Parseval's theorem; Energy spectral density and power spectral density.

**ZITE2290****Electrical Engineering Research 2A****School of Information Technology and Electrical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Dr G Milford****Prerequisite/s: Enrolment in the relevant CDF program**

This course is available to students in the BE (ElecCDF) program. Students will undertake a research project of scope commensurate with the level of attainment expected of a second-year Electrical Engineering student in the CDF Students Program. The project will take the form of a piece of research or investigation, or a feasibility study or design chosen from a list of topics selected or approved by the Head of School. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the project and preparation of the project report and seminar. Late in the Session each student will be required to lead a seminar on their project topic attended by other students and members of staff. Evidence of sufficient progress may be required from time to time. The project report, which will have a nominal length of 4000 words, is to be presented not later than the first day of the examination period. Reports must be presented both typed and in electronic form.

**ZITE2291****Electrical Engineering Research 2B****School of Information Technology and Electrical Engineering****UOC6 HPW6****S2 on-campus****Staff Contact: Dr G Milford****Prerequisite/s: Enrolment in the relevant CDF program**

This course is available to students in the BE (ElecCDF) program. Students will undertake a problem-based learning project of scope commensurate with the level of attainment expected of a second-year Electrical Engineering student in the CDF Students Program. The project will take the form of a piece of research or investigation, or a feasibility study or design chosen from a list of topics selected or approved by the Head of School. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the project and preparation of the project report and seminar. Late in the Session each student will be required to lead a seminar on their project topic attended by other students and members of staff. Evidence of sufficient progress may be required from time to time. The project report, which will have a nominal length of 4000 words, is to be presented not later than the first day of the examination period. Reports must be presented both typed and in electronic form.

**ZITE2292****Advanced Programming for CDF Engineers****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr D Essam****Prerequisite/s: Enrolment in the relevant CDF program**

Good software is versatile, efficient and reliable. This course teaches advanced concepts and techniques in problem solving by computer in order to enable the student to tackle sophisticated programming problems, and do it well. The course has three main streams – algorithms, programming paradigms, and data structures. In the area of algorithms, analysis of the complexity and efficiency of a solution is taught, as well as several key techniques including searching, sorting, recursion, and hashing. In the area of programming paradigms, the theory and practice of Object Oriented, Event Driven and Concurrent programming is taught – equipping the student to tackle a far wider range of problems.

The data structures stream addresses the classic area of dynamic memory management – linked lists, queues, stacks and trees – enabling students to write programs that are responsive, at runtime, to the size and type of the problem.

**ZITE2293****Data Structures and Representation (CDF)****School of Information Technology and Electrical Engineering****Enrolment in the relevant CDF program****UOC3 HPW3****Not offered in 2007****Staff Contact: Dr L Brown**

This course is available to students in the BE (ElecCDF) program. This course further explores the representation of data in computer systems, from both data-centric and algorithm-centric perspectives. Data-centric topics may include relational data representation and databases, hierarchical data representation and XML, and knowledge representation and reasoning, with an emphasis on system design. Advanced data structures studied may include hash tables and tree structures. The study of applications concentrates particularly on the issues of problem representation, and on search methods for constraint satisfaction and optimisation.

**ZITE2301****Design of Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Mr G Millar****Prerequisite/s: ZITE1301 and ZITE1302**

Students will analyse, design and build a workgroup level information system to consolidate and apply core information systems competencies introduced in 2nd semester IS studies.

**ZITE2302****Operation of Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S2 on-campus****Staff Contact: Mrs J Backhouse****Prerequisite/s: ZITE2301**

Students will establish and operate a workgroup level information system environment. The course will further develop, consolidate and apply Design of IS knowledge and introduce the students to the IS environment to develop and practice operational management skills.

**ZITE2401****Computer Tools for Decision Making****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr R Sarker**

The aim of this introductory course is to examine the basic quantitative techniques of Operations Research (OR). The course generally covers: History of OR, nature of OR problems, OR modelling and problem solving approaches. Specific topics include: linear programming, distribution and allocation models, integer programming, network models, game theory, goal programming and OR modelling using computer packages.

**ZITE2402****Decision Analysis****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: School Office**

The aim of this course is to expose students to various methods of analysing decision-making problems and demonstrate their use. The topics covered will include decision tables, decision trees, influence diagrams, descriptive theories, Utility theory, multifactor evaluation techniques and group decision-making techniques.

**ZITE2403****Management Science in Practice****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr R Sarker**

This course introduces the use of management science techniques for solving different real-world decision making problems. It covers topics such as: an overview of mathematical modelling, the process of quantitative problem solving, and spreadsheet based decision modelling and their applications in practical problem solving. The types of decision problems considered in this course are: resource allocation, planning, distribution, project selection, scheduling, prediction and waiting line in both defence and non-defence environments.

**ZITE2901****Information Technology Research Project 1****School of Information Technology and Electrical Engineering****UOC6 HPW2****S2 on-campus****Staff Contact: Dr G Milford****Prerequisite/s: Enrolment in the relevant CDF program**

This course is available to students in the BSc (CDF) or BA (CDF) program. Students will undertake a research project on a nominated topic in a specific discipline area commensurate with study at Year 2 level. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZITE3101****Computing Project - Computer Science****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Mr M Ford****Prerequisite/s: ZITE3110 or ZITE2302**

A substantial supervised project in a small team in consultation with an appropriate member of the school. Topics for projects will be garnered from the School, Defence and local organisations, and will be chosen in consultation with staff.

**ZITE3102****Cryptography****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: Dr L Brown**

This course provides details of the history, theoretical foundations, and the current state of cryptographic algorithms. Topics may include classical cipher design and analysis; modern private key block cipher design, details, modes of use and analysis; stream ciphers; an introduction to number theory; public key encryption algorithms; digital signatures and hash functions; key management, X.509 certificates and certificate authorities; quantum computing and quantum cryptography.

**Assumed Knowledge:** Basic mathematical algebra**ZITE3103****Data Structures and Representation****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Dr L Brown****Prerequisite/s: ZITE1102**

This course further explores the representation of data in computer systems, from both data-centric and algorithm-centric perspectives. Data-centric topics may include relational data representation and databases, hierarchical data representation and XML, and knowledge representation and reasoning, with an emphasis on system design. Advanced data structures studied may include hash tables and tree structures. The study of applications concentrates particularly on the issues of problem representation, and on search methods for constraint satisfaction and optimisation.

**ZITE3104****Electronic Commerce****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Ms C Andrews**

This course provides students with an overview of the technological and managerial issues associated with electronic business (e-business). The different categories of e-business transactions are examined together with the technologies and applications that underpin them. Aspects of the strategic and legal environments in which e-business applications are implemented are also examined.

**ZITE3105****Human Computer Interaction****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr T G Freeman****Prerequisite/s: ZITE2101 or ZITE2201 or ZITE2103**

This course presents the principles and practical aspects of designing, implementing and evaluating user interfaces. Topics include: interfaces in web documents and in a client-server architecture; criteria for judging interfaces; information presentation techniques; programming to respond to and control interfaces.



**ZITE3106****Interactive Computer Graphics****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr T G Freeman****Prerequisite/s: ZITE2101 or ZITE2201 or ZITE2103**

This course teaches students about interactive graphics of 2D and 3D scenes, and programming to produce graphics. Topics include rubber shape drawing, graphical input event handling, perspective and orthographic views, transformation of coordinate spaces, colour perception and specification, animation, double buffering, ray tracing, surface properties, scene rendering.

**ZITE3107****Multimedia and Virtual Environments****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr M Barlow****Prerequisite/s: ZITE2101 or ZITE2201**

Theory and practice of multimedia and virtual environment construction. Types and formats of different digital media (images, sounds, movies, 3D models, animation). Issues in construction. Practical work in Java and VRML.

**ZITE3108****Java Programming Applications****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr T G Freeman****Prerequisite/s: ZITE2101 or ZITE2201 or ZITE2103**

This course explores more advanced features of the Java packages that support programming, beyond what is covered in ZITE1102 or ZITE1205. It covers different types of file organisation, the use of threads for concurrent programming, the ability to determine at run-time the properties of an object, the ability to create a class within another class, the ability to call methods on an object running on a remote machine, the use of servlets and JSP on websites, access to databases, and calling functions within another language.

**ZITE3109****Knowledge Based Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZITE1102 or ZITE1302 or ZITE1205**

This course covers the underlying technologies, and the planning and implementation of knowledge based systems in organisations. It covers issues of knowledge representation and the corresponding inference engines, providing practical experience in the design and implementation of knowledge-based systems. It discusses the integration of knowledge-based systems with the operating environment, and their interaction with web applications. It addresses the issues of acquiring the knowledge for a knowledge based system, its development processes, and the evaluation of systems.

**ZITE3110****Software Engineering****School of Information Technology and Electrical Engineering****UOC6 HPW6****S1 on-campus****Staff Contact: Mr G Millar****Prerequisite/s: ZITE2101 or ZITE2103**

This course aims to give students an understanding of the difficulties involved in developing large software systems, and of tools and techniques for overcoming these problems. The major item for assessment is a group project. Technical skills taught include analysis and design (structured and object-oriented), documenting requirements and design, design for modifiability and understandability, testing, and the use of appropriate tools. Management skills taught include project planning and tracking, estimation, quality assurance, configuration management, process improvement. The course also includes material on professionalism and ethical responsibilities in software development and human-computer interaction.

**ZITE3111****Special Topic****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC3 HPW3****S1 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

**ZITE3112****Special Topic 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors, external lecturers or members of staff.

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**ZITE3113****Computer Languages and Algorithms****School of Information Technology and Electrical Engineering****UOC6 HPW6****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZITE1102**

This course introduces students to the main programming paradigms, comparative features of computer languages, data structures and algorithms. Paradigms covered in the course may include low-level languages, traditional imperative languages, and object-oriented, functional and logic paradigms. The course emphasises: iterative, concurrent and recursive control structures; simple linear data structures and applications especially in sorting algorithms.

**ZITE3114****Internetworking****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr W Zhu****Prerequisite/s: ZITE2102**

This course aims to further the student's knowledge of Internetworking with TCP/IP. In particular, it examines advanced IP addressing, routing with advanced routing protocols and network security.

**ZITE3115****Systems and Network Administration****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr H Larkin****Prerequisite/s: ZITE2102**

This course introduces students to the skills, methodologies and activities required to administer a computer system which consists of various hardware, software and users within an organisational infrastructure. In particular, students will be introduced to ethics, user, device, file system administration, computer and network security, system monitoring, performance tuning, administrative support tools, network, server and client administration. Students should possess a good working knowledge of UNIX.

**ZITE3116****XML Technologies****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr D Cornforth**

This course will provide you with a knowledge of XML, and enable you to use and apply XML technologies in building the web of tomorrow. The power of XML is its position as an open standard, and this enables its ready adoption in a wide variety of applications. You will learn about XML source, validation, and document formatting. You will be introduced to SAX and DOM, XML databases, XForms, Web Services, XML-based e-commerce, and the Semantic Web. This is a hands-on course and includes plenty of practice writing XML source and using software tools.

**ZITE3201****Analogue Communications****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr X Jia**

Review of Fourier transform and its properties. Amplitude and modulation, double sideband, single sideband, vestigial sideband. AM modulators and demodulators, coherent detection, envelope detection. Angle modulation: frequency modulation, phase modulation, narrowband FM, wideband FM, FM modulators and demodulators. FDM, QAM, Superheterodyne receiver. White noise, narrowband noise and signal to noise ratio. Pre-emphasis and de-emphasis and system comparisons.

**ZITE3202****Control Theory 1****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr V Ougrinovski**

Introduction to feedback control systems; deriving models from physical systems; transfer function models; state space models; block diagram manipulation; conversion between state space and transfer function models; state space phase variable form; model uncertainty; linearisation of nonlinear models; sensor noise and actuator saturation; pole placement controller design; transient response of control systems; inverse Laplace transform calculation of transient response; dominant poles; time domain response of state space systems; the use of MATLAB and SIMULINK in control systems modelling, simulation and design.

**ZITE3203****Control Theory 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr V Ougrinovski**

Control system accuracy and steady state error; integral action; frequency response; Bode plots; Nyquist plots; graphical construction of Bode and Nyquist plots; control system stability for discrete and continuous systems; Nyquist stability criterion; gain and phase margins; stability robustness; root locus diagrams; lead and lag compensators; PID compensators; loop shaping control system design; the use of MATLAB in frequency domain control analysis and design; MATLAB tools for modern control system design.

**ZITE3204****Digital Communications****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr C Harb**

Revision of Fourier techniques; sampling theorem and aliasing; quantisation noise; pulse code modulation; bandwidth requirement of digital signals; entropy of signals; channel capacity, entropy encoding; differential PCM, DM and CVSDM techniques; synchronisation; matched filters; decision theory; baseband systems; intersymbol interference; equalisation; M-ary baseband systems; binary modulation techniques, performance comparisons.

**ZITE3205****Electrical Power and Machines****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: School Office**

Magnetic circuits and magnetic materials; single phase and three phase transformers; real and reactive power, electromagnetic energy conversion principles; principle of rotating electric machines. DC machines, steady-state behaviour and speed control. Rotating mmf waves in AC machines, synchronous machines, principles of operation and equivalent circuit, steady-state behaviour.

**ZITE3206****Electronics 3****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr G Milford**

Electronic circuit analysis and design using computer aids. Frequency response of amplifiers; exact analysis, Miller Theorem approximation and Time Constant analysis. Differential and multistage amplifiers. Feedback amplifiers. Electronic oscillator circuits. Characterisation of noise in electronic circuits. Practicalities: electronic component parasitics, circuit stability, coupling and decoupling, circuit prototyping and construction.

**ZITE3207****Electronics Design Laboratory 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Lambert**

This course continues the electronic circuit design experience of Electronics Design Laboratory 1, providing students with a range of laboratory experience, including the analysis, design, construction and testing of a variety of electronic circuits. Students typically work in pairs to produce and characterise a basic analogue AM communication system consisting of transmitter and receiver circuitry. Each group then undertakes additional analysis and design to supplement the basic system with additional features, such as alternative analogue or digital modulation schemes, frequency agility etc. This course provides students with the opportunity to consolidate theoretical material from other courses.

**ZITE3208****Engineering Electromagnetics 1****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr G Milford**

Transmission Lines: structures, transmission line parameters, characteristic impedance, propagation constant, reflection and transmission coefficients, Smith Chart, transmission line applications. Review of Vector tools: grad, div, curl and theorems; coordinate systems. Review of Electrostatics and Magnetostatics. Maxwell's equations and electromagnetic boundary conditions; wave equation and time harmonic fields. From Theory to Practice: solution of antenna radiation and wave propagation problems. Propagation: Plane wave propagation in lossless and lossy media, normal and oblique incidence to conducting and dielectric boundaries, reflection and transmission coefficients; propagation over the Earth (free space, ground wave, ionospheric and diffraction effects).

**ZITE3209****Engineering Electromagnetics 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr E Huntington**

Waveguides: TEM, TE and TM propagation; field theory for metal (rectangular and circular) and dielectric (optical) waveguides; losses, modes, cut off, wavelength, dispersion and bandwidth. Antennas: elemental dipole, radiation pattern, polarisation, directivity, gain, impedance; wire and loop antennas, aperture antennas; antenna arrays.

**ZITE3210****Management Science E****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof H Abbass**

This course examines various quantitative techniques of management science with their applications to engineering design and decision problems. The course generally covers: the decision making process, mathematical formulation and problem solving techniques. Specific topics are: linear, integer, and goal programming, network optimisation, inventory and queuing systems.

**ZITE3211****Microcomputer Interfacing****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr A Lambert**

Introduction to programming in the C language. Program development, debugging and execution on an 8 bit embedded microprocessor system. Unconditional input/output interfacing. Interfacing of keyboards, displays, motors, ADC's and DAC's. I/O interfacing using interrupts. Introduction to cooperative and pre-emptive tasking.

**ZITE3212****Optoelectronic Techniques****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr E Huntington**

The electromagnetic spectrum; the nature of light, blackbody radiation. The detection process in the visible and infrared spectrum. Operation and characteristics of photon detection devices; photoconductive cells, photodiodes, phototransistors, and photo emissive devices. Effects of noise. Light emitting diodes and diode lasers. Introduction to optical communication systems. A project will comprise approximately one third of the course.

**ZITE3214****Power Electronics and Electrical Drives****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof H Pota**

Power Semiconductor Devices; AC to DC converters; DC to DC switch-mode converters; DC to AC inverters; Induction motors - rotating mmf, basic principles of operation, equivalent circuit, torque-speed characteristics; Induction motor drives - speed control by varying stator frequency and voltage; variable reluctance and stepper-motor drives; synchronous servomotor drives.

**ZITE3290****Electrical Engineering Research 3****School of Information Technology and Electrical Engineering****UOC6 HPW6****S1 on-campus, S2 on-campus****Staff Contact: Dr G Milford****Prerequisite/s: Enrolment in the relevant CDF program**

Students will undertake a problem-based learning project of scope commensurate with the level of attainment expected of a third-year Electrical Engineering student in the CDF Students Program. The project will take the form of a piece of research or investigation, or a feasibility study or design chosen from a list of topics selected or approved by the Head of School. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the project and preparation of the project report and seminar. Shortly after the May recess, the students will prepare a poster presentation on their project, and late in second session each student will be required to lead a seminar on their project topic attended by other students and members of staff. Evidence of sufficient progress may be required from time to time. The project report, which will have a nominal length of 8000 words, is to be presented not later than the first day of the examination period. Reports must be presented both typed and suitably bound and in electronic form.

**ZITE3301****Applications of Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Dr E Lewis****Prerequisite/s: ZITE1301 and ZITE1302**

This course examines the different types of information systems used by the business, government and military sectors. Applications considered vary from C3I systems through to e-business systems. The course also includes material on enterprise architecture. Students will acquire research skills in a chosen research topic that amplifies their knowledge of an aspect of these applications.

**ZITE3302****Management of Work Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus****Staff Contact: Mr G Millar****Prerequisite/s: ZITE2301**

Students will be able to provide advice about introducing and managing information systems in large organisations. This course will increase students' awareness of the issues of IT governance, software project management, change management, and work practices.

**ZITE3303****Selection of Systems****School of Information Technology and Electrical Engineering****UOC6 HPW5****S2 on-campus****Staff Contact: Dr R Stocker****Prerequisite/s: ZITE2301 or ZITE2001**

Students will be able to select information systems that best support business objectives. A broad range of methodologies, tools and techniques for evaluating, and acquiring information systems and services will be explored.

**ZITE3304****Computing Project - Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S2 on-campus****Staff Contact: Mr M Ford****Prerequisite/s: ZITE2302**

A substantial supervised project in a small team in consultation with an appropriate member of the school. Topics for projects will be garnered from the School, Defence and local organisations, and will be chosen in consultation with staff.

**ZITE3305****Special Topic 3****School of Information Technology and Electrical Engineering****UOC6 HPW5****S1 on-campus, S2 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the area of Information technology, given by visitors or external lecturers or members of staff.

**ZITE3401****Operations Research****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZITE2401**

This course introduces a number of Operations Research techniques and their applications to various real-world problems. The topics include: project planning and controlling tools, markov models, queuing systems, reliability, maintenance and replacement models, inventory theory, dynamic programming and case studies in OR.

