If you would like further information, please contact Student Administrative Services:

Student Enquiries
Email: sas@adfa.edu.au
Telephone: +61 (02) 6268 6000
Facsimile: +61 (02) 6268 8666
http://sas.unsw.adfa.edu.au

Student Administrative Services
UNSW Canberra
PO Box 7916
CANBERRA BC ACT 2610
CRICOS Provider Code: 00098B • CMU 146667
## Important dates for students in 2015

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 commences</td>
<td>2 March</td>
</tr>
<tr>
<td>Last day to add S1 distance mode courses</td>
<td>27 February</td>
</tr>
<tr>
<td>Last day to add courses via myUNSW</td>
<td>8 March</td>
</tr>
<tr>
<td>Last day to drop S1 courses without financial penalty</td>
<td>31 March</td>
</tr>
<tr>
<td>Provisional exam timetable released for S1</td>
<td>17 April</td>
</tr>
<tr>
<td>Last day to drop S1 courses without academic penalty</td>
<td>24 April</td>
</tr>
<tr>
<td>Last day to report exam clashes for S1</td>
<td>1 May</td>
</tr>
<tr>
<td>Mid Semester Break</td>
<td>4 - 15 May</td>
</tr>
<tr>
<td>Final exam timetable released for S1</td>
<td>29 May</td>
</tr>
<tr>
<td>S1 study recess</td>
<td>15 - 19 June</td>
</tr>
<tr>
<td>Examinations (UG students only)</td>
<td>22 June - 3 July</td>
</tr>
<tr>
<td>Mid-Year leave</td>
<td>6 - 17 July</td>
</tr>
<tr>
<td>S1 results published on myUNSW</td>
<td>16 July</td>
</tr>
<tr>
<td>Last day to add S2 distance mode courses</td>
<td>17 July</td>
</tr>
<tr>
<td>Last day to drop S2 courses without financial penalty</td>
<td>31 August</td>
</tr>
<tr>
<td>Provisional exam timetable released for S2</td>
<td>3 September</td>
</tr>
<tr>
<td>Last day to drop S2 courses without academic penalty</td>
<td>11 September</td>
</tr>
<tr>
<td>Last day to report exam clashes for S2</td>
<td>18 September</td>
</tr>
<tr>
<td>Mid Semester Break</td>
<td>28 September - 2 October</td>
</tr>
<tr>
<td>S2 Study recess</td>
<td>26 - 30 October</td>
</tr>
<tr>
<td>Final exam timetable released for S2</td>
<td>9 October</td>
</tr>
<tr>
<td>Semester 2 ends</td>
<td>23 October</td>
</tr>
<tr>
<td>Examinations (UG students only)</td>
<td>2 - 13 November</td>
</tr>
<tr>
<td>S2 results published to myUNSW</td>
<td>26 November</td>
</tr>
</tbody>
</table>

## 2015 Public Holidays

### S1
- **Canberra Day**: 9 March (Monday lost)
- **Good Friday**: 3 April (Friday timetable on Thursday 2 April, Friday lost)
- **Easter Monday**: 6 April (Monday timetable on Tuesday 7 April, Tuesday lost)
- **ANZAC Day**: 25 April (Saturday, Friday will be a non-teaching day, Friday lost)

### S2
- **Family and Community Day**: 28 September (Mid Semester Recess - no timetable impact)
- **Labour Day**: 5 October (Monday lost)

## Approved ADFA activities - Non Teaching Days for Undergraduate Students (Semester 2)

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Dress Rehearsal</td>
<td>Tues 11 Aug</td>
</tr>
<tr>
<td>XO / OC Day</td>
<td>Wed 2 Sept</td>
</tr>
<tr>
<td>Sports Carnival (incl tug-of-war)</td>
<td>Thurs 24 Sept</td>
</tr>
<tr>
<td>Green Eagle (ARA) and/or XO / OC Day</td>
<td>Fri 16 Oct</td>
</tr>
</tbody>
</table>

### Events
- **ADFA Open Day**: 29 August
- **Conferring of degrees ceremony**: 9 December
- **Graduation Day**: 10 December

## Important Dates for 2016

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1 commences</td>
<td>29 February</td>
</tr>
<tr>
<td>Semester 1 break</td>
<td>2 - 13 May</td>
</tr>
<tr>
<td>Semester 1 ends</td>
<td>12 June</td>
</tr>
<tr>
<td>Study Period</td>
<td>13 - 17 June</td>
</tr>
<tr>
<td>June Examination period</td>
<td>20 June - 1 July</td>
</tr>
<tr>
<td>Sem 1 Results available</td>
<td>14 July</td>
</tr>
<tr>
<td>Mid-year recess</td>
<td>4 - 15 July</td>
</tr>
<tr>
<td>Semester 2 commences</td>
<td>16 July</td>
</tr>
<tr>
<td>Semester 2 break</td>
<td>19 - 23 September</td>
</tr>
<tr>
<td>Semester 2 ends</td>
<td>21 October</td>
</tr>
<tr>
<td>Study Period</td>
<td>24 - 28 October</td>
</tr>
<tr>
<td>Examination period</td>
<td>31 October - 11 November</td>
</tr>
<tr>
<td>Sem 2 Results available</td>
<td>24 November</td>
</tr>
<tr>
<td>Conferral ceremonies</td>
<td>7 December</td>
</tr>
<tr>
<td>Graduation Parade</td>
<td>8 December</td>
</tr>
</tbody>
</table>
Contacts

Schools

School of Business (SBUS)
Building 27, Room 219
Ph. +61 2 6268 8841
Fax: +61 2 6268 8450
Email: bus.studentadmin@adfa.edu.au
http://bus.unsw.adfa.edu.au

School of Engineering and Information Technology (SEIT)
Building 17, Level 2
Ph. +61 2 6268 8580
Fax: +61 2 6268 8276
Email: seit.teaching@adfa.edu.au
http://seit.unsw.adfa.edu.au

School of Humanities and Social Sciences (HASS)
Building 29, HASS Shopfront, Ground Floor
Ph: +61 2 6268 8867
Fax: +61 2 6268 8879
Email: hass@adfa.edu.au
http://hass.unsw.adfa.edu.au

School of Physical, Environmental and Mathematical Sciences (PEMS)
PEMS South, Building 26, Room 102
Ph. +61 2 6268 8801
Fax: +61 2 6268 8786
Email: ugcoord.peams@adfa.edu.au
http://pems.unsw.adfa.edu.au

Academic Support Units

Student Administrative Services
Building 1, Level 2
Ph: +61 2 6268 6000
Email: sas@adfa.edu.au
http://sas.unsw.adfa.edu.au

UNSW Canberra Academy Library
Building 13
Ph: +61 2 6268 8882
Email: library@adfa.edu.au
http://lib.unsw.adfa.edu.au

Information, Communication and Technology Services (ICTS)
Building 14
Helpdesk hours are from 8:00 am to 5:00pm on weekdays.
Ph: +61 2 6268 8140
Email: helpdesk@adfa.edu.au
Heat self-service help requests:
Tip sheets:

Academic Language and Learning Unit (ALL)
Building 36, Room 102
Ph: +61 2 6268 8797
Email: knowALL@adfa.edu.au
https://gateway.unsw.adfa.edu.au/iteaching/iall

Creative Media Unit (CMU)
Building 13, Lower Ground Floor
Ph: +61 2 6868 8503
Email: cmu@adfa.edu.au
Preface

The information in this booklet may be amended without notice by UNSW Canberra. Any updates will be maintained on the electronic copy available via the Student Gateway, and the Version number and date of this booklet updated accordingly.

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

The University of New South Wales at the Australian Defence Force Academy (UNSW Canberra) is a registered ACT Provider under ESOS Act 2000 - CRICOS Provider Code: 00098G.

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.
## Contents

**ESSENTIAL INFORMATION** ..............................................6
- Student Gateway ...................................................6
- myUNSW ...............................................................6
- MOODLE ...............................................................6
- Timetable Information............................................6
- Special Consideration ...........................................6
- Examinations........................................................6
- Permission to Withdraw from a Course without Penalty ............6
- Academic Standing Rules........................................6
- Credit for Previous Studies........................................6
- Program (Study) Leave ..........................................6
- Student Forms .......................................................6
- Off-campus Language Study ....................................6
- Prizes and Awards ................................................7
- Student Conduct Policy and Procedure ...........................7
- Student Complaint Policy and Procedure ..........................7
- Student Misconduct Procedures ..................................7
- Graduation ...........................................................7
- Assessment Policy ................................................7
- Equity and Diversity ...............................................7
- Work Health and Safety Policy (WH&S) ..........................8

**GETTING HELP** ..........................................................9
- Who does what? ....................................................9
- Student Administrative Services .................................9
- School Undergraduate Coordinators .............................9
- School Administration Offices ..................................9
- Course Convenors ................................................10

**GLOSSARY OF TERMS AND ACRONYMS** ......................11

**UNDERGRADUATE PROGRAMS** .......................................14
- Understanding your UNSW Canberra Degree .......................14
- UNSW Canberra Regulations for Undergraduate Students ..........14
- 4400 Arts ................................................................16
- 4405 Business .........................................................17
- 4410 Science ..........................................................20
- 4426 Information Technology ......................................22
- 4430 Technology (Aeronautical Eng) .............................24
- 4437 Technology (Aviation) .......................................25
- 4471 Electrical Engineering (Honours) ........................28
- 4472 Aeronautical Engineering (Honours) ........................31
- 4473 Civil Engineering (Honours) ................................33
- 4474 Mechanical Engineering (Honours) ........................36

**BACHELOR DEGREES IN THE CHIEF OF DEFENCE FORCE STUDENTS PROGRAMS** ..................40
- 4461 Arts (CDF) ........................................................42
- 4462 Business (CDF) ...............................................44
- 4463 Science (CDF) ................................................45
- 4468 Technology (Aero Engineering) (CDF) ......................47
- 4469 Information Technology (CDF) ..........................49
- Engineering (CDF) Degrees .........................................51
- 4475 Electrical Engineering (Honours) (CDF) ..................51
- 4476 Aeronautical Engineering (Honours) (CDF) ..........53
- 4477 Civil Engineering (Honours) (CDF) .......................55
- 4478 Mechanical Engineering (Hons) (CDF) ..................57
HONOURS PROGRAMS .................................................. 60
4511 Arts (Honours) .............................................. 60
4512 Business (Honours) ...................................... 61
4513 Science (Honours) ........................................ 62
4514 Information Technology (Honours) .............. 64

STREAMS ........................................................................ 66
Aviation ..................................................................... 66
Business .................................................................... 67
Chemistry .............................................................. 67
Computer Science ................................................ 68
English ..................................................................... 69
Geography ............................................................ 69
History ....................................................................... 70
Indonesian Studies ............................................... 71
Information Systems ............................................. 71
International and Political Studies ....................... 72
Mathematics and Statistics .................................. 73
Oceanography ....................................................... 74
Operations Research .......................................... 75
Physics .................................................................... 75

COURSE CATALOGUE ...................................................... 77
Course offerings and timetable information .......... 77
Using the UNSW Canberra course catalogue ...... 78
Essential Information

Student Gateway
A starting point for finding information about your studies.
https://gateway.unsw.adfa.edu.au

myUNSW
An essential online portal for enrolment and academic records.
www.my.unsw.edu.au

MOODLE
Access online components of your courses and various support services.

Timetable Information
Information on current course and exam timetables.
https://gateway.unsw.adfa.edu.au/isas/current_students/timetable

Special Consideration
If you believe your studies have suffered due to misadventure you may be eligible to receive Special Consideration.
https://gateway.unsw.adfa.edu.au/isas/current_students/special_consideration

Examinations
Information about exam periods held at the end of each semester.

Permission to Withdraw from a Course without Penalty
https://my.unsw.edu.au/student/atoz/CourseChanges.html

Academic Standing Rules
https://my.unsw.edu.au/student/academiclife/assessment/academicstandingrulesug

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 Canberra degree.
https://gateway.unsw.adfa.edu.au/isas/current_students/forms/credit.html

Program (Study) Leave
If you need to take a break from your studies, you can apply for Program Leave. Undergraduate students must have military approval.
https://gateway.unsw.adfa.edu.au/isas/current_students/forms/leave.html

Student Forms
Most administrative processes require a student to complete and lodge a form.
https://gateway.unsw.adfa.edu.au/isas/current_students/forms/ugforms.html

Off-campus Language Study
For undergraduate students who wish to study a language as part of their degree.
Prizes and Awards
www.students.adfa.edu.au/student/prizes

Student Conduct Policy and Procedure

Student Complaint Policy and Procedure
www.policy.unsw.edu.au/policy/Student_Complaint_Policy

Student Misconduct Procedures
www.policy.unsw.edu.au/procedure/studentmisconduct.pdf

Graduation
For information on the 2015 graduation ceremony.

Assessment Policy
This policy outlines the University’s commitment to the design and delivery of assessment that facilitates achieving the specified learning outcomes of courses and programs. It enables the development of rules and procedures that facilitate the management of student assessment and related activities. The policy specifies minimum requirements for design and delivery of assessments. It does not constrain the development of alternative or additional forms of effective assessment, provided such assessments are consistent with the principles stated in this policy.

https://my.unsw.edu.au/student/academiclife/assessment/AssessmentatUNSW

Equity and Diversity
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:
https://gateway.unsw.adfa.edu.au/iadmin/iequity
Work Health and Safety Policy (WH&S)

All students must comply with legislation and all relevant Defence and/or UNSW Canberra policies, procedures and instructions such as:

- 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 Canberra 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.
Getting Help

Who does what?
There are many sources of academic and administrative advice and assistance available to students at UNSW Canberra. Initial points of contact include:

- Student Administrative Services (SAS)
- Deputy Head of School (Teaching)
- School Administration Offices
- Course Convenors - lecturers and tutors
- Creative Media Unit (CMU)
- Academic Language and Learning Unit (ALL)
- Information Communication and Technology Services (ICTS)
- Academy Library

School Undergraduate Coordinators

Undergraduate Coordinators are members of academic staff delegated by their Head of School to advise students on matters requiring academic knowledge and judgment.

Consult with the Undergraduate Coordinator (or in the School of Engineering and Information Technology, the Director of Undergraduate Studies) about:

- The nature and content of majors and courses
- Approval of enrolment variations, class and examination clashes
- Assessment and approval of requests for program transfers, program leave, cross-institutional study and concurrent enrolment
- Determination and approval of credit for students who have undertaken studies at other appropriate tertiary institutions
- Advice on assessment and academic standing policies and practices related to the undergraduate programs
- Matters of special consideration – advice on intensity of enrolment when study is interrupted by illness or other personal difficulties

Student Administrative Services

SAS is responsible for a number of general academic administrative services. Students should seek advice at SAS for matters relating to:

- Admission to programs
- Credit from previous study
- Coordinating enrolment/re-enrolment advisory sessions
- Degree Structures (BA, BSc, BIT and BBus only)
- Seeking advice about your program of study
- Enrolment advice - adding or dropping courses
- Program Transfer requests
- Program (Study) Leave requests
- Special Consideration
- Coordination of class and examination timetabling
- Coordination of end-of-semester examinations
- Release of end-of-semester results
- Coordination of conferral ceremonies for the award of degrees
- Advice on any UNSW policy or procedure
School Administration Offices

Each School has its own administration office located close to staff and the teaching areas. School Administration staff are responsible for the support of academic staff and students within the School.

Students should seek advice at the School Administration Offices or with the School Student Administrative Officer for matters relating to:

- General enquiries for staff and courses taught within the School
- Handling of assessment items

Course Convenors

Convenors are responsible for the administration of a course. Responsibilities include the coordination of the academic staff teaching and/or marking in the course, the determination of the assessment, preparation and distribution of course handouts, and the determination of the provisional final mark for students enrolled in the course. The course convenor, or their nominee, also acts as a referee who must be available to resolve queries at the time of any examination in the course.

Lecturers and tutors are available by arrangement outside regular class times to assist students with their studies.

Information regarding individual contact arrangements is available in the course outline.
Glossary of Terms and Acronyms

**Academic Standing:** Is an indication of your current progress toward completion of your Program. It is calculated at the end of each semester and is based on the proportion of load passed together with your Academic Standing at the end of the previous semester. Academic Standing is calculated at the career level (i.e., Undergraduate/Postgraduate), not at the program level. See https://my.unsw.edu.au/student/academiclife/assessment/AcademicStandingExplanation.html

**AD(E):** Associate Dean (Education). The current ADE is Associate Professor David Blaazer from the School of Humanities and Social Sciences.

**ADFAPASS:** the password that gains access to the student email, and other ADFA facilities.

**Advanced Standing:** See Credit.

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

**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.

**CDFS Program:** Chief of Defence Force Students (CDFS) Programs. These are programs for academically high achieving students and are endorsed by the Chief of Defence Force.

**Core course:** A course which is a compulsory requirement of a degree major or specialisation.

**Course Authority:** Is responsible to the UNSW Canberra Assessment Review Group for the assessment in a course. A course authority is normally the head of the school in which the course is taught. Heads of School normally delegate their authority for academic decisions to the relevant School Coordinators, such as the Undergraduate Coordinator or the Deputy Head of School (Teaching).

**Course Convenor:** Is responsible for the administration of a course. Responsibilities include the coordination of the academic staff teaching and/or marking in the course, the determination of the assessment, preparation and distribution of course materials, and the determination of the provisional final mark for students enrolled in the course. The course convenor, or their nominee, also acts as a referee who must be available to resolve queries at the time of any examination in the course.

**Course Outlines:** Documents available via Student Gateway and Moodle that list the details of each course.

**Credit:** A student who has completed previous tertiary studies at UNSW Canberra 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. Credit for previous study does not recognize the mark or grade attained at the other institution and is not included in the WAM calculation.

For undergraduate students having advanced standing in your program does not mean that you can leave ADFA and progress to your Service early. The AMET program is 3-years, so all students will remain at ADFA for this duration. Students with significant credit may complete their UG degree early and commence postgraduate studies or an Honours program.

**Discipline:** An area of academic study, such as a ‘major’.
**Exemption:** If a student has 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 they study an alternative course relevant to their program. This alternative course will be selected in negotiation with the UG Coordinator. Units of credit are not granted for an exemption. Students who have completed formal course work should apply for ‘credit’ – see above.

**FSEO:** Faculty Students Ethics Officer – see AD(E).

**Getting Started Guide:** A Guide designed to help you get started as efficiently and smoothly as possible. It explains administrative processes and requirements, and provides details of where to find any further information you may need. Available at [http://sas.unsw.adfa.edu.au/publications/pdf/Getting_Started.pdf](http://sas.unsw.adfa.edu.au/publications/pdf/Getting_Started.pdf)

**General Education (GE):** All undergraduate students are required to complete 12 units of credit of General Education courses, except those who have had equivalent courses, taken at another tertiary institution, credited as GE courses. The Manager, Student Administrative Services has the delegated authority on decisions related to GE courses.

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

**Leave of Absence:** Once a student has completed at least one full-time (or equivalent) semester of study, Leave of Absence (Program Leave) 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 semesters of leave. Students who are granted Program Leave 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 undergraduate combination of 48 units of credit in the one discipline area, of which at least 36 units of credit are for upper-level courses.

**Moodle:** Moodle is the Learning Management System in use at UNSW Canberra. Lecturers may use Moodle to distribute class materials, provide information about class activities and communicate with students.

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

**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:** For undergraduate studies, this person is the undergraduate coordinator.

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

**Stream:** Also known as a major in undergraduate degrees. It is an area of concentration defined by a group of courses which must be completed.

**Undergraduate (UG):** A student who is studying a Bachelor degree. All undergraduate students at UNSW Canberra are members of the Australian Defence Force or selected members of overseas Defence Forces and equivalent ranks from selected foreign Defence Forces.

**Undergraduate Coordinator:** (or in the School of Engineering and Information Technology, the Director of Undergraduate Studies) Undergraduate Coordinators are members of academic staff delegated by their Head of School to advise students on matters requiring academic knowledge and judgment.

**Units of Credit (UOC):** The University of New South Wales operates a uniform unit 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, ie 24 units of credit per Semester. As a guide, 1 unit of credit equates to approximately 25-30 hours of total student workload per Semester (including lectures, tutorials, labs, private study and examinations).

**UNSW:** University of New South Wales.

**UNSW Canberra:** The University of New South Wales, Canberra campus at the Australian Defence Force Academy.
UNSW Canberra Regulations: These standardised regulations apply to all undergraduate coursework students. These should be read in conjunction with the academic rules and program information identified for your degree.