**ZITE3402****Operations Research Project****School of Information Technology and Electrical Engineering****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZITE2101, ZITE2301, ZITE2401, ZITE2201 or ZITE2103**

A substantial supervised project in a small team in consultation with an appropriate member of the school. Topics for projects will be garnered from the School, Defence and local organisations, and will be chosen in consultation with staff.

**ZITE3403****Optimisation Techniques****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZITE1102 or ZITE1302 or ZITE1205**

This course introduces the students to a set of computational models for optimisation. The course covers a simple introduction to graph theory, satisfiability, travelling salesman problem, heuristics, evolutionary computation, and continuous optimisation. Students are not expected to have a strong mathematical background but they should be comfortable with mathematical notations.



**ZITE3404****Simulation****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr M Ford**

This course introduces students to the skills of writing simulation models. Topics will include concepts of modelling, continuous and discrete systems, random number generation and tests for randomness, time-stepped and event-stepped simulation, object oriented simulation techniques, statistical analysis of output, verification and validation approaches of simulation models.

**ZITE3901****Information Technology Research Project 2****School of Information Technology and Electrical Engineering****Enrolment in the relevant CDF program****UOC6 HPW2****S1 on-campus****Staff Contact: Mr G Milford**

This course is available to students in the BSc (CDF) or BA (CDF) program. Students will undertake a research project on a nominated topic in a specific discipline area commensurate with their year of study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZITE3902****Information Technology Research Project 3****School of Information Technology and Electrical Engineering****UOC6 HPW2****S2 on-campus****Staff Contact: Mr G Milford****Prerequisite/s: Enrolment in the relevant CDF program**

This course is available to students in the BSc (CDF) or BA (CDF) program. Students will undertake a research project on a nominated topic in a specific discipline area commensurate with their year of study. As one of the aims of the program is to further develop critical thinking and independent research skills, the project will involve "hands-on" research experience in collaboration with a staff member or their research team. A supervisor, who will work closely with the student, will manage each project. The research project will be chosen after discussion between the student and the supervisor. Students will be expected to present a short introductory seminar on the topic by week 4 of Session. Final assessment will be based on a written paper and an oral presentation.

**ZITE4101****Computer Science 4 (Combined Honours) F/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Office**

In the Combined Honours programs candidates are required to present a thesis or research project on a topic that is concerned with Computer Science/Information Systems and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZITE4102****Computer Science 4 (Combined Honours) P/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Office**

In the Combined Honours programs candidates are required to present a thesis or research project on a topic that is concerned with Computer Science/Information Systems and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZITE4103****Computer Science 4 (Honours) F/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School.

**ZITE4104****Computer Science 4 (Honours) Part-Time****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School.

**ZITE4201****Advanced Communication Techniques****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office**

M-ary ASK, FSK and PSK systems, performance comparisons; hardware implementation of ASK, FSK and PSK modulators and demodulators; channel coding, block codes (e.g. BCH and RS codes), convolution codes, Viterbi decoding; modulation and coding trade-offs, QPSK, OQPSK, MSK and QAM systems; secure communications: encryption, spread spectrum modulation (direct sequence and frequency hopping).

**ZITE4202****Antennas and Propagation****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office**

Antenna fundamentals: wave equation and boundary conditions, scalar and vector potentials, far field radiation pattern, directivity, gain, efficiency, terminal impedance. Antenna types: survey of wire, aperture and array antennas; EMI and EMC. Analysis tools: estimation methods, moment method, NEC and ELNEC, visualisation tools. Receive antennas: effective height or area, Friis transmission formula, antenna noise, communication link design. Propagation: free space, ground wave, troposphere, ionosphere effects; flat and spherical Earth propagation; modelling and prediction over long and short distances.

**ZITE4203****Avionics and Navigational Aids****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Mr C Benson**

This course evaluates avionics systems by examining the systems architecture. The design of subsystems and interfaces are reviewed with particular emphasis on the integration of sensors and use of multiplex bus architecture. Active navigation aids such as ILS, TACAN, DME, VOR are introduced but greater emphasis is placed on the more modern integrated navigation systems using GPS, INS, DOPPLER and AIR DATA sensor components. This material will focus on applied real time computing implementing a discrete Kalman filter to achieve sensor integration.

**ZITE4204****Communications Networks****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof L Godara**

Introduction to communications networks, the ISO OSI and TCP/IP reference models, ISDN and ATM; concepts of transmission, switching, signalling and framing; overview of multiple access protocols, IEEE standards for LANS and MANS, bridges and high speed LANS; study of routing and congestion control schemes, internetworking and connection management; understanding of network design issues and network security; examples of networks including the Internet and ATM networks; applications of communications networks.

**ZITE4205****Communications Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof M Frater**

Review of signal characteristics including bandwidth requirements of common data and message types in voice, picture and data transmission; discussion of transmission media and their signal handling capabilities, dispersion and attenuation characteristics, and the determination of signal bandwidth; understanding of open wire, coaxial cable and optical fibre channels; design considerations for microwave radio, satellite links, RF transmission, troposcatter and optical communications systems; review of mobile communication concepts; understanding of fading and channel characteristics; multiple access schemes, diversity techniques and wireless standards; cellular design fundamentals; and familiarisation with modulation techniques for mobile communications; importance and need for equalisers.

**ZITE4206****Computer Control Theory****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr V Ougrinovski**

Control system implementation; discrete time state space models; sampling of continuous time state space models; time domain response of discrete time systems; use of MATLAB and SIMULINK in the simulation of computer control systems; stability of discrete time systems; controllability and observability; disturbance models and random processes; MATLAB tools for computer control system design; pole placement state feedback controller design; state estimation and observers; output feedback controller design; linear quadratic optimal control; Kalman Filters and optimal filtering theory.

**ZITE4207****Digital Image Processing and Remote Sensing****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof D Fraser**

Digital Image Processing: as 2D or higher dimensional signal processing; image domain and frequency domain filtering; capture and display; registration; enhancement; HSI and uniform colour space; warping and interpolation - rotation, non-linear warping, morphing; restoration. Applications - astronomical imaging, surveillance, forensic, medical, machine vision. Remote Sensing: Planck's black body radiation law and wavelength selection; atmospheric windows; passive/active microwaves; reflectance and scattering of the Earth's surface; past, present and future systems, high and low resolution sensors including multispectral scanners and CCD arrays; SLAR and SAR radar; distortion and correction; radiometric and geometric enhancement, interpretation of imagery and classification techniques.

**ZITE4208****Digital Signal Processing****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr A Lambert**

Discrete time signals and systems, difference equations, state equations, discrete convolution, complex analysis, Z-transforms, inverse transforms, transfer functions, discrete-time Fourier transform, transform properties, sampling and aliasing, artefacts of block processing. Discrete Fourier transform signal processing including the FFT, frequency response estimation, interpolation, down sampling, convolution, block convolution, correlation, cepstrum. Digital FIR Filter Design including windowing. Digital IIR Filter Design, discrete-time approximation of analogue filters, Linear phase filters, filter structures and DSP hardware. Quadrature Mirror Filters, sub-band filtering, and the Wavelet transform.

**ZITE4209****Electronics 4****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Assoc Prof H Pota**

Oscillators: configurations, design; Noise: thermal and non-thermal mechanisms, characterisation, Op-Amp noise parameters, BJT noise parameters (Y and S), communication system noise characterisation; noise figure, noise factor, noise temperature, noise measurement; Filters: passive filter analysis and design, active filter analysis and design, filter specifications and measurement; Mixers: unbalanced, single and double balanced mixers, non-linear behaviour and characterisation, applications; Introduction to Phase Lock Loop synthesisers: loop analysis, available components, noise.

**ZITE4210****Guided Weapons Electronics****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Mr C Benson**

This course is an introduction to the multi disciplinary engineering found in guided weapons. It covers dispersion errors in unguided weapons, the modelling of a weapon trajectory and looks at guided weapons from a system perspective. The course focus is on guided weapons instrumentation, guided weapons autopilots (control), and the application of automatic control guidance methods including guidance homing & proportional navigation. An overview is presented on guidance homing heads, proximity fuses & arming, acoustic guidance and counter measures.

**ZITE4211****Image and Video Transmission Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr M Pickering**

Physiological aspects of television, television standards, colour systems with particular reference to the PAL system. Television equipment; cameras, transmitters, receivers, video recorders. An introduction to digital video and image transmission, JPEG image compression standard, MPEG audio and video compression standards, digital television standards, digital video broadcasting.

**ZITE4212****Introduction to Radar and Radar Imaging****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr X Jia**

Radar Fundamentals: range, backscatter, noise, clutter, range equation, RCS. Clutter: backscatter characteristics (sea, land, rain), target detection. RCS: backscatter characteristics, low reflection materials, mission design. CW/FM Radar: doppler, range and frequency resolution, system design. Pulse Radar: pulse width, PRF, resolution, signal spectrum, ambiguities in range/doppler, pulse integration. MTI Radar: non-coherent and coherent detection, matched filter, pulse compression, system design. Imaging Radar: range and cross-range resolution, image formation and characteristics, distributed and point targets, inverse imaging, SAR and ISAR system design, airborne/spaceborne SAR platforms (AIRSAR, Seasat, ERS, Radarsat). Applications: target detection, Earth resources assessment, atmospheric monitoring.

**ZITE4213****Lasers and Laser Applications****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: Dr C Harb**

Interaction of radiation with matter; spontaneous and stimulated emission, coherent radiation. Line broadening mechanism. Population inversion and pumping schemes, threshold conditions for oscillation. Design and principles of operation of maser and laser systems. Non-linear optics, optical frequency harmonic and sub-harmonic generation, Q-switching and modulation techniques. Introduction to a selection of defence, industrial and medical laser applications such as laser range finding, laser-guided munitions, directed energy weapons, holographic non-destructive-testing, 3-D display, optical signal processing and lidar.

**ZITE4214****Modelling and Simulation****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office**

Models for nonlinear systems, phase portraits, linearisation, limit cycles, nonlinear system stability, chaotic systems. Case studies involving switching control systems. Van der Pol oscillator, nonlinear systems with hysteresis, nonlinear resistor circuits (tunnel diode and Chua circuits). Computer simulation of nonlinear systems, use of MATLAB and SIMULINK in simulation. Modelling via system identification, MATLAB systems identification toolbox.

**ZITE4215****Occasional Option 1: Underwater Communications****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: School Office**

The syllabus for this course changes from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZITE4216****Occasional Option 2****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: School Office**

The syllabus for this course changes from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZITE4217****Occasional Option 3****School of Information Technology and Electrical Engineering****UOC3 HPW3****S1 on-campus****Staff Contact: School Office**

The syllabus for this course changes from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZITE4218****Occasional Option 4****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: School Office**

The syllabus for this course changes from one occasion to the next, allowing the presentation of a modern topic by a visiting academic of eminence or a special lecture course on a trial basis.

**ZITE4219****Power Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office**

Introduction to power systems; networks; transmission and distribution; Power system components; transmission lines, generators and three phase transformers. Steady state analysis of power systems; symmetrical and asymmetrical faults, power flow, load frequency control, transmission losses. Introduction to power systems dynamics and dynamic simulation.

**ZITE4220****Robotics and Mechanical Systems****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof H Pota**

Introduction to different robot configurations. Homogeneous transformations; Kinematics; inverse kinematics; Jacobians; robot dynamics; Newton Euler methods; Flexible robots; Flexible beam dynamics; Euler-Lagrange equation; Acoustical system dynamics; modal analysis; transfer functions; Finite-dimensional models;

Modelling of piezoelectric actuators, DC motors, acoustic speakers. Classical and modern control methods for the control of robots, flexible structures and acoustical systems.

**ZITE4221****Software Engineering: Principles and Practice****School of Information Technology and Electrical Engineering****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office**

A course that presents the principles of the software engineering discipline and practices students in the application of software engineering techniques. The theoretical component of the course covers current issues in software development and acquisition, process models, software management issues, computer-aided software engineering (CASE), software cost and schedule estimation, software development standards, software documentation, capability maturity models, metrics, quality assurance, configuration management, validation and verification, and test and evaluation. These principles are then reinforced through the conduct of a number of laboratory exercises to practice good software design and development.

**ZITE4222****Systems Engineering****School of Information Technology and Electrical Engineering****UOC3 HPW3****S2 on-campus****Staff Contact: Dr M Ryan**

Systems Engineering provides a framework within which to develop an understanding of the processes and management practises associated with the Systems Engineering discipline. The underlying Systems Engineering process is presented and is shown to be applied repeatedly throughout the entire system lifecycle. Attention then focuses on the broad topic of Systems Engineering Management and some of the activities normally associated with engineering management are detailed. The course also introduces tools commonly used in Systems Engineering and details how Systems Engineering coexists with other disciplines (particularly Project Management, Quality Management and Integrated Logistics Support Management).

**ZITE4290****Electrical Engineering: Project, Thesis, Practical Experience and Specialist Lectures****School of Information Technology and Electrical Engineering****UOC12 HPW9.5****S1 on-campus, S2 on-campus****Staff Contact: School Office**

Students will undertake a problem-based learning project of scope commensurate with the level of attainment expected of a final-year Electrical Engineering student in the CDF Students Program. The project will take the form of a piece of research or investigation, or a feasibility study or design chosen from a list of topics selected or approved by the Head of School. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the project and preparation of the project thesis and seminar. Shortly after the May recess, the students will prepare a poster presentation on their project, and late in second session each student will be required to lead a seminar on their project topic attended by other students and members of staff. Evidence of sufficient progress may be required from time to time. The thesis, which will have a nominal length of between 20000 words, is to be presented not later than the first day of the examination period. Theses must be presented both typed and suitably bound and in electronic form. Before graduation a student shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each such block being in the service of a single employer. During the year students will be required to

participate in a series of specialist lectures and seminars. Specialist lectures will normally take the form of attendance by students on at least 8 occasions during the year at nominated meetings of the local professional societies.

**ZITE4299****Electrical Engineering: Project, Thesis, Laboratory Work, Practical Experience, Specialist Lectures****School of Information Technology and Electrical Engineering****UOC12 HPW9.5****S1 on-campus, S2 on-campus****Staff Contact: School Office**

The project will take the form of a minor piece of research or investigation, a feasibility study or design, or a comprehensive literature review chosen from a list of topics selected or approved by the Head of School. Where appropriate, these topics may be of a military nature. Group effort may be permitted in appropriate cases. In each case at least one staff member will be nominated as a supervisor to provide guidance and general supervision during the project and preparation of the thesis. Shortly after the May recess the students will prepare a poster presentation on their project, and late in second session each student will be required to lead a seminar on their project topic attended by other students taking this course and members of staff. Evidence of sufficient progress may be required from time to time. The thesis, which typically will have a length of from 15,000 to 20,000 words, is to be presented not later than the first day of examination period. Theses must be presented both typed and suitably bound and in electronic form. The laboratory work component of the course is made up of a program of practical work spread uniformly throughout the year. Before graduation a student shall complete 60 days of approved practical engineering experience which must be done in blocks of at least 20 working days each, each such block being in the service of a single employer. During the year students will be required to participate in a series of specialist lectures and seminars. Specialist lectures will normally take the form of attendance by students on at least eight occasions during the year at nominated meetings of the local professional societies.

**ZITE4301****Information Systems 4 (Combined Honours) Full-time****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Office**

In the Combined Honours programs candidates are required to present a thesis or research project on a topic that is concerned with Computer Science/Information Systems and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZITE4302****Information Systems 4 (Combined Honours) P/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Office**

In the Combined Honours programs candidates are required to present a thesis or research project on a topic that is concerned with Computer Science/Information Systems and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.



**ZITE4303****Information Systems 4 (Honours) F/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School.

**ZITE4304****Information Systems 4 (Honours) P/T****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School.

**ZITE4401****Operations Research & Statistics 4 (Honours) Full Time****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School. Operations Research and Statistics: Applying mathematical models to the solution of problems encountered by individuals, groups and organisations became a science during the Second World War and is now known as Operations Research or Management Science. The techniques developed were, after the war, modified and extended to be applicable in the civilian world, in areas such as banking, mining, the oil industry, transportation, and many others. Today, the study of Operations Research and Management Science provides insight into decision making.

**ZITE4402****Operations Research & Statistics 4 (Honours) Part Time****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: School Office**

A course of advanced lectures and seminars supported by appropriate projects approved by the Head of School. Operations Research and Statistics: Applying mathematical models to the solution of problems encountered by individuals, groups and organisations became a science during the Second World War and is now known as Operations Research or Management Science. The techniques developed were, after the war, modified and extended to be applicable in the civilian world, in areas such as banking, mining, the oil industry, transportation, and many others. Today, the study of Operations Research and Management Science provides insight into decision making.

**ZITE7101****Introduction to Data Networks****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Dr H Larkin**

This course introduces the design, implementation, operation and management of data networks. Students will learn about the techniques, devices and protocols used in local and wide area networks.

**Assumed Knowledge:** ZITE7104 or equivalent.

**ZITE7102****Introduction to Database Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Mrs J Backhouse**

This course provides a theoretical and practical introduction to modern relational database management systems. It covers data analysis and modelling using entity-relationship techniques, relational theory and normalisation, database query languages (SQL and QBE), database security and integrity, physical design principles, and it describes the elements of transaction management and concurrency control.

**ZITE7103****Introduction to Programming****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: Dr D Essam**

This is a first course in computer programming that introduces problem solving by computer. Students are introduced to a problem solving methodology together with a modern programming language. A number of practical assessment tasks parallel and guide the student through the acquisition of the semantics and syntax of the programming language.

**ZITE7104****Introduction to Telecommunications****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: School Office**

The course introduces students to the principal components of telecommunications. Students will learn about telecommunication architectures and standards, concepts and issues in data and multimedia communications, fundamentals of local and wide area networks, applications of techniques and technologies and future directions.

**ZITE7105****Introduction to the Web****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: Mr T Turner**

This course introduces students to the basic workings of the Web and issues surrounding the design and construction of Web pages that conform to current and emerging standards. The course considers Web architectures, protocols and standards; web page construction and the use of style sheets; issues of design usability and accessibility; and the role of client-side scripting languages (such as Javascript).

**ZITE7106****Systems Analysis and Design****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Mrs J Backhouse**

The aim of this course is to introduce students to the principles that are appropriate for analysing the business requirements of an organisation and for developing the requirements into a specification as the basis for system design. In addition, the course examines the design process of an Information System and how an object orientated approach can be used to produce a design specification for the construction of software which meets business requirements.

**ZITE7201****Analogue Communications****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus****Staff Contact: Dr X Jia**

Fourier series, Fourier and power spectrum, properties of the Fourier transform. Impulse response and transfer function. Random processes, autocorrelation, power spectral density, white and narrowband noise, signal to noise ratio. Amplitude modulation, double, single and vestigial sideband, modulators and demodulators, coherent detection, envelope detection, superheterodyne receiver, performance. Angle modulation, frequency modulation, phase modulation, narrowband FM, modulators and demodulators, pre-emphasis, system comparisons.

**ZITE7202****Communications Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus****Staff Contact: Assoc Prof M Frater**

Review of signal characteristics. Closed transmission media; open wire, coaxial cable and optical fibre; dispersion and attenuation characteristics. Design issues in open transmission systems; microwave radio, satellite communications, ULF, ELF and VLF transmission, cellular radio, net radio, troposcatter systems. Link budget analysis. This course will include a major design exercise.