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 Semester, and a separate cumulative WAM is calculated for relevant results over the student’s entire program.

ZMail: Kensington campus email which is required if your course is being delivered via MOODLE. Moodle announcements are sent via email to your Zmail account (https://zmail.unsw.edu.au/). You will need to create a forwarding rule from this email (and your ADFA email if you do not wish to use it as your main email account) to your preferred email account (which can be work email or a private email address).

ZPASS: The password that permits access to myUNSW. This web portal will give you access to undertake and change your enrolment, confirm your enrolment details and grades, and the ability to change contact details.
Understanding your UNSW Canberra 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 2015. Continuing students should refer to the handbook from the year they commenced study for their degree rules. New or revised courses added to current degree rules are applicable to students who commenced prior to 2015.

UNSW Canberra Regulations for Undergraduate Students

These rules apply to all undergraduate students regardless of the degree they are studying. See below or refer to the following website: http://sas.unsw.adfa.edu.au/future_students/undergraduate/undergraduate-programs.html

Academic Rules

These rules detail the requirements and structure of a degree. These can be found under information for each degree.

General Education (GE)

All undergraduate students are required to complete GE courses worth 12 UOC in total.

Please review the UNSW Canberra Rules, section 4 (refer to page 15) before enrolling in your GE courses.

UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules apply to each student who enters an undergraduate program from 2015 onwards. 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 - see program rules in the archived UNSW Handbook website.

1. Meeting degree requirements

1.1 To be eligible to graduate, a student must comply with the UNSW Canberra at ADFA 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 require approval from the relevant School before enrolling in a course if they have not met the prerequisites specified.

1.4 Each course completed or granted as credit towards a program may be counted towards only one major in that program.

Major Rules

If you are studying a BA or BSc, you are required to complete two majors as part of your degree. These rules detail courses a student must complete in order to meet the requirements of a major. In most cases, students must understand these rules before enrolling to ensure the courses they complete will count towards their degree.

Students studying BBus, BIT, BEng or BTech degrees enrol in the courses set out in their Academic Rules and do not need to complete majors.
2. Concurrent enrolment in multiple programs

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

3. Study required per UOC

25-30 hours of work (over a 13 week teaching period) including face-to-face teaching sessions and private study time, is expected for 1 UOC per Semester (i.e. 150-180 hours of study is expected for a 6 UOC course).

4. General Education requirement

4.1 All UNSW Canberra programs include 12 UOC of General Education courses.

4.2 ZGEN courses are worth 6 UOC and are offered each semester. If students wish to undertake more than 12 UOC of ZGEN courses they may select an additional ZGEN course/s as Upper Level free elective/s.

4.3 Students must select one General Education course from each of the following groups:

Group 1: ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership; AND

Group 2: ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy.

5. Limit of Pass Conceded (PC)

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

6. Limitation on enrolment each Semester

In any semester, a student cannot enrol in 30 UOC or more without the approval of the Manager, Student Administrative Services and the relevant Officer Commanding, ADFA. Any student wishing to enrol in 30 UOC or more in a semester must also first discuss their program with their school Undergraduate Coordinator, or SEIT Director Undergraduate Studies.

7. Credit cancellation period

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

8. Credit for previous study

8.1 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.

8.2 All credit transfer assessments will be based on the completion date for the course to be used for credit and not the completion date of the program.

8.2.1 Courses with a successful completion date within 7 years or less can be used for ‘specific’ credit.

8.2.2 Courses with a successful completion date of up to 10 years can be used for ‘unspecified’ credit.

8.3 All courses approved as credit are not included in the term or cumulative WAM calculation.

8.4 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 core course for one outside their degree rules.

9. Variation of program or course requirements

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 Manager, Student Administrative Services.
**4400 Arts**

- **Typical Duration:** 3 years
- **Minimum UOC for Award:** 144 units of credit
- **Typical UOC per Semester:** 24 units of credit
- **Related Program:**
  - 4461 Arts (CDF),
  - 4511 Arts (Honours)

**Program Description**

The Bachelor of Arts is a three-year program at pass level. A separate fourth-year program at Honours level (Program Code 4511) is also available for eligible applicants.

A Bachelor of Arts program enriches your understanding of how human beings make, recognise, and debate about life’s meaning and the values that support civilisation. All Arts disciplines teach students to develop their capacity for critical analysis and argument as well as an awareness of the value of language as a political, intellectual, creative and communicative tool.

Students can combine courses from Business, English, Indonesian Studies, Geography, History, and International and Political Studies, building expertise in two or more of these disciplines.

Honours students who are RAN midshipmen or RAAF officer cadets continue with their programs at UNSW, Canberra and complete their degrees at the end of the fourth year. Army officer cadets transfer to the Royal Military College, Duntroon at the end of their third year. 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 Honours degree.

**Program Objectives and Graduate Attributes**

The objective of a Bachelor of Arts program is to stimulate students intellectually and to immerse them in the discipline of learning.

The program will develop graduate attributes, such as strong written and oral communications skills, the capacity to research, criticise and reflect, and the ability to work independently and collaboratively.

The following majors are available in the Bachelor of Arts:

- Business
- English
- Geography
- History
- Indonesian Studies
- International and Political Studies

Detailed information on the individual majors (also known as streams) are available from page 66 of this booklet.

**Program Structure**

The program structure below is intended to illustrate the operation of the program rules. Nothing in this section replaces or modifies any part of the program rules.

<table>
<thead>
<tr>
<th></th>
<th>Arts Major 1</th>
<th>Arts Major 2</th>
<th>Prescribed Electives</th>
<th>Free Electives</th>
<th>Gen. Ed.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1</strong></td>
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<tr>
<td><strong>Stage 2/3</strong></td>
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<td><strong>Total</strong></td>
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</tbody>
</table>
Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

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

(refer to http://sas.unsw.adfa.edu.au/future_students/undergraduate/undergraduate-programs.html)

2. Program Rules Dictionary

“Major” consists of courses totalling no less than 48 UOC, with at least 36 UOC from Level II and III courses, with at least 18 UOC at Level III.

“Level I” means courses at an introductory level, normally taken at Stage 1.

“Level II” means courses at an upper level, normally taken at Stage 2.

“Level III” means courses at an upper level, normally taken at Stage 3.

3. Program Rules

3.1 The degree of Bachelor of Arts shall be conferred as a ‘Pass with Distinction’ when a Distinction level performance based on a weighted average mark (WAM) of at least 75% has been achieved in all courses completed.

3.2 The BA program must include courses totalling no less than 144 UOC.

3.3 Students must select a minimum of two Arts discipline areas in which they will major. Each major consists of courses totalling no less than 48 UOC, with at least 36 UOC from Level 2 and 3 courses, with at least 18 UOC at Level 3.

3.4 Students must complete two prescribed elective courses: ZPEM2312 Fundamentals of Data Analysis and ZINT2100 Introduction to Cybersecurity: Policy and Operations.

Exclusions: Students who complete ZPEM1301 Mathematics 1A or ZPEM1303 Engineering Mathematics 1A will be exempt from ZPEM2312.

3.5 Students are required to include 12 UOC of General Education courses, normally taken in the second or third year of study. Students must select one General Education course from each of the following groups:

Group 1: ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;

AND

Group 2: ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy

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

3.7 At least 96 units of credit must be taken from Upper-Level courses.

4405 Business

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program:
4462 Business (CDF),
4512 Business (Honours)

Program Description

The Bachelor of Business is a three-year program at pass level. A separate 4th-year program at Honours level (Program Code 4512) is also available for eligible applicants.

The program 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 Graduate Attributes

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

The first year of the BBus comprises the foundation core: four semester-length courses, Introduction to Accounting and Finance, Business Economics, Organisational Behaviour and Business Inquiry and Decision Making (Integrating Core 1). Students normally complete all four pre-requisite courses before proceeding to upper-level study in the BBus.

ZBUS1101 Organisational Behaviour
ZBUS1102 Business Economics
ZBUS1103 Introduction to Accounting
ZBUS1104 Foundations of Management

The second and third year of the BBusiness comprises core Business courses and Business-related electives, one prescribed elective course, one free elective course, and two General Education courses.

Business Core Courses:
ZBUS2101 Business Law
ZBUS2302 Leadership
ZBUS2820 International Business
ZBUS3103 Business Capstone
ZBUS3303 Logistics Management
ZPEM2312 Fundamentals of Data Analysis

Prescribed Elective Course:
ZINT2100 Introduction to Cyber-Security

Business Elective Courses:
Students must complete 6 courses from the following list:
ZBUS2200 Markets and Competition
ZBUS2202 Australia and the World Economy
ZBUS2207 Managing in the Public Sector
ZBUS2401 Financial Management
ZBUS3102 Project Management
ZBUS3203 The Making of Economic Policy
ZBUS3206 Managing Across Cultures
ZEIT2001 Managing Information Systems
ZEIT2307 Capability Option Analysis
ZEIT3104 Electronic Business
ZHSS2601 Introductory Business Ethics

Note: ZBUS2200, ZBUS2202 and ZBUS3203 have a prerequisite of ZBUS1102 Business Economics

General Education Courses:
Students must complete a minimum of 12 UOC total as per General Education Requirements at UNSW Canberra. Students must select one General Education course from each of the following groups:

Group 1: ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;
AND
Group 2: ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy
Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

A student must comply with the UNSW Canberra Regulations for Undergraduate Studies. In the event of a conflict, the rules for the Bachelor of Business take precedence over the UNSW Canberra Regulations for Undergraduate Studies.

2. Program Rules Dictionary

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

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

“Business Core” means compulsory courses in the Bachelor of Business as listed in the Program Structure.

“Business Electives” means elective courses in the Bachelor of Business as listed in the Program Structure.

3. Program Rules

3.1 The degree of Bachelor of Business shall be conferred as a ‘Pass with Distinction’ when a Distinction level performance based on a weighted average mark (WAM) of at least 75% has been achieved in all courses completed.

3.2 To qualify for the degree of Bachelor of Business, a student shall normally be enrolled for a minimum of six semesters and gain a minimum of 144 units of credit (normally 24 units in each full-time semester), 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) Upper-Level Business electives totalling 36 units of credit;

(d) Prescribed elective course ZINT2100 Introduction to Cyber-security: Policy and Operations;

(e) A minimum of 12 units of credit of General Education courses;

(f) 6 units of credit taken from Upper-Level courses offered by Schools other than the School of Business.

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

3.4 At least 96 units of credit must be taken from Upper-Level courses.

Program Structure Table:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Business Core</th>
<th>Business Electives</th>
<th>Prescribed Elective</th>
<th>Free Electives</th>
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<td>30</td>
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<td>144</td>
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</tbody>
</table>
4410 Science

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program:
4463 Science (CDF),
4513 Science (Honours)

Program Description
The Bachelor of Science is a three-year program at pass level. A separate fourth-year program at Honours level (Program Code 4513) is also available for eligible applicants. 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 programs within three years. Honours students who are RAN midshipmen or RAAF officer cadets continue with their programs at UNSW Canberra and complete their programs 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 return to the Academy to complete their program.

Program Objectives and Graduate Attributes
A Bachelor of Science program will develop students’ lifetime skills including creativity, problem-solving ability, critical thinking and communication skills that will be useful not only in a scientific environment but in all professions. It will prepare students to deal with technical and management issues that will often require scientific knowledge and the intellectual and practical problem-solving skills developed through studies in physical, environmental and mathematical sciences, and information technology.

The Bachelor of Science program rules allow students to include a mix of Science courses with courses from Arts, Business, Information Technology and Engineering.

The following Science discipline areas are available as majors in the Bachelor of Science:
- Aviation
- Chemistry
- Computer Science
- Geography
- Information Systems
- Mathematics
- Oceanography
- Operations Research
- Physics

Recommended Double-Major Combinations
One of the following double major combinations must be undertaken in order to complete on-time with no timetable impact, such as AMET clashes.

For the study plans of these combinations see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html
- Mathematics – Physics
- Physics – Chemistry
- Chemistry – Geography
- Mathematics – Oceanography
- Physics – Oceanography
- Geography – Oceanography
- Mathematics – Aviation
- Physics – Aviation
- Chemistry – Aviation
- Geography – Aviation
- Mathematics – Computer Science
- Geography – Information Systems
Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Science take precedence over the UNSW Canberra Regulations for Undergraduate Studies.

2. Program Rules Dictionary

“Major” means an approved combination of 48 or more units of credit in the one discipline area, with at least 18 UoC at each of Level 2 and Level 3.

“Level 1” means courses at an introductory level, normally taken at Stage 1.

“Level 2” means courses at an upper level, normally taken at Stage 2.

“Level 3” means courses at an upper level, normally taken at Stage 3.

3. Program Rules

3.1 The degree of Bachelor of Science shall be conferred as a ‘Pass with Distinction’ when a Distinction level performance based on a weighted average mark (WAM) of at least 75% has been achieved in all courses completed.

3.2 The BSc program must include courses totalling no less than 144 UoC.

3.3 Students must select two Science discipline areas in which they will major. Each major consists of courses totalling 48 UoC with at least 36 UoC from Level 2 and 3 courses, and with at least 18 UoC at Level 3.

3.4 Students must complete two prescribed elective courses ZPEM2312 Fundamentals of Data Analysis and ZINT2100 Introduction to Cybersecurity: Policy and Operations. These two courses do not count towards the students’ 96 UoC for their Science discipline area.

Exclusion: Students who complete ZPEM1301 Mathematics 1A or ZPEM1303 Engineering Mathematics 1A will be exempt from ZPEM2312.

3.5 Students are able to include courses from Business, Engineering and Arts in the program, subject to timetabling constraints and prerequisites.

3.6 Students are required to include 12 UOC of General Education courses, normally taken in the second or third year of study.

Students must select one General Education course from each of the following groups:

Group 1: ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;

AND

Group 2: ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy

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

3.8 At least 96 units of credit must be taken from Upper-Level courses.

Program Structure

The program structure should be read in conjunction with the program rules:

<table>
<thead>
<tr>
<th>Science Major 1</th>
<th>Science Major 2</th>
<th>Prescribed Electives</th>
<th>Free Electives</th>
<th>Gen. Ed.</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Stage 1</td>
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<tr>
<td>Stage 2/3</td>
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<td>Total</td>
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<td>48</td>
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<td>24</td>
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</tr>
</tbody>
</table>
4426 Information Technology

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program:
4469 Information Technology (CDF),
4514 Information Technology (Hons)

Program Description
The Bachelor of Information Technology is a three year program at pass level. A separate 4th-year program at Honours level (program code 4514) is also available for eligible applicants. Information Technology (IT) is "the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware", according to the Information Technology Association of America (ITAA-www.ITAA.org). IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and securely retrieve information. Today, the term information has ballooned to encompass many aspects of computing and technology. IT professionals perform a variety of duties that range from installing applications to designing complex computer networks and information databases.

Graduates of the Bachelor of Information Technology at ADFA will be able to do, think, and manage IT:

“Do IT” - the ability to design and realise (build) IT artifacts

“Think IT” - the ability to analyse and explain IT-related problems

“Manage IT” - the ability to evaluate, acquire, and integrate IT solutions (through people/teams)

Program Objectives and Graduate Attributes
The Bachelor of Information Technology program develops students’ lifetime skills including creativity, problem-solving ability, critical thinking and communication skills that will be useful not only in an IT environment but also in all professions. It prepares students to deal with technical and management issues in the IT environment and for which IT is applied in organisational settings. It develops intellectual and practical problem-solving skills through studies in the information technology milieu.

Program Structure
A Bachelor of Information Technology involves a minimum of 96 units of credit (UOC) from the IT disciplinary core. The Bachelor of Information Technology program rules allow students to include a mix of Information Technology courses with courses from Science, Business, Engineering and the Arts.

Year One: 30 UOC IT Core Courses, 18 UOC ‘other’ Level I Courses

Year Two: 42 UOC IT Core Courses, 6 UOC General Education Courses

Year Three: 36 UOC IT Core Courses, including a year-long project, 6 UOC General Education Courses and a Level III 6 UOC elective course

<table>
<thead>
<tr>
<th>Stage</th>
<th>IT core</th>
<th>Prescribed Electives</th>
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<td>96</td>
<td>12</td>
<td>24</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

Information Technology Core Courses

First Year Program
ZEIT1101 Computational Problem Solving
ZEIT1102 Introduction to Programming
ZEIT1301 Introduction to the IT Profession
ZEIT1302 Introduction to Systems Thinking

Plus 18 UOC from other Level I courses and 6 UOC from an approved Maths course:

Approved Maths courses - select one course from this list:
ZPEM1301 Mathematics 1A
ZPEM1302 Mathematics 1B
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
Second Year Program
ZEIT2102 Computer Technology
ZEIT2103 Data Structures
ZEIT2301 Solution Design
ZEIT2306 Service Design
ZEIT2307 Capability Options Analysis
ZEIT2403 Intro to Operations Research
ZINT2100 Introduction to Cyber Security
Plus one 6 UOC General Education course

Third Year Program
ZEIT3101 IT Project 2
ZEIT3118 IT Project 1
Select four courses from the following list:
ZEIT3110 Service Management
ZEIT3113 Computer Languages & Algorithm
ZEIT3114 Internetworking
ZEIT3302 Software Project Management
ZEIT3405 Problem Structuring Techniques
ZEIT3406 Quantitative Operations Research
Plus one 6 UOC General Education course
Plus one 6 UOC elective course from the following list or as approved by the SEIT UG Coordinator:
ZEIT3102 Cryptography
ZEIT3104 Electronic Business
ZEIT3111 Special Topic
ZEIT3112 Special Topic 2
ZEIT3115 Systems and Network Admin
ZEIT3117 Cyber-security
ZEIT3307 Computer Games
ZEIT3308 E-Warrior
ZEIT3404 Simulation

Students must select one General Education course from each of the following groups:

Group 1: ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;

AND

Group 2: ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students
   
   These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

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

2. Program Rules Dictionary
   
   “Level I” means courses at an introductory level, normally taken at Stage 1.
   “Level II” means courses at an upper level, normally taken at Stage 2.
   “Level III” means courses at an upper level, normally taken at Stage 3.
   “Upper Level” means courses normally taken at Stage 2 and Stage 3.

3. Program Rules

3.1 The degree of Bachelor of Information Technology shall be conferred as a ‘Pass with Distinction’ when a Distinction level performance based on a weighted average mark (WAM) of at least 75% has been achieved in all courses completed.

3.2 To qualify for the degree of Bachelor of Information Technology, a student shall normally be enrolled for a minimum of six semesters and gain a minimum of 144 Units of Credit (UoC) including:

   (a) A minimum of 48 UOC of Level I courses, with 24 UOC comprised of Information Technology Core courses;
   (b) A minimum of 72 UOC of upper-level Information Technology Core courses;
   (c) 12 UOC from prescribed courses - approved Level I Mathematics course and ZINT2100;
   (d) A minimum of 12 UOC of General Education courses;
   (e) A 6 UOC taken from upper-level elective course;
   (f) No more than 48 UOC may be gained for Level 1 courses; and
   (g) At least 96 UOC must be taken from Upper-Level courses.
4430 Technology (Aeronautical Eng)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4468 Tech Aero Engineering (CDF)

Program Description
Engineering Technology degrees within UNSW Canberra provide outstanding technology education to the future leaders of the Australian Defence Force and encourage excellence through contributions to the engineering profession, industry and community.

Students holding a Bachelor of Technology in the Aeronautical Engineering program may, under normal circumstances, articulate to the Bachelor of Engineering in the Aeronautical Engineering program with 12 months of additional study.

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

Program Objectives and Graduate Attributes
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: foundation science, engineering technology, materials and structures, dynamics and control, thermofluids, design and management as well as discipline specific streams such as aircraft systems and engines.

At the end of the program students are expected to meet the graduate attributes of the University and Stage 1 Competencies of Engineers Australia, ready to practise in their chosen profession and with the ingenuity and resourcefulness to meet rapid technological change.

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
Bachelor of Technology degrees require a prescribed program structure as determined by the technology program chosen.

First Year Program
ZEIT1500 Statics
ZEIT1501 Engineering Practice and Design
ZEIT1502 Dynamics
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1305 Engineering Problem Solving
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2500 Thermofluids
ZEIT2501 Mechanical and Electronic Design
ZEIT2502 Fundamentals of Flight
ZEIT2503 Fluid Mechanics
ZEIT2504 Mechanics of Solids
ZINT2501 Engineering Materials and Chemistry
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B

Third Year Program
ZEIT3500 Engineering Structures
ZEIT3501 Engineering Materials
ZEIT3503 Aerodynamics
ZEIT3802 BTech Project and Practical Experience
ZINT2100 Introduction to Cyber-Security
And 2 x General Education courses
And 1 x Technical Elective courses

Technical Electives
ZEIT3502 Vibration and Control Engineering
ZEIT3504 Aircraft and Systems Design 1
ZEIT3505 Flight Dynamics and Aircraft Control
ZEIT4003 Computational Fluid Dynamics
ZEIT4008 Integrated Mechanical Design
ZEIT4702 Instrumentation
ZEIT4013 Hypersonics ZEIT6551 Rotorcraft Engineering
ZEIT6552 Advanced Rotorcraft

Upper Level courses from BEng (Aero) or other programs may be taken with the approval of the Director of Undergraduate Coordinator's Study, approval although such choices may add time to a subsequent articulation to a BE degree.
Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

1.1 These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

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

2. Program Rules Dictionary

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

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

2.3 A student 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 student’s enrolment will be accepted for any course, the student must have completed the relevant pre-requisite courses shown in the Course Catalogue, except where the School Undergraduate Coordinator for the appropriate course approves otherwise.

2.5 Students are required to include 12 UOC of General Education courses, normally taken in the second or third year of study.

3. Practical Experience Requirements

Before graduation a student shall complete 40 days of approved practical engineering experience which must be done in blocks of at least 20 working days each where practicable and where each block must be in the service of a single provider. 20 days of appropriate service training may be counted towards this total. Before

4437 Technology (Aviation)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit

Program Description

Engineering Technology degrees within UNSW Canberra provide outstanding technology education to the future leaders of the Australian Defence Force and encourage excellence through contributions to the engineering profession, industry and community.

Program Objectives and Learning Outcomes

The BTech (Av) program is based on core engineering subjects, however, specialist components of the BTech (Av) program focus on the interface between technology, individuals and organizations in the aviation industry. The aim is to provide the student with a deep understanding of the various technological and human systems that contribute to the safe and efficient operation of aircraft.

A key element in this program is the focus on the role of people as key components in a technologically advanced and complex aviation system. There is particular emphasis on the role of human operators (e.g. pilots, air combat officers and air traffic controllers) in aviation infrastructure and safety management systems. Other courses such as aerodynamics and aircraft systems often incorporate problem-based learning informed by academic research and industrial practice. Electives and a final semester project enable students to pursue particular interests both within and outside the specialist discipline.

The BTech (Av) program is designed for potential pilots, navigators and air traffic controllers entering the Australian Defence Force. It is differentiated from the BTech (Aero) program in that there is greater focus on the role of humans in the operation of complex aerospace systems. This program does not provide a short articulation pathway to a Bachelor of Engineering.
Program Structure

The BTech (Av) program is grounded in foundation science and engineering therefore all first year courses are common to aerospace and mechanical engineering streams. In second and third year the program diverges into an aviation specialist stream.

First Year Program
ZEIT1500 Statics
ZEIT1501 Engineering Practice and Design
ZEIT1502 Dynamics
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1305 Engineering Problem Solving
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2502 Fundamentals of Flight
ZEIT2800 Introduction to Aviation
ZEIT2802 Aircraft Systems for Aviators
ZEIT2803 Aviation Safety
ZPEM2302 Mathematics Tools for Science
ZPEM2506 Physics 2A
And 2 x General Education courses

Third Year Program
ZINT2100 Introduction to Cyber-Security
ZEIT3504 Aircraft and Systems Design 1
ZEIT3801 Advanced Aviation Safety
ZEIT3803 Air Traffic Management
ZEIT3804 Behavioural Science Project and Practical Experience
ZPEM3204 Environmental Hazards
and 2 x Technical Elective courses

Technical Elective Courses
ZBUS3103 Human Resource Management
ZEIT2307 Capability Option Analysis
ZEIT2403 Introduction to Operations Research
ZEIT3406 Quantitative Operations Research
ZEIT3501 Engineering Materials
ZEIT3505 Flight Dynamics and Aircraft Control
ZEIT4505 Mechanical and Aeronautical Engineering Management
ZEIT4702 Instrumentation

Upper level courses from BE (Aero) or other programs may be taken with the Program Coordinator’s approval.

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

1.1 These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

1.2 A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Technology (Aviation) take precedence over the UNSW Canberra Regulations for Undergraduate Students.
2. Program Rules Dictionary

2.1 The degree of Bachelor of Technology (Aviation) shall be conferred as a ‘Pass with Distinction’ when a Distinction level performance based on a weighted average mark (WAM) of at least 75% has been achieved in all courses completed since enrolment at UNSW.

2.2 To qualify for the degree of Bachelor of Technology (Aviation) a student shall normally be enrolled for a minimum of six semesters and gain a minimum of 144 units of credit (normally 24 UOC in each full-time semester).

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

2.4 A student completing a Non-Standard Program shall, subject to the requirements of Rule 2.5 (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.

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

3. Practical Experience Requirements

Before graduation a student shall complete 40 days of approved practical engineering/aviation experience which must be done in blocks of at least 20 working days each where practicable and where each block must be in the service of a single provider. 20 days of appropriate service training may be counted towards this total.

Engineering Degrees

The school offering engineering degrees within UNSW Canberra aims 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 Bachelor of Engineering (BE) program is four years in duration, and the degree is awarded as an Honours degree. The engineering programs at UNSW Canberra have been granted full accreditation by Engineers Australia. All Bachelor of Engineering degrees have the engineering specialisation stipulated.

Except for Electrical Engineering and those in the Chief of Defence Force Students Program, first-year engineering and technology students enrol in a common program taking foundation science and engineering courses. In second and increasingly in third and fourth years the programs diverge into their specialties although there are some courses that span across programs in all years. A key element in all years is the design stream which emphasises complex problem solving. Other streams such as structures, materials, hydraulics, environmental engineering, geotechnics stability, control, thermofluid dynamics, mechanics and project management often incorporate project based learning informed by academic research and industrial practice. Electives and a final year thesis or integrated design enable students to pursue particular interests both within and outside the specialist discipline.

At the end of the program students are expected to meet the graduate attributes of the University and Stage 1 Competencies of Engineers Australia, ready to practise in their chosen profession and with the ingenuity and resourcefulness to meet rapid technological change.
4471 Electrical Engineering (Honours)

Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program:
4478 Electrical Engineering (Hons) (CDF)

Program Description

Engineering degrees offered by UNSW Canberra aim 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 Bachelor of Engineering (Honours) in Electrical Engineering is of four years duration and the degree may be awarded at Honours Class I, Honours Class II, Division I or Honours Class II, Division II. These Honours levels will be displayed on the final testamur. Candidates who do not achieve Honours Class 1 or 2 will receive a Bachelor of Engineering (Honours) in Electrical Engineering with no honours level displayed.

The Bachelor of Engineering (Honours) in Electrical Engineering program at UNSW Canberra has been granted full accreditation by Engineers Australia and has been recognised by the Institute of Electrical and Electronics Engineers.

Program Objectives and Graduate Attributes

The Bachelor of Engineering (Honours) 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. Most courses in the first three years of the program are common for all electrical engineering students. In the fourth year students have the option to select specialty topics 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 (Honours) in Electrical Engineering degree requires 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 ZEIT) and courses taught by other Schools within UNSW Canberra.

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 enrol concurrently in courses from more than one year of the program.

First Year Program
ZEIT1101 Computational Problem Solving
ZEIT1102 Introduction to Programming
ZEIT1206 Design of Electronic Circuits
ZEIT1208 Introduction to Electrical Engineering
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2102 Computer Technology
ZEIT2103 Data Structures
ZEIT2207 Design of Electronic Circuits 2
ZEIT2208 Programmable Digital Systems
ZINT2100 Introduction to Cyber Security
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B
ZPEM2502 Physics 2B

Third Year Program
ZEIT3215 Signals and Systems
ZEIT3216 Design of Electronic Circuits 3
ZEIT3218 Communications Techniques
ZEIT3220 Engineering Electromagnetics
ZEIT3502 Vibration and Control Engineering
ZEIT6521 Digital Signal Processing
Plus 2 x General Education courses

Fourth Year Program
ZEIT4222 Systems Engineering
ZEIT4224 Power and Machines
ZEIT4230 Electrical Engineering Design
ZEIT4500 Engineering Project A
ZEIT4501 Engineering Project B

Students must undertake 18 UOC of technical elective courses selected from the courses listed below. Students may select a maximum of one course from Group B below.

Technical Elective Courses

Group A
ZEIT4215 Occasional Option 1: Underwater Communication
ZEIT4216 Occasional Option 2
ZEIT4217 Occasional Option 3
ZEIT4218 Occasional Option 4
ZEIT4225 Satellite Communications
ZEIT4226 Digital Image Processing
ZEIT4227 Radar Techniques and Applications
ZEIT4229 Navigational Systems: Theory and Practice
ZEIT4297 Project Extension
ZEIT4702 Instrumentation
ZEIT6574 Marine Project

Group B
ZEIT3102 Cryptography
ZEIT3110 Service Management
ZEIT3113 Computer Languages and Algorithms
ZEIT3114 Internetworking
ZEIT3302 Software Project Management
ZEIT3404 Simulation

Students may choose to specialise by taking all elective courses in the following areas of interest:

Marine Stream
ZEIT4702 Instrumentation
ZEIT6574 Marine Project

Note: Enrolment in ZEIT4216, ZEIT4217 and ZEIT4218 requires the approval of the SEIT Director of Undergraduate Studies.

Upper level courses from other programs may be taken with the approval of the SEIT Director of Undergraduate Studies. Not all electives may be offered in any year.
Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering (Honours) in Electrical Engineering take precedence over the UNSW Canberra Regulations for Undergraduate Students.

2. Program Rules Dictionary

2.1 The degree of Bachelor of Engineering (Honours) in Electrical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

2.1.1 The Class of Honours is calculated as follows:

Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Courses will be weighted according to the following:

<table>
<thead>
<tr>
<th>Foundation (ie Level 2 and 3 courses)</th>
<th>Disciplinary (ie Level 4 courses not including final year projects)</th>
<th>Thesis (ie Final year projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) in Electrical 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

3. Practical Experience Requirements

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.

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:

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

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

Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
4472 Aeronautical Engineering (Honours)

Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4476 Aeronautical Engineering (Hons) (CDF)

Program Description

Engineering degrees offered by UNSW Canberra 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 Bachelor of Engineering (Honours) in Aeronautical Engineering is of four years duration and the degree may be awarded at Honours Class I, Honours Class II, Division I or Honours Class II, Division II. These Honours levels will be displayed on the final testamur. Candidates who do not achieve Honours Class 1 or 2 will receive a Bachelor of Engineering (Honours) in Aeronautical Engineering with no honours level displayed.

The engineering programs at UNSW Canberra have been granted full accreditation by Engineers Australia.

Program Objectives and Graduate Attributes

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 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.

At the end of the program students are expected to meet the graduate attributes of the University and Stage 1 Competencies of Engineers Australia, ready to practise in their chosen profession and with the ingenuity and resourcefulness to meet rapid technological change.

Program Structure

The Bachelor of Engineering (Honours) in Aeronautical Engineering degree requires 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 ZEIT) and courses taught by other Schools within UNSW Canberra.

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 enrol concurrently in courses from more than one year of the program.

First Year Program
ZEIT1500 Statics
ZEIT1501 Engineering Practice and Design
ZEIT1502 Dynamics
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1305 Engineering Problem Solving
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B
Second Year Program
ZEIT2500  Thermofluids
ZEIT2501  Mechanical and Electronic Design
ZEIT2502  Fundamentals of Flight
ZEIT2503  Fluid Mechanics
ZEIT2504  Mechanics of Solids
ZINT2501  Engineering Materials and Chemistry
ZPEM2309  Engineering Mathematics 2A
ZPEM2310  Engineering Mathematics 2B

Third Year Program
ZEIT3500  Engineering Structures
ZEIT3501  Engineering Materials
ZEIT3503  Aerodynamics
ZEIT3504  Aircraft and Systems Design 1
ZEIT3505  Flight Dynamics and Aircraft Control
ZINT2100  Introduction to Cyber-Security
Plus 2 x General Education courses

Fourth Year Program
ZEIT4500  Engineering Project A
ZEIT4501  Engineering Project B
ZEIT4502  Aircraft Design 2
ZEIT4503  Applied Thermodynamics and Propulsion
ZEIT4505  Mechanical and Aeronautical Engineering Management

Students must undertake 18 UOC of Technical Elective courses selected from the courses listed below.

Technical Elective Courses
ZEIT3502  Vibration and Control Engineering
ZEIT4001  Engineering Structures 2
ZEIT4003  Computational Fluid Dynamics
ZEIT4006  Structural Integrity Assessment
ZEIT4008  Integrated Mechanical Design
ZEIT4011  Occasional Elective 1
ZEIT4012  Occasional Elective 2
ZEIT4013  Hypersonics
ZEIT4014  Impact Dynamics
ZEIT4017  Instrumentation
ZEIT6522  Electrical and Mechanical Plant
ZEIT6551  Rotorcraft Engineering
ZEIT6552  Advanced Rotorcraft

Students may choose to specialise by taking all elective courses in the following areas of interest:

Structural Integrity Stream
ZEIT4001  Engineering Structures 2
ZEIT4006  Structural Integrity Assessment
ZEIT4008  Integrated Mechanical Design

Rotorcraft Stream
ZEIT4006  Structural Integrity Assessment
ZEIT6551  Rotorcraft Engineering
ZEIT6552  Advanced Rotorcraft

High Performance Aerospace Vehicle Stream
ZEIT4003  Computational Fluid Dynamics
ZEIT4013  Hypersonics
Note: Enrolment in ZEIT4011 and ZEIT4012 require the approval of the SEIT Director of Undergraduate Studies.

Upper Level courses from other programs may be taken with approval from the SEIT Director of Undergraduate Studies. Not all electives may be offered in any year.

Academic Rules
1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering (Honours) in Electrical Engineering take precedence over the UNSW Canberra Regulations for Undergraduate Students.

2. Program Rules Dictionary

2.1 The degree of Bachelor of Engineering (Honours) in Electrical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:
Honours Class I
Honours Class II, Division I
Honours Class II, Division II
Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

2.1.1 The Class of Honours is calculated as follows:
Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Courses will be weighted according to the following:

| Foundation  
| Level 2 and 3 courses | Disciplinary  
| Level 4 courses (not including final year projects) | Thesis  
| Final year projects |
|---|---|---|
| 1 | 2 | 3 |

2.2 To qualify for the degree of Bachelor of Engineering (Honours) in Electrical 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

3. Practical Experience Requirements
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.

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:

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

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

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

4473 Civil Engineering (Honours)
Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program:
4477 Civil Engineering (CDF) (Hons)

Program Description
Engineering degrees offered by UNSW Canberra 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 Bachelor of Engineering (Honours) in Civil Engineering program is of four years duration and the degree may be awarded at Honours Class I, Honours Class II, Division I or Honours Class II, Division II. These honours levels will be displayed on the final testamur. Candidates who do not achieve Honours Class 1 or 2 will receive a Bachelor of Engineering (Honours) in Civil Engineering with no honours level displayed.
Program Objectives and Graduate Attributes

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, electronics 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.

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.

Program Structure

The Bachelor of Engineering (Honours) in Civil Engineering degree requires 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 ZEIT) and courses taught by other Schools within UNSW Canberra.

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 enrol concurrently in courses from more than one year of the program.

First Year Program

ZEIT1500 Statics
ZEIT1502 Dynamics
ZEIT1600 Introduction to Civil Engineering
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1305 Engineering Problem Solving
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program

ZEIT2500 Thermofluids
ZEIT2504 Mechanics of Solids
ZEIT2601 Soil Mechanics and Engineering Geology
ZEIT2602 Hydraulic Engineering
ZINT2100 Introduction to Cyber-Security
ZINT2501 Engineering Materials and Chemistry
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B

Third Year Program

ZEIT3501 Engineering Materials
ZEIT3600 Structural Analysis
ZEIT3601 Environmental Engineering
ZEIT3602 Geotechnical Design
ZEIT3603 Design Steel and Timber Structures
ZEIT3604 Project Management Civil Engineering
Plus 2 x General Education courses

Fourth Year Program

ZEIT4500 Engineering Project A
ZEIT4501 Engineering Project B
ZEIT4600 Civil Design Practice
ZEIT4602 Design of Concrete Structures
ZEIT4604 Hydrology and Environmental Engineering Practice
ZEIT4605 Foundation and Pavement Engineering

Students must undertake 12 UOC of Technical Elective courses selected from the courses listed below.
Technical Elective Courses

- ZEIT4002 Sustainability of Concrete Structures
- ZEIT4003 Computational Fluid Dynamics
- ZEIT4004 Geosynthetics and Ground Improvement
- ZEIT4006 Structural Integrity Assessment
- ZEIT4011 Occasional Elective 1
- ZEIT4012 Occasional Elective 2
- ZEIT4014 Impact Dynamics
- ZEIT4601 Civil Design Practice Ext
- ZEIT4603 Finite Element Methods
- ZEIT6522 Electrical and Mechanical Plant
- ZEIT6573 Naval Architecture
- ZEIT6574 Marine Project

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering (Honours) in Civil Engineering take precedence over the UNSW Canberra Regulations for Undergraduate Students.

2. Program Rules Dictionary

2.1 The degree of Bachelor of Engineering (Honours) in Civil Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

2.1.1 The Class of Honours is calculated as follows:

- Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
- Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
- Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Courses will be weighted according to the following:

<table>
<thead>
<tr>
<th>Foundation (Level 2 and 3 courses)</th>
<th>Disciplinary (Level 4 courses not including final year projects)</th>
<th>Thesis (Final year projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) in Civil 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

3. Practical Experience Requirements

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.
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:

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

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

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

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4474 Mechanical Engineering (Honours)

Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit

Program Description
All engineering degrees within UNSW Canberra 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 Bachelor of Engineering (Honours) in Mechanical Engineering is of four years duration, and the degree may be awarded at Honours Class I, Honours Class II, Division I or Honours Class II, Division II. These honours levels will be displayed on the final testamur. Candidates who do not achieve Honours Class 1 or 2 will receive a Bachelor of Engineering (Honours) in Mechanical Engineering with no honours level displayed.

The Bachelor of Engineering (Honours) in Mechanical Engineering program at UNSW Canberra has been granted full accreditation by Engineers Australia.

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Program Objectives and Graduate Attributes

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 coordinating 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 Encyclopedia Britannica).
Army Bachelor of Engineering (Honours) in Mechanical Engineering 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, headquarters or on equipment procurement in the Material Branch.

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.

At the end of the program students are expected to meet the graduate attributes of the University and Stage 1 Competencies of Engineers Australia, ready to practise in their chosen profession and with the ingenuity and resourcefulness to meet rapid technological change.

Program Structure

The Bachelor of Engineering (Honours) in Mechanical Engineering degree requires 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 ZEIT) and courses taught by other Schools within UNSW Canberra.

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 enrol concurrently in courses from more than one year of the program.

First Year Program

- ZEIT1500 Statics
- ZEIT1501 Engineering Practice
- ZEIT1502 Dynamics
- ZPEM1303 Engineering Mathematics 1A
- ZPEM1304 Engineering Mathematics 1B
- ZPEM1305 Engineering Problem Solving
- ZPEM1501 Physics 1A
- ZPEM1502 Physics 1B

Second Year Program

- ZEIT2500 Thermofluids
- ZEIT2501 Mechanical and Electronic Design
- ZEIT2503 Fluid Mechanics
- ZEIT2504 Mechanics of Solids
- ZEIT2700 Mechanics of Machines
- ZINT2501 Engineering Materials and Chemistry
- ZPEM2309 Engineering Mathematics 2A
- ZPEM2310 Engineering Mathematics 2B

Third Year Program

- ZEIT3500 Engineering Structures
- ZEIT3501 Engineering Materials
- ZEIT3502 Vibration and Control Engineering
- ZEIT3700 Mechanical Design 1
- ZEIT3701 Heat Transfer and Refrigeration
- ZINT2100 Intro to Cyber-Security
- Plus 2 x General Education courses

Fourth Year Program

- ZEIT4500 Engineering Project A
- ZEIT4501 Engineering Project B
- ZEIT4505 Mechanical and Aeronautical Engineering Management
- ZEIT4700 Mechanical Design 2

Students must undertake 24 UOC of Technical Elective courses selected from the courses listed below:

Technical Elective Courses

- ZEIT4001 Engineering Structures 2
- ZEIT4003 Computational Fluid Dynamics
- ZEIT4006 Structural Integrity Assessment
- ZEIT4008 Integrated Mechanical Design
- ZEIT4011 Occasional Elective 1
- ZEIT4012 Occasional Elective 2
- ZEIT4014 Impact Dynamics
- ZEIT4503 Applied Thermodynamics and Propulsion
- ZEIT6522 Electrical and Mechanical Plant
- ZEIT6551 Rotorcraft Engineering
- ZEIT6552 Advanced Rotorcraft
- ZEIT6571 Land Mobility and Weapons
- ZEIT6572 Land Vehicles
- ZEIT6573 Naval Architecture
- ZEIT6574 Marine Project
Note: The courses ZEIT4503 Applied Thermodynamics and Propulsion, ZEIT6574 Marine Project and ZEIT6572 Land Vehicles share some common teaching materials which make them mutually exclusive.