**ZITE7203****Communications and Information Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus****Staff Contact: Dr M Ryan**

This course provides an overview of the fundamental elements required to provide telecommunication services and management information systems. Communication topics include: fundamentals of electric signals; modulation and multiplexing techniques; management of the electromagnetic spectrum and acts controlling its use; video signals and systems; radio wave propagation; basic antenna theory; receiver and transmitter design; types of communications systems; and local and wide area networks. The fundamentals of information systems are presented including: information processing concepts and architectures; operating systems; databases; software languages and development; and the storage, retrieval and management of information.

**ZITE7204****Digital Signal Processing****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus****Staff Contact: Dr A Lambert**

Discrete time systems, Nyquist frequency and Shannon's sampling theorem, aliasing. Fourier Transform, Discrete Fourier Transform, Fast Fourier Transform, spectral leakage. Discrete and circular convolution. The z-transform and its relationship with the Fourier and Laplace transforms. Digital filters, filter realisation, design of finite impulse response and infinite impulse response filters, design of digital filters from analogue filters. Digital signal processing hardware. A project will comprise approximately one third of the course.

**ZITE7205****Fundamentals of Surveillance Technologies****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Mr C Benson**

This course includes an overview of the technologies and systems utilised in ground, airborne and spaceborne surveillance systems. Topics include an examination of the portions of the electromagnetic spectrum used for surveillance; optics fundamentals; image intensification techniques; thermal imaging; non-imaging infrared systems; fundamentals of lasers; laser systems; fundamentals of RADAR; RADAR systems and their employment; ground, spaceborne and airborne imaging systems; camouflage and concealment techniques; and counter measures.

**ZITE7206****Introduction to Optoelectronic Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Dr E Huntington**

The electromagnetic spectrum, the nature of light, black body radiation. The detection process in the visible and infrared spectrum. Operation and characteristics of photon detection devices, photoconductive cells, photodiodes, phototransistors, photoemissive devices and pyroelectric detectors. Effects of noise. Light emitting diodes and diode lasers. Introduction to optical communication systems. A project will comprise approximately one third of the course.

**ZITE7207****Occasional Elective 1****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office**

The syllabus for these courses changes from one occasion to the next, allowing the presentation of a relevant topic by a visiting academic or a special lecture course on a trial basis.

**ZITE7208****Occasional Elective 2****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

The syllabus for these courses changes from one occasion to the next, allowing the presentation of a relevant topic by a visiting academic or a special lecture course on a trial basis.

#### **ZITE7209**

##### **Television and Image Transmission Systems**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Dr M Pickering**

The physiology of the human viewer and its impact on television system design, analogue television standards, colour television systems, PAL. Television equipment, cameras, transmitters, receivers, video recorders. An introduction to digital image and video recorders. An introduction to digital image and video transmission. A project will comprise approximately one third of the course.

#### **ZITE7401**

##### **Introduction to Management Science**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance, S2 on-campus**

**Staff Contact: Dr R Sarker**

This introductory course examines the quantitative techniques of management science. An introduction to the analytical method is presented together with discussion of the various models including linear programming, network analysis, queuing and inventory modelling, simulation and game theory. Examples will illustrate the application of the models.

#### **ZITE7402**

##### **Introduction to Simulation**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus, S1 distance**

**Staff Contact: School Office**

**Excluded: Not available to students who have completed ZITE8412**

The aim of this course is to introduce students to the principles of simulation. These cover: concepts of modelling; continuous and discrete systems; time stepped and event stepped simulation of queue systems and inventory systems; exposure to simulation languages.

#### **ZITE7403**

##### **Introduction to CDEW**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance**

**Staff Contact: School Office**

**Excluded: Not available to students who have completed ZITE8402**

Introduction to Concept Development, Experimentation and Wargaming (CDEW) prepares students to support the decision making process in Defence. They will be able to propose options and be able to provide useful and insightful input to senior decision makers. This course is focussed on Ackoff problems. Problems are characterised by incomplete knowledge of the issues and the system, and are thus not amenable to exact solution via mathematical optimisation. Instead, formulation of the issues and any objective functions must be agreed by the stakeholders and the analysts. This course is similar to ZITE8402 but is assessed differently.

#### **ZITE8101**

##### **Advanced Java Programming**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: Dr T G Freeman**

This course explores more advanced features of the Java packages that support programming, beyond what is covered in ZITE 7103 Introduction to Programming. It covers different types of file organisation, the use of threads for concurrent programming, the ability to determine at run-time the properties of an object, the ability to create a class within another class, the ability to call methods in an object running on a remote machine, the use of Servlets and JSP on websites, access to databases, and calling functions written in another language.

**Assumed Knowledge:** ZITE7103 or equivalent.

#### **ZITE8102**

##### **C3I Systems**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 Intensive Delivery (Feb 2007)**

**Staff Contact: Mr M Ford**

The aim of this subject is to contribute to the preparation of middle to upper-level management who must deal with the extraordinarily complicated issues of C3I systems. In more general terms, the subject will be of interest to anyone who has a professional interest in Defence. Topics include: various paradigms for C3I systems and the sub-systems that constitute them; awareness of the various technologies and IT systems that are used to establish these C3I sub-systems; knowledge of some of the factors that influence the design, acquisition and management of C3I systems.

#### **ZITE8103**

##### **Computer Graphics**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

Interactive graphics of 2D and 3D scenes, rubber shape drawing, graphical input event handling, perspective and orthographic views, transformation of coordinate spaces, colour perception and specification, animation, double buffering, ray tracing, surface properties, scene rendering. X Windows, Java and Postscript. Rasterisation algorithms. Programming to produce graphics.

**Assumed Knowledge:** ZITE7103 or equivalent.

#### **ZITE8104**

##### **Computer Security**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus, S1 distance**

**Staff Contact: Dr L Brown**

This course provides an introduction to the theory and practice used to maintain security on computer systems and networks. Topics may include risk analysis, security policies and management, user identification and access controls, network attacks and defences, firewall design, database security, legal and ethical issues.

**Assumed Knowledge:** ZITE7104 or equivalent and ZITE8137 or equivalent.

**ZITE8105****Computer Speech Processing****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course introduces theoretical and practical concepts of computer speech processing: speech digitisation; sampling theorem; fundamentals of digital signal processing; human speech production; fundamentals of acoustic phonetics; time-domain and frequency-domain speech analysis; linear-predictive coding; fundamentals of speech synthesis and speech/speaker recognition by computer.

**ZITE8106****Cryptography****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr L Brown**

This course provides details of the history, theoretical foundations, and current state of cryptographic algorithms. Topics may include classical cipher design and analysis; modern private key block cipher design, details, modes of use and analysis; stream ciphers; an introduction to number theory; public key encryption algorithms; digital signatures and hash functions; key management, X.509 certificates and certificate authorities; quantum computing and quantum cryptography.

**ZITE8108****Data Structures and Algorithms****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Dr D Essam**

This is a second course in computer programming, emphasising the underlying data structures to represent the problem space. Particular focus is given to dynamic data structures - their appropriate employment and the algorithms needed to support them. Other topics may include recursive algorithms, programming tools, searching and sorting, algorithm complexity, and file access mechanisms.

**Assumed Knowledge:** ZITE7103 or equivalent**ZITE8109****Databases and E-Commerce Transaction Management****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course presents the principles and practical aspects of analysis, design and related software implementation issues of advanced distributed database and transaction processing and workflow management systems. It considers how cooperative database transaction and workflow models can be used for designing web-enabled E-Commerce and E-Market systems in an integrated internet environment. Further, we consider the design of E-Business Models and Information Architectures based on database and transaction processing systems. We describe how business processes can be realised using workflow-based agent models. This course then considers applications of the transactional paradigm for distributed agent systems, distributed knowledge systems, and multimedia databases.

**Assumed Knowledge:** ZITE7102 or equivalent.**ZITE8110****Decision Support Systems****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course addresses the principles and practice of decision support systems (DSS). Areas addressed are the design, development and applications of DSS: conceptual framework, cognitive styles, evaluating and using DSS, DSS architectures, data base management systems, model-base management systems, problem solving and decision-making tools, brainstorming, operations research tools, artificial intelligence techniques, dialogue generation and management software, man-machine interfaces, adaptive design approach, knowledge acquisition, applications and case studies.

**ZITE8111****Directed Studies in Information Technology 1****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 distance, S1 on-campus, S2 on-campus, S2 distance****Staff Contact: School Office**

This reading course allows a student to carry out independent study, supervised by a member of staff, in an area of information technology not offered in any MSc(IT) course. Details for the reading course will be defined and approved individually for each student, and will include objectives, assessment, and an initial reading list.

**ZITE8112****Directed Studies in Information Technology 2****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Office**

This reading course allows a student to carry out independent study, supervised by a member of staff, in an area of information technology not offered in any MSc(IT) course. Details for the reading course will be defined and approved individually for each student, and will include objectives, assessment, and an initial reading list.

**ZITE8114****Electronic Business****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: School Office**

This course provides students with an overview of the technological and managerial issues associated with electronic business (e-business). The different categories of e-business transactions are examined together with the technologies and applications that underpin them. Aspects of the strategic and legal environments in which e-business applications are implemented are also examined.

**ZITE8115****Information Operations****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 distance, S1 on-campus****Staff Contact: School Office**



This course addresses the evolution of Information Operations (IO), from its roots in early warfare, through recent manifestations as Command and Control Warfare and Information Warfare, to its modern conception as a strategy for conflict and competition in the information age. The course focuses on the present day formulation of IO as a broad range of military and non-military activities intended to achieve information and decision superiority. The course complements related studies in command and control, decision support, information management and knowledge management.

#### **ZITE8116**

##### **Information Systems Policy and Strategy**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance, S2 on-campus**

**Staff Contact: Dr E Lewis**

This course presents a framework and structured method for developing strategies and policies that will support the organisation within which they are developed. Based on fundamental information management principles and directly addressing the risks within the organisation, the method presented provides guidance without constraining the user to a particular result. The course aims to develop the strategic and policy capabilities of the students in a particular manner.

#### **ZITE8117**

##### **Integrating Information Systems Technologies**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 distance, S1 on-campus**

**Staff Contact: Dr R Stocker**

This course presents an analysis of an integrated technical architecture (hardware, software, networks, and data) to serve organisational needs in a rapidly changing competitive and technological environment. Technologies for intra- and inter-organisational systems are investigated.

#### **ZITE8118**

##### **Integrating the Enterprise and IS Functions**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance, S2 on-campus**

**Staff Contact: Ms C Andrews**

It is recommended that students attempt this course towards the end of their study. This capstone course is intended to round off and integrate the knowledge gained in other IS management courses. It covers: IS's role in transforming organisations and industries; an integrated view of the organisation from an external and internal perspective; operational vs. governance responsibilities of the CIO; IS's internal role in integrating the enterprise through cohesive business processes and functional applications to meet business needs; enterprise resource planning and enterprise functionality; coordinating skills and organisational infrastructure; the role of human capital; current/emerging issues in managing the day-to-day operations of the IS function; external relations with suppliers, outsourcers, customers; collaborative business strategies.

**Assumed Knowledge:** ZITE8138 or equivalent, ZITE8116 or equivalent.

#### **ZITE8119**

##### **Internetworking**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Dr W Zhu**

This course aims to further the student's knowledge of Internetworking with TCP/IP. In particular, it examines advanced IP

addressing, routing with advanced routing protocols and network security.

**Assumed Knowledge:** ZITE7101 or equivalent and ZITE7104 or equivalent.

#### **ZITE8120**

##### **IT Special Topic 1**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

#### **ZITE8121**

##### **IT Special Topic 2**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

#### **ZITE8122**

##### **IT Special Topic 3**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

#### **ZITE8123**

##### **IT Special Topic 4**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: School Office**

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

#### **ZITE8124**

##### **Knowledge Based Systems**

#### **ZITE8126**

##### **XML Technologies**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 on-campus, S2 distance**

**Staff Contact: Dr D Cornforth**

This course will provide you with a knowledge of XML, and enable you to use and apply XML technologies in building the web of tomorrow. The power of XML is its position as an open standard, and this enables its ready adoption in a wide variety

of applications. You will learn about XML source, validation, and document formatting. You will be introduced to SAX and DOM, XML databases, XForms, Web Services, XML-based e-commerce, and the Semantic Web. This is a hands-on course and includes plenty of practice writing XML source and using software tools.

**Assumed Knowledge:** Knowledge of HTML to at least the level provided by ZITE7105 Introduction to the Web.

#### **ZITE8128**

##### **Modern Heuristic Techniques**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course covers a number of new heuristic search techniques in operations research. These recent techniques have been proposed to deal with complex problems (such as scheduling, timetabling, and allocation) where traditional optimisation methods failed. The techniques are inspired by natural phenomena. No background in biology or neuroscience is required. The topics covered in this course include: evolutionary algorithms, simulated annealing, Tabu search, ant colony optimisation, marriage in honey bees optimisation, immune systems, and artificial neural networks. The applications cover both traditional problems such as propositional satisfiability and the travelling salesman, as well as real life applications.

#### **ZITE8129**

##### **Multimedia and Virtual Environments**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: Dr M Barlow**

Multimedia and Virtual Environments from a programmer's perspective. Types of Media: 2D imagery, 3D graphics, Text, Video, Sound and Animation. Principles of media types. Issues in control of media: bandwidth, processing. Standards. Combining and synchronising media. Virtual environments: models, immersion, technology. Practical work in Java and the Java Media APIs (JMF, Java3D, JAI) plus VRML.

#### **ZITE8130**

##### **Network Management and Troubleshooting**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course provides insight into the techniques and methodologies of network design and management. Network design tools and techniques, management and troubleshooting tools, identifying troubleshooting targets, documenting symptoms, actions and results, diagnosing and correcting TCP/IP problems, diagnosing and correcting wide area networking problems.

**Assumed Knowledge:** ZITE7101 or equivalent and ZITE7104 or equivalent.

#### **ZITE8131**

##### **Object Oriented Analysis and Design**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: Dr C Lokan**

This course addresses the object-oriented approach to information system development, particularly in reference to the earlier stages of analysis and design. It covers the principles and basic concepts of object orientation and the different aspects of OO modelling (e.g. static/functional/state) as represented by the Unified

Modelling Language (UML) technique. Experience in using and designing with a typical UML-based CASE tool forms an important part of the course.

**Assumed Knowledge:** ZITE7103 or equivalent and ZITE7106 or equivalent.

#### **ZITE8132**

##### **Object Oriented Programming**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course emphasises the data abstraction and encapsulation techniques that introduce object orientation, using the C++ programming language. Examples concentrate on the class construct, and explore function and operator overloading, scope, object constructors and destructors, the this pointer, the friend concept, file input / output streams, operator concatenation using reference arguments, templates. Class derivation and inheritance, polymorphism.

**Assumed Knowledge:** ZITE7103 or equivalent.

#### **ZITE8133**

##### **Operating Systems**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Dr W Zhu**

This course investigates the design, implementation, operation and management of computer operating systems. Areas covered are: history of Operating Systems, processes, pre-emption and scheduling, Input / Output, memory management, Virtual Memory Management, file systems, interprocess communication and synchronisation, OS security.

**Assumed Knowledge:** ZITE7103 or equivalent.

#### **ZITE8134**

##### **Software Architectures**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: School Office**

The course seeks to provide students with a strong practical understanding of software architectures. The design, evolution and quality evaluation of a software architecture is also presented. Other topics discussed include: architectural styles, and architectural recovery and reuse.

#### **ZITE8135**

##### **Software Engineering and ADA**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course introduces the programming language ADA. Advanced functions and procedures. Parameter passing in, out, in out. Problem solving through modularisation. ADA packages. The concept of information hiding. Top-down and bottom-up development and testing. Private declarations. Problem solving by abstraction. Private data types and user-defined operation. Problem solving in real-time systems, tasks, inter-task communication, task synchronisation.

**Assumed Knowledge:** ZITE7103 or equivalent.

**ZITE8136****Software Project Management****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Mr G Millar****Excluded: Not available to students who have completed ZITE8216.**

This course introduces students to the basic concepts of software project management. An overview of software life cycle processes is provided. This is followed by an examination of several key life cycle processes and activities, including: software development, risk management, software measurement, verification, validation, and quality assurance.

**ZITE8137****Systems and Network Administration****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: Dr H Larkin**

This course introduces students to the skills, methodologies and activities required to administer a computer system which consists of various hardware, software and users within an organisational infrastructure. In particular, students will be introduced to ethics, user, device, file system administration, computer and network security, system monitoring, performance tuning, administrative support tools, network, server and client administration. Students should possess a good working knowledge of UNIX.

**ZITE8138****Systems Planning****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: Dr E Lewis**

This course will help students to plan so that Information and Communication Technology (ICT) services are used wisely in their organisation. The students will know the principles of systems planning, procedures to put the principles into practice in preparing a Business Case, some supporting software tools. They will become aware of the theory underlying the development of the procedures. Topics include: work systems, systems theory, ICT evaluation theory and practice, risk management; use of the risk-remedy technique and the Analysis network Linked (AnnL) software.

**ZITE8139****Telecommunications Design and Management****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course reviews current telecommunications technology and current issues facing telecommunications manager. These include service bundling, pricing and charging of services, private and public network services, deregulation, managing and designing interoperable systems, network planning and management issues, and globalisation.

**Assumed Knowledge:** ZITE7101 or equivalent and ZITE7104 or equivalent.

**ZITE8140****User Interface Construction****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus****Staff Contact: Dr T G Freeman**

This course presents the principles and practical aspects of designing, implementing and evaluating user interfaces. Topics include: interfaces in web documents and in a client-server architecture; criteria for judging interfaces; information presentation techniques; programming to respond to and control interfaces; Java, CGI, X-widgets, command languages.

**Assumed Knowledge:** ZITE7103 or equivalent.

**ZITE8141****WAN Technologies****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus, S2 distance****Staff Contact: Dr H Larkin**

This course aims to further the student's knowledge of wide area networks. Students will be introduced to current wide area networks technologies and will investigate how these technologies may be used to build practical wide area networks in the Australian environment.

**Assumed Knowledge:** ZITE7101 or equivalent and ZITE7104 or equivalent.

**ZITE8142****Web Design****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course provides an introduction to a number of areas critical to the design of successful websites. The aim is to provide the student with the critical capacity to judge good design, and the beginnings of the capability of creating it. Topics may include: principles of graphic design, principles of typography, principles of user interface design and construction, usability and accessibility issues, principles of website organisation, logical design, navigational design.

**Assumed Knowledge:** ZITE7105 or equivalent.

**ZITE8143****Distributed Applications****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Dr W Zhu**

A course on the development and management of distributed applications, such as web and database applications, with an emphasis on performance and reliability needs. Topics covered will include: introduction to distributed applications, clients and servers, distribution paradigms, designing programming and configuring distributed applications with databases, XML, distributed objects, agents, ubiquitous computing.

**ZITE8144****Information and Communication Technology Processes****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: Mr G Millar**

Information and Communication Technology (ICT) has become

increasingly vital for creating and delivering organisational value. This course aims to familiarise students with the processes required to manage ICT resources. Topics include: the role of the CIO, the IT organisation, IT processes, IT sourcing, and process improvement. This course will examine major initiatives in this area, including Information Technology Infrastructure Library (ITIL) and Control Objectives for Information and related Technology (COBIT).