Note: Enrolment in ZEIT4011 and ZEIT4012 requires the approval of the SEIT Director of Undergraduate Studies.

Students may choose to specialise by taking all elective courses in the following areas of interest:

**Marine Stream**
- ZEIT4702 Instrumentation
- ZEIT6522 Electrical and Mechanical Plant
- ZEIT6573 Naval Architecture
- ZEIT6574 Marine Project

**Land-based Stream**
- ZEIT4702 Instrumentation
- ZEIT6522 Electrical and Mechanical Plant
- ZEIT6571 Land Mobility and Weapons
- ZEIT6572 Land Vehicles

Upper level courses from other programs may be taken with the approval of the SEIT Director of Undergraduate Studies. Not all electives may be offered in any year.

**Academic Rules**

1. **UNSW Canberra Regulations for Undergraduate Students**

   These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

   A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Engineering (Honours) in Electrical Engineering take precedence over the UNSW Canberra Regulations for Undergraduate Students.

2. **Program Rules Dictionary**

   2.1 The degree of Bachelor of Engineering (Honours) in Electrical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

   Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

   2.1.1 The Class of Honours is calculated as follows:

   - Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
   - Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
   - Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

   Courses will be weighted according to the following:

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<tr>
<th>Foundation (ie Level 2 and 3 courses)</th>
<th>Disciplinary (ie Level 4 courses, not including final year projects)</th>
<th>Thesis (ie Final year projects)</th>
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<td>1</td>
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<td>3</td>
</tr>
</tbody>
</table>

   2.2 To qualify for the degree of Bachelor of Engineering (Honours) in Electrical 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

3. Practical Experience Requirements

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.

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:

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

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

Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
Bachelor Degrees in the Chief of Defence Force Students Programs

General Description
The Chief of Defence Force Students (CDFS) Programs in Arts, Business, Engineering, Science and Technology - Aeronautical offer the opportunity for students entering UNSW Canberra 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 those available in the standard Bachelor Degree programs.

The range of CDFS Programs, described in detail in the following sections, is characterised by the inclusion of specialist courses in critical analysis and/or research methods appropriate to the area of study. All programs also include discipline-specific research projects. The research projects will be supervised by academic staff from the relevant discipline. With the approval of the relevant Heads of Schools, multi- or cross-disciplinary projects may be undertaken. 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 will be based on a written paper or report and oral presentations.

Throughout the program, and in addition to completing the courses given in the following schedules, 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.

The CDFS Programs are of three-years’ duration in Arts, Business, Science and Technology - Aeronautical. A separate Honours year may be undertaken. The programs in Engineering are all of four-years’ duration and are awarded with Honours.

Objectives and Learning Outcomes
Each of the CDFS Programs has objectives and learning outcomes in common with the standard Bachelor degree in the same area, but extends the educational principles embodied in the standard degree to a higher level. In the programs, students will be exposed to courses in critical analysis and/or research methods in the discipline(s) of their chosen program, which will offer significant extensions to the ideas and analysis normally available in the standard degree program. This will allow all CDFS to undertake research-oriented courses at the appropriate level through their program, thereby integrating research into their studies in a way that is not available in the standard degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the CDFS Programs and give students the ability to develop their full potential.

Program Rules Dictionary
Terms used in the CDFS Programs are the same as those used for the standard Bachelor degree programs.

UNSW Canberra Undergraduate Regulations
A student must comply with the UG Regulations for Undergraduate Students. In the event of a conflict, the rules for the relevant Bachelor Degree in the CDFS Programs take precedence over the Faculty Regulations for Undergraduate Students.(refer to http://sas.unsw.adfa.edu.au/future_students/undergraduate/undergraduate-programs.html)
Admission to CDFS Programs
A student for enrolment in a CDFS Program shall hold an Entrance Rank equivalent to a ATAR of equal to or greater than that specified below for the degree concerned.

<table>
<thead>
<tr>
<th>Degree Programs</th>
<th>Entrance Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts (CDFSP)</td>
<td>95</td>
</tr>
<tr>
<td>Bachelor of Science (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Business (CDFSP)</td>
<td>95</td>
</tr>
<tr>
<td>Bachelor of Engineering in Aeronautical Engineering (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Engineering in Civil Engineering (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Engineering in Electrical Engineering (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Engineering in Mechanical Engineering (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Information Technology (CDFSP)</td>
<td>98</td>
</tr>
<tr>
<td>Bachelor of Technology – Aeronautical Engineering (CDFSP)</td>
<td>98</td>
</tr>
</tbody>
</table>

Transfer to CDFS Programs
A student enrolled in a standard Bachelor Degree Program may, at the discretion of the relevant Head of School, transfer to the CDFS Program in the same degree area upon completion of a minimum of 24 units of credit in either semester of the Year 1 program with a semester-based Weighted Average Mean (WAM) equal to or greater than that specified below for the degree concerned. The latest date by which students may transfer to the CDFS Program in the same degree area is for the commencement of Semester 1 of the Year 2 program.

<table>
<thead>
<tr>
<th>Degree Programs</th>
<th>WAM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Science (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Business (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Aeronautical Engineering (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Civil Engineering (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Electrical Engineering (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Mechanical Engineering (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Information Technology (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Technology – Aeronautical Engineering (CDFSP)</td>
<td>80</td>
</tr>
</tbody>
</table>

Progression through CDFS Programs
To continue as a student in the CDFS Program, a student shall normally achieve a semester-based Weighted Average Mean (WAM) equal to or greater than that specified below for the degree concerned. Candidature shall be reviewed at the end of each academic semester. The relevant Head(s) of School may exercise discretion in decisions relating to candidature.

<table>
<thead>
<tr>
<th>Degree Programs</th>
<th>WAM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Science (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Business (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Aeronautical Engineering (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Civil Engineering (Hons) (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Electrical Engineering (Hons) (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Engineering in Mechanical Engineering (Hons) (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Information Technology (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Science (CDFSP)</td>
<td>80</td>
</tr>
<tr>
<td>Bachelor of Technology – Aeronautical Engineering (CDFSP)</td>
<td>80</td>
</tr>
</tbody>
</table>

Credit Transfer
A student transferring between the CDFS Program and the standard Bachelor Degree Program in the same degree area will be granted credit for all courses successfully completed.

General Education Courses
As is the case for standard Bachelor Degree Programs, all CDFS Programs require the completion of 12 units of credit of General Education courses, normally taken across Years 2 and 3.

Students must select one General Education course from each of the following groups:

Group 1
ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;

Group 2
ZGEN2215 Law, Force and Legitimacy, OR ZGEN2240 Introduction to Military Ethics.
Honours

(a) Honours in the Bachelor of Arts (4511), Bachelor of Business (4512), Bachelor of Information Technology (4514) and Bachelor of Science (4513) Degree Programs is awarded on the basis of a separate fourth year of study.

(b) Honours in the various Bachelor of Engineering degree programs is calculated based on the Weighted Average Mean over years 2, 3 and 4 of the program, with additional weighting given to the final year project.

(c) Honours is not available in the Bachelor of Technology – Aeronautical Engineering (CDF).

4461 Arts (CDF)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Programs: 4400 Arts, 4511 Arts (Honours)

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

   A student must comply with the UNSW Canberra Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Arts (Chief of Defence Force) take precedence over the UNSW Canberra Regulations for Undergraduate Students.

   Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. Program Rules Dictionary

   2.1 The BA (CDF) program must include courses totaling no less than 144 UOC.

   2.2 At least 96 UOC must be from courses in the Arts discipline areas listed below, of which at least 48 UOC must be in Level 2 and Level 3 courses.

   2.3 Students must complete two majors in Arts disciplines. A major consists of courses totaling no less than 48 UOC, with at least 36 UOC from Level 2 and 3 courses, with at least 18 UOC at Level 3.

   2.4 Students must complete three designated CDF courses as identified in the Sample Program (viz, ZHSS2902, ZHSS3901 and ZHSS3902. These designated CDF courses will count towards one or both of the students Arts majors.

   2.5 Students are able to include courses from Business, Information Technology, Engineering and Science in the program, subject to timetabling constraints and prerequisites.

   2.6 Students are required to include 12 UOC of General Education courses, normally taken in the second or third year of study.

Program Structure

The following Arts disciplines are available in the BA (CDF):

- Business
- English
- Geography
- History
- Indonesian Studies
- International & Political Studies
## Sample Program
Two Arts Majors

<table>
<thead>
<tr>
<th>Yr</th>
<th>Major #1</th>
<th>Major #2</th>
<th>CDF Courses</th>
<th>Free Electives</th>
<th>General Education plus Prescribed Electives</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>12 UOC</td>
<td>24 UOC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>12 UOC</td>
<td>24 UOC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>24 UOC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>12 UOC</td>
<td>24 UOC</td>
<td>ZHSS2902</td>
<td>24 UOC</td>
</tr>
<tr>
<td>S1</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>24 UOC</td>
<td>ZHSS3901</td>
<td>24 UOC</td>
</tr>
<tr>
<td>S2</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>12 UOC</td>
<td>24 UOC</td>
<td>ZHSS3902</td>
<td>24 UOC</td>
</tr>
<tr>
<td>Total</td>
<td>48 UOC</td>
<td>48 UOC</td>
<td>24 UOC</td>
<td>24 UOC</td>
<td></td>
<td>144 UOC</td>
</tr>
</tbody>
</table>

At least three of the four disciplines chosen in Year 1 must be Arts disciplines.

CDF Courses may be taken in either or both Arts majors, but may only be counted simultaneously in each major.

* Business – Candidates taking a BA (CDF) in which Business is a major may wish to undertake the special CDF Program courses offered by the School of Business instead of those offered in the Schedule above.

Consultation with the HASS and/or Business CDF Program Coordinator is strongly recommended.

** Geography – Candidates taking a BA (CDF) in which Geography is a major may wish to undertake the special CDF Program courses offered by the School of Physical, Environmental and Mathematical Sciences (Geography) instead of those offered in the Schedule above.

Consultation with the HASS and/or PEMS CDF Program Coordinator is strongly recommended.
4462 Business (CDF)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit

Related Program:
4405 Business,
4512 Business (Honours)

Academic Rules
1. Faculty Regulations for Undergraduate Students
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.(refer to http://sas.unsw.adfa.edu.au/future_students/undergraduate/undergraduate-programs.html)

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. Program Rules Dictionary
2.1 To qualify for the degree of Bachelor of Business, a student shall normally be enrolled for a minimum of six semesters and gain a minimum of 144 UOC (normally 24 UOC in each full-time semester), including:
(a) Level I courses totalling 48 units of credit, with 24 UOC chosen from Business core courses;
(b) Upper-Level Business core courses totalling 60 UOC;
(c) Upper-Level Business electives totalling 12 UOC;
(d) Compulsory prescribed elective course ZINT2100 Introduction to Cyber-Security: Policy and Operations;
(e) A minimum of 12 UOC of General Education courses;
(f) 6 units of credit taken from Upper-Level courses offered by Schools other than the School of Business.

2.2 No more than 48 UOC may be gained for Level I courses.

2.3 At least 96 UOC must be taken from Upper-Level courses.

2.4 As is the case for standard Bachelor Degree Programs, all CDFS Programs require the completion of 12 UOC of General Education courses, normally taken across Years 2 and 3.

Program Objectives and Graduate Attributes
On successful completion of the Bachelor of Business (CDF), students will have the ability to:

– understand and critically apply competing theories to leadership situations work effectively within a team and manage team processes
– communicate ideas clearly, coherently and concisely in both written and oral formats
– consider professional ethics and cultural context when making decisions
– understand, integrate and apply foundational disciplinary knowledge and concepts
– apply basic analytical techniques to justify business decisions
– critique research literature and write a report based on original research

Program Structure

<table>
<thead>
<tr>
<th>Stage</th>
<th>Business Core</th>
<th>Business Electives</th>
<th>Prescribed Elective</th>
<th>Electives</th>
<th>General Education</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>24</td>
<td></td>
<td></td>
<td>24</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Stage 2</td>
<td>36</td>
<td></td>
<td>ZINT2100</td>
<td>6</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Stage 3</td>
<td>24</td>
<td>12</td>
<td></td>
<td>6</td>
<td></td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>12</td>
<td>6</td>
<td>30</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>
The first year of the BBus(CDF) comprises four foundation courses which are compulsory courses:

**Level 1 Business Core Courses**
ZBUS1101 Organisational Behaviour  
ZBUS1102 Business Economics  
ZBUS1103 Intro to Accounting  
ZBUS1104 Foundations of Management

The second and third year of the Bachelor of Business (CDF) comprises core Business courses and Business-related electives, one compulsory course and free elective course, and General Education courses.

**Compulsory Prescribed Elective Course:**  
ZINT2100 Intro to Cyber-Security

**General Education Courses:**
Plus x 2 General Education Courses
Students must select one General Education course from each of the following groups:

- **Group 1:** ZGEN2222 Introduction to Strategic Studies, OR ZGEN2801 Strategy, Management and Leadership;  
- **Group 2:** ZGEN2240 Introduction to Military Ethics, OR ZGEN2215 Law, Force and Legitimacy

**Upper-Level Business Core Courses:**
ZBUS2101 Business Law  
ZBUS2302 Leadership  
ZBUS2820 International Business  
ZBUS2901 Business Research  
ZBUS2902 Research Project in Business 1  
ZBUS3102 Project Management  
ZBUS3104 Business Capstone  
ZBUS3901 Research Project in Business 2  
ZBUS3902 Research Project in Business 3  
ZPEM2312 Fundamentals of Data Analysis

**Upper-Level Business Electives - students must complete 2 courses from the following:**
ZBUS2200 Markets and Competition  
ZBUS2202 Australia & the World Economy  
ZBUS2207 Managing the Public Sector  
ZBUS2304 Management Accounting  
ZBUS2401 Finance  
ZBUS3103 Human Resource Management  
ZBUS3203 The Making of Economic Policy  
ZBUS3206 Managing Across Cultures  
ZBUS3303 Logistics Management  
ZEIT2001 Managing Info Systems  
ZEIT2307 Capability Option Analysis  
ZEIT3104 Electronic Business  
ZHSS2601 Introductory Business Ethics

*Note: ZBUS2202 and ZBUS3203 have a pre-requisite of ZBUS1102 Business Economics*

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**4463 Science (CDF)**

**Typical Duration:** 3 years  
**Minimum UOC for Award:** 144 units of credit  
**Typical UOC per Semester:** 24 units of credit  
**Related Program:**  
4410 Science,  
4513 Science (Honours)

**Academic Rules**

**Faculty Regulations for Undergraduate Students**

A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Science (Chief of Defence Force) program take precedence over the Faculty Regulations for Undergraduate Students.

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

1. **Degree Requirements**

1.1 To qualify for the degree of Bachelor of Science (CDF), a candidate shall normally be enrolled for a minimum of six semesters and gain a minimum of 144 UOC, normally 24 units in each full-time semester.

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

1.2 A candidate completing the program shall complete courses, in the years prescribed as set out in the relevant schedule.

1.3 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.
1.4 A candidate for the BSc (CDF) shall complete courses as set out in the Program Structure below.

2 Program Rules Dictionary

2.1 The BSc program must include courses totalling no less than 144 UOC.

2.2 Students must select two Science discipline areas in which they will major. Each major consists of courses totalling 48 UOC with at least 36 UOC from Level 2 and 3 courses, and with at least 18 UOC at Level 3.

2.3 Students must complete four designated CDF courses as identified in the Program Structure below.

2.4 Students must complete at least one of the prescribed elective courses ZPEM2312 Fundamentals of Data Analysis or ZINT2100 Introduction to Cyber-Security: Policy and Operations. These two courses do not count towards the students’ 96 UOC for their Science discipline area.

Exclusion: Students who complete ZPEM1301 Mathematics 1A or ZPEM1303 Engineering Mathematics 1A will be exempt from ZPEM2312, and must complete ZINT2100 in semester 1 of their second year of study.

2.5 Students are able to include a course from Business, Engineering or Arts in the program, subject to timetabling constraints in Semester 1 of their first year of study.

2.6 Students are required to include 12 UOC of General Education courses, taken in the second year of study.

2.7 No more than 48 UOC may be gained for Level I courses.

2.8 At least 96 UOC must be taken from Upper Level courses.

Program Structure

The following disciplines are available in the BSc (CDF):

- Aviation
- Chemistry
- Computer Science
- Geography
- Information Systems
- Mathematics
- Oceanography
- Operations Research
- Physics

Sample Program

A student must obtain, normally over three years of study, a minimum of 144 units of credit, which must include one of the following two options:

<table>
<thead>
<tr>
<th>Yr 1 S1</th>
<th>Science Major 1</th>
<th>Science Major 2</th>
<th>CDF Courses</th>
<th>Science Courses</th>
<th>Electives/Prescribed Electives</th>
<th>General Education</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 UOC</td>
<td>6 UOC</td>
<td></td>
<td>6 UOC</td>
<td></td>
<td>6 UOC</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Yr 1 S2</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>ZPEM1901 or ZEIT1901</td>
<td>6 UOC</td>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Yr 2 S1</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td></td>
<td></td>
<td>ZPEM2312 or ZINT2100 (prescribed elective)</td>
<td>6 UOC</td>
<td>24</td>
</tr>
<tr>
<td>Yr 2 S2</td>
<td>6 UOC</td>
<td>6 UOC</td>
<td>ZPEM2901 or ZEIT2901</td>
<td></td>
<td>6 UOC</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Yr 3 S1</td>
<td>6 UOC</td>
<td>12 UOC</td>
<td>ZPEM3901* or ZEIT3901</td>
<td></td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yr 3 S2</td>
<td>12 UOC</td>
<td>6 UOC</td>
<td>ZPEM3902+ or ZEIT3902+</td>
<td></td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>42 *</td>
<td>42 *</td>
<td>24</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

* This course will be counted towards Major 1.

+ This course will be counted towards Major 2.
4468 Technology (Aero Engineering) (CDF)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4430 Technology (Aeronautical Eng)

Program Description

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW Canberra 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 Program is in the process of being accredited by Engineers Australia.

Program Objectives and Graduate Attitudes

The BTech (Aero) (CDF) program is very similar to the first three years of the BE(Aero) (CDF) program. The BTech (Aero) (CDF) 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.

Academic Rules

1. UNSW Canberra 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.

   Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. Program Rules Dictionary

   2.1 To qualify for the degree of Bachelor of Technology (CDF), a student shall normally be enrolled for a minimum of eight sessions and gain a minimum of 144 UOC (normally 24 UOC in each full time semester).

   2.2 A student 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 student 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 student’s enrolment will be accepted for any course, the student 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 student for enrolment for the degree of Bachelor of Technology (CDF) shall hold an Australian Tertiary Admission Rank (ATAR) or equivalent, of no less than 98.

2.6 To qualify for the degree of Bachelor of Technology (CDF), a student shall normally achieve a sessional Weighted Average Mean (WAM) of 85.

2.7 Normally, a student who does not comply with the requirements of Rule 2.7 (above) shall be transferred to student for the degree of Bachelor of Technology. Such review will occur at the end of each semester.

2.8 A student 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 UOC with a WAM of 80 or greater in semester 1 or 2 of the Year One program.

2.9 Rule 2.8 above shall not normally be invoked for students with Potential Graduand status.

3. Practical Experience Requirements

3.1 Before graduation a student shall complete 40 days of approved practical engineering experience which must be done in blocks of at least 20 working days each where practicable and where each block must be in the service of a single provider. 20 days of appropriate service training may be counted towards this total.

Program Structure

The Bachelor of Technology (AeroEng) (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 Canberra. The specialisation in Aeronautical Engineering increases as the degree program progresses. A research component is taken each semester in years 1-3.

First Year program

ZEIT1500 Statics
ZEIT1502 Dynamics
ZEIT1901 Engineering Research 1A
ZEIT1902 Engineering Research 1B
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM 1501 Physics 1A
ZPEM 1502 Physics 1B

Second Year program

ZEIT2500 Thermofluids
ZEIT2501 Mechanical and Electronic Design
ZEIT2502 Fundamentals of Flight
ZEIT2503 Fluid Mechanics
ZEIT2504 Mechanics of Solids
ZEIT2901 Engineering Research 2A
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B

Third Year program

ZEIT3500 Engineering Structures
ZEIT3501 Engineering Materials
ZEIT3503 Aerodynamics
ZEIT3901 Engineering Research 3A
ZEIT3902 Engineering Research 3B
ZINT2100 Introduction to Cyber-Security
Plus 2 x General Education Courses
4469 Information Technology (CDF)

Typical Duration: 3 years
Minimum UOC for Award: 144 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4426 Information Technology

Program Description
The Chief of Defence Force Students (CDFS) Programs offer the opportunity for students entering UNSW Canberra 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 Bachelor Degree programs.

The range of CDFS Programs is characterised by the inclusion of specialist courses in critical analysis and/or research methods appropriate to the area of study. All programs also include discipline-specific research projects. The research projects will be supervised by academic staff from the relevant discipline. With the approval of the relevant Heads of Schools, multi- or cross-disciplinary projects may be undertaken. 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 will be based on a written paper or report, or a unique IT artefact, and oral presentations.

Throughout the program, and in addition to completing the courses given in the following schedules, 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.

Program Objectives and Graduate Attributes
The CDFS Program has objectives and learning outcomes in common with the standard Bachelor degree in Information Technology, but extends the educational principles embodied in the standard degree to a higher level. In the program, students will be exposed to courses in critical analysis and/or research methods in the IT discipline, which will offer significant extensions to the ideas and analysis normally available in the standard degree program.

This will allow all CDFS to successfully undertake research-oriented courses at the appropriate level through their program, thereby integrating research into their studies in a way that is not available in the standard degree. The individual projects undertaken in close association with academic staff on research topics of mutual interest underpin the CDFS Programs and give students the ability to develop their full potential.

Academic Rules
1 UNSW Canberra Regulations for Undergraduate Students
A student must comply with the Faculty Regulations for Undergraduate Students. In the event of a conflict, the rules for the Bachelor of Information Technology (CDFSP) take precedence over the Faculty Regulations for Undergraduate Students.

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2 Program Rules Dictionary
“Level I” means courses at an introductory level, normally taken at Stage I.

“Level II” means courses at an upper level, normally taken at Stage II.

“Level III” means courses at an upper level, normally taken at Stage III.

“Upper-Level” means courses normally taken at Stage II and Stage III.
3 Program Rules

To qualify for the degree of Bachelor of Information Technology, a student shall usually be enrolled for a minimum of six semesters and gain a minimum of 144 Units of Credit (UOC) including:

(a) A minimum of 48 UOC of Level 1 courses, with 24 UOC comprised of Information Technology Core courses;

(b) A minimum of 72 UOC of upper-level Information Technology Core courses;

(c) 12 UOC of prescribed courses - approved Level I Maths and ZINT2100;

(d) A minimum of 12 UOC of General Education courses;

(e) One 6 UOC upper-level free elective course;

(f) No more than 48 UOC may be gained for Level I courses; and

(g) At least 96 UOC must be taken from Upper-Level courses.

Program Structure

A typical program in the Bachelor of IT (CDF) is presented below. Students may vary the program in Years 2 and 3 by swapping the timing of GE courses with IT or other electives, subject to timetabling.

<table>
<thead>
<tr>
<th>Stage</th>
<th>IT core</th>
<th>Prescribed Electives</th>
<th>Free Electives</th>
<th>Gen. Ed.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>24</td>
<td>6</td>
<td>18</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Stage 2</td>
<td>36</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Stage 3</td>
<td>36</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>12</td>
<td>24</td>
<td>12</td>
<td>144</td>
</tr>
</tbody>
</table>

First Year Program
ZEIT1101  Computational Problem Solving
ZEIT1102  Introduction to Programming
ZEIT1301  Introduction to the IT Profession
ZEIT1302  Introduction to Systems Thinking
ZEIT1901  Engineering Research 1A
ZEIT1903  Introduction to Research in Information Technology

Plus 6 UOC in an approved Maths Course and 6 UOC ‘other’ Level I courses

Approved Maths courses - select one course from this list:
ZPEM1301  Mathematics 1A
ZPEM1302  Mathematics 1B
ZPEM1303  Engineering Mathematics 1A
ZPEM1304  Engineering Mathematics 1B

Second Year Program
ZEIT2102  Computer Technology
ZEIT2103  Data Structures and Representation
ZEIT2306  Service Design
ZEIT2403  Introduction to Operations Research
ZEIT2903  Information Technology Research Project 1
ZEIT2904  Information Technology Research Project 2
ZINT2100  Introduction to Cyber-Security

Third Year Program
ZEIT3101  IT Project 2
ZEIT3118  IT Project 1
ZEIT3903  IT Research Project 3
ZEIT3904  IT Research Project 4

Plus 1 x General Education Course
Plus 3 x Elective Courses

Select three courses from the following list or any other course as approved by the SEIT UG Coordinator:
ZEIT3113  Computer Languages & Algorithm
ZEIT3114  Internetworking
ZEIT3302  Software Project Management
ZEIT3405  Problem Structuring Techniques
ZEIT3406  Quantitative Operations Research
Engineering (CDF) Degrees

The aim of offering engineering degrees within UNSW Canberra 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 accredited 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 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.

The Chief of Defence Force Students Program in Engineering offers the opportunity for students entering UNSW Canberra 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 instead of one of the courses in the main degree stream, will be supervised by academic staff from the same or a closely related discipline as in the replaced course. 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 semester, will be based on a written paper and an oral presentation.

4475 Electrical Engineering (Honours) (CDF)

Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4471 Electrical Engineering (Hons)

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students

These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.
2. Degree Requirements

2.1 The degree of Bachelor of Engineering (Honours) in Electrical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

2.1.1 The Class of Honours is calculated as follows:

- Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
- Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
- Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Courses will be weighted according to the following:

<table>
<thead>
<tr>
<th></th>
<th>Level 2 and 3 courses</th>
<th>Level 4 courses (not including final year projects)</th>
<th>Thesis Final year projects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Electrical Engineering, a student 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 semester).

2.3 A student 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 student 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 student’s enrolment will be accepted for any course, the student 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 student for enrolment for the degree of Bachelor of Engineering (Honours) (CDF) in Electrical Engineering shall hold a Australian Tertiary Admission Rank (ATAR) or equivalent, of no less than 98.

2.7 A student for the degree of Bachelor of Engineering (Honours) in Electrical Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (Honours) (CDF) in Electrical Engineering upon completion of 24 units of credit with a WAM of 85 or greater in semesters 1 or 2 of the Year 1 program.

2.8 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Electrical Engineering, a student shall usually maintain a sessional Weighted Average Mean (WAM) of 80.

2.9 Usually, a student who does not comply with the requirements of Rule 2.8 (above) shall be transferred to candidature for the degree of Bachelor of Engineering (Honours) in Electrical Engineering, although exceptions maybe made at the discretion of the Head of School. Such review will occur at the end of each semester.

2.10 Rule 2.9 above shall not usually be invoked for students with Potential Graduand status.

3. Practical Experience Requirements

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.

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:

- Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW Canberra at ADFA is not eligible for consideration.)
- Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.
- Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
Program Structure

The Bachelor of Engineering (CDF) degree requires a prescribed program structure. 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 semester in years 1-3. The full year thesis is worth twice the normal credit allocation in the final year. At the discretion of the Head of School, students may be allowed to enrol concurrently in courses from more than one year of the program.

First Year Program
ZEIT1101 Computational Problem Solving
ZEIT1102 Introduction to Programming
ZEIT1290 Electrical Engineering Research 1A
ZEIT1291 Electrical Engineering Research 1B
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2103 Data Structures
ZEIT2207 Design of Electronic Circuits 2
ZEIT2901 Engineering Research 2A
ZEIT2902 Engineering Research 2B
ZINT2100 Intro to Cyber Security
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B
ZPEM2502 Physics 2B

Third Year Program
ZEIT3215 Signals and Systems
ZEIT3216 Design of Electronic Circuits 3
ZEIT3218 Communications Techniques
ZEIT3220 Engineering Electromagnetics
ZEIT3502 Vibration and Control Engineering
ZEIT3901 Engineering Research 3A
ZEIT3902 Engineering Research 3B
ZEIT6521 Digital Signal Processing

Fourth Year Program
ZEIT4222 Systems Engineering
ZEIT4224 Power and Machines
ZEIT4901 Engineering Research 4A (12 UOC)
ZEIT4902 Engineering Research 4B (12 UOC)
Plus 2 x General Education Courses

4476 Aeronautical Engineering (Honours) (CDF)

Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4475 Aeronautical Engineering

Academic Rules

1. UNSW Canberra Regulations for Undergraduate Students
These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. Program Rules Dictionary
2.1 The degree of Bachelor of Engineering (Honours) in Aeronautical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:
Honours Class I
Honours Class II, Division I
Honours Class II, Division II

Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.
2.1.1 The Class of Honours is calculated as follows:

Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65

Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65

Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65

Courses will be weighted according to the following:

<table>
<thead>
<tr>
<th>Foundation (Level 2 and 3 courses)</th>
<th>Disciplinary (Level 4 courses, not including final year projects)</th>
<th>Thesis (Final year projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Aeronautical 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

2.6 A student for enrolment for the degree of Bachelor of Engineering (Honours) (CDF) in Aeronautical Engineering shall hold a Australian Tertiary Admission Rank (ATAR) or equivalent, of no less than 98.

2.7 A student for the degree of Bachelor of Engineering (Honours) in Aeronautical Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (Honours) (CDF) in Aeronautical Engineering upon completion of 24 units of credit with a WAM of 85 or greater in semesters 1 or 2 of the Year 1 program.

2.8 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Aeronautical Engineering, a student shall usually maintain a sessional Weighted Average Mean (WAM) of 80.

2.9 Usually, a student who does not comply with the requirements of Rule 2.8 (above) shall be transferred to candidature for the degree of Bachelor of Engineering (Honours) in Aeronautical Engineering, although exceptions maybe made at the discretion of the Head of School. Such review will occur at the end of each semester.

2.10 Rule 2.9 above shall not usually be invoked for students with Potential Graduand status.

3. Practical Experience Requirements

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.

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:

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

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

Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
Program Structure
The Bachelor of Engineering (Honours) (CDF) in Aeronautical Engineering requires 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 Canberra. Specialisation in Aeronautical Engineering increases as the degree program progresses. A research component is taken each semester in years 1-3. The full year thesis is worth twice the normal credit allocation in the final year.

First Year Program
ZEIT1500 Statics
ZEIT1502 Dynamics
ZEIT1901 Engineering Research 1A
ZEIT1902 Engineering Research 1B
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2500 Thermofluids
ZEIT2501 Mechanical and Electronic Design
ZEIT2502 Fundamentals of Flight
ZEIT2503 Fluid Mechanics
ZEIT2504 Mechanics of Solids
ZEIT2901 Engineering Research 2A
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B

Third Year Program
ZEIT3500 Engineering Structures
ZEIT3501 Engineering Materials
ZEIT3503 Aerodynamics
ZEIT3504 Aircraft and Systems Design 1
ZEIT3505 Flight Dynamics and Aircraft Control
ZEIT3901 Engineering Research 3A
ZEIT3902 Engineering Research 3B
ZINT2100 Introduction to Cyber-Security

Fourth Year Program
ZEIT4502 Aircraft Design 2
ZEIT4503 Applied Thermodynamics and Propulsion
ZEIT4901 Engineering Research 4A (12UOC)
ZEIT4902 Engineering Research 4B (12UOC)
Plus 2 x General Education courses.

4477 Civil Engineering (Honours) (CDF)
Typical Duration: 4 years
Minimum UOC for Award: 192 units of credit
Typical UOC per Semester: 24 units of credit
Related Program: 4473 Civil Engineering

Academic Rules
1. 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. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.
   Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. Degree Requirements
   2.1 The degree of Bachelor of Engineering (Honours) in Civil Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

2.1.1 The Class of Honours is calculated as follows:

Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65
Courses will be weighted according to the following:

<table>
<thead>
<tr>
<th>Foundation (ie Level 2 and 3 courses)</th>
<th>Disciplinary (ie Level 4 courses (not including final year projects))</th>
<th>Thesis (ie Final year projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) in Civil 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

2.6 A student for enrolment for the degree of Bachelor of Engineering (Honours) (CDF) in Civil Engineering shall hold a Australian Tertiary Admission Rank (ATAR) or equivalent, of no less than 98.

2.7 A student for the degree of Bachelor of Engineering (Honours) in Civil Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (Honours) (CDF) in Civil Engineering upon completion of 24 units of credit with a WAM of 85 or greater in semesters 1 or 2 of the Year 1 program.

2.8 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Civil Engineering, a student shall usually maintain a sessional Weighted Average Mean (WAM) of 80.

2.9 Usually, a student who does not comply with the requirements of Rule 2.8 (above) shall be transferred to candidature for the degree of Bachelor of Engineering (Honours) in Civil Engineering, although exceptions may be made at the discretion of the Head of School. Such review will occur at the end of each semester.

2.10 Rule 2.9 above shall not usually be invoked for students with Potential Graduand status.

3. Practical Experience Requirements

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.

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:

- Naval Midshipmen, 30 days for experience gained at a defence establishment between second and third years. (Time at sea prior to arrival at UNSW Canberra at ADFA is not eligible for consideration.)
- Army Cadets, 30 days for the year spent at Royal Military College between third and fourth years.
- Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.

Program Structure

The Bachelor of Engineering (Honours) (CDF) in Civil Engineering requires 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 Canberra. Specialisation in Civil Engineering increases as the degree program progresses. A research component is taken each semester in years 1-3. The full year thesis is worth twice the normal credit allocation in the final year.

First Year Program

- ZEIT1500 Statics
- ZEIT1502 Dynamics
- ZEIT1901 Engineering Research 1A
- ZEIT1902 Engineering Research 1B
- ZPEM1303 Engineering Mathematics 1A
- ZPEM1304 Engineering Mathematics 1B
- ZPEM1501 Physics 1A
- ZPEM1502 Physics 1B
Second Year Program
ZEIT2500 Thermofluids
ZEIT2504 Mechanics of Solids
ZEIT2601 Soil Mechanics and Engineering Geology
ZEIT2602 Hydraulic Engineering
ZEIT2901 Engineering Research 2A
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B
ZINT2100 Introduction to Cyber-Security

Third Year Program
ZEIT3501 Engineering Materials
ZEIT3600 Structural Analysis 1
ZEIT3601 Environmental Engineering
ZEIT3602 Geotechnical Design
ZEIT3603 Design Steel and Timber Structures
ZEIT3604 Project Management Civil Engineering
ZEIT3901 Engineering Research 3A
ZEIT3902 Engineering Research 3B

Fourth Year Program
ZEIT4901 Engineering Research 4A (12 UOC)
ZEIT4902 Engineering Research 4B (12 UOC)
2 x General Education Courses
2 x Technical Elective courses from the list below

Technical Elective Courses
ZEIT4602 Design of Concrete Structures
ZEIT4603 Finite Element Methods
ZEIT4604 Hydrology and Environmental Engineering Practice
ZEIT4605 Foundation and Pavement Engineering

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**4478 Mechanical Engineering (Hons) (CDF)**

<table>
<thead>
<tr>
<th>Typical Duration:</th>
<th>4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum UOC for Award:</td>
<td>192 units of credit</td>
</tr>
<tr>
<td>Typical UOC per Semester:</td>
<td>24 units of credit</td>
</tr>
<tr>
<td>Related Program:</td>
<td>4474 Mechanical Engineering (Honours)</td>
</tr>
</tbody>
</table>

**Academic Rules**

1. **UNSW Canberra Regulations for Undergraduate Students**
   
   These regulations apply to all undergraduate degrees and are to be used in conjunction with Academic Rules and Program Information. All rules in this Handbook apply to each student who enters an undergraduate program in 2015. 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.

   Students should read the CDFSP Introductory pages for information related to the transfer in and out of the credit arrangements. See pages 40 and 41.

2. **Program Rules Dictionary**

2.1 The degree of Bachelor of Engineering (Honours) in Mechanical Engineering shall be conferred as a Bachelor Honours degree at Level 8 in the AQF. Honours in recognition of meritorious performance may be awarded in the following categories:

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

   Where candidates do not achieve Honours Class 1 or 2, the Class of Honours is not displayed.

   2.1.1 The Class of Honours is calculated as follows:

   - Honours Class 1: Honours WAM of at least 80.0 and Thesis Mark of at least 65
   - Honours Class 2 Division 1: Honours WAM of at least 75.0 and Thesis Mark of at least 65
   - Honours Class 2 Division 2: Honours WAM of at least 65.0 and Thesis Mark of at least 65
Courses will be weighted according to the following:

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<th>Foundation courses (Level 2 and 3)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2.2 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Mechanical 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 prerequisite courses shown in the Course Catalogue, except where the Course Authority for the appropriate course approves otherwise.

2.6 A student for enrolment for the degree of Bachelor of Engineering (Honours) (CDF) in Mechanical Engineering shall hold an Australian Tertiary Admission Rank (ATAR) or equivalent, of no less than 98.

2.7 A student for the degree of Bachelor of Engineering (Honours) in Mechanical Engineering may, at the discretion of the Head of School, transfer to the degree of Bachelor of Engineering (Honours) (CDF) in Mechanical Engineering upon completion of 24 units of credit with a WAM of 85 or greater in semesters 1 or 2 of the Year 1 program.

2.8 To qualify for the degree of Bachelor of Engineering (Honours) (CDF) in Mechanical Engineering, a student shall usually maintain a sessional Weighted Average Mean (WAM) of 80.

2.9 Usually, a student who does not comply with the requirements of Rule 2.8 (above) shall be transferred to candidature for the degree of Bachelor of Engineering (Honours) in Mechanical Engineering, although exceptions may be made at the discretion of the Head of School. Such review will occur at the end of each semester.

2.10 Rule 2.9 above shall not usually be invoked for students with Potential Graduand status.

3. Practical Experience Requirements

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.

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:

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

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

Air Force Cadets, 30 days for experience gained at a defence establishment between second and third years.
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 Canberra. The specialisation in Mechanical Engineering increases as the degree program progresses. A research component is taken each semester in years 1-3. The full year thesis is worth twice the normal credit allocation in the final year.

First Year Program
ZEIT1500 Statics
ZEIT1502 Dynamics
ZEIT1901 Engineering Research 1A
ZEIT1902 Engineering Research 1B
ZPEM1303 Engineering Mathematics 1A
ZPEM1304 Engineering Mathematics 1B
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Second Year Program
ZEIT2500 Thermofluids
ZEIT2501 Mechanical and Electronic Design
ZEIT2503 Fluid Mechanics
ZEIT2504 Mechanics of Solids
ZEIT2700 Mechanics of Machines
ZEIT2901 Engineering Research 2A
ZPEM2309 Engineering Mathematics 2A
ZPEM2310 Engineering Mathematics 2B

Third Year Program
ZEIT3500 Engineering Structures
ZEIT3501 Engineering Materials
ZEIT3502 Vibration and Control Engineering
ZEIT3700 Mechanical Design 1
ZEIT3701 Heat Transfer and Refrigeration
ZEIT3901 Engineering Research 3A
ZEIT3902 Engineering Research 3B
And 1 x General Education Course

Fourth Year Program
ZEIT4505 Mechanical and Aeronautical Engineering Management
ZEIT4700 Mechanical Design 2
ZEIT4901 Engineering Research 4A (12 UOC)
ZEIT4902 Engineering Research 4B (12 UOC)
ZINT2100 Introduction to Cyber-Security
And 1 x General Education Course
Honours Programs

4511 Arts (Honours)

Typical Duration: 1 year
Minimum UOC for Award: 48 units of credit
Typical UOC per Semester: 24 units of credit
Related Programs:
4400 Arts, 4512 Business (Honours), 4513 Science (Honours)

Program Description
The Bachelor of Arts (Honours) is a one-year program following on from a three year full-time equivalent pass degree.

The purpose of BA Honours degree is to enable students who have performed well at undergraduate level to deepen their knowledge of approaches, perspectives and traditions in their chosen scientific discipline and undertake a significant research project. Honours is a means for connecting undergraduate study with supervised independent research by consolidating and extending work completed in the undergraduate program and providing an academic foundation for students continuing on to a Masters by research or a PhD.