**ZITE8145****Soft Computing****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Soft computing is a paradigm shift in computer science representing the state-of-the-art approaches to making computers smart and able to find and handle knowledge efficiently. This subject will expose students to different methods and techniques with on-hand programming exercises and providing students with practical experience on a number of software packages. Students will use Prolog and Perl to manipulate knowledge and texts for knowledge management and web mining. They will be exposed to cutting-edge areas such as evolutionary computation, multi-agent systems, neural networks, and machine learning. The course will also expose students to real life use of these techniques in web mining, e-commerce, and knowledge management. Examples will be drawn from many real life situations including, but not limited to, business, banking sectors, medical databases, command and control, and wargaming.

**ZITE8198****Project - Information Technology (Part time)****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S1 distance, S2 on-campus, S2 distance****Staff Contact: School Office**

A supervised project carried out in consultation with an appropriate member of the School. Topics for projects will be elicited from staff of the School, Government departments, local organisations, and the students themselves. Topics will be chosen in consultation with staff of the School.

**ZITE8199****Project - Information Technology****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC12 HPW6****S1 distance, S1 on-campus, S2 distance, S2 on-campus****Staff Contact: School Office**

A supervised project carried out in consultation with an appropriate member of the School. Topics for projects will be elicited from staff of the School, Government departments, local organisations, and the students themselves. Topics will be chosen in consultation with staff of the School.

**ZITE8201****Adaptive Antenna Arrays****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

A selection of topics from: introduction to optimal array processing, array signal representation, narrowband and broadband processor structures, element space and beamspace processing in time domain as well as in frequency domain, adaptive algorithms, spatial spectral analysis.

**ZITE8202****Advanced Data Networks****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Topological design of data networks; public data protocols, X.25; local area networks, Ethernet; design of a local area network; metropolitan area networks, DQDB; fibre distributed data interface; point to point protocol; Broadband ISDN concepts and protocols, switching, loss mechanisms; performance of a data network.

**ZITE8203****Advanced Digital Signal Processing Techniques****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Review of basic theory: discrete time signals and systems, Fourier theory and related theorems, sampling, multi-rate sampling and reconstruction, quantisation, time/frequency resolution, Z transform and related theorems, Laplace transform. Topics selected from: signal analysis, one-dimensional filter structure design (FIR, IIR, ARMA) with implementation on DSP hardware (processing in real-time), multi-rate structures, introduction to two-dimensional structures including array filters and beamformers, introduction to Kalman filtering, introduction to signal estimation, finite precision arithmetic effects.

**ZITE8204****Airborne Radar****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Detection and ranging: pulsed operation, the range equation, detection probability, pulse compression, FM ranging. Doppler information: spectrum of pulse train, ambiguities, the ambiguity function, digital filters, measuring range rate. Ground return: sources of ground return, clutter and target spectra, clutter and target spectra, clutter with range and Doppler ambiguities, choice of PRF. Categories of PRF: low PRF, high PRF, medium PRF. Tracking: angle tracking, range tracking, Doppler tracking, filtering. High resolution mapping: resolution requirements, synthetic array radar, SAR design, ISAR and Doppler beam sharpening.

**ZITE8205****Antennas****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

A selection of topics from: a review of basic wave, aperture, surface wave, wide band and frequency independent antennas; conformal and adaptive arrays; tolerance theory.

**ZITE8206****Digital Communications****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Review of mathematics of communication theory, analogue to digital and digital to analogue conversion, source encoding, baseband digital transmission, digital modulation techniques (ASK, FSK, PSK), coherent and incoherent detection, performance



comparisons, synchronisation and timing extraction, channel coding, error correction and error detection, linear block codes (Hamming, Golay, BCH and RS), convolution encoding and Viterbi decoding, link analysis.

#### **ZITE8208**

##### **Digital Video Communications**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Dr M Pickering**

Numerical representation of visual information, Huffman, run length and arithmetic coding techniques, pulse code modulation, distortion measures, intra and interframe predictive coders, motion estimation and compensation schemes, delta modulation and derivatives, transform encoding, hybrid techniques, subband, vector quantisation and quadtree schemes, video coding standards, network issues and error resilience.

#### **ZITE8209**

##### **Electrical Engineering Elective**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S1 on-campus, S2 on-campus**

**Staff Contact: School Office**

An occasional elective on an electrical engineering topic, selected according to the specific expertise and experience of visitors to the School of Information Technology and Electrical Engineering.

#### **ZITE8213**

##### **Mobile Communications**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Assoc Prof L Godara**

A selection of topics from an introduction to the concepts of mobile communications, fundamentals of multiple access schemes and channel allocation methods; description of various system configurations; understanding of mobile radio environment, propagation conditions, co-channel interference and design parameters; methods of capacity improvement, outage probability and handoff reduction; performance analysis.

#### **ZITE8214**

##### **Neural Networks**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

Introduction to artificial neural networks, historical development and comparison with natural neural networks; the artificial neuron or processing element as a correlator; multi-layer networks and the role of a nonlinear activation function; multilayer perceptron with back-propagation training; gradient-descent versus higher-order training; radial basis function networks; matrix associative memory; Hopfield net as associative memory; competitive learning networks; Carpenter and Grossberg Adaptive Resonance Theory; Kohonen self-organising feature map; applications of neural networks in signal processing, image processing and machine vision, including associative memory, supervised and unsupervised classifiers and pattern recognition.

#### **ZITE8215**

##### **Principles of Modern Communications and Information Systems**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course provides an overview of the principles of modern communications and information systems. Course content includes fundamentals of digital and analogue signals, modulation, multiplexing, transmitters and receivers, transmission lines, radio wave propagation, antennas, types of communication systems, satellite communications, personal communications systems, networking, internetworking, the Internet, fundamentals of information systems, information management, software languages, databases and operating systems.

#### **ZITE8216**

##### **Principles of Software Engineering**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

**Excluded: Not available to students who have completed ZITE8136**

This course provides an overview of the principles associated with software engineering. Topics include the software crisis, introduction to software development, software process models, risk management, computer-aided software engineering, software development capability and capability development models, software measurement (metrics), software quality assurance, software configuration management, verification and validation, test and evaluation, cost and schedule estimation, and software development standards.

#### **ZITE8217**

##### **Principles of Surveillance Technologies**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course provides an overview of the theory and practice of the technologies and systems utilised in ground and airborne surveillance systems. Topics include an examination of the portions of the electromagnetic spectrum used for surveillance; optics fundamentals; image intensification techniques; thermal imaging; fundamentals of lasers and laser systems. Participants will be introduced to the theory and practice of a broad range of radar systems including pulse radar, CW and CW/FM radar, pulse doppler and MTI radar and SAR. Radar EW will be covered using the traditional breakdown of Electronic Support, Electronic Protection and Electronic Attack.

#### **ZITE8218**

##### **Robotics**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: Assoc Prof H Pota**

Classification of robots; dynamical models of a manipulator arm; flexible and rigid arms analysis; control of manipulator arm; design of adaptive controllers; mobile robots; self-learning intelligent robots.

**ZITE8219****Satellite Communications****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 Intensive Delivery (RAAF Retention Scheme)****Staff Contact: Dr M Ryan**

Fundamentals of satellites, including: applications, orbits, propagation and link calculations, system hardware for space and ground segments, multiplexing and multiple access techniques, network design, and future trends. Fundamentals of signals and noise associated with satellite communications. Transmission concepts: calculate analogue transmission rates with respect to distortionless transmission, amplitude and delay distortions with equalisation, nonlinear distortion with companding, and carrier-to-noise ratio and signal-to-noise ratio; and calculate digital transmission rates with respect to line codes, intersymbol interference, pulse shaping and equalisation, bit energy-to-noise density and error probabilities.

**ZITE8220****Software Engineering****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

A laboratory-based course involving a number of software design and coding exercises that lead to a software project chosen by the student. Software engineering principles are taught through the use of a graphical object oriented programming tool called Prograph. The emphasis of the course is that of software design using appropriate class and inheritance within various re-useable software components.

**ZITE8221****Spaceborne Imaging Technology****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Planck's blackbody radiation law, atmospheric transmission and atmospheric windows. Wavelength ranges available for earth imaging and corresponding energy-matter interaction mechanisms. Detectors in the visible and reflective infrared regimes. Imaging spectrometry. Thermal detectors. Passive and active microwave sensing of earth surface features, including synthetic aperture radar methods. Spaceborne imaging systems including Landsat MSS and TM, Spot HRV, SIR A, B, C, ERS-1, JERS-1, Radarsat and aircraft systems. Image processing methods used in support of image interpretation.

**ZITE8222****Special Elective 1****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office**

An occasional elective given by a member of staff or external lecturers or visitors on a topic of immediate relevance. Alternatively a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZITE8223****Special Elective 2****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office**

An occasional elective given by a member of staff or external lecturers or visitors on a topic of immediate relevance. Alternatively a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZITE8224****Special Elective 3****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

An occasional elective given by a member of staff or external lecturers or visitors on a topic of immediate relevance. Alternatively a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZITE8225****Special Elective 4****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

An occasional elective given by a member of staff or external lecturers or visitors on a topic of immediate relevance. Alternatively a literature review of the technology in a specific area or a design project of appropriate intellectual and technical challenge may be undertaken.

**ZITE8226****Systems Engineering Practice****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 Intensive Delivery (RAAF Retention Scheme), S2 on-campus, S2 distance****Staff Contact: Dr M Ryan**

This course provides students with an overview of Systems Engineering theory including process, management, related disciplines and tools. A simulated design exercise allows students to apply Knowledge of Systems Engineering processes and management to real-life system development. Throughout the exercise, design reviews are conducted to evaluate progress and introduce realistic development issues.

**ZITE8227****Digital Image Processing and Enhancement****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

Digital image processing as 2D signal processing; the effect of sampling a 2D signal (and higher dimensional signals); the 2D and higher dimensional discrete Fourier and other transforms, including wavelet transform; filtering in spatial and spatial frequency domains; image registration and its use in many image

processing applications; 3D depth reconstruction using multiple views (stereo) and shape-from-shading; image warping and morphing; simple grey-level contrast enhancement and colour representation and display; imaging system response; concept of image degradation through convolution by point-spread function (PSF or impulse response); natural degradation due to defocus blur; motion blur and atmospheric turbulence; image restoration by deconvolution with position-invariant PSF; the importance and problem of signal noise; inverse filter and the Wiener filter; iterative image restoration; the need for additional information or constraints; speckle astronomy and phase restoration; the problem of position-dependent PSF; tomographic reconstruction; applications in medical imaging, security, law enforcement and astronomy.

#### **ZITE8228**

##### **Modern Signal Estimation and Filtering Techniques**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

This course focuses on modern state-space filtering techniques and their applications. Topics include the fundamentals of discrete-time and continuous-time linear system modelling of random signals; state-space signal estimation; Kalman filtering and smoothing; the extended Kalman filter; introduction to advanced filtering techniques such as robust filtering and adaptive filtering; Matlab tools for state-space signal estimation and filtering; example applications from the following selection: channel equalisation, CDMA networks, estimation of wireless communication signals. The course offers a series of lectures and tutorials aimed at assisting students understand the idea and implementations of state-space filters. At the completion of the course students will have both theoretical knowledge and practical skills necessary to develop and implement modern signal estimation and filtering algorithms including the Kalman filter and the H-infinity filter.

#### **ZITE8229**

##### **Non-Communications Electronic Warfare**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 distance**

**Staff Contact: Mr C Benson**

This course introduces the field of non-communications electronic warfare including Radar Electronic Support and Jamming, Infrared Countermeasures, and Missile and Laser Warning. It addresses the fundamentals of each area, and provides an understanding of the support, platform and operational issues affecting Electronic Warfare systems. Students should have, or be willing to gain an appreciation of radar.

#### **ZITE8298**

##### **Project Report - Electrical Engineering (PT)**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC6 HPW3**

**S1 distance, S1 on-campus, S2 distance, S2 on-campus**

**Staff Contact: School Office**

Research project plus report in approved form.

#### **ZITE8299**

##### **Project Report - Electrical Engineering**

**School of Information Technology and Electrical Engineering**

**Enrolment requires school approval**

**UOC12 HPW6**

**S1 on-campus, S2 on-campus**

**Staff Contact: School Office**

Research project plus report in approved form.

#### **ZITE8401**

##### **Analysis of Military Systems**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance, S2 on-campus**

**Staff Contact: Assoc Prof M Frater**

This course will provide introductory instruction on the analysis of military combat systems. The course will cover the combat system chain of sensor, command and control and weapon systems. The sensors covered will include radar, sonar and electronic support and the analysis will include the general principles, propagation and clutter issues as well as target characteristics. The command and control functions covered will include tracking and decision support. The weapon system analysis will include general weapon kinematics, guidance schemes and terminal effects.

#### **ZITE8402**

##### **Concept Development, Experimentation & Wargaming**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance**

**Staff Contact: School Office**

**Excluded: Not available to students who have completed ZITE7403**

CDEW prepares students to support the decision making process in Defence. They will be able to propose options and be able to provide useful and insightful input to senior decision makers. This course is focused on Ackoff problems. Problems are characterised by incomplete knowledge of the issues and the system, and are thus not amenable to exact solution via mathematical optimisation. Instead, formulation of the issues and any objective functions must be agreed by the stakeholders and the analysts.

#### **ZITE8403**

##### **Decision Analysis**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S1 distance, S1 on-campus**

**Staff Contact: Dr A McLucas**

The aim of this course is to expose students to various methods of structuring and analysing decision-making problems and demonstrate their use. The topics covered will include pay-off matrices, multifactor evaluation techniques, decision trees, AHP, influence diagrams, mind maps and group decision making techniques.

#### **ZITE8404**

##### **Introduction to Defence Operations Research**

**School of Information Technology and Electrical Engineering**

**UOC6 HPW3**

**S2 distance**

**Staff Contact: School Office**

This course will describe the operations analysis process, data collection, validation of models, sensitivity analysis, and the applicability of models. The areas of military and defence operations analysis such as search, detection and damage assessment, simulation and wargames, cost effectiveness and cost benefit analysis, linear and integer programming, heuristic optimisation, AHP and SMART technologies, combat models and threat assessment will be covered. The course will also address the validation of results from operations research tasks and the implementation difficulties. The present process of tasking OR agencies and the management of tasks will be outlined.

**ZITE8405****Optimisation Techniques****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: Dr R Sarker**

The aim of this course is to expose students to various deterministic optimisation tools and techniques. The course generally covers topics such as: an overview of mathematical modelling, linear programming, integer programming, network techniques, goal programming and multi-objective approaches, large-scale optimisation systems, mathematical programming languages and other optimisation software, and case studies in both defence and non-defence environments.

**ZITE8406****OR Special Topic 1****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the areas of Operations Research and/or Statistics, given by visitors or external lecturers or members of staff.

**ZITE8407****OR Special Topic 2****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S1 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the areas of Operations Research and/or Statistics, given by visitors or external lecturers or members of staff.

**ZITE8408****OR Special Topic 3****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the areas of Operations Research and/or Statistics, given by visitors or external lecturers or members of staff.

**ZITE8409****OR Special Topic 4****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

Occasional topics of relevance in the areas of Operations Research and/or Statistics, given by visitors or external lecturers or members of staff.

**ZITE8410****Soft Systems Methodologies****School of Information Technology and Electrical Engineering****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

Systems methodologies referred to as soft, focus on a paradigm of learning and gaining knowledge about systems rather than being primarily based on a paradigm of optimisation. This course will introduce key concepts of systems thinking and systems practice which are particularly suited to strategic decision making. It will include Checkland's Soft Systems Methodology as well as Influence Diagrams and Cognitive Mapping. Guidelines will be developed and provided to assist the choice of the appropriate Soft Systems Methodologies for different problem situations and the student will gain proficiency in these methodologies by the completion of a number of projects as well as by participation in class tutorials.

**ZITE8411****Warfare Modelling and Analysis****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course will introduce students to some of the concepts and techniques in analysing warfare. It will cover the simulation of warfare, including manoeuvre, detection, attrition and command control. A range of techniques and approaches to the analysis of warfare will be described, including the use of mathematical modelling techniques particularly Lanchester models, the use of war games and of computer combat models including agent-based approaches. The course will also cover measures of effectiveness and the role of the environment.

**ZITE8412****Simulation****School of Information Technology and Electrical Engineering****UOC6 HPW3****S1 on-campus, S1 distance****Staff Contact: School Office**

The aim of this course is to present the principles of simulation. These cover: concepts of modelling, continuous and discrete systems, time stepped and event stepped simulation of queue systems and inventory systems, exposure to simulation languages. The course is similar to ZITE7402 but is assessed differently.

**ZITE8413****Advanced Simulation****School of Information Technology and Electrical Engineering****UOC6 HPW3****Not offered in 2007****Staff Contact: School Office**

This course addresses topics such as simulation architectures (HLA, DIS), engagement models, representation of human factors, human in the loop simulation, simulation for training, distributed simulation, grid simulation, defence and security applications.

**ZITE8498****Defence Operations Research Report Full Time****School of Information Technology and Electrical Engineering****Enrolment requires school approval****UOC24****S1 distance, S1 on-campus, S2 distance, S2 on-campus****Staff Contact: School Office**

Full time study on a research project of relevance to the Defence Operations Research program, plus report in approved form.



**ZITE8499****Defence Operations Research Report Part Time**

**School of Information Technology and Electrical Engineering**  
**UOC12**

**S1 distance, S1 on-campus, S2 distance, S2 on-campus**

**Staff Contact: School Office**

Part time study in a research project of relevance to the Defence Operations Research program, plus report in approved form.

**ZITE8500****Professional Education**

**School of Information Technology and Electrical Engineering**  
**UOC6**

**S1 on-campus, S1 distance, S2 on-campus, S2 distance**

**Staff contact: School Office**

**Enrolment Requires School approval**

This course requires students to reflect on their role as a professional and to submit an essay in an approved form to explore issues related to their professional practice in information technology and electrical engineering. To be eligible to enrol in this course a student must already have completed at least 12 days of approved professional education short courses.

This course may only be used for credit at the Graduate Diploma and Masters level.

**ZITE8901****Case Studies in Information Technology**

**School of Information Technology and Electrical Engineering**  
**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: School Office**

This course offers perspectives on information technology through case studies. The case studies address issues that are covered more generally in other courses within the Information Technology degrees. The course is designed to raise awareness of generic questions at the level of particular cases, and to illustrate general principles through specific experience. There will be an emphasis on in-class participation and on real workplace situations.

**ZITE8902****Professional Practices**

**School of Information Technology and Electrical Engineering**  
**UOC6 HPW3**

**S2 on-campus**

**Staff Contact: Mr T Turner**

This course will help students to know how to carry out the tasks of a member of the Information and Communication Technology (ICT) discipline in a professional manner. The students will know how to find the most useful sources of information to build upon their knowledge of the discipline; follow the ethics of the discipline; meet the needs of the client for the acceptable and efficient use of ICT services; understand the practical concerns of managing contracts, projects, and risks; and present results of their work in terms understandable to business managers.

**ZITE8903****Research Methods**

**School of Information Technology and Electrical Engineering**  
**UOC6 HPW3**

**S1 on-campus**

**Staff Contact: Dr D Cornforth**

This course aims to provide students undertaking research with an understanding of basic frameworks in research. The course covers research techniques for gathering information, developing a research proposal and evaluating research carried out by others. Major areas include scientific and interpretive approaches, design, survey methods and instruments, case study, field study, experimentation, data collection and analysis. The principal skills imparted are in carrying out the research processes, and in the written and oral presentation of results.