Program Objectives and Graduate Attributes
At the end of the program, students should have acquired all of the following learning outcomes:

1. An advanced understanding of one or more of the theoretical underpinnings of the particular honours discipline;
2. The understanding and application of research methodologies appropriate to the particular discipline; and
3. The capacity to undertake independent research.

Program Structure
A student must obtain, usually over one year of study, a minimum of 48 units of credit in an area of study approved by the Head of School.

The coursework component will normally consist of 18 UOC of semester-based courses. The research thesis component will normally consist of 30 UOC.

Honours will be offered in the following disciplines:
- English
- Human Geography
- History
- International and Political Studies

Students wishing to undertake Honours in Business should apply for admission to the Bachelor of Business (Hons) (Program Code 4512).

Students wishing to undertake Honours in Geography should apply for admission to the Bachelor of Science (Hons) (Program Code 4513).

Honours Courses
ZHSS4001 Arts Honours Research 1
ZHSS4002 Arts Honours Research 2
ZHSS4003 Arts Honours Special Topic 1
ZHSS4004 Arts Honours Special Topic 2

Academic Rules
Rules governing the award of the degree of Bachelor of Arts with Honours.

1. Admission Requirements
To apply for admission to the award of the degree at Honours level, an applicant must have:

   a) successfully completed a three year BA with a major in the relevant honours discipline at UNSW Canberra at ADFA; or

   b) gained a BA degree from another approved institution; and

   c) achieved at least a credit average (65%) across the entire undergraduate program including a credit average over the Level III courses in the discipline in which honours is proposed.
2. Calculation of Honours

The final grade will be determined by the addition of the marks for the coursework component to the mark awarded for the thesis component.

The weighting for the class of Honours is WAM-based.

The thesis component will be examined by two examiners, neither of whom will be the thesis supervisor.

3. Class of Honours

The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3) as follows:

- Honours Class 1: 85 or greater;
- Honours Class 2 Division 1: 75 to 84;
- Honours Class 2 Division 2: 65 to 74;
- Honours Class 3 or Pass: 50 to 64

Pathways

Students who complete an Honours program and achieve an Honours Class 1 are well placed to apply for higher degree research (a Doctor of Philosophy (PhD) or Masters by Research (MA)) and scholarships such as the Australian Postgraduate Award (APA). Further details on career opportunities for students who complete an Honours degree can be obtained from the School.

4512 Business (Honours)

<table>
<thead>
<tr>
<th>Typical Duration:</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum UOC for Award:</td>
<td>48 units of credit</td>
</tr>
<tr>
<td>Typical UOC per Semester:</td>
<td>24 units of credit</td>
</tr>
<tr>
<td>Related Programs:</td>
<td>4511 Arts (Honours), 4513 Science (Honours), 4514 Information Technology (Honours), 4405 Business</td>
</tr>
</tbody>
</table>

Program Description

The Bachelor of Business (Honours) is a one-year program following on from a three year full-time equivalent pass degree.

The purpose of Business (Honours) degree is to enable students who have performed well at undergraduate level to deepen their knowledge of approaches, perspectives and traditions in their chosen scientific discipline and undertake a significant research project.

Honours is a means for connecting undergraduate study with supervised independent research by consolidating and extending work completed in the undergraduate program and providing an academic foundation for students continuing on to a Masters by research or a PhD.

Program Objectives and Graduate Attributes

At the end of the program, students should have acquired all of the following learning outcomes:

- apply advanced knowledge of the principles and concepts in one or more disciplines in business and knowledge of research principles and methods appropriate to the area of business and related disciplines.;
- apply cognitive skills to review, analyse, communicate and synthesise business knowledge to identify and provide solutions to complex problems with intellectual independence; and
- demonstrate the application of business knowledge and skills to plan and execute project work and/or a piece of research and scholarship in a business area with some independence.
Program Structure

A student must obtain, usually over one year of study, a minimum of 48 units of credit in an area of study approved by the Head of School. The coursework component will consist of two (12 UOC) semester-based courses. The research component will consist of 36 UOC thesis.

The coursework component of this program will consist of the following 6 UOC courses:

- ZBUS4001 Literature Review (6 UOC)
- ZBUS4002 Research Methods (Honours) (6 UOC)

Students must successfully complete both courses to be eligible to graduate from this program.

Thesis Courses

- ZBUS4101 Business Research 1 (Honours)
- ZBUS4102 Business Research 2 (Honours)

Academic Rules

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

1. Admission Requirements

To enrol for the award of the degree at Honours level, a student must have:

a) completed a relevant pass-degree program, such as a Business or Arts degree; or -

b) completed an equivalent degree from an approved institution; and -

c) 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.

2. Calculation of Honours

The final grade will be determined by the addition of the marks for the coursework component to the mark awarded for the thesis component.

The weighting for the class of Honours is WAM-based.

The thesis component will be examined by two examiners, neither of whom will be the thesis supervisor.

3. Class of Honours

The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3) as follows:

- Honours Class 1: 85 or greater;
- Honours Class 2 Division 1: 75 to 84;
- Honours Class 2 Division 2: 65 to 74;
- Honours Class 3 or Pass: 50 to 64

Pathways

Students who complete an Honours program and achieve an Honours Class 1 are well placed to apply for higher degree research (a Doctor of Philosophy (PhD) or Masters by Research (MSc)) and scholarships such as the Australian Postgraduate Award (APA). Further details on career opportunities for students who complete an Honours degree can be obtained from the School.
Safety (OH&S) training, attend and present seminars, write a literature review, and write a thesis.

Honours students who are RAN midshipmen or RAAF officer cadets continue with this program at UNSW Canberra at ADFA after completion of their three year BSc program and then complete their Honours program at the end of the fourth year. Army officer cadets, however, at the end of the third year BSc program transfer to the Royal Military College, Duntroon for a year of military training to be commissioned as lieutenants. Those who qualify to undertake their Honours program return to the Academy to complete their program for a year.

Program Objectives and Graduate Attributes

A Bachelor of Science (Honours) program will develop students’ lifetime skills including creativity, problem-solving ability, critical thinking and communication skills that will be useful not only in a scientific environment but in all professions. It will prepare students to deal with technical and management issues that will often require scientific knowledge and the intellectual and practical problem-solving skills developed through studies in physical, environmental and mathematical sciences, and information technology. The key focus of the Honours year is to equip students with research and problem solving skills relevant to their discipline.

At the end of the program, students should have acquired all of the following learning outcomes:

- Construct a research project that demonstrates critical thinking and judgment in developing new understanding;
- Demonstrate cognitive skills that review, analyse, consolidate and synthesize knowledge;
- Identify and formulate solutions to complex problems with intellectual independence;
- Demonstrate a broad understanding of a body of knowledge and theoretical concepts with advanced understanding in some areas;
- Demonstrate initiative and judgment in scholarship;
- Demonstrate an ability to adapt knowledge and skills in diverse contexts;
- Demonstrate responsibility and accountability for own learning and practice and in collaboration with others within broad parameters;
- Demonstrate communication skills to present a clear and coherent exposition of knowledge and ideas to a variety of audiences;
- Construct a research project that demonstrates technical skills in research and design; and
- Demonstrate coherent and advanced knowledge of the underlying principles and concepts in one or more disciplines, and knowledge of research principles and methods.

Program Structure

A student must obtain, usually 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.

The breakdown between research and coursework components is:-

i) 25% coursework. This consists of two x 6 UOC courses, worth 12.5% each (total 25%). They could be undertaken by one course in each semester, or both could be undertaken in Semester 1;

and

ii) 75% Research Project, including a thesis. The written component of the thesis should not exceed 25,000 words.

The following Science discipline areas are available in the Bachelor of Science (Honours):

- Aviation
- Chemistry
- Geography
- Mathematics and Statistics
- Oceanography
- Physics

Students wishing to undertake Honours in Human Geography should apply for admission to the Bachelor of Arts (Hons) (Program Code 4511).

Students wishing to undertake Honours in Computer Science, Information Systems or Operations Research should apply for admission to the Bachelor of Information Technology (Hons) (Program Code 4514).
Academic Rules

1. Admission Requirements

To enrol for the award of the degree at Honours level, a student must have:

a) completed a relevant pass-degree program; or
b) completed an equivalent degree from an approved institution; and

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.

2. Honours Grading

At the completion of their Honours program students will be awarded an honours grading as follows:

- Honours Class 1: WAM 85 or greater;
- Honours Class 2 Division 1: WAM 75 to 84;
- Honours Class 2 Division 2: WAM 65 to 74;
- Honours Class 3 or Pass: WAM 50 to 64.

The weighting for the class of Honours is WAM-based.

Please note that only courses completed as part of the Honours program will be included within an honours calculation. Honours marks and gradings will be scrutinized at a School level as either part of an Honours Committee or School Assessment Committee to ensure consistency across sub-disciplines and cohorts. The College will also review these marks and grades prior to the release of results at the Assessment Review Group meeting.

Pathways

Students who complete an Honours program and achieve an Honours Class 1 are well placed to apply for higher degree research (a Doctor of Philosophy (PhD) or Masters by Research (MSc)) and scholarships such as the Australian Postgraduate Award (APA). Further details on career opportunities for students who complete an Honours degree can be obtained from the School Information Technology (Honours)

Typical Duration: 1 year
Minimum UOC for Award: 48 units of credit
Typical UOC per Semester: 24 units of credit
Related Programs: 2925 Computer Science, 1885 Computer Science, 1743 Information Technology, 9380 Information Technology.

Program Description

The Bachelor of Information Technology (Honours) is a one-year program following on from a three year full-time equivalent pass degree.

The Bachelor of Information Technology (Honours) degree is intended for students wishing to deepen their knowledge and develop more advanced, independent research skills. The student will undertake courses that will extend their knowledge in their chosen topic area as well as enhancing their research skills. A major project will be undertaken that will result in a thesis dissertation of between 20,000 and 35,000 words. The dissertation may be larger or smaller depending on the project, the production of a specific information technology artefact and discussion with the Honours supervisor.

Program Objectives and Graduate Attributes

At the end of the program, students should have acquired all of the following learning outcomes:

i) Demonstrate coherent and advanced knowledge of the underlying principles and concepts in one or more disciplines, and knowledge of research principles and methods;

ii) Construct a research project that demonstrates technical skills in research and design;

iii) Construct a research project that demonstrates critical thinking and judgment in developing new understanding;

iv) Identify and formulate solutions to complex problems with intellectual independence;

v) Demonstrate cognitive skills that review, analyse, consolidate, synthesize and adapt knowledge in diverse contexts;
vi Identify and formulate solutions to complex problems with intellectual independence demonstrating judgment in scholarship;

vii) Demonstrate responsibility and accountability for own learning and practice and in collaboration with others within broad parameters; and

viii) Demonstrate communication skills to present a clear and coherent exposition of knowledge and ideas to a variety of audiences.

Program Structure
A student must obtain, usually over one year of study, a minimum of 48 units of credit approved by the Head of School. The course work component will normally consist of four semester-based courses. The thesis component will be examined by two examiners, neither of whom will be the thesis supervisor.

Honours will be offered in the following disciplines:
- Computer Science
- Information Systems
- Operations Research

Academic Rules
Rules governing the award of the degree of Bachelor of Information Technology with Honours.

1. Admission Requirements
To enrol for the award of the degree at Honours level, a student must:
   i) complete a relevant information technology pass-degree program requirements; or
   ii) gain an equivalent approved award from elsewhere; and
   iii) have achieved at least a credit average (65) across the entire undergraduate program including a credit average over the Level III core IT courses or equivalent courses.

2. Calculation of Honours
   i) The Honours year will consist of a combination of course work contributing 50% to the total final mark and supervised academic research exercise / thesis contributing the remaining 50%.

   ii) The final grade will be determined by the addition of the marks for the coursework component to the mark awarded for the thesis component.

3. Class of Honours
   The Honours degree is awarded in three classes (Class 1, Class 2 in two Divisions, and Class 3) as follows:
   - Honours Class 1: mark of 85 or greater;
   - Honours Class 2 Division 1: mark from 75 to 84;
   - Honours Class 2 Division 2: mark from 65 to 74;
   - Honours Class 3 or Pass: mark from 50 to 64.

Pathways
Students who complete an Honours program and achieve an Honours Class 1 are well placed to apply for higher degree research (a Doctor of Philosophy (PhD) or a professional doctorate in Information Technology (DIT) or a research Masters (MSC) and scholarships such as the Australian Postgraduate Award (APA). Further details on career opportunities for students who complete an Honours degree can be obtained from the School.
Streams

Streams are also known as a major in the BA and BSc undergraduate degrees. It is an area of concentration defined by a group of courses which must be completed.

Students should refer to their BA, BA (CDF) or BSc, BSc (CDF) degree structures when considering how to select courses within their majors.

Students should refer to the BA (Hons), BBus (Hons), BIT (Hons) and BSc (Hons) program information on the online UNSW Handbook when selecting courses within their Honours disciplines.

Other Programs

Students in all other degrees may select courses from these disciplines and count them as free elective courses. Prerequisite and timetabling requirements must be met.

Aviation

School of Engineering and Information Technology
Programs Available: 4410, 4463

Stream Summary

The Aviation major provides the student with a deep understanding of the various technological and human systems that contribute to the safe and efficient operation of aircraft and the aviation environment. A key element in this major is the focus on the role of people as key components in a technologically advanced and complex aviation environment. There is a particular emphasis on the role of human operators (e.g. pilots, air combat officers and air traffic controllers) in aviation in infrastructure and safety management systems.

The Aviation major is designed for potential pilots, air combat officers and air traffic controllers entering the Australian Defence Force.

Stream Structure

For the recommended double major combinations involving Aviation and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

A major sequence in Aviation for students entering the BSc comprises a total of 48 UOC, which comprises the following:

Select the following two (12 UOC) level I courses:
ZPEM1501 Physics 1A
ZPEM1502 Physics 1B

Note: Level I Mathematics (ZPEM1301 and ZPEM1302 or ZPEM1303 and ZPEM1304) is a prerequisite for some level II and III Aviation courses. For students doing a double major in Physics and Aviation, the two level I Mathematics units are to be part of the Aviation major since the level I Physics units are counted towards the Physics major.

Select three courses at level II:
ZEIT2502 Fundamentals of Flight
ZEIT2800 Introduction to Aviation
ZEIT2802 Aircraft Systems for Aviators
ZEIT2803 Aviation Safety
ZPEM2302 Mathematics Tools for Science

Note: Students must take at least one of the Level II courses ZEIT2502 Fundamentals of Flight or ZPEM2302 Mathematics Tools for Science for their Aviation major.

Select three of the following 4 Level III courses:
ZEIT3801 Advanced Aviation Safety
ZEIT3803 Air Traffic Management
ZEIT3804 Behavioural Science Project
ZPEM3204 Environmental Hazards

Students wishing to do ZEIT3804 Behavioural Science Project in their third year must take ZPEM2302 Mathematics Tools for Science in their second year.

Honours

Students must have achieved at least a credit average (65) across the entire undergraduate program including a credit average over the Level III courses or equivalent courses
Business

School of Business
Programs Available: 4400, 4461

Stream Summary
Business is about managing human, financial, physical and information resources to achieve the best outcomes for an organisation in its business environment. Effective business decision making requires both an internal focus on people, operations and finances, and a strategic focus on developments in the economic and social environment – markets, ethics, the law and government policy.

Stream Structure
A major sequence in Business comprises a minimum of two (12 UOC) of the following Level I courses:
- ZBUS1101 Organisational Behaviour
- ZBUS1102 Business Economics
- ZBUS1103 Introduction to Accounting

Plus 18 UOC from the following Level II courses:
- ZBUS2101 Business Law
- ZBUS2200 Markets and Competition
- ZBUS2207 Managing the Public Sector
- ZBUS2302 Leadership
- ZBUS2304 Management Accounting
- ZBUS2820 International Business
- ZEIT2001 Managing Information Systems
- ZHSS2601 Introductory Business Ethics

Plus 18 UOC from the following Level III courses:
- ZBUS3102 Project Management
- ZBUS3103 Human Resource Management
- ZBUS3203 The Making of Economic Policy
- ZBUS3303 Logistics Management
- ZBUS3401 Finance

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

Chemistry

School of Physical, Environmental and Mathematical Sciences
Programs Available: 4410, 4463

Stream Summary
Chemistry is a foundation science of civilisation and is central to modern technology and medicine. Many fields of science involve an understanding and/or application of chemistry or materials derived from chemical processes. Since the late 20th century six notable Australians have won Nobel prizes for their contributions to science, which involved significant aspects of chemistry. These include Sir John Cornforth (1975); and for Medicine with a substantial chemistry component - Florey (1945), - MacFarlane Burnet (1960), - Eccles (1963) and - Doherty (1996). W.H. Bragg, W.L. Bragg won the prize in Physics (1915), which led to major advances in chemistry, biology and material science.

Chemistry has prominence in the modern world via applications involving nanotechnologies and popular compact electronic devices of everyday use. However, there are many more chemical uses that support modern society and occupy many roles without being noticed or even pondered.

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 UNSW Canberra Chemistry majors have found employment.

Chemistry is divided into several sub-fields. The School of PEMS has strengths in Physical and Theoretical Chemistry as well as Inorganic and Organic Chemistry. Within each of these sub-fields there are specialist fields of laser spectroscopy, biological chemistry, supramolecular chemistry, explosives and molecular design. 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.
Stream Structure

For the recommended double major combinations involving Chemistry and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

A major sequence in Chemistry comprises the following two Level I courses:
ZPEM1101 Chemistry 1A
ZPEM1102 Chemistry 1B

Plus the following Level II courses:
ZPEM2102 Organic Chemistry 2
ZPEM2113 Inorganic Chemistry and Spectroscopy
ZPEM2114 Biological Chemistry

Plus the following Level III courses:
ZPEM3103 Applications of Quantum Theory
ZPEM3107 Explosives
ZPEM3121 Supramolecular Chemistry

In 2015, Level III students must also undertake the course ZPEM2114 Biological Chemistry in order to complete a Chemistry major.

Stream Structure

For the recommended double major combinations involving Computer Science and Mathematics and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

A Major sequence in Computer Science comprises two Level I courses:
ZEIT1101 Computational Problem Solving
ZEIT1102 Introduction to Programming

Plus 2 specified Level II courses in Computer Science:
ZEIT2102 Computer Technology
ZEIT2103 Data Structures

Plus 4 specified Level III courses:
ZEIT3101 IT Project 2
ZEIT3113 Computer Languages and Algorithms
ZEIT3114 Internetworking
ZEIT3118 IT Project 1

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 (24 UOC a semester for one year)
ZEIT4103 Computer Science 4 (Hons) F/T (24 UOC)

Part time (12 UOC a semester for two years)
ZEIT4104 Computer Science 4 (Hons) P/T (12 UOC)

Combined Honours

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 (24 UOC a semester for one year)
ZEIT4101 Computer Science Honours Special Topic 1 (12 UOC)

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

Computer Science

School of Engineering and Information Technology
Programs Available: 4410, 4463

Stream Summary

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.
English
School of Humanities and Social Sciences
Programs Available: 4400, 4461

Stream Summary
The first-year courses in English deal with various literary genres 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 second and third year courses, including some devoted to chronological and introductory surveys of major periods of English, American and Australian writing.

Stream Structure
A Major sequence in English comprises two Level I courses:
ZHSS1101 English 1A
ZHSS1102 English 1B
Plus 36 UOC which must be from Level II and III courses, with at least 18 UOC from Level III:
Level II courses:
ZHSS2104 Studies in the Media
ZHSS2108 American Literature
ZHSS2120 Heroism, Banditry and Manhood
ZHSS2133 Australian Literature
ZHSS2600 Practical Ethics
Level III courses:
ZHSS3105 Modernism and Postmodernism
ZHSS3109 Romanticism and Revolution
ZHSS3121 Classic Literary Texts
ZHSS3138 War Literature
ZHSS3139 Reading Theory
ZHSS3140 Literatures of the World

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 Honours Program Coordinator within HASS.

Geography
School of Physical, Environmental and Mathematical Sciences
Programs Available: 4400, 4410, 4461, 4463

Stream Summary
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.

Stream 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 the systematic branches of the discipline, either human or physical geography, or, take courses that integrate both human and physical geography or focus on geographic methods.

Potential honours students are encouraged to take more than 12 UOC 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 or Geography Discipline Coordinator.