**ZITE8998****DIT Dissertation (F/T)**

**School of Information Technology and Electrical Engineering**  
**Enrolment requires school approval**

**UOC24**

**S1 on-campus, S2 on-campus**

**Staff Contact: School Office**

Research component of the Doctor of Information Technology degree.

**ZITE8999****DIT Dissertation (P/T)**

**School of Information Technology and Electrical Engineering**  
**Enrolment requires school approval**

**UOC12**

**S1 on-campus, S2 on-campus**

**Staff Contact: School Office**

Research component of the Doctor of Information Technology degree.

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# SCHOOL OF PHYSICAL, ENVIRONMENTAL AND MATHEMATICAL SCIENCES

## ZPEM1101

### Chemistry 1A

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW6

S1 on-campus

Staff Contact: Dr L Wallace

The course commences with chemical reactions, concepts involved in chemical equations and an introduction to nomenclature of inorganic and organic substances. The gas laws are presented and then the electronic structure of gaseous atoms is developed. This leads to the concept of an orbital and provides a basis for the later description of ionic and covalent bonding and molecular geometry. Intermolecular forces are introduced which then leads to the chemistry of solutions and their properties. Finally, the chemistry of carbon, organic chemistry, is studied. Sub-topics include classes of organic compounds and common functional groups; and conclude with an introduction to biological chemistry.

## ZPEM1102

### Chemistry 1B

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW6

S2 on-campus

Staff Contact: Dr L Wallace

The direction in which chemical reactions proceed (thermodynamics) is studied. There is an introduction to the laws of thermodynamics and the concepts of entropy, enthalpy and free energy. In kinetics, the temperature and concentration dependence for rates of reaction are discussed. This includes the concept of rate laws, activation energy and mechanism. The degree to which a reaction proceeds (chemical equilibrium) is discussed and related to the change of free energy. Electron transfer is introduced as an important area of chemistry, together with the principles of electrochemical cells. Finally, some military chemistry is presented, including a brief introduction to chemical and biological weapons.

## ZPEM1103

### Engineering Chemistry 1A

School of Physical, Environmental and Mathematical Sciences

UOC3 HPW3

S1 on-campus

Staff Contact: Assoc Prof C Woodward

This course gives a basic introduction to the electronic structure of atoms and molecules as well as the origin of inter-molecular forces and their implications for the strength of materials. We consider the microstructure of alloys and their phase transitions, and survey other modern materials such as composites, ceramics and polymers. Fundamental principles of corrosion and energetic materials are also covered.

## ZPEM1104

### Engineering Chemistry 1B

School of Physical, Environmental and Mathematical Sciences

UOC3 HPW4

S2 on-campus

Staff Contact: Assoc Prof C Woodward

In this course the basics of solution chemistry are introduced. Apart from simple solutions, such as electrolyte solutions, we also consider hydrophobic solvation and colloidal dispersions. Aspects of surface chemistry and colloidal stabilisation are investigated.

Chemical equilibria, including acid-base equilibrium, as well as the fundamentals of chemical kinetics are studied. An introduction to the chemistry of concrete and polymeric materials is also given.

## ZPEM1106

### Introduction to Engineering Materials for Electrical Engineers

School of Physical, Environmental and Mathematical Sciences

UOC3 HPW3

Not offered in 2007

Staff Contact: Assoc Prof H Riesen

This course gives a basic introduction to the electronic structure of atoms and molecules as well as the origin of inter-molecular forces and their implications for the strength of materials. We consider the microstructure of alloys and their phase transitions; fundamental principles of corrosion and energetic materials are also covered. Various materials of importance to electrical engineering are surveyed, including high-temperature superconductors, conducting polymers, ceramics and semi-conductors.

## ZPEM1201

### Geography 1A: Introduction to Global Change

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW6

S1 on-campus

Staff Contact: Prof B Lees

The course introduces geographical perspectives on the nature and magnitude of global change. It sets out to provide an understanding of how human society arrived at the global crises which now face us. It looks at natural and human-generated processes and their impact on society and interaction one with another. The course looks at the causes of global change, the evolution and dispersal of humans as a result of global environmental changes, our ancestors attempts to manipulate and control their changing environment, and how this influenced population. It looks at the start of urbanisation and agriculture, and the subsequent globalisation of economic activity. The course finally looks at the impact of geographical knowledge and technology on the pre-industrial world. It provides the basis and explains the motivation underlying subsequent courses. This course normally involves a 2-day field school.

## ZPEM1202

### Geography 1B: Contemporary Global Change

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW6

S2 on-campus

Staff Contact: Dr G Banks

Explores the range of contemporary global processes and their local implications. Such geographic processes and outcomes provide the backdrop to an understanding of conflict in the contemporary world. As with Introduction to Global Change in first session, the emphasis is on the linkages between social and physical geographies across a range of scales. Topics may include the historical origins of contemporary global processes, the changing global economy, global cities, current environmental issues including land degradation and climate change, geographic technologies for analysing and managing environmental change, patterns of health and disease, and the nature of discourse and debates around global processes.

## ZPEM1301

### Mathematics 1A

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW6

S1 on-campus

Staff Contact: Dr Z Jovanoski

This course emphasises understanding of mathematical concepts and developing an appreciation for mathematical thinking. Linear Algebra unveils the logical structure of mathematics and

its development: geometrical description of vectors and their properties; problems leading to linear equations whose solution is facilitated by the development of matrix theory; applications of matrices in workforce planning and population dynamics; the study of eigenvalue problems. Calculus focuses on developing the essential skills of differentiation and integration, and applications to solve problems involving functions of one and two variables. It lays the foundations for subsequent studies in applied mathematics.

#### **ZPEM1302**

##### **Mathematics 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S2 on-campus**

**Staff Contact: Dr P McIntyre**

**Prerequisite/s: ZPEM1301**

The course covers material from ordinary differential equations (ODE's), complex numbers and probability. These are arguably the most important tools when Mathematics is applied to situations in science and engineering. Students will study first-order and second-order ODE's analytically, graphically and numerically. Many applications of ODE's will be explored. The possibilities that complex numbers open up are fascinating, and proficiency in them is developed. Random variation is present in almost all modelling situations. The foundation to probability presented here will make students aware of how much order there is in 'randomness' and how uncertainty can be quantified.

#### **ZPEM1303**

##### **Engineering Mathematics 1A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S1 on-campus**

**Staff Contact: Assoc Prof R Weber**

An introduction to the basics of calculus, complex numbers, linear algebra, modelling and differential equations. The course is designed to provide students from diverse backgrounds with the appropriate foundations for further studies in Mathematics and Engineering. The following topics are covered: algebra, calculus of a single variable, complex numbers, first-order differential equations, vectors and matrices.

#### **ZPEM1304**

##### **Engineering Mathematics 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S2 on-campus**

**Staff Contact: Prof R Sammut**

**Prerequisite/s: ZPEM1303**

This course covers three topics. The first, Linear Systems, considers linear second-order differential equations, phase planes and modelling various applicable systems using eigenvectors. The second topic, Probability, considers the fundamental laws of probability including continuous and discrete random variables, with applications to system reliability. The third topic, Multivariable Calculus, introduces the student to calculus in two dimensions such as gradients, line and double integrals and basic vector fields. There will be some use of computer packages such as MATLAB.

#### **ZPEM1401**

##### **Marine Science 1A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S1 on-campus**

**Staff Contact: Mr J Mathias**

An introduction to the behaviour of the oceans, with an emphasis on processes associated with water circulation and the ocean's

response to atmospheric forcing. Topics may include: an historical introduction to Marine Science, general properties of sea water, an introduction to waves and tides, oceanic and atmospheric circulation and their impacts on climate, El Nino. The course normally involves a three-day field school.

#### **ZPEM1402**

##### **Marine Science 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S2 on-campus**

**Staff Contact: Dr A Kiss**

**Prerequisite/s: ZPEM1401**

An introduction to the processes associated with the development of and interaction between the earth's crust and oceans. Topics may include: marine and submarine geology and bathymetry, structure of the sea floors, marine sediments, chemical oceanography, environmental and biological oceanography, coastal processes, marine resources and management, and defence oceanography.

#### **ZPEM1501**

##### **Physics 1A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S1 on-campus**

**Staff Contact: Assoc Prof W Lawson**

Students will be introduced to Physics through a selection of topics in three areas: Motion and Ballistics; Thermodynamics of the Terrestrial Environment; and Space Physics and Astrodynamics. The laboratory program comprises eight three-hour sessions relating to and supplementing the lecture course. Students acquire an appreciation of the place and utility of computers in Physics.

#### **ZPEM1502**

##### **Physics 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S2 on-campus**

**Staff Contact: Assoc Prof W Lawson**

**Prerequisite/s: ZPEM1501**

Students will be introduced to fundamental concepts in Physics through a selection of topics in three areas: Electromagnetism and Applications; Waves in Optical and Remote Sensing Systems; Atoms and Nuclei. The laboratory program comprises eight three-hour sessions, relating to and supplementing the lecture course.

#### **ZPEM1503**

##### **Engineering Physics 1A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S1 on-campus**

**Staff Contact: Assoc Prof W Lawson**

Students will be introduced to fundamental concepts in Physics through a selection of topics in the following three areas. General Physics and Mechanics: dimensions and dimensional analysis; coordinate systems; kinematics and dynamics; Newton's laws of motion, momentum, friction; energy, work and power; rotational dynamics, moments of inertia, angular momentum. Wave Motion and Optics: classification of waves, wave equation, harmonic waves, superposition, standing waves, Doppler effect; Huygens' principle, reflection, refraction, lenses and mirrors, interference, diffraction, resolving power of instruments. Atomic and Nuclear Physics: wave-particle duality; the wave nature of particles; de Broglie wavelength; electron and X-ray diffraction; photoelectric effect; quantisation of energy; Bohr model of the hydrogen atom; the nucleus and nuclear particles, unstable nuclei; ionising

radiation; radiocarbon dating; nuclear energy. Lectures and tutorials are supported by four three-hour laboratory sessions.

#### **ZPEM1504**

##### **Engineering Physics 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S2 on-campus**

**Staff Contact: Assoc Prof W Lawson**

**Prerequisite/s: ZPEM1303, ZPEM1503 or ZPEM1505**

Students will be introduced to fundamental concepts in Physics through a selection of topics in the following two areas: Electricity and Magnetism: Coulomb's law, calculations of electric fields and potentials; Gauss's law, capacitance, conductors and electric currents, origins of electrical resistance, Ohm's law, electrical measurements; motion of charges in electric and magnetic fields; Ampere's law; Biot-Savart law; electromagnetic induction, Faraday's law, inductance; displacement current, Maxwell's equations in integral form. Properties of Matter and Heat: elasticity; hydrostatic pressure and buoyancy; surface tension; ideal fluids, Bernoulli's equation, real fluids; temperature, thermometry, thermal expansion, equations of state; kinetic theory of gases; first law of thermodynamics, heat capacity, latent heat; heat transfer processes, conduction, convection, radiation. Lectures and tutorials are supported by four three-hour laboratory sessions.

#### **ZPEM1505**

##### **Electrical Engineering Physics 1A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S1 on-campus**

**Staff Contact: Assoc Prof W Lawson**

The lecture/tutorial component is identical to Engineering Physics 1A. Lectures and tutorials are supported by eight three-hour laboratory sessions.

#### **ZPEM1506**

##### **Electrical Engineering Physics 1B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S2 on-campus**

**Staff Contact: Assoc Prof W Lawson**

**Prerequisite/s: ZPEM1303, ZPEM1503 or ZPEM1505**

The lecture/tutorial component is identical to Engineering Physics 1B. Lectures and tutorials are supported by eight three-hour laboratory sessions.

#### **ZPEM1901**

##### **Contemporary Issues in Science**

**School of Physical, Environmental and Mathematical Sciences**

**Enrolment requires school approval**

**UOC6 HPW4**

**S2 on-campus**

**Staff Contact: School Office**

The course introduces the philosophy, thinking, skills and techniques involved in the study of sciences, centred on contemporary issues such as global warming. The course involves lectures, seminars and workshops. Each student will also undertake a discipline-specific project related to the main themes of the courses, give an oral presentation on their project and submit a written report.

#### **ZPEM2101**

##### **Inorganic Chemistry 2**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr L Wallace**

**Prerequisite/s: ZPEM1101 and ZPEM1102**

Inorganic Chemistry can be defined as the chemistry of the elements other than organic carbon, and is widely applicable to natural and synthetic materials. The various concepts of bonding for metals and non-metals are introduced, and these are applied to transition-metal chemistry, providing a basis for the understanding of the principles of coordination number, stereochemistry, liability, reactivity, and accessibility of multiple oxidation states. These principles are exemplified in the pivotal role played by metal ions and their coordination complexes in bio-inorganic chemistry, e.g. nitrogen fixation in living systems, and the use of metal ions and ligands in medicinal chemistry.

#### **ZPEM2102**

##### **Organic Chemistry 2**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Assoc Prof G Collins**

**Prerequisite/s: ZPEM1101 and ZPEM1102**

Organic Chemistry is about the reactions, structures and synthesis of molecules that have a carbon-based backbone. These materials form the basis of all known life, most pharmaceuticals and a wide range of materials. In this course, we look at the skills that chemists need to determine the structure of the compounds that they have isolated or prepared; how to determine the way they will react; and introduce strategies used in synthesis. We introduce and use NMR and IR methods for structure determination. The reaction mechanisms are investigated using the traditional functional groups and the concepts of nucleophiles and electrophiles.

#### **ZPEM2103**

##### **Physical Chemistry 2**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Assoc Prof H Riesen**

**Prerequisite/s: ZPEM1101 and ZPEM1102**

In chemistry we often need to understand the behaviour of large collections of particles. Intuitively we know that thermodynamic properties must be related to intermolecular forces. In the first part of this unit the relationship between microscopic interactions and bulk thermodynamic properties will be examined and the principles of Statistical Mechanics developed and applied to chemical topics. The second part of this unit will present an introduction to quantum chemistry and its applications in spectroscopy, including EPR, NMR, rotational, vibrational and electronic transitions. The knowledge gained will facilitate a better understanding of the chemical properties of atoms, ions and molecules.

#### **ZPEM2109**

##### **Environmental Chemistry**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr M Rahman**

**Prerequisite/s: ZPEM1101 and ZPEM1102**

This course provides students with an appreciation and understanding of the background and concepts of environmental chemistry. The topics discussed are based on aquatic and



atmospheric chemistry and are selected from the following areas: water and air quality; water purification; acid-base reactions in water; hydrolysis of organic compounds and hydrated metal ions; stratification of the atmosphere, and sources and abatement of toxic pollutants including particulate matter. The course includes a discussion of selected environmental issues such as global warming, acid rain, photochemical smog or ozone depletion and their environmental consequences.

### **ZPEM2111**

#### **Marine Chemistry 2**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr M Rahman**

**Prerequisite/s: ZPEM1401 and ZPEM1402**

This course begins with discussion of the unique properties of water. The effects of pressure and temperature on the structure of water are examined, leading to consideration of structural changes due to the presence of hydrated ions, and properties such as diffusion, conductivity, and density of seawater. The chemical composition of seawater, its relationships with physical oceanographic and biological processes, techniques for the precise measurement of variables such as salinity and chlorinity, and their influence on speciation of major and trace elements, are illustrated using examples largely drawn from the chemistry of the southern oceans.

**Note/s:** This course is an Oceanography course; it cannot form part of a Chemistry Major or Minor.

### **ZPEM2202**

#### **Ecological Biogeography**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S1 on-campus**

**Staff Contact: Dr D Paull**

An introduction to biogeography, the study of why organisms live where they do. In this course we will investigate factors that influence plant and animal distributions. Topics covered include: energy flow and nutrient cycling in ecosystems; habitat and niche concepts; how climate and topography affect the distribution of species; short and long distance dispersal of plants and animals; competition and interaction between species; the effects of natural and human-induced disturbance on biological communities; and, Island Biogeography Theory. Contemporary biogeographical and environmental issues may be highlighted.

### **ZPEM2203**

#### **Fundamentals of Remote Sensing**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr I Takken**

**Excluded: ZPEM2206**

Remote sensing provides a unique source of information for various environmental, oceanographic, social and military applications. This course will introduce the most important, currently available remote sensing techniques and sensors. It will provide an overview of the fundamentals of spectral, thermal and microwave remote sensing, whereby lectures and practical exercises will also demonstrate basic applications of remote sensing in geography and oceanography.

### **ZPEM2205**

#### **Rivers and Coasts**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S2 on-campus**

**Staff Contact: Assoc Prof J Croke**

Rivers play a dynamic role in shaping the Earth's landforms. Understanding sediment transport, erosion and deposition processes within rivers is critical to the management of our catchments. Coastal and estuarine areas are key features at the land-marine interface and play a major role in controlling pollutant delivery to the world's oceans. This subject examines processes forming and modifying contemporary river basins, and the delivery of material downstream to estuaries and coasts. Particular attention is given to the response of rivers and coasts to climate and land use change along with the social and economic factors influencing their management.

### **ZPEM2206**

#### **Remote Sensing: A Tool for Earth Observation**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S2 on-campus**

**Staff Contact: Dr I Takken**

**Excluded: ZPEM2403**

Remote sensing provides a unique source of information on phenomena and objects on the earth surface, such as vegetation, rocks, oceans and man-made objects, and found its application in many different disciplines. This course will look at the most important, currently available techniques and sensors for earth observation. It will deal with the theory of spectral remote sensing and will develop basic skills in the application of digital image processing techniques. It will also include the fundamentals of hyperspectral, thermal and microwave remote sensing. Current applications of remote sensing technology will be demonstrated in both lectures and practical exercises.

### **ZPEM2207**

#### **Social Geography**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S1 on-campus**

**Staff Contact: Dr S Sharpe**

This course examines how societies shape the places in which they live, and how people's attitudes and behaviours are influenced by these places. The course focuses on urban areas, mainly in Australia, and explores the ways in which cities facilitate the exchange of goods, services, ideas, knowledge, culture and friendship. The course normally includes a five day residential field school in May.

### **ZPEM2209**

#### **Development and Change**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S2 on-campus**

**Staff Contact: Dr G Banks**

Development and Change focuses on the background to, and processes of, economic, political, cultural and social change. Working with case studies drawn predominately from the Asia-Pacific region, this unit examines the history of development processes, the politics of development interventions, linkages between resources, environment and conflict in the developing world, and critical approaches to development. The theoretical background to economic geography and development studies used to frame these examinations is of value to those taking geography majors as well as those enrolled in politics, history, economics and business. The course provides useful context for those seeking to understand conflict in the region.

**ZPEM2301****Linear Systems****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S1 on-campus****Staff Contact: Prof C Pask****Prerequisite/s: ZPEM1301 and ZPEM1302.**

This course builds on the basic concepts of linear algebra introduced in Mathematics 1A and looks at a variety of applications - from fitting curves to data, to modelling systems of differential equations with applications to the evolution of population growth, problems in mechanics, chemical reactions and other areas of science. Key topics include the central concepts of linearity and linear superposition, generalisation of the dot product to an inner product, general vector spaces, and approximation of functions by orthogonal sets such as Fourier Series.

**ZPEM2302****Data Analysis****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM1301 and ZPEM1302.**

This course gives an introduction to data analysis, with emphasis on the analysis of experiments. It teaches the principles of good experimental design, and focuses on a project where you design and analyse your own experiment. The course introduces a simple statistical computer package that is used for data exploration and presentation, and the analysis of data from simple experimental and observational studies.