For the recommended double major combinations involving Geography in the BSc program and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html
A major sequence in Geography comprises two Level I courses:
ZPEM1201 Geography 1A
ZPEM1202 Geography 1B

Plus 18 UOC from the following Level II courses:
ZPEM2202 Ecological Biogeography
ZPEM2207 Social Geography
ZPEM2209 Development Geography
ZPEM2212 Managing Environmental Change
ZPEM2213 GIS & RS

Plus 18 UOC from the following Level III courses:
ZPEM3202 Cultural Geography
ZPEM3203 Conservation Biogeography
ZPEM3204 Environmental Hazards
ZPEM3208 Geographic Research Methods
ZPEM3222 Coastal Geomorphology

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

In 2015 third year students undertaking a Geography Major must ensure that they have a total of 36 UOC from Levels II and III combined.

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**Stream Structure**

The major in History begins with Level I History. Students have maximum flexibility in completing the major. They are able to select their own combinations of single-session courses (Level II or III), regardless of their year level.

The two first-year courses consist of subjects focused on the key themes in global history of trade, diplomacy and war from the twelfth to the eighteenth centuries. 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.

A major in History comprises of two Level I courses:
ZHSS1201 History 1A
ZHSS1202 History 1B

Plus 36 UOC which must be from Level II and III courses, with at least 18 UOC at Level III

**Level II Courses:**
ZHSS2201 East Asia: Between Tradition and Modernity
ZHSS2204 Modern Navies and Sea Power
ZHSS2206 Social Change in East Asia
ZHSS2209 The Making of Contemporary Society
ZHSS2210 The Origins of Modern War
ZHSS2217 Genocide
ZHSS2221 Ireland and Britain: 1798-1998
ZHSS2223 India: from the Mughals to the Mall
ZHSS2224 The Road to Ruin: Germany
ZHSS2229 Russian History
ZHSS2230 Contemporary African History
ZHSS2231 US Military History
ZHSS2232 British Empire at War
ZHSS2233 Assault from the Sea

**Level III Courses:**
ZHSS3201 Preliminary Honours History
ZHSS3202 Methodology Research and Writing
ZHSS3211 The Second World War
ZHSS3212 Australian Military History
ZHSS3228 Insurgency/Counterinsurgency
ZHSS3231 First World War
ZHSS3233 Naval History and Sea Power in the 20th Century
ZHSS3234 Nazi Germany
ZHSS3235 Britain 1776-1877
ZHSS3402 Political Cultures in Asia & Pacific
Students may also include one or more of the following courses as part of a History major if they obtain permission from the Head of School.

ZHSS2503 State Systems of Pre-Colonial SE Asia
ZHSS3501 Contemporary Muslim Identity

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 Honours Program Coordinator within HASS.

Indonesian Studies

School of Humanities and Social Sciences
Programs Available: 4400, 4461

Stream Summary

Two streams of Indonesian language and culture are available at UNSW Canberra as detailed under the options for constructing a major in Indonesian. In exceptional circumstances, and with permission from the relevant Head of School, students may be able to make variations in the structure of a major in Indonesian.

Note. Native speakers of Indonesian or Malay will not be permitted to enrol in Indonesian.

Stream Structure

A major in Indonesian for students entering the BA or BSc must have a minimum of 48 UOC which comprises:

For students who have completed Year 12 Indonesian or equivalent:

Two (12 UOC) Level I courses:
ZHSS1303 Intermediate Indonesian 1C
ZHSS1304 Intermediate Indonesian 1D

Plus 36 UOC that must be from Level II and Level III courses, with at least 18 UOC at Level III:
ZHSS2303 Advanced Indonesian 2C
ZHSS2304 Advanced Indonesian 2D
ZHSS2504 Popular Culture in Indonesia
ZHSS2506 Indonesian Peripheries
ZHSS3501 Contemporary Muslim Identity
ZHSS3505 Women, Class, Society

For students who have little or no prior knowledge of Indonesian:

Two (12 UOC) Level I courses:
ZHSS1301 Indonesian 1A
ZHSS1302 Indonesian 1B

Plus 36 UOC that must be from Level II and III courses of which at least 18 UOC must be at Level III:
ZHSS2301 Indonesian 2A
ZHSS2302 Indonesian 2B
ZHSS2504 Popular Culture in Indonesia
ZHSS2506 Indonesian Peripheries
ZHSS3301 Indonesian 3A
ZHSS3302 Indonesian 3B
ZHSS3501 Contemporary Muslim Identity
ZHSS3505 Women, Class, Society

Honours

Honours is not currently available in Indonesian Studies.

Information Systems

School of Engineering and Information Technology
Programs Available: 4410, 4461, 4463

Stream Summary

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.
For the recommended double major combinations involving Information Systems and Geography in the BSc program and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

Stream Structure
A major sequence in Information Systems comprises of two Level I courses:
ZEIT1301 Introduction to the IT Profession
ZEIT1302 Introduction to Systems Thinking
and 2 specified Level II courses in Computer Science:
ZEIT2301 Solution Design
ZEIT2306 Service Design
Plus 4 specified Level III courses:
ZEIT3101 IT Project 2
ZEIT3110 Service Management
ZEIT3118 IT Project 1
ZEIT3302 Software Project Management

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 (24 UOC a semester for 1 year)
ZEIT4303 Information Systems Honours Special Topic 3 full time (24 UOC)
Part time (12 UOC a semester for 2 years)
ZEIT4304 Information Systems Honours Special Topic 4 part time (12 UOC)

Combined Honours
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 (24 UOC a semester for 1 year)
ZEIT4301 Information Systems Honours Special Topic 1
Part time (12 UOC a semester for 2 years)
ZEIT4302 Information Systems Honours Special Topic 2

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

International and Political Studies
School of Humanities and Social Sciences
Programs Available: 4400, 4461

Stream Summary
International and Political Studies involves the study of power - how it is exercised and by whom, and how its privileges and responsibilities are a focus of conflict. The program is designed for students who are interested in politics and international affairs in a rapidly changing global environment. Our courses cover the major actors, ideas and key issues of domestic, regional and global politics, all of which have a profound impact on Australia’s national security and its place in the world. The program emphasises the development of critical thinking and high-level analytical and communication skills. The skills and knowledge gained through the program are valuable for members of the ADF, which operates in an increasingly challenging domestic and international environment.
Stream Structure

In the first year the teaching program is designed to introduce students to the theories and key issues of Australian politics and international relations. International and Political Studies (IPS) 1A examines the role of ideals, interests and power in the Australian political system. International and Political Studies (IPS) 1B covers world politics, the shifting balance of power, international organisations, and the sources of conflict.

In years 2 and 3, the teaching program focuses on four themes:

- International relations
- Countries of strategic significance to Australia
- Security studies
- Political thought

A major in International and Political Studies comprises:

Two Level I courses:
ZHSS1401 IPS1A: Ideals, Interests and Power
ZHSS1402 IPS1B: World Politics

Plus 36 UOC which must be from Level II and III courses, with at least 18 UOC at Level III.

Level II courses:
ZHSS2403 Politics of China
ZHSS2408 Civil-Military Relations
ZHSS2410 Modern Political Ideologies
ZHSS2412 Politics of Australian Security
ZHSS2416 The Politics of Southeast Asia
ZHSS2423 Key Political Thinkers
ZHSS2424 The Application of Air Power
ZHSS2427 Politics of the Great Powers
ZHSS2428 Great Clashes that Define Us
ZHSS2503 State Systems in Pre-Colonial SE Asia
ZHSS2600 Practical Ethics

Level III courses:
ZHSS3402 Political Cultures in Asia and Pacific
ZHSS3414 Regional Security Issues
ZHSS3417 Ethnic Conflict
ZHSS3421 Political Philosophy
ZHSS3422 Politics of Globalisation
ZHSS3425 Air Power in Small and Irregular Wars
ZHSS3426 Crisis in the South Pacific
ZHSS3431 International Human Rights
ZHSS3432 Justice, Norms and Practice
ZHSS3433 International Politics and Ethics of War
ZHSS3434 Australia: Who Really Holds Power?

Students may also include one or more courses from other disciplines as part of an International and Political Studies major if they obtain permission from the Head of School.

Honours

The School of Humanities and Social Sciences offers a four-year Honours program consisting of coursework and sub-thesis which expands and further develops the intellectual skills of our best students. Admission to International & Pol. Studies Honours is at the discretion of the Head of School. Interested students should contact the Honours Program Coordinator within HASS.

Mathematics and Statistics

School of Physical, Environmental and Mathematical Sciences

Programs Available: 4410, 4463

Stream Summary

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. These are universal skills which are applicable to virtually any task and are of value to anyone who has to face complex problems and make decisions. Hence mathematics is crucial in one’s professional life, including the ADF.

Science, Engineering and Technology are based on mathematical thinking and use the language of mathematics. The Humanities, the Natural Sciences and the business world draw on the power of mathematics 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.
Stream 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 both Level I Mathematics courses, or at least the Level I Mathematics course ZPEM1301 Mathematics 1A. The course ZPEM1302 Mathematics 1B is a prerequisite for Level II and Level III Mathematics courses.

Level II and III courses delve into mathematical methods in greater depth and examine a variety of applications. Several of the courses taught are related, in some way, to the research that is currently undertaken by staff members. Students are shown, first hand, the crucial role that mathematics and statistics play in various areas of Science, Engineering and Technology.

For the recommended double major combinations involving Mathematics and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

A Major sequence in Mathematics and Statistics comprises the following Level I courses:

- ZPEM1301 Mathematics 1A
- ZPEM1302 Mathematics 1B

Plus the following Level II courses:

- ZPEM2302 Mathematical Tools for Science
- ZPEM2311 Mathematical Modelling
- ZPEM2313 Discrete Mathematics

Plus the following Level III courses:

- ZPEM3301 Topics in Mathematics
- ZPEM3311 Math Methods for Diff Equations
- ZPEM3313 Applied Nonlinear Dynamics

In 2015, Level III students must also take ZPEM3312 Methods for Data Analysis in order to complete a Mathematics major.

Oceanography

School of Physical, Environmental and Mathematical Sciences

Programs Available: 4410, 4463

Stream Summary

Viewed from space, the Earth is a blue planet with over 70% of its surface covered by water. Because of this, the oceans exert a major influence on the Earth’s climate and shipping operations. The three-year major program covers key principles of oceanography and the related issues of meteorology and climate. It offers a comprehensive account of physical oceanography, including components that cover waves, currents, sonar, and remote sensing, and employs mathematical arguments to describe the physical phenomena that take place within the world’s oceans. It provides all future ADF officers with a sound understanding of the influence of oceans and weather. Double Majors of Oceanography with either Physics or Mathematics cover the requirements for a position at RAN’s METOC (Meteorology and Oceanography) office.

Stream Structure

The Level I course Introduction to Oceanography is designed as a general course suitable for those Science and Arts students majoring in other fields of study. It 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 I Mathematics (ZPEM1301 Mathematics 1A and ZPEM1302 Mathematics 1B or the equivalent in Engineering mathematics courses) is a prerequisite for students enrolling in Level II and Level III Oceanography.

For the recommended double major combinations involving Oceanography and the corresponding study plans please see http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html

A Major sequence in Oceanography comprises two Level I courses:

- ZPEM1402 Introduction to Oceanography
- ZPEM1501 Physics 1A

Note: Level I Mathematics (ZPEM1301 and ZPEM1302) is a prerequisite for Levels II and III Oceanography.
Plus the following Level II courses:
ZPEM2213 GIS & RIS
ZPEM2401 Australian Waters
ZPEM2506 Physics 2A

Plus the following Level III courses:
ZPEM3222 Coastal Geomorphology
ZPEM3532 Advanced Topics Physics/Ocean
ZPEM3401 Ocean Circulation and Mixing
OR
ZPEM3404 Ocean Waves and Modelling
depending on which course ZPEM3401 or ZPEM3404 is being offered at the time of enrolment.

Note that students doing level III Oceanography in 2015 with the residual requirement of 24 UOC towards their major need to enrol in both ZPEM3401 and ZPEM3404.

Operations Research

School of Engineering and Information Technology
Programs Available: 4410, 4463

Stream Summary
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.

Stream Structure
A Major sequence in Operations Research comprises two Level I courses:

Please note that the courses selected in Semester 1 will pre-determine the course selection for Semester 2 within this plan.
ZEIT1101 Computational Problem Solving
ZEIT1102 Introduction to Programming
ZEIT1301 Introduction to the IT Profession
ZEIT1302 Introduction to Systems Thinking
ZPEM1301 Mathematics 1A
ZPEM1302 Mathematics 1B
plus 2 specified Level II courses in Operations Research:

Level II courses:
ZEIT2307 Capability Option Analysis
ZEIT2403 Introduction to Operations Research

plus 4 specified Level III courses:

Level III courses:
ZEIT3101 IT Project 2
ZEIT3118 IT Project 1
ZEIT3405 Problem Structuring Techniques
ZEIT3406 Quantitative Operations Research

Honours
Honours is not currently available in Operations Research.

Physics

School of Physical, Environmental and Mathematical Sciences
Programs Available: 4410, 4463

Stream Summary
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.

**Stream Structure**

Level I Physics is structured primarily to lead into Level II Physics. However, ZPEM1501 Physics 1A: Mechanics, Waves and Thermodynamics and ZPEM1502 Physics 1B: Electromagnetism and Modern Physics are self-contained courses suitable for Science and Arts students 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.

Level I Mathematics (ZPEM1301 Mathematics 1A and ZPEM1302 Mathematics 1B or the equivalent in engineering mathematics courses) are prerequisites for students enrolling in Level II and Level III Physics. ZPEM2302 Mathematical Tools for Science is a prerequisite for the Level II course ZPEM2502 Physics 2B: Electrons, Photons and Matter and Level III Physics. For students doing a double major in Physics and Aviation, the two Level 1 Mathematics units are to be part of the Aviation major since the Level 1 Physics units are counted towards the Physics major. ZPEM2302 Mathematical Tools for Science is a prerequisite for the Level II course ZPEM2502 Physics 2B: Electrons, Photons and Matter and Level III Physics.

For the recommended double major combinations involving Physics and the corresponding study plans please see [http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html](http://sas.unsw.adfa.edu.au/future_students/undergraduate/programs/DoubleMajorCombinations.html)

A major sequence in Physics comprises the Level I courses:

- ZPEM1501 Physics 1A
- ZPEM1502 Physics 1B

**Plus the following Level II courses:**

- ZPEM2502 Physics 2B
- ZPEM2506 Physics 2A
- ZPEM2509 Nuclear Astrophysics

**Plus the following Level III courses:**

- ZPEM3103 Applications of Quantum Theory
- ZPEM3503 Electromagnetism and Materials
- ZPEM3532 Advanced Topics Physics/Ocean

Note that students doing Level III Physics in 2015 with the residual requirement of 24 UOC towards their major need to also enrol in ZPEM2509.
Course Catalogue

Course offerings and timetable information

How do I find the latest course information?
The UNSW Online Handbook is automatically updated for any late changes to course offerings, timetable changes or lecturer information.

Add a favourite to this web link www.handbook.unsw.edu.au or access the Online Handbook from the myUNSW homepage.

The easiest way to search the Online Handbook is to:
1. Click on “Undergraduate Study”;
2. In the left side panel – click on search “Programs by Faculty”;
3. Select “UNSW Canberra at ADFA”;
4. Select your program;
5. The “Program Description” will identify the degree and its majors and courses;
6. If you wish to search for other courses – go to the left panel and click on “Courses A-Z”;
7. All UNSW Canberra courses are coded with a Z prefix.

How do I find my timetable information?
Each student has an individual timetable based on their enrolment selection through their myUNSW account.

Course timetable information is available via the Online Handbook or myNSW.

When you select a course on the Online Handbook, click on “Further Information: See Class Timetable” in the course header. This link will provide you with:
- class time
- class activities, e.g. tutorials or lab classes
- room and venue details, and
- lecturer name.

How do I find the semester course offerings?
A complete table-format list of all Undergraduate Course offerings for the year is available from the UNSW Canberra Student Gateway website, see:

www.unsw.adfa.edu.au/student/current/undergrad

Course offering information is also available via the “Further Information: See Class Timetable” link on the Online Handbook for each course.

How do I find my class room?
Your timetable details will be listed, e.g. Lecture Theatre North 12 (Z-32-LT12)

This coding means: Z = ADFA campus; 32 = Building 32; LT = Lecture Theatre 12

For further information about room locations see:

www.unsw.adfa.edu.au/student/timetables/index

See the inside back cover of this guide for a copy of the ADFA campus map.

How do I access future semester information?
Course offering information for the following year is published on the UNSW Canberra Student Gateway in November.

Course offerings and timetable information is also generally available via the UNSW Online Handbook:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semester 1</td>
<td>mid October</td>
</tr>
<tr>
<td>Semester 2</td>
<td>mid May</td>
</tr>
</tbody>
</table>
Using the UNSW Canberra 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 several schools, are distinguished by a separate prefix.

ZBUSXXXX – Course offered by SBUS
ZEITXXXX – Course offered by SEIT
ZGENXXXX – General Education course
ZHSSXXXX – Course offered by HASS
ZINTXXXX – Interdisciplinary course
ZPEMXXXX – Course offered by PEMS

Code Suffix
With the exception of General Education (ZGEN) and Interdisciplinary (ZINT) courses, the first digit at the end of a course code indicates the level of a course.

Undergraduate
ZXXX1000 – Level I or 1st year UG Course
ZXXX2000 – Level II or 2nd year UG Course
ZXXX3000 – Level III or 3rd year UG Course
ZXXX4000 – Level IV or Honours UG 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).

Some courses may indicate that you require School Approval before your enrolment is confirmed. If this is the case, you will need to complete an Enrolment Variation form, available from SAS or the UNSW Canberra student gateway.

Units of Credit
All courses listed in the Course Catalogue are 6 UOC unless specified otherwise.

ZBUS1101 Organisational Behaviour
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, stress, team effectiveness, decision-making, power, conflict, leadership, organisational structure, design, culture and change.

ZBUS1102 Business Economics
The course introduces you to the main principles of economics. It briefly reviews the development of ideas in the discipline and provides the foundation to understanding the economic environment in which organisations conduct business. Students will learn how economists model behaviour of individuals and firms. They will also learn how policies are used by governments to influence outcomes in the market place.

ZBUS1103 Introduction to Accounting
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 and financial statement analysis.

ZBUS1104 Foundations of Management (IC1)
Prerequisite: Enrolment in 4405 or 4462
This course is the first of three, comprising the Integrating Core in the BBus degree. The Integrating Core courses aim to systematically develop the critical thinking, research and problem solving skills that are required for success in business environments. This course presents management as a profession that is founded on research. It outlines the broad range of activities that constitute management and shows how different management activities can be supported by different types of research. It aims to develop managers who use research evidence to support decision making and policy making. In this course, students learn how to locate and critically analyse information in the management research literature. The course has a particular focus on developing Graduate Attributes and 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.

ZBUS2101 Business Law
This course aims to provide a general understanding of the law and legal processes operating within a private or public business context. The course introduces students to a range of legal topics and issues underpinning the conduct of commercial enterprises and making of business decisions. There is particular emphasis on contract law as a key knowledge tool for working effectively in the procurement processes of large organisations (such as the Defence Department). Legal analysis, writing and problem solving skills are developed throughout the course.
ZBUS2200  Markets and Competition  
Prerequisite: ZBUS1102  
In this course, the understanding of microeconomics gained in the course Business Economics is extended by a more in-depth investigation of microeconomic theory and by a rigorous application of microeconomic principles to a range of real world issues. A special emphasis is placed on the application of microeconomic concepts to international trade issues. Successful completion of the course is a prerequisite for taking further upper level economics courses in the School of Business.

ZBUS2202  Australia and the World Economy  
Prerequisite: ZBUS1102  
In this course, the understanding of macroeconomics gained in the course Business Economics is extended by developing a macroeconomic framework to analyse open-economy macroeconomic fluctuations and policies. The analytical framework is applied to current macroeconomic issues.

ZBUS2207  Governing Australia: Managing the Public Sector  
The course focuses on strategic level management of the Australian public sector and comprehends setting objectives, planning implementation and marshalling resources. 
Students completing this course will understand how Australian public policy objectives are set, how public policy programs are implemented and how competition for limited policy resources is adjudicated. Students will be encouraged to evaluate the ADF’s role in the policy process and to assess critically wider policy and management issues.

ZBUS2302  Leadership  
Prerequisite: ZBUS1101  
This course considers leadership as a management activity and provides a critical analysis of the assumptions 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.

ZBUS2304  Management Accounting  
Prerequisite: ZBUS1103  
This course develops an understanding of management accounting with a view to equip 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.

ZBUS2401  Financial Management  
Prerequisite: ZBUS1103 and ZBUS2104  
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.