**ZPEM2303****Modelling Continuous Systems****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S2 on-campus****Staff Contact: Dr I Towers****Prerequisite/s: ZPEM1301 and ZPEM1302.**

Drawing on a basic knowledge of calculus and the fundamental principles of differential equations introduced in Level 1 Mathematics, we develop models from a variety of disciplines (such as biology, geography, archaeology and physics). The properties and methods of solution of first-order and second-order ordinary differential equations and some partial differential equations arising in these contexts are studied.

**ZPEM2304****Discrete Dynamics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S1 on-campus****Staff Contact: Dr H Sidhu****Prerequisite/s: ZPEM1301 and ZPEM1302**

Discrete dynamics is the study of quantities that change at discrete points in time, such as the size or genetic make-up of populations. Topics covered may include linear difference equations, the role of probability in discrete dynamical modelling, nonlinear difference equations, self-similarity and fractal geometry, systems of discrete equations. Examples will be drawn from diverse areas including biology and finance.

**ZPEM2305****Networks and Patterns****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S2 on-campus****Staff Contact: Dr Z Jovanoski****Prerequisite/s: ZPEM1301 and ZPEM1302**

Networks are everywhere: roads, telephone lines, airline routes, nerve cells, family trees, social and management organisations and the world wide web for example. This course will provide an introduction to the mathematics of networks, looking at some of the key problems and applications. There will be an introduction to graph theory and the classic problems of Euler, Hamilton and the Travelling Salesperson. Additional topics may include an introduction to topology and symmetry theory as applied to networks.

**ZPEM2306****Regression Modelling****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2302**

Regression is one of the most widely used statistical tools. Its purpose is to uncover patterns in data, and to explore relationships between variables. The course emphasises informal techniques rather than mathematical analysis, and model building rather than formal statistical analysis. Topics covered include simple linear regression, multiple regression, graphical methods, transformations and model selection.

**ZPEM2307****Special Topic 2A****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

**ZPEM2308****Special Topic 2B****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

**ZPEM2309****Engineering Mathematics 2A****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW6****S1 on-campus****Staff Contact: Dr Z Jovanoski****Prerequisite/s: ZPEM1304**

The course covers two distinct topics. The first, Ordinary Differential Equations (ODEs), looks at the basics of mathematical modelling with ODEs, non-dimensionalisation, first-order and second-order

ODEs, Laplace transform methods, series solutions, perturbation methods, phase planes and non-linear systems. The second topic, Multivariable Calculus, looks at gradients, divergence, curl, multiple integrals, vector fields, vector fluxes and integral theorems. Both topics will use the MATLAB computer package and examples from engineering and applied mathematics.

## **ZPEM2310**

### **Engineering Mathematics 2B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**S2 on-campus**

**Staff Contact: Dr S Barry**

**Prerequisite/s: ZPEM2309**

The course covers two distinct topics. The first, Partial Differential Equations (PDEs), looks at the basics of mathematical modelling with PDEs, with special emphasis on diffusion and wave equations in Cartesian, cylindrical and spherically symmetric systems. The course will cover non-dimensionalisation, separable PDEs and orthogonal functions. The second topic, Probability and Statistics, builds on the first-year probability course to consider a selection of topics such as: lifetime distributions, hypothesis testing, lifetime data and regression. Computer packages such as R and MATLAB will be used in both topics to analyse typical engineering problems.

## **ZPEM2401**

### **Ocean Dynamics 2A**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW4**

**S1 on-campus**

**Staff Contact: Dr X H Wang**

**Prerequisite/s: ZPEM1301 and ZPEM1302 and ZPEM1401 and ZPEM1402**

Physical properties of the oceans and sea water including topics on salinity, temperature, density, water column stability, and double diffusion. An introduction to the flow of fluids and a description of the forces that control the currents of the world's oceans. Ideas of space-time scales in the ocean. The dynamics of wind-driven flow, the Ekman and geostrophic balances, and inertial oscillations. Tides in the oceans and the dynamics that govern tidal processes. Topics include equilibrium tidal theory, semi-diurnal and diurnal tides, Spring-Neap cycles, tides in gulfs. A field school is normally held for four days during the May recess during which students collect, process and analyse oceanographic data.

## **ZPEM2402**

### **Ocean Dynamics 2B**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: DR X H Wang**

**Prerequisite/s: ZPEM2401**

Topics on surface gravity waves are discussed and may include wave dispersion, short and long surface waves, wave groups, wind generation of waves. Near shore processes are discussed including topics on wave refraction and shoaling, surf and rip currents and long shore drift. An introduction is presented to the use of models in the marine environment to describe physical and ecological processes. We consider the development of models from our basic knowledge of the science of the oceans and consider analytical and numerical models with applications to both small-scale coastal systems and the global ocean.

## **ZPEM2501**

### **Electronic Properties of Materials**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Assoc Prof G Stewart**

**Prerequisite/s: ZPEM1301, ZPEM1302, ZPEM1501, ZPEM1502**

The course covers the physics relevant for the manufacture and operation of electronic and optoelectronic devices which have revolutionised civilian and military technology. In particular it discusses crystal structure, and its determination by x-ray diffraction and electron microscopy, as an introduction to the concept of wave-particle duality. Other topics include the time-independent Schroedinger equation and the quantum-mechanical description of electrons, the Pauli Exclusion Principle, an introduction to the concept of band gaps, factors influencing the speed of electronic switching, and the absorption and emission of photons. The physical concepts are applied to a selection of the following topics: high-speed amplifiers and modulation doping, band-gap engineering, semiconductor lasers and light-emitting diodes, solar cells, thermoelectric devices, and piezoelectric transducers.

## **ZPEM2502**

### **Waves and Remote Sensing**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Assoc Prof W Lawson**

**Prerequisite/s: ZPEM1301, ZPEM1302, ZPEM1501, ZPEM1502**

A selection of the following topics will be covered. General wave physics (diffraction and resolution limits; refractive index and wave velocity; ray tracing; dispersion and Fourier composition; wave energy transport). Wave propagation (sound in air; sound in water; light and other electromagnetic waves in the atmosphere; mirages; sonar and radar shadow zones; optical fibre imaging; radar, including time-of-flight ranging; pulse-Doppler systems; radio-acoustic sounding systems (RASS)). Electromagnetic radiation (dipoles; polarisation; dielectrics; electrets and magnets; eddy currents, metal detectors and magnetic anomaly detectors; the magnetron; displacement current; Maxwell's equations and the electromagnetic wave equation in free space and in ideal materials; generation and reception of electromagnetic waves; the Poynting vector).

## **ZPEM2503**

### **Astronomy and Astrophysics**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr R Smith**

**Prerequisite/s: ZPEM1301, ZPEM1302, ZPEM1501, ZPEM1502**

The course provides an introduction to the field of Astronomy and Astrophysics and as such encompasses a broad range of topics. For example, it is important to be familiar with the basic tools of astronomy in order to understand observations made using these tools. In addition, astronomy has developed its own terminology and system of measurement units that need to be understood. Central to the course is the process of stellar evolution, with tenuous beginnings in interstellar clouds and, for the more massive stars, spectacular endings in supernova explosions. Stars normally do not occur in isolation so they need to be seen as members of binary systems, star clusters, our own Milky Way Galaxy, other galaxies and even clusters of galaxies. Throughout the course the fundamental physics underpinning the observations and the processes that produce them needs to be kept in mind in order to provide a foundation for understanding what is taking place.

**ZPEM2506****Meteorology and Atmospheric Physics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S2 on-campus****Staff Contact: Dr J Taylor****Prerequisite/s: ZPEM1301, ZPEM1302, ZPEM1501, ZPEM1502****Excluded: ZGEN2402, ZPEM2511, ZPEM3527, ZPEM4505**

A selection of the following will be explored: Hydrostatic balance and the vertical structure of the atmosphere; altimetry. Pressure systems and winds; geostrophic, gradient and ageostrophic balance. The global circulation, synoptic-scale weather systems, air masses and fronts, local winds. Thermodynamics of dry and moist air; the aerological diagram; stability and conditional stability; cloud base and tops.

**ZPEM2507****Sonar and Underwater Optics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S2 on-campus****Staff Contact: Assoc Prof G Stewart****Prerequisite/s: ZPEM1301 and ZPEM1302 and ZPEM1401 and ZPEM1402**

The course includes the following topics: plane wave approximation, acoustic refraction, ray tracing and sound channels; acoustic wave theory, the decibel unit, transmission across a media interface and propagation loss; acoustic beam formation and electronic steering; sonar applications: active sonar versus passive sonar, echo sounders, sidescan sonar, sonobuoys, towed arrays, multiple beam and switching sonar; sonar equations and sonar system effectiveness. Mechanisms for attenuation of light by sea-water, the extra-low frequency and blue transmission windows; airborne mapping of coastal waters: the Nd:YAG infra-red laser, frequency doubling, Q-switching, and the Australian (LADS) and US (ABS) systems.

**ZPEM2510****Electrical Engineering Physics 2****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S2 on-campus****Staff Contact: Dr H Timmers****Prerequisite/s: Enrolment in Program 4422, ZPEM1504 or ZPEM1506**

The electrodynamic field concept and Maxwell's theory are fundamental to electrical engineering, while modern opto-electronic devices such as semiconductor diodes and transistors can only be understood within a quantum-mechanical approach. Building on the first-year engineering physics programme this course introduces the foundations of electrodynamics and presents basic concepts of quantum mechanics. This includes the following topics: charge distributions, field concept, Coulomb force, Gauss' law, Stokes' law, integral representations of Maxwell's equations, differential representations of Maxwell's equations, vector algebra and analysis, differential operators, conductors and dielectrics, boundary conditions, current density, conductivity, Biot-Savart Law, Ampere's law, scalar and vector potentials, Faraday's law, plane-wave propagation; limits of classical physics, one-dimensional Schrodinger equation, wave function, eigen functions, expectation values, one-dimensional potential wells, tunnelling, band structure. The course content is applied in two assessed laboratory sessions and in two workshops which focus on problem-solving.

**ZPEM2511****Introductory Meteorology AV****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S1 on-campus****Staff Contact: Dr J Taylor****Prerequisite/s: ZPEM1303, ZPEM1304, ZPEM1503, ZPEM1504****Excluded: ZGEN2402, ZPEM2506, ZPEM3527, ZPEM4505**

A selection of the following will be explored: The atmosphere (composition; density, pressure and temperature; variations with altitude, principal layers; hydrostatic equation; altimetry). Thermal/moisture processes (properties of dry and moist air, phase changes, latent heat; long- and short-wave radiation; heat flows, energy balance; development of temperature gradients and thermal circulations). Stability ('parcel' model of stability, dry and moist adiabatic processes, the aerological (F160) diagram; temperature inversions). Clouds (cloud classification, formation and location). Precipitation (types of precipitation and relation to cloud type; droplet formation and growth). Wind (meteorologically significant forces, equations of motion, geostrophic and gradient flows; variations with height and time). Meteorological practice (terminology, instruments, observations, forecasts).

**ZPEM2512****Aviation Meteorology AV****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S2 on-campus****Staff Contact: Dr A Drake****Excluded: ZGEN2402**

This course builds on ZPEM2511 Introductory Meteorology AV to develop knowledge and understanding of weather phenomena of significance to aviation, and of meteorological information products provided for aviators. The topics covered are: the global circulation, large-scale weather systems in mid-latitudes and the tropics, high-altitude meteorology, fronts, thunderstorms, local weather phenomena, icing, visibility, turbulence, and wind shear. The meteorological services available to aviators, and the terminologies and message code used in aviation weather forecasts, are also introduced, and climatic conditions for some key Australian airports summarised.

**ZPEM2901****Research Project 1****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC6 HPW3****S2 on-campus****Staff Contact: School Office**

Students will undertake one or more research-based projects together with coursework as set by the School. As one of the aims of the program is to develop critical thinking and independent research skills, the projects will involve 'hands-on' research experience in collaborations with staff members and their research team. A supervisor, who is a member of academic staff, will work closely with the student and will manage each project. The projects will be chosen after discussion between the student, the supervisor and possibly other members of staff. Students will be expected to present a short introductory seminar on a project in the first half of the Session. Assessment in the course will be based on a written paper and oral presentations on the projects, and a combination of examinations, tests and assignments on the coursework if appropriate.



**ZPEM3101****Inorganic Chemistry 3****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

This course comprises two topics of approximately equal weight. Molecular Architecture - elementary considerations of symmetry and formal classifications of molecules based on their symmetry elements and operations; spatial relationships between atoms or groups of atoms. Structures such as the amazing C60 molecule, the intricate polymer DNA, selected inorganic and organic coupled-ring systems, helical molecules, molecular knots, and chemical curiosities such as spirane and cubane are also described. Macrocyclic coordination chemistry: synthetic and naturally occurring macrocyclic ligands; binding of metals and anions; cyclodextrins; host-guest chemistry; supramolecular self-assembly; industrial, biological, medical and other applications.

**ZPEM3102****Organic Chemistry 3****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

Organic Chemistry has always pondered these questions: What is this compound? How and why does it react? How can I make it? However, the way in which we answer these questions is continually changing with our increasing technological skills. We will build on the skills from ZPEM 2102 Organic Chemistry 2 in a course based on solving practical and theoretical problems. To answer these questions we will delve into spectroscopic problem solving, introduce molecular orbitals and use them to predict compound reactivity. Finally retrosynthetic analysis will be employed as a tool in developing synthetic pathways for a range of organic molecules.

**ZPEM3103****Physical Chemistry 3****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Assoc Prof H Riesen****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

Two major explanatory theories of Physical Chemistry, quantum theory and statistical theory, are studied in equal parts in this subject: (i) An introduction to spectroscopy and quantum chemistry, and their use in determining the energies, structures, dimensions and other properties of individual molecules. (ii) An introduction to the behaviour of assemblies of molecules using statistical mechanics applied to fluids to explain structure from intermolecular forces and thermodynamic properties. The laboratory work includes spectroscopic experiments for the determination of molecular energies and dimensions, comparing results with theoretical calculations.

**ZPEM3106****Biological Chemistry****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Assoc Prof G Collins****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

The composition, structure and reactivity of enzymes are studied. The enhancement of reactivity in enzymic reactions, from both

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a kinetic and mechanistic viewpoint, and methods of enzyme inhibition are discussed. The structure and function of DNA is then examined. Topics covered include replication, transcription, translation, and gene regulation. The second part of the course covers general aspects of the inorganic chemistry of biological systems, in particular the roles of metal ions in biological processes, e.g. the function of iron in haemoglobin and myoglobin is elaborated. Techniques discussed include X-ray structure analysis, EXAFS, electron paramagnetic resonance (EPR) and luminescence spectroscopy.

**ZPEM3107****Explosives****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Dr L Wallace****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

History of energetic materials: black powder to modern explosives. Free radical mechanisms of fuel oxidation and explosive combustion. Thermal explosions. Thermodynamic methods for obtaining maximum temperatures and pressures of explosions. Decomposition and detonation mechanisms and models for energetic materials. Techniques for investigating very fast reactions. Collision and activated complex theories of reaction kinetics. Insensitive munitions. Classification of explosives. Manufacture, properties and applications of military and commercial explosives. Physical and chemical methods of explosives detection.

**ZPEM3109****Polymeric Materials****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2101, ZPEM2102, ZPEM2103, ZPEM2109**

Artificial macromolecules are of great importance. Synthetic methods of polymerisation are defined and illustrated through examples such as polyethylene, synthetic rubbers, silicones, nylons,

epoxy resins and carbon-fibre reinforced plastics. The degradation of polymers is also discussed. Some fundamental aspects of polymer solutions and melts are also explored, e.g. polymer statistics are related to viscosity and light-scattering experiments.

**ZPEM3121****Supramolecular Chemistry****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Assoc Prof C Woodward**

This course draws together concepts in inorganic, organic and some physical chemistry to study the behaviour and applications of supramolecular assemblies. Supramolecular Chemistry describes the chemistry of large molecules, many of which are the building blocks of molecular systems employed in the set of chemical applications now called nanotechnology. The range of topics covered include macrocyclic coordination compounds, cyclodextrins, cucurbiturils, host-guest chemistry, polymers and liquid crystals and supramolecular self-assembly. We look at many applications from the military, industry, medicine and biology.

**ZPEM3202****Cultural Geography****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Dr S Sharpe**

Do sex, sport and humour serve as domains in which different cultures can communicate? Or are they sites of cultural division? Cultural geography approaches such questions by examining the way meaning is constructed according to the role of space and place. This course introduces students to the sub-discipline of cultural geography through the meanings attached to three important domains of cultural life: sex, sport and humour. These domains are produced and consumed very differently depending on location. Students will have the opportunity to research their own case study from one of these areas.

**ZPEM3203****Conservation Biogeography****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Dr D Paull**

The contribution of biogeography in facing the current global extinction crisis. The course begins with a consideration of historical biogeography as the basis for understanding past, present and future patterns of biological diversity on earth. The principles and practice of the sub-discipline Landscape Ecology are then examined with particular emphasis given to wildlife ecology in Australia. Other ecological systems and their management may also be emphasized.

**ZPEM3204****Environmental Hazards****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Dr A Griffin**

This course will look at both natural and human-induced environmental hazards and what their study can tell us about how humans interact with the environment. We will look at how a number of concepts (e.g. privilege/poverty; time/change; scale/intensity; risk/vulnerability) can inform our understanding of both hazards and institutional reactions thereto. As members of the ADF, it is quite likely at some point you will be involved in a relief operation either in Australia or overseas. An understanding of the nature of hazards, hazard mitigation and emergency management will help to prepare you for participation in these activities.

**ZPEM3207****Making Decisions in Geography****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Prof B Lees**

This course provides a practical introduction to the use of geographic information systems and spatial modelling using digital geographic data to support decision making. The practical exercises take the form of an Environmental Impact Study of a small coastal catchment. On the satisfactory completion of the course, students will have built spatial models of hydrology, erosion, conservation, wildlife habitat, forest, agriculture, fire and economy, and integrated these components within the geographic information system. Lectures will develop a solid understanding of the principles involved in the practical work.

**ZPEM3208****Geographic Research Methods****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Dr S Sharpe****Prerequisite/s: ZPEM1201 and ZPEM1202**

Research frameworks in geography. Topic definition, theory and methodology. Practicalities of data collection and field work. Data analysis and interpretation. Reporting research findings. Applications of geographic research. Research ethics. The course provides students with experience in designing and undertaking a field-based geographic research project. The course normally involves a residential field school of approximately six-days duration.

**ZPEM3209****Water Matters****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Assoc Prof J Croke**

What happens when the water runs out? The current demands for water in Australia have created an urgent need for more effective water management strategies. This subject examines topics relating to three major components of water resource management; water quality, water quantity and water resource allocation. The course uses specific case studies from river and coastal areas to examine key issues of water management focusing primarily on the physical processes but also addressing the social and economic barriers to effective water management in Australia.

**ZPEM3213****Resource Management****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S2 on-campus****Staff Contact: Dr I Takken****Prerequisite/s: ZPEM1201 or ZPEM1202**

The course is concerned with the analysis, allocation and management of natural resources. It involves understanding the characteristics of resources; what is involved in their allocation, and, how they are managed. Case studies are examined in parts of the course.

**ZPEM3215****Transport Geography****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Dr P Tranter**

The course explores different approaches to the geographical study of transport. It deals mainly with the transport of people in urban areas, and concentrates on specific issues within transport geography (e.g. transport planning, quality-of-life issues, environmental concerns, road safety and political decision making). A key theme in the course is reciprocal relationships between transport and all aspects of environment (physical, economic, social and political). This theme is illustrated through a range of examples, including high-speed rail projects, light-rail systems, traffic calming in European and Australian cities, and new road building.

**ZPEM3221****Special Topics (Geography)****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC6 HPW5****S1 on-campus, S2 on-campus****Staff Contact: School Office**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

**ZPEM3301****Applied Mathematical Techniques****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S1 on-campus****Staff Contact: Prof R Sammut****Prerequisite/s: ZPEM2301 and ZPEM2303**

This course introduces a variety of techniques, mainly dealing with mathematical problems that do not have exact analytical solutions. Topics may be selected from the following: perturbation theory; bifurcation; dynamical systems; asymptotics; calculus of variations; integral transforms; integral equations; comparison theorems.

**ZPEM3302****Complex Variables****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM1301 and ZPEM1302**

The extension of basic calculus into the complex plane leads to some of the most beautiful (and sometimes surprising) results in Mathematics. After revising the basic properties of complex numbers, this course looks at how familiar concepts such as functions, derivatives and integrals are defined and evaluated in the complex plane. Specific topics include: analytic functions, the Cauchy-Riemann equations, complex line integrals, Cauchy's theorem and integral formulae, Laurent series, the Residue theorem, evaluation of real integrals by contour integration, and elementary functions as mappings.

**ZPEM3304****Projectiles****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****Not offered in 2007 on-campus****Staff Contact: School Office****Prerequisite/s: ZPEM2301 and ZPEM2303**

This course will consider the motion of projectiles from a mathematical point of view. The major forces, namely gravity, drag and lift, will be included in progressively more sophisticated models of projectile motion, with an emphasis on being able to determine numerical values for all relevant parameters and on calculating complete trajectories. Advanced topics, such as the effect of the Coriolis force and the fluid-mechanical origin of drag and lift, will also be included. Analytical and numerical techniques will be used, and there will be considerable discussion of the application to projectiles in sport.

**ZPEM3305****Projects****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2301 and ZPEM2303**

A short introduction to mathematical modelling; the skills required, possible strategies. Occasional lectures on particular problems, with emphasis on the way in which the problems were translated into mathematical form. Practical experience in setting up and using mathematical models: students work alone or in small groups. Regular reports and conferences with project supervisors are required. At the conclusion each student must make a formal presentation and submit a written report.

**ZPEM3306****Fluid Mechanics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S2 on-campus****Staff Contact: Assoc Prof R Weber****Prerequisite/s: ZPEM2301 and ZPEM2303**

Approaches to the study of fluid flow from the mathematical point of view of solving differential equations and approximating governing equations in limiting cases where viscosity is dominant or negligible. Applications from: aerodynamics, boundary layers, instability, lubrication, meteorology, swimming of micro-organisms, vortices and waves in fluids.

**ZPEM3307****Waves****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S2 on-campus****Staff Contact: Dr P McIntyre****Prerequisite/s: ZPEM2301 and ZPEM2303**

An introduction to the mathematical description of waves. Theory and physical intuition are developed using simple examples such as waves on strings. More complex systems are then examined, including sound waves, light waves and water waves in a variety of applications.

**ZPEM3308****Biological Mathematics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM1302**

The current scientific literature shows how extensively different types of mathematics can be applied to biology and medicine. This course considers recent developments in a selection of these areas. Possible topics include: how size matters in insect flight or in how animals jump; scale effects in animal physiology and body design; fractal structures in nature; emerging infectious diseases and strategies to reduce their spread; metabolic processes including poisons, drugs in sport, blood glucose and insulin, and the nonlinear kinetics of enzymes.

**ZPEM3309****Elements of Optimisation****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****S2 on-campus****Staff Contact: Dr G Mercer****Prerequisite/s: ZPEM2301 and ZPEM2303**

Optimisation can be thought of as the process of minimising costs or maximising benefits, or finding the best possible compromise between the two. It is an important tool in decision-making, and there is even a theory that the structures of animals, their movement and behaviour, have been influenced by optimisation through evolution. In this course we develop some of the mathematics that deals with different aspects of optimisation, with and without constraints. Specific topics include: maxima and minima of functions of several variables, linear programming, the calculus of variations, network flows, transportation and allocation problems.

**ZPEM3310****Financial Mathematics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM1301 and ZPEM1302**

Financial Mathematics is primarily concerned with the pricing of products known as 'financial derivatives' and is currently one of the most active areas of applied mathematics. Derivatives are products whose value is derived from the value of an underlying asset such as stock, an ounce of gold or a foreign currency. This course introduces various financial products such as bonds, bills and stocks as well as financial derivatives futures and options. We examine how these products are priced and traded. We also examine how 'arbitrage' (certain profit) opportunities can arise. Part of the course involves following the progress of a portfolio of ASX stocks and bonds.

**ZPEM3311****Mathematical Methods for Differential Equations****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW5****S1 on-campus****Staff Contact: Dr H Sidhu****Prerequisite/s: ZPEM2301 and ZPEM2303**

A variety of methods for solving ordinary and partial differential equations are considered. Examples and applications used to motivate the course will be drawn from areas such as solid and fluid mechanics, electrical circuits, pattern formation, heat and river pollution. The types of problems and methods of solution

considered may include: systems of differential equations (including phase-plane analysis), boundary-value problems, partial differential equations and elementary perturbation analysis. Computational methods for solution of ordinary and partial differential equations will be introduced and software packages will be used to implement the algorithms and visualise the results.

**ZPEM3312****Nonlinear Systems****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2.5****Not offered in 2007****Staff Contact: School Office****Prerequisite/s: ZPEM2301 and ZPEM2303**

Nonlinear phenomena and complex behaviour are encountered in many real-world systems (such as oscillations in chemical reactions, fibrillation of the heart, spread of disease, spontaneous ignition and market volatility). This course examines the questions of whether we can still predict the behaviour of such systems and how this behaviour changes as the parameters of the system are varied. Topics covered may include nonlinear algebraic equations, first-order ordinary differential equations (equilibrium points, stability and bifurcation), systems of ordinary differential equations (phase-plane analysis), the origins of oscillatory behaviour and an introduction to chaotic systems.

**ZPEM3320****Special Topic 3A****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC3 HPW2****S1 on-campus****Staff Contact: Dr S Barry**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

**ZPEM3321****Special Topic 3B****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC3 HPW2****S2 on-campus****Staff Contact: Prof R Sammut**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

**ZPEM3325****Engineering Mathematics 3****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC4 HPW4****Not offered in 2007****Staff Contact: School Office**

Note: This course is only available to those students who were enrolled previously, but are required to re-enrol in 2006. This course covers two distinct areas of importance for applications in engineering. The Differential Equations component includes: separation of variables for partial differential equations in cylindrical and spherical coordinates, arising from the wave equation, Laplace's equation and the heat equation; Bessel and Legendre functions; understanding of where partial differential equations arise, and how one can interpret and simplify these equations using proper non-dimensionalisation techniques;



modelling and solution of applicable industrial problems. The statistics component gives an introduction to the analysis of data, covering the basics of estimation and hypothesis testing, using data from engineering and the sciences.

#### **ZPEM3400**

##### **Special Program (Oceanography)**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW6**

**Not offered in 2007**

**Staff Contact: School Office**

This course is available for the presentation of a specialist topic by a visiting member of staff or for presenting a lecture course on a trial basis.

#### **ZPEM3401**

##### **Ocean Circulation and Mixing**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW5**

**S1 on-campus**

**Staff Contact: Dr A Kiss**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

This course examines the dynamics of large-scale wind-driven ocean currents. The course aims to explain why there is a broad equator-ward flow in all the major ocean basins, except the Southern Ocean, and why there are strong, poleward-flowing boundary currents such as the Gulf Stream and the East Australia Current on the western boundaries. The production of turbulence in the oceans and its role in mixing is also examined. The discussion of mixing in the ocean normally includes Kolmogoroff and Batchelor lengths, molecular mixing and diffusive boundary layers; the logarithmic boundary layer and mixing lengths; vertical mixing by wind and tidal stirring; dispersion in the ocean, its measurement, and the Taylor mechanism.

#### **ZPEM3402**

##### **Continental Shelf Dynamics**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr A Kiss**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

The course examines wind-driven currents on continental shelves where the presence of a land boundary places significant constraints on the circulation. Topics covered may include the steady response to cross-shore winds, coastal trapped waves and storm surges.

#### **ZPEM3403**

##### **Oceanographic Data Acquisition and Analysis**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr R Robertson**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

A discussion of the range of instrumentation and measuring techniques used in obtaining oceanographic observations. Both traditional and modern technologies and methods are examined, including satellite remote sensing. Introduction to commonly used time-series analysis tools used in analysing oceanographic data. This includes lagged-correlation, digital filtering and spectral analysis. Both theory and applications are considered.

#### **ZPEM3404**

##### **Internal Waves**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr R Robertson**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

Just as waves occur on the surface of the ocean, they occur in its interior. Wherever the density is increasing with depth there may be "internal gravity waves" which result in up-and-down motion of density surfaces and are important in ocean mixing, bottom currents and acoustic propagation. Acoustic waves can propagate throughout the ocean and are the main technique for remotely sensing the ocean interior. This course examines the dynamics, generation and propagation of internal gravity waves and their impact on the ocean environment. We also examine the ways in which acoustic remote sensing is used to study the ocean interior and bottom.

#### **ZPEM3405**

##### **Oceanography Research Report**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr X H Wang**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

The course of study aims to develop students' understanding of a particular facet of Oceanography through the preparation of a presentation and report. Students are introduced to basic research methodologies and techniques, and are required to consider effective ways of communicating the knowledge they acquire in a specialised area.

#### **ZPEM3406**

##### **Regional Oceanography**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr R Robertson**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

Oceanography of the Australian region including the major current systems, such as the Antarctic Circumpolar Current, East Australia Current and the Leeuwin Current, and their influence on coastal communities, fisheries, climate and marine ecology. The concepts of polar oceanography will be introduced and applied to the polar seas of interest to Australia. Regions outside Australian waters may also be considered. The dynamics of estuaries, embayments and lagoons, and modelling of their flushing times and mixing regimes, in relation to the environmental quality of the land-sea margins.

#### **ZPEM3407**

##### **Oceanography Research Project**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S2 on-campus**

**Staff Contact: Dr XH Wang**

**Prerequisite/s: ZPEM2401 and ZPEM2402**

The project aims to broaden students' understanding of a particular aspect of Oceanography through consideration and analysis of a small body of data. Students' research skills, methodologies and planning abilities are extended as they examine a topic of particular interest and prepare their interpretation/comment for presentation.

**ZPEM3501****Atmospheric Dynamics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****S2 on-campus****Staff Contact: Dr D Low****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

The weather we experience from day to day is largely a result of the interaction of large-scale dynamical processes occurring on continental scales (the domain of synoptic meteorology) and the small-scale physics of clouds and precipitation. Students are introduced to these weather processes and their forecasting through the study of a selection from the following topics: the meteorological equations of motion and the vorticity equation; geostrophic winds; vorticity conservation; diagnosis of vertical motion using atmospheric vorticity and ageostrophic motion; synoptic-scale weather systems in the Australian region; cloud formation; the microphysics of water droplet and ice-crystal formation and growth in clouds; water and ice precipitation; the global atmospheric observing system; the assimilation of meteorological data.

**ZPEM3502****Cosmology and Relativistic Astrophysics****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****S1 on-campus****Staff Contact: Assoc Prof R Sood****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

This course is divided into two parts. The first part deals with the origin and evolution of the Universe. Topics discussed in this part include the following: structure of the Universe; relativistic cosmology; the Big Bang and the very early Universe; matter distribution in the Universe, dark matter and dark energy; the cosmic microwave background radiation. The second part of the course deals with dense states of cosmic matter, and includes a discussion of the formation and nature of white dwarfs, neutron stars and black holes.

**ZPEM3503****Electromagnetic Remote Sensing****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****S2 on-campus****Staff Contact: Dr R Smith****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

The course can be summed up in two words, propagation and interaction. Imagine any remote sensing situation involving electromagnetic radiation: a radar system is an obvious example with extensive civilian and military applications. The important processes are the propagation of the radiation to and from the object being sensed, the interaction of this radiation with the medium it is propagating through and its interaction with the material the object is made of. This need not to be confined to propagation between an antenna and a target. Before it reaches the antenna the radiation must pass through cables and waveguides which again involve propagation and interaction. Fundamental to all this are Maxwell's equations, and it is important to reach an understanding of what they can tell us about the propagation and interaction of electromagnetic radiation.

**ZPEM3504****Physics of Advanced Materials****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****S1 on-campus****Staff Contact: Dr W Hutchison****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

This course provides a comprehensive introduction to the use of materials in contributing to the quality and continuing development of our society and environment. The crystal structures of technologically important materials will be described; principles and applications of x-ray and neutron diffraction in determining crystal and magnetic structures; summary of the various types of structural states (such as polycrystalline, nanostructured, amorphous); phase diagrams relating to microstructure and mechanical properties; origins of different types of magnetic behaviour and properties of magnetic materials; basic theories of diamagnetism, paramagnetism and ferromagnetism. The applications of magnetic materials - their use in permanent magnets, transformers and information storage - magnetic disks and tapes and magneto-optical data storage.

**ZPEM3521****Experimental Physics-Laboratory****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW4****S1 on-campus****Staff Contact: Dr G Robinson****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

Students will carry out a selection of laboratory experiments which range from basic physics through to applications of direct relevance to the Australian Defence Force. At least some of the experiments available for selection will be designed to complement the lecture courses on offer in Level III Physics.

**ZPEM3522****Experimental Physics-Project****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW4****S2 on-campus****Staff Contact: Dr G Robinson****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506, ZPEM3521**

This will be in the form of a research project which each student will conduct in collaboration with a member of the academic staff. Many of the topics offered are designed to be of relevance to the Australian Defence Force. However, project topics related to other areas of interest to staff and/or students may be chosen.

**ZPEM3523****Infrared and Laser Technology****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW2****S1 on-campus****Staff Contact: School Office****Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

**Infrared technology:** from motion sensors to night vision scopes; although we can't see it infrared radiation plays a role in our everyday life. Historically, this field owes much to the research that was carried out to develop the many military applications of infrared technology. However, there is also a history of fundamental physics behind it which needs to be understood to use this technology. The atmosphere also plays a role. Infrared radiation also needs specialised detectors which lead us into solid-state physics and they often need cooling, which leads us into the field of cryogenics. All these contribute to the infrared technology which we use today. **Laser technology:** from low-

power semiconductor lasers in CD and DVD players, to high power gas lasers used in material processing, lasers are ubiquitous. In this part of the course we investigate the special properties of laser light which makes lasers such versatile devices; how and under what conditions a laser operates and the practical aspects of the design of lasers. We also look at how the light and operation of a laser can be manipulated to tailor it to specific applications.

### **ZPEM3524**

#### **Navigation and Guidance Physics**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW2**

**S2 on-campus**

**Staff Contact: Assoc Prof R Sood**

**Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

This course examines the scientific fundamentals of navigation systems and their use in the guidance of machines and humans. The course is of particular relevance in military applications. However, it is developed from the point of view of the scientific principles involved, and their applications in the military, civilian and research environments. All navigation systems require accurate time-keeping capability, coordinate reference definition, and information coding, transmission and interpretation. These concepts are examined in the areas of celestial navigation, underwater navigation, and old and new satellite-based navigation, including a detailed study of GPS systems. Inertial navigation and guidance is of primary importance in aircraft and weapon guidance. The science of inertial navigation systems is studied. Finally, the techniques involved in integrating inertial, celestial and GPS systems to produce state-of-the-art navigation and guidance capability are discussed.

### **ZPEM3527**

#### **Atmospheric Physics and Meteorology**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW3**

**S1 on-campus**

**Staff Contact: Dr J Taylor**

**Prerequisite/s: ZPEM1303, ZPEM1304, ZPEM1503, ZPEM1504**

**Excluded: ZGEN2402, ZPEM2506, ZPEM2511, ZPEM4505**

A selection of the following will be explored: the atmosphere (composition; density, pressure and temperature; variations with altitude, principal layers; hydrostatic equation; altimetry). Thermal/moisture processes (properties of dry and moist air, phase changes, latent heat; long- and short-wave radiation; heat flows, energy balance; development of temperature gradients and thermal circulations). Stability (parcel model of stability, dry and moist adiabatic processes, the aerological (F160) diagram; temperature inversions). Clouds (cloud classification, formation and location). Precipitation (types of precipitation and relation to cloud type; droplet formation and growth). Wind (meteorologically significant forces, equations of motion, geostrophic and gradient flows; variations with height and time). Meteorological practice (terminology, instruments, observations, forecasts).

### **ZPEM3528**

#### **Thermodynamics and Propulsion**

**School of Physical, Environmental and Mathematical Sciences**

**UOC3 HPW2**

**Not offered in 2007**

**Staff Contact: Dr G Robinson**

**Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

The course begins with a discussion of the laws of thermodynamics and entropy. Heat transfer and engine cycles, as employed in vehicle propulsion will then be considered. Examples of these include the Carnot, Otto, Diesel, Stirling, Rankine and gas turbine cycles. Additional topics to be treated may be selected from the following: rockets and related aspects of aerospace propulsion; electromagnetic propulsion; fundamentals of fuel cells; chemical, liquid and solid fuels; and explosive propulsion.

### **ZPEM3529**

#### **Occasional Physics Elective 1**

**School of Physical, Environmental and Mathematical Sciences**

**Enrolment requires School Approval**

**UOC3 HPW2**

**S1 on-campus, S2 on-campus**

**Staff Contact: Assoc Prof D Isbister**

**Prerequisite/s: ZPEM2501, ZPEM2502, ZPEM2503, ZPEM2506**

The syllabus for this course changes from one occasion to the next, allowing for the presentation of a current topic by a visiting academic or a special lecture course on a trial basis.

### **ZPEM3530**

#### **Occasional Physics Elective 2**

**School of Physical, Environmental and Mathematical Sciences**

**Enrolment requires School approval**

**UOC3 HPW2**

**S2 on-campus**

**Staff Contact: Assoc Prof D Isbister**

The syllabus for this course changes from one occasion to the next, allowing for the presentation of a current topic by a visiting academic or a special lecture course on a trial basis.

### **ZPEM3901**

#### **Research Project 2**

**School of Physical, Environmental and Mathematical Sciences**

**Enrolment requires School approval**

**UOC6 HPW3**

**Not offered in 2007**

**Staff Contact: School Office**

Students will undertake a research project on a nominated topic in a specific discipline area and coursework as set by the School. As one of the aims of the program is to develop critical thinking and independent research skills, the project will involve 'hands-on' research experience in collaboration with a staff member and their research team. A supervisor, who is a member of academic staff, will work closely with the student and will manage each project. The project will be chosen after discussion between the student and supervisor. Students will be expected to present a short introductory seminar on the project by Week 4 of Session. Assessment in the course will be based on a written paper and oral presentation on the project and a combination of examinations, tests and assignments on the coursework if appropriate.

### **ZPEM3902**

#### **Research Project 3**

**School of Physical, Environmental and Mathematical Sciences**

**UOC6 HPW2**

**S2 on-campus**

**Staff Contact: School Office**

Students will undertake a research project on a nominated topic in a specific discipline area and coursework as set by the School. As one of the aims of the program is to develop critical thinking and independent research skills, the project will involve 'hands-on' research experience in collaboration with a staff member and their research team. A supervisor, who is a member of academic staff, will work closely with the student and will manage each project. The project will be chosen after discussion between the student and supervisor. Students will be expected to present a short introductory seminar on the project by Week 4 of Session. Assessment in the course will be based on a written paper and oral presentation on the project and a combination of examinations, tests and assignments on the coursework if appropriate.

**ZPEM4101****Chemistry 4 (Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: Assoc Prof G Collins**

The Honours course consists of study in a specialised field (or fields) of Chemistry. There is a major research project component and a course work component, usually of three 15-hour lecture segments.

**ZPEM4102****Chemistry 4 (Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S1 on-campus, S2 on-campus****Staff Contact: Assoc Prof G Collins**

The Honours course consists of study in a specialised field (or fields) of Chemistry. There is a major research project component and a course work component, usually of three 15-hour lecture segments.

**ZPEM4103****Chemistry 4 (Combined Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires school approval****UOC24****S2 on-campus****Staff Contact: Assoc Prof G Collins**

In the Combined Honours program, candidates are required to present a thesis on a research project that combines Chemistry with another discipline, the project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete such course work as is approved by the Head of School.

**ZPEM4104****Chemistry 4 (Combined Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Assoc Prof G Collins**

In the Combined Honours program, candidates are required to present a thesis on a research project that combines Chemistry with another discipline, the project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete such course work as is approved by the Head of School.

**ZPEM4201****Geography 4 (Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: Dr S Sharpe**

Candidates for Honours in Geography are required to (a) prepare a thesis of approximately 15,000 words in length; (b) undertake coursework as prescribed by the School; (c) present work-in-progress seminars; and (d) attend seminars related to the applications of geographic research.

**ZPEM4202****Geography 4 (Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Dr S Sharpe**

Candidates for Honours in Geography are required to (a) prepare a thesis of approximately 15,000 words in length; (b) undertake coursework as prescribed by the School; (c) present work-in-progress seminars; and (d) attend seminars related to the applications of geographic research.

**ZPEM4203****Geography 4 (Combined Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Dr S Sharpe**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Geography and the interests of the other disciplines involved, the thesis or project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZPEM4204****Geography 4 (Combined Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC6****S2 on-campus****Staff Contact: Dr S Sharpe**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Geography and the interests of the other discipline involved, the thesis or project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZPEM4301****Mathematics 4 (Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC24****S1 on-campus, S2 on-campus****Staff Contact: Assoc Prof R Weber**

Specialised study in selected topics, together with an approved project in the area in which the honours program is concentrated.

**ZPEM4302****Mathematics 4 (Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Assoc Prof R Weber**

Specialised study in selected topics, together with an approved project in the area in which the honours program is concentrated.



**ZPEM4303****Mathematics 4 (Combined Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Assoc Prof R Weber**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Mathematics and the interests of the other discipline involved, the thesis or project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete course work as approved by the Head of School.

**ZPEM4304****Mathematics 4 (Combined Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC6****S2 on-campus****Staff Contact: Assoc Prof R Weber**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Mathematics and the interests of the other School involved, the thesis or project being supervised and examined by the two Schools conjointly. In addition, candidates are required to complete course work as approved by the Head of School.

**ZPEM4401****Oceanography 4 (Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC24****S2 on-campus****Staff Contact: Dr XH Wang**

Candidates for Honours in Oceanography are required to (a) prepare a thesis of approximately 15,000 words in length; (b) undertake coursework as prescribed by the School; (c) present work-in-progress seminars; and (d) attend seminars related to the applications of oceanographic research.

**ZPEM4402****Oceanography 4 (Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Dr XH Wang**

Candidates for Honours in Oceanography are required to (a) prepare a thesis of approximately 15,000 words in length; (b) undertake coursework as prescribed by the School; (c) present work-in-progress seminars; and (d) attend seminars related to the applications of oceanographic research.

**ZPEM4403****Oceanography 4 (Combined Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12****S2 on-campus****Staff Contact: Dr XH Wang**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Oceanography and the interests of the other discipline

involved, the thesis or project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZPEM4404****Oceanography 4 (Combined Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC6****S2 on-campus****Staff Contact: Dr XH Wang**

In the Combined Honours program candidates are required to present a thesis or research project on a topic that is concerned with Oceanography and the interests of the other discipline involved, the thesis or project being supervised and examined by the two disciplines conjointly. In addition, candidates are required to complete coursework as approved by the Head of School.

**ZPEM4501****Physics 4 (Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC24 HPW4****S1 on-campus, S2 on-campus****Staff Contact: Assoc Prof R Sood**

Students undertake both coursework and a research project. The research project, which extends over both semesters, is selected from topics proposed by academic staff and requires the preparation of a thesis and oral reports. Four courses are taken in total, usually two in each session. They are usually selected from the following: Astrophysics; Experimental Magnetism; Meteorological Remote Sensing; Microcomputer Applications; Small-scale Atmospheric Motions, Solid-state Physics; Chaos and Statistical Mechanics; and Stellar Physics. Alternatively, with Head of School approval, appropriate courses from other disciplines of Schools may be substituted.

**ZPEM4502****Physics 4 (Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12 HPW2****S2 on-campus****Staff Contact: Assoc Prof R Sood**

As for ZPEM4501 except that the research project extends over all four sessions and usually one course is taken in each semester.

**ZPEM4503****Physics (Combined Honours) Full-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC12 HPW4****S2 on-campus****Staff Contact: Assoc Prof R Sood**

Students undertake both coursework and a research project. The research project, which extends over both semesters, is on a topic incorporating Physics and the other discipline. It is supervised jointly by academic staff from both disciplines and requires the preparation of a thesis and oral report. Four courses are taken in total, usually two in each session. They are usually selected from the following: Astrophysics; Experimental Magnetism; Meteorological Remote Sensing; Microcomputer Applications; Small-scale Atmospheric Motions, Solid-state Physics; Chaos and Statistical Mechanics; and Stellar Physics. The remaining coursework is taken from the other discipline. Alternatively, with Head of School approval, appropriate courses from other disciplines of Schools may be substituted.

**ZPEM4504****Physics 4 (Combined Honours) Part-Time****School of Physical, Environmental and Mathematical Sciences****Enrolment requires School approval****UOC6 HPW2****S2 on-campus****Staff Contact: Assoc Prof R Sood**

As for ZPEM4503 except that the research project extends over all four sessions and usually one course is taken in each semester.

**ZPEM4505****Meteorology and Applications****School of Physical, Environmental and Mathematical Sciences****UOC3 HPW3****S1 on-campus****Staff Contact: Dr J Taylor****Corequisite/s: ZACM4050 or ZACM4252 or ZACM4253 or ZACM4450****Excluded: ZGEN2402, ZPEM2506, ZPEM2511, ZPEM3527**

This course will explore the thermodynamics and kinematics of atmospheric processes, and their relevance to the world we live in. The lecture material covers three main categories: atmospheric physics, including composition, scales, altimetry, and hydrostatic balance; behaviours in the vertical dimension, including dry and moist adiabatic processes, stability, convection, clouds, and precipitation; and behaviour in the horizontal dimension, including geostrophic balance, gradient winds, thermal winds, advection, and forecasting.

**ZPEM7301****Introduction to Data Analysis****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW3****S2 distance, S2 on-campus****Staff Contact: Mrs B Catchpole**

The course provides a foundation for further studies in statistics, management or any other area requiring some proficiency in data analysis. It gives an introduction to data analysis, with emphasis on the analysis of experiments. It teaches the principle of good experimental design, and focuses on a project where you design and analyse your own experiment. The course introduces a simple statistical computer package that is used for data exploration and presentation, and the analysis of data from simple experimental and observational studies.

**ZPEM8202****Principles of Geographic Information Analysis and Remote Sensing****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW4****Not offered in 2007****Staff Contact: School Office**

This course deals with the concepts and principles of remote sensing and geographic information analysis. The course is designed to provide students from diverse backgrounds with a theoretical basis in spatial phenomena and an understanding of data processing and analysis techniques. Topics include data acquisition, digital image processing, database design, spatial analysis and visualization. The course will be taught in both lectures and practical exercises. In a final project, students will integrate remote sensing and GIS technologies in a practical application. At the end of the course students will have an understanding of how to select or acquire appropriate spatial data and will be able to perform basic digital image processing and spatial analysis tasks.

**ZPEM8203****Applications in Remote Sensing****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW3****Not offered in 2007****Staff Contact: Dr A Griffin****Prerequisite/s: ZPEM8202**

This course is concerned with the evaluation of environmental conditions and natural resources through assessment and analysis techniques using remote sensing technologies. We will focus on the theory of optical, hyperspectral, thermal and microwave radiation, and will consider applications of remote sensing to natural resources and environmental management; biophysical and ecological indicators of environmental health; field survey design and analysis; and resource and environmental evaluation principles. This course will consist of lectures, seminar discussions and practical exercises. Lectures may also include invited speakers from military, government, and private business.

**ZPEM8204****Strategic Geographical Issues in Australia's Neighbourhood****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: Dr G Banks**

This course is concerned with the geographical context underlying contemporary strategic issues in the Australian neighbourhood. It begins by addressing the implications of such matters as the pattern of landforms, oceans and islands within Australia's strategic sphere and the dynamics and diversity of terrain form and land cover. The course then takes in a range of contemporary geographical issues including urbanisation, poverty and rural development in SE Asia, resource development and management, the current and potential impact of regional environmental issues, and migration. The course will include discussion of broad issues and specific case studies at a range of geographical scales and through a diversity of geographical approaches.

**ZPEM8205****Environmental Issues in Northern Australia****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW2****Not offered in 2007****Staff Contact: School Office**

This course is concerned with the geographical context underlying contemporary strategic issues in the Australian neighbourhood. It begins by addressing the implications of such matters as the pattern of landforms, oceans and islands within Australia's strategic sphere and the dynamics and diversity of terrain form and land cover. The course then takes in a range of contemporary geographical issues including urbanisation, poverty and rural development in SE Asia, resource development and management, the current and potential impact of regional environmental issues, and migration. The course will include discussion of broad issues and specific case studies at a range of geographical scales and through a diversity of geographical approaches.

**ZPEM8206****Applications in Geographic Information Analysis****School of Physical, Environmental and Mathematical Sciences****UOC6 HPW4****Not offered in 2007****Staff Contact: Dr A Griffin****Prerequisite/s: ZPEM8202**

Building from "Principles of Geographic Information Analysis and Remote Sensing", this course explores the development of GIS applications, extending principles and techniques to build practical applications. Lectures and lab projects may cover topics

# Current course and program information is now available through the UNSW Online Handbook:

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such as spatial pattern analysis, modelling of both spatially and temporally dynamic and/or stochastic systems, routing methods, data distortion, fuzzy representations, and the consideration of error and uncertainty. Lectures may also include invited speakers from military, government, and private business.

## ZPEM8301

### Statistical Trials Analysis

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

S1 distance

Staff Contact: Dr W Anderson

This course teaches the principles of good experimental design-maximising precision, blocking, selecting sample size, sensitivity and efficiency. Emphasis throughout is on understanding concepts and analysing practical data using a modern statistical computer package. Topics include: randomised blocks, Latin squares and factorial designs; analysis of variance and multiple comparisons; fixed and random effects models; repeated measures designs.

## ZPEM8304

### Statistical Forecasting

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: School Office

Companies make forecasts of economic growth when they plan expansion and diversification. The Defence Force makes forecasts when it decides how many weapons to stockpile, and how many new recruits to accept. This course teaches techniques for forecasting in the short and long term, calculation of uncertainty limits on the forecasts, and tests of how good a forecasting technique has been on past data. Techniques studied include time-series decomposition, exponential smoothing methods, regression, Box-Jenkins methodology. Students will have an opportunity to practise the techniques on their own chosen set of data.

## ZPEM8307

### Financial Mathematics

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: School Office

Financial mathematics is primarily concerned with the pricing of products known as "financial derivatives" and is currently one of the most active areas of applied mathematics. Derivatives are products whose value is derived from the value of an underlying asset such as stock, an ounce of gold or a foreign currency. This course introduces various financial products such as bonds, bills and stocks as well as financial derivatives-futures and options. We examine how these products are priced and traded. We also examine how "arbitrage" (certain profit) opportunities can arise. Part of the course involves following the progress of a portfolio of ASX stocks and bonds.

## ZPEM8308

### Reliability and Maintainability

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

S2 on-campus, S2 distance

Staff Contact: Dr J Chapman

The objectives of this course are: to develop familiarity with the probabilistic and statistical techniques needed in survival analysis; to develop familiarity with the various mathematical models for survival; to develop skills in modelling reliability data using a modern statistical language, and the ability to rapidly transport these skills into any other high-level language; to learn how to model the survival of complex systems containing many components; to study repairable and maintainable systems, and to perform cost-benefit analyses of competing management strategies; to appreciate the applicability of all of the above to military situations.

## ZPEM8501

### Weapons Assessment

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

Not offered in 2007

Staff Contact: School Office

Prerequisite/s: Enrolment in program 5841 or 8559.

The aim of this course is to study the performance of weapons. Topics that will be covered include measure of effectiveness, dispersion of fire, assessment of direct and indirect fire, data acquisition and carpet graphs and response surfaces.

## ZPEM8502

### CBRNE Fundamentals and Management

School of Physical, Environmental and Mathematical Sciences

UOC6 HPW3

S2 on-campus, S2 distance

Staff Contact: Assoc Prof R Sood

This course has been designed to enable students to gain high level understanding of the fundamentals and the science behind the use of Chemical, Biological, Radiological, Nuclear and Explosives weapons, which will enhance their ability to manage and to deal with incidents involving CBRNE. The course will start with the study of the history of CBRNE. This will set the scene for the study of the science and technology behind each of these five methods of warfare and associated acts of terrorism, their immediate and long-term impact on individuals and on communities. It will next focus on the practices involved in dealing with and monitoring contamination from incidents, both deliberate and accidental. There will be a strong practical component associated with the management of CBRNE incidents. Practising professionals in the field of national security, emergency response units and emergency health units, will be invited to attend selected parts of the course to further their knowledge and background for preparedness to deal with CBRNE events.

| <i>Program</i>                           | <i>Code</i> | <i>School/s</i> |
|--|-------------|-----------------|
| <b>Undergraduate</b>                     |             |                 |
| <b>Bachelor Degrees</b>                  |             |                 |
| Arts                                     | 4400        | HASS            |
| Arts (CDF)                               | 4461        | HASS            |
| Business                                 | 4405        | SOB             |
| Business (CDF)                           | 4462        | SOB             |
| Engineering – Aeronautical               | 4424        | ACME            |
| Engineering – Aeronautical (CDF)         | 4465        | ACME            |
| Engineering – Civil                      | 4421        | ACME            |
| Engineering – Civil (CDF)                | 4466        | ACME            |
| Engineering – Electrical                 | 4422        | ITEE            |
| Engineering – Electrical (CDF)           | 4464        | ITEE            |
| Engineering – Mechanical                 | 4423        | ACME            |
| Engineering – Mechanical (CDF)           | 4467        | ACME            |
| Science                                  | 4410        | PEMS            |
| Science (CDF)                            | 4463        | PEMS            |
| Technology – Aeronautical                | 4430        | ACME            |
| Technology – Aeronautical (CDF)          | 4468        | ACME            |
| Technology – Aviation                    | 4437        | ACME            |
| Technology to Engineering (articulation) | 4425        |                 |
| <b>Combined Bachelor Degrees</b>         |             |                 |
| Arts/Engineering – Aeronautical          | 4445        | HASS/ACME       |
| Arts/Science                             | 4450        | HASS/PEMS       |
| Science/Engineering – Aeronautical       | 4435        | PEMS/ACME       |
| Science/Engineering – Electrical         | 4432        | PEMS/ITEE       |
| Science/Engineering – Mechanical         | 4433        | PEMS/ACME       |
| <b>Postgraduate (Coursework)</b>         |             |                 |
| <b>Graduate Certificate</b>              |             |                 |
| Defence Studies                          | 7384        | HASS            |
| Engineering Science                      | 7387        | ACME/ITEE       |
| Management Studies                       | 7383        | SOB             |
| Science                                  | 7382        | ITEE            |
| <b>Graduate Diploma</b>                  |             |                 |
| Arts                                     | 5855        | HASS            |
| Defence Studies                          | 5914        | HASS            |
| Engineering Science                      | 5889        | ACME/ITEE       |
| Management Studies                       | 5823        | SOB             |
| Science                                  | 5882        | ITEE            |
| <b>Masters</b>                           |             |                 |
| Arts                                     | 8175        | HASS            |
| Defence Studies                          | 9900        | HASS            |
| Engineering Science                      | 8569        | ACME/ITEE       |
| Management Studies                       | 8398        | SOB             |
| Science                                  | 8562        | ITEE            |
| <b>Postgraduate (Research)</b>           |             |                 |
| <b>Masters</b>                           |             |                 |
| MPhil (ACME)                             | 2227        | ACME            |
| MPhil (HASS)                             | 2225        | HASS            |
| MPhil (ITEE)                             | 2228        | ITEE            |
| MPhil (PEMS)                             | 2229        | PEMS            |
| MPhil (SOB)                              | 2226        | SOB             |
| Arts                                     | 2405        | HASS            |
| Engineering – Aerospace                  | 2693        | ACME            |
| Engineering – Civil                      | 2651        | ACME            |
| Engineering – Electrical                 | 2663        | ITEE            |
| Engineering – Mechanical                 | 2691        | ACME            |
| Science – Chemistry                      | 2911        | PEMS            |
| Computer Science                         | 2925        | ITEE            |
| Geography                                | 2041        | PEMS            |
| Oceanography                             | 2042        | PEMS            |
| Mathematics and Statistics               | 2921        | PEMS            |
| Physics                                  | 2931        | PEMS            |
| <b>PhD</b>                               |             |                 |
| Aerospace Engineering                    | 1663        | ACME            |
| Civil Engineering                        | 1631        | ACME            |
| Mechanical Engineering                   | 1661        | ACME            |
| Business (Economics and Management)      | 1541        | SOB             |
| Computer Science                         | 1885        | ITEE            |
| Electrical Engineering                   | 1643        | ITEE            |
| History                                  | 1241        | HASS            |
| English                                  | 1201        | HASS            |
| Indonesian                               | 1203        | HASS            |
| Politics                                 | 1321        | HASS            |
| Mathematics and Statistics               | 1881        | PEMS            |
| Physics                                  | 1892        | PEMS            |
| Chemistry                                | 1871        | PEMS            |
| Geography                                | 1081        | PEMS            |
| Oceanography                             | 1082        | PEMS            |
| <b>Postgraduate (Combined)</b>           |             |                 |
| <b>Masters</b>                           |             |                 |
| Arts/Philosophy                          | 8691        | HASS            |
| Defence Studies/Philosophy               | 8692        | HASS            |
| Engineering Science/Philosophy           | 8693        | ACME/ITEE       |
| Science/Philosophy                       | 8694        | PEMS            |
| Management Studies/Philosophy            | 8695        | SOB             |
| <b>PhD</b>                               |             |                 |
| Doctor of Information Technology         | 9920        | ITEE            |