ZBUS2820  International Business  
This course exposes students to several higher order business concepts including strategy, marketing, and management. Importantly, the focus of this course is in the application of theory to real-life situations encountered by organisations. The international context underpins these discussions. This is important due to the global nature of interactions students are likely to encounter during their careers.

ZBUS2901  Business Research  
Prerequisite: Enrolment in Program 4462  
School Consent Required

ZBUS2902  Research Project in Business 1  
Prerequisite: Enrolment in Program 4462  
School Consent required
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 semester, and final assessment will be based on a written paper and oral presentation.

ZBUS3102  Project Management  
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.

ZBUS3103  Human Resource Management  
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.
ZBUS3104 Business Capstone
This course builds on skills of problem definition, analysis and decision making, by showing how solutions may be implemented in business and organisational settings. It applies organisation theory and social network analysis to diagnose strengths and weaknesses of organisations and informal networks. Study in this course also draws on theories of leadership, negotiation, organisational change, structure, culture, economics and politics. It considers the formulation of business strategy and its implementation in an environment of continuous change.

ZBUS3203 The Making of Economic Policy
Prerequisite: ZBUS1102
This course deals with the process of economic policy making and analyses the rationale for, and implications of, economic policies in open economies.
Topics covered may include rationale 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.

ZBUS3206 Managing People Across Cultures
This course provides students with the critical knowledge and skills to manage and work in environments that include people from cultures other than their own. The course provides conceptual and theoretical frameworks for developing an understanding of the potential 'people problems' that arise from different cultural backgrounds and how these challenges impact upon managing work in organisations.

ZBUS3303 Logistics Management
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.

ZBUS3901 Research Project in Business 2
Prerequisite: Enrolment in Program 4462
School Consent required
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 semester, 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.

ZBUS3902 Research Project in Business 3
Prerequisite: Enrolment in Program 4462
School Consent required
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 semester, 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.

ZEIT1101 Computational Problem Solving
HPW5
Computation underpins our 'daily digital life': Students taking this course will receive a foundational background in computational problem-solving. On the theoretical side this includes an introduction to logic, along with the scientific and engineering methodologies, design principles, and a grounding in the theories and models of computation. In parallel practical skills of problem structuring, solution design, algorithm writing, structured programming, and data representation within a computational environment will be acquired. Theoretical and practical lessons are contextualised in the modern IT environment with introductions to core computer science topics such as operating systems, networks, simulation, and programming languages. Students will design and implement a number of solutions to computational problems - bringing together the theory, milieu, and practical skills acquired in the course.

ZEIT1102 Introduction to Programming
Pre-requisite: ZEIT1101
Introduction to Programming builds on Computational Programming Solving, concentrating on computer programming in an object-oriented paradigm. By the end of this course students will be able to effectively analyse a well-defined problem, design a program solution, and will be able to efficiently implement the solution in Java. Topics include algorithms, classes and objects, object-oriented design, control structures, applets, data structures, searching and sorting, and recursion.

ZEIT1206 Design of Electronic Circuits 1
Resistance and Ohm's Law; Kirchhoff's voltage and current laws; power; simple DC circuits; superposition; Thévenin'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. 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.
This course explores Ohms Law, Kirchhoff’s Laws, 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.

The course also provides 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.

This course is restricted to students in the BE (Elec-CDF) program. Students will be required to attend specialist School seminars on at least six occasions during the Semester.

At least one staff member will be nominated as a supervisor to provide guidance and general supervision during the literature review and seminar. Late in the Semester 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 ZEIT1208 Introduction to Electrical Engineering.

This course is restricted to students in the BE (Elec-CDF) 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.

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 report and seminar. Late in the Semester 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 ZEIT1206.

Introduction to Information Technology Profession outlines the IT discipline including a brief review of its history, a survey of how IT has become pervasive in society, the concept of an IT profession and the issues the IT profession faces. The course will provide a brief historical review of the development of computing technologies, software and its usability, and point to some likely future technologies. Finally, the course will outline how IT professionals work together and how the IT profession integrates with other professions in the broader workplace and society.

Introduction to Systems Thinking provides students with the basic tools for problem solving in an organisational context where information is a key part of the solution. The course begins by introducing the fundamental concepts needed to understand systems thinking.

This is followed by an overview of several holistic approaches for improving organisational performance, including General Systems Theory (GST), organisational cybernetics, Peter Senge’s Fifth Discipline, and complexity science. The course then describes several methods and techniques that can be used as part of a system intervention, ranging from soft system methods such as Soft System Methodology (SSM) through to more hard system methods such as systems and software engineering.

This course is a foundation for many engineering and technology disciplines. It provides an introduction to Newtonian mechanics with applications to stationary particles, rigid bodies, beams, trusses, frames and machines. Topics include force vectors, Cartesian vectors and operations, force system resultants, moments, equilibrium of particles and rigid bodies, internal forces in structural members and free body diagrams, dry friction, centres of gravity, centroid of areas, lines and volumes, and moments of inertia.

This course provides an introduction to Engineering Practice and Design with an emphasis on communication of engineering information. Emphasis is placed on Computer Aided Design (CAD), sketching, schematic diagrams and specification writing. Other topics covered include safety, ethics, and practice of engineering in the services. Students will participate in skills workshops relevant to their degree streams during the May training period. The delivery of the course will be predominantly through studio based small group activities supported by key lectures.

This course is a foundation for many engineering and technology disciplines. It 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.

This course introduces students to the Civil Engineering discipline and its various specialised fields. They will learn to communicate engineering information effectively, using engineering drawings. Students will achieve knowledge of the interface between design, surveying and construction. Students will also learn surveying techniques and will be introduced to the geometric design of rural roads, airfields.

This course is restricted to those students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Mech)(CDF), or BTech(Aero)(CDF) programs. Students undertaking this course will attend lectures and complete the assessment tasks for ZEIT1600 Introduction to Civil Engineering for BE(Civil) students and ZEIT1501 Engineering Practice for the other degree programs. In addition, students will attend a number of research seminars within the School and demonstrate an understanding of the research problems and solutions presented in the seminars, as an introduction to the discipline of engineering research.
ZEIT1902 Engineering Research 1B
This course is restricted to those students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Mech)(CDF), or B Tech(Aero)(CDF) programs.

Students enrolled in this course will undertake group work projects under the guidance of a research supervisor. These projects will be based upon current research activities within the department. Assessment will be in the form of a presentation of their group work and a written research paper. In addition to the project, students will receive specialist lectures and assignments in research-related topics such as measurement techniques, mathematical techniques, uncertainty analysis and presentation of data.

ZEIT1903 Introduction to Research in Information Technology
This course is available to students in the BIT (CDF) program. This course introduces students to the technique and practice of IT research today. A background in the science, engineering, and systems methods of research and their common elements of research question, experimental design, data gathering, analysis, and presentation is provided. Context (and mentoring) is achieved through guided revelation of IT research activity conducted in the relevant groups and labs within the school - exposing the student to the variety and diversity of IT research. Students will pick, analyse in greater detail, and report upon, one current IT research activity from the set they are exposed to in the various groups and labs.

ZEIT2001 Managing Information Systems
This course introduces students to the principles of managing the information resources used in organisations. It covers the management of the risks associated with the use 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.

ZEIT2102 Computer Technology
Prerequisite: ZEIT1102
This course presents details of the range of computing and data networking technologies available and how they can be applied. Topics 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.

ZEIT2103 Data Structures and Representation
Prerequisite: ZEIT1101 and ZEIT1102
Data Structures and Representation is an intermediate course in computer programming, that aims to further explore computer program control and data structures, using Java as the teaching language. The main focus is on the appropriate selection and application of data structures to specific problems. Structures explored include lists, hash tables, trees, heaps, and graphs. We also explore the use of persistent data structures in text and XML files, and in SQL databases. And we further develop fundamental notions of object-oriented program design, and of software engineering ideas and techniques.

ZEIT2207 Design of Electronic Circuits 2
Prerequisite: ZEIT1206 or ZEIT1291
Students study the principles of operation of the Bipolar Junction Transistor (BJT) and Field Effect Transistor (FET), and learn how these can be used to design various amplifier and power regulation circuits to meet a specified performance. Students are introduced to project management principles, and gain practice in application of project management skills in the practical work in the course. Students also study quantitative methods for describing transient behaviour in electronic circuits.

ZEIT2208 Programmable Digital Systems
Prerequisite: ZEIT1208
Interfacing with the analogue world; Digital-to-Analogue conversion; Analogue-to-Digital conversion. Synchronous system design; Practical timing constraints when implementing digital logic circuits, Signal conditioning, buffers/latches, buses, Operation of standard TTL, ECL and CMOS devices; Interfacing digital circuits from different logic families, Introduction to VHDL, C programming language for embedded processor development. Microprocessor solution for electronic control. Field Programmable Gate Arrays. Interfacing of peripheral hardware in serial/parallel; memory and IO spaces of the processor, Interrupts, Serial communication via RS232. Examples of modern bus systems and signalling.

ZEIT2301 Solution Design
Prerequisite: ZEIT1302
This course enables the students to use basic Software Engineering practices to design a Decision Support System for a small group.

ZEIT2306 Service Design
Prerequisite: ZEIT1302
This course introduces students to the basic Service Management practices that are used to design IT services.

ZEIT2307 Capability Option Analysis
Prerequisite: ZEIT1102 or ZEIT1302
This course trains students into giving qualitative and quantitative insights into the relative merits of agreed options by using live and constructive simulation, studies and experimentation tools to provide rigour and structured analysis to support major decisions. Topics covered include: Business Cases, Options Development, Best Practice of Experimentation and Experimentation Design, Measure of effectiveness and data collection, Gaming, Agent-based Modelling, Experimentation, Decision Making Under Uncertainty and Risk, SMART and AHIP.

ZEIT2403 Introduction to Operations Research
Operations research - a topic conceived in the Second World War by the US military - is the science of understanding and analysing problems to come up with a recommended course of action. It mimics the Military Appreciation Process. This course introduces students to the wide variety of models in Hard and Soft Operations Research (OR).

The course starts with an overview of OR, its history, the code for best practice, and problem formulation. Hard OR topics will include linear programming, network theory, project management, trend analysis, probability theory, queuing theory and game theory. Soft OR topics will include an introduction to soft OR and simulation.
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 thermodynamics, and the application of control volume techniques to engineering problems.

**ZEIT2501 Mechanical and Electronic Design**

The project develops sound design principles through participation in the Warman Design and Build Competition, which is a small-group, project-based learning activity. This project is mechatronic in nature and students will be exposed to the broad principles of mechanical and electronic design and engineering report writing.

The lectures will deliver the relevant material for the successful completion of the project.

**ZEIT2502 Fundamentals of Flight**

**Prerequisite: ZPEM1302 or ZPEM1304**

This course introduces the student to the fundamentals of aerodynamics, aircraft performance and stability. The following topics will be introduced: Aircraft components; Properties of the atmosphere; Bernoulli's equation; Altimetry and airspeed; Elements of fluid flow - boundary layers, laminar and turbulent flow; Subsonic and supersonic flow; Aerodynamic lift, drag and pitching moment; Wings; Propulsion; Aircraft performance cruise, climb, take off and landing, load factor, turning flight; Key factors in aircraft stability. Subject to aircraft availability a flight laboratory will be offered.

**ZEIT2503 Fluid Mechanics**

**Prerequisite: ZEIT1502, ZPEM1303, ZPEM1304**

This course covers fundamental aspects of fluid mechanics. It aims at developing an understanding of the physical mechanisms underlying fluid flow. It contains a review of the fundamental equations of Fluid Mechanics, an expansion of the methods of momentum analysis known from Thermofluids, and a detailed discussion of the powerful technique of Dimensional Analysis, which allows the systematic discovery of parameter sets that govern the characteristic features of a flow.

These techniques will be used in engineering applications, such as the fluid mechanical treatment of turbo machines and devices for flow measurement. Special emphasis will be given to friction effects in fluid flows. Several examples of flows in which friction is important, such as Couette flows, pipe flows and boundary layers, will be discussed. The final chapter of the course is an introduction to compressible flows.

**ZEIT2504 Mechanics of Solids**

**Prerequisite: ZEIT1500**

The mechanical behaviour and analysis of solid objects under various loadings is considered in this course.

The fundamental concepts of stress and strain are introduced to quantify the behaviour of structural components. The aim of the course is to provide students with fundamental knowledge regarding the examination of the stresses and strains inside bodies of finite dimensions that deform under loads using the physical properties of the materials as well as various theoretical models and concepts.

Experimental material characterization and techniques for solving for stresses, strains and displacements of rods and torsional shafts, bending in beams and buckling of columns also form part of the syllabus. The course extends the work done in Statics to enable detailed behaviour of deformable solids under complex loading to be presented.

**ZEIT2601 Soil Mechanics and Engineering Geology**

**Prerequisite: ZEIT1500**

This is an introductory course that addresses: introductory aspects of engineering geology; engineering classification of soils; effective stress principle; effects of drainage conditions; final settlement due to 1 D consolidation; 1 D seepage and effects on effective stress; and failure of soils.

**ZEIT2602 Hydraulic Engineering**

**Prerequisite: ZEIT1502**

This course covers fundamental aspects of fluid mechanics and hydraulics. It contains a review of the fundamental equations of Fluid Mechanics, an expansion of the methods of momentum analysis known from Thermofluids, and a detailed discussion of the powerful technique of Dimensional Analysis, which allows the systematic discovery of parameter sets that govern the characteristic features of a flow.

Special emphasis will be given to friction effects in fluid flows. The course then examines several important applications in civil engineering, including friction and minor losses in single pipelines and pipe networks, pump-pipe systems and open channel flow; the latter will include friction losses and conservation of energy and momentum principles.

**ZEIT2700 Mechanics of Machines**

**Prerequisite: ZEIT1500, ZEIT1502**

This course will combine concepts learned in Statics and Dynamics in the context of mechanisms analysis and design. The students will learn about the different types of links and joints making up mechanisms; kinematics and kinetics of mechanisms; design and analysis of cams, gears and drive trains; static and dynamic force analysis; synthesis of coupler curves; balancing of rotating and reciprocating masses.

**ZEIT2800 Introduction to Aviation**

This course provides an introduction to flight. Within an historical framework, the student will be introduced to the basic science of flight will regard to the development of aerofils, airframes and propulsive technologies.

The lectures will highlight key areas in the advance of aviation as a discipline. Subject to aircraft availability a flight laboratory may be offered.

**ZEIT2802 Aircraft Systems for Aviators**

This course explores the purpose and general arrangement of aircraft systems and propulsive technologies. The role of the operator - pilot or engineer - will be discussed with reference to the concept of integrated aircraft system design and function.
ZEIT2903 Aviation Safety

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 aviation human factors - 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, incorporating human behaviour, information processing, time management and situational awareness, judgment and 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 organizations are planned.

ZEIT2901 Engineering Research 2A

This course is restricted to those students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Elec)(CDF), BE(Mech)(CDF), or BTech(Aero)(CDF) programs. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT2902 Engineering Research 2B

This course is restricted to those students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Elec)(CDF), BE(Mech)(CDF), or BTech(Aero)(CDF) programs. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT2903 Information Technology Research Project 1

This course is available to students in the BIT (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 and will focus on the design and possibly development of a complex problem solution. 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.

ZEIT2904 IT Research Project 2

Prerequisite: ZEIT2903

This course is available to students in the BIT (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 and will focus on option identification and selection in information technology projects and problems. 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.

ZEIT3101 IT Project 2

Prerequisite: ZEIT3118

This is the second half of a year-long course. Students must also have completed ZEIT3118 IT Project 1 before being awarded any UOC.

ZEIT3102 Cryptography

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.

ZEIT3104 Electronic Business

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.

ZEIT3110 Service Management

Prerequisite: ZEIT2306

This course enables students to use basic Service Management practices to manage service transition and operation for a IS unit, with an emphasis upon problem-solving.

ZEIT3111 Special Topic

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.

ZEIT3112 Special Topic 2

Occasional topics of relevance in the area of Information Technology, given by visitors or external lecturers or members of staff.
ZEIT3113 Computer Languages and Algorithms
Prerequisite: ZEIT2103
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.

ZEIT3114 Internetworking
Prerequisite: ZEIT2102 or ZEIT2902
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.

ZEIT3115 Systems and Network Administration
Prerequisite: ZEIT2102 or ZEIT2902
This course will cover systems administration in depth. While there are numerous brands of systems in use today, the fundamental architecture remains constant. As such, the practical elements of this course will be based on a single operating system, Linux. Hence some working knowledge in Linux will be helpful. This course will introduce you 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 user, device and file system administration, computer and network security, system monitoring, administrative support tools, network, server and client administration.

ZEIT3117 Cyber-Security
Prerequisite: ZEIT2102
This course provides a solid understanding of the theory and practice used to manage information security on computer systems and networks. In more detail, topics include: an overview of computer and communications security, risk assessment, human factors, identification and authentication, access controls, malicious software, software security, O/S security, trusted computer systems, network attacks and defences, firewalls, intrusion detection and prevention, database security, legal and ethical issues.

ZEIT3118 IT Project 1
This is a capstone course in the degree. The Project affords the opportunity to take skills and knowledge from other courses in the degree and forge a contribution to the IT discipline by a research investigation, a feasibility study, a design project, or a comprehensive literature review and analysis project, chosen from a list of topics approved by the Head of School. To the extent possible, topics will be solicited and sponsored by the Australian Defence Force. Students are expected to take significant ownership of an original piece of work and reflect this to the wider community by presentations and a written thesis. A staff member is nominated as a supervisor to provide guidance and general supervision. Project management techniques will be adopted and assessed in the implementation of the project. A series of briefings will be used to expose the students to basic research strategies and techniques. Evidence of sufficient progress may be required from time to time.

ZEIT3215 Signals and Systems
Prerequisite: ZPEM2309
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 transforms; Fourier spectrum and power spectrum; Parseval’s theorem; Energy spectral density and power spectral density; Discrete time signals and systems; sampling theory and rate conversion; discrete convolution and correlation; Discrete Fourier transform algorithms including FFT; computer aided analysis of digital and analog linear systems.

ZEIT3216 Design of Electronic Circuits 3
Prerequisite: ZEIT2207
This course continues the development of the student’s engineering skills through a tight coupling of theoretical and practical skills. Students investigate higher level electronic circuit analysis and design techniques, and apply this knowledge to the design of specific electronic hardware. The topics covered are frequency response of amplifiers, use of approximation techniques for estimating amplifier performance, differential and multistage amplifier design, the use of feedback for improving circuit performance, oscillator and phase-lock loop design, and design of wave shaping and data converter circuits. Additionally students gain experience with issues associated with electronic component parasitics, circuit stability, coupling and decoupling, circuit simulation, prototyping and construction.

ZEIT3218 Communications Techniques
Prerequisite: ZPEM2309

ZEIT3220 Engineering Electromagnetics
Prerequisite: ZPEM1502, ZPEM2502, ZPEM2309, ZPEM2310
The focus of this course is on developing an understanding of the electromagnetic properties of electronic circuits and electromagnetic devices from an electrical engineering perspective. This course builds upon previous courses in electromagnetics and circuit theory, focussing on the design and utilisation of electromagnetic devices in practical situations. This course will cover transmission lines, antennas, as well as propagation in free-space, metallic waveguides and dielectric waveguides.
ZEIT3302 Software Project Management
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.

ZEIT3307 Computer Games
Computer Games takes an IT professional and computational view of the technology and industry of computer games. The focus is primarily upon the technological dimension - simulation, graphics, human computer interaction, AI, etc. - with lesser emphasis on the social and business dimensions. Further, the course contains a significant design & development theme – the generic and game specific principles of design will be examined; while students will critically analyse (from a design perspective) a successful game and develop their own game content. Finally, the course will expose students to the critical role that play has for healthy human development and the way that modern defence forces (and other organisations), including the ADF are employing serious games – utilising the technology of computer games to meet some of their training, education, recruitment, decision-support or other requirements.

ZEIT3308 The E-Warrior
Information Technology (IT) influences every aspect of modern warfare. This course 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 factors that influence design and acquisition of these technologies, the role of IT in military training and analysis, and challenges arising from the use of such technologies on the modern battlefield.

ZEIT3404 Simulation
Prerequisite: ZEIT1101
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.

ZEIT3405 Problem Structuring Techniques
Prerequisite: ZEIT2403
Most defence problems - especially strategic ones - are messy. This course will assist students to frame these problems in a coherent - mostly qualitative - manner. The course trains students to appreciate scope and structure issues that are poorly defined or understood through exploration of so-called soft operations research techniques so that reasonable proposals may be made for executive action in areas which cannot be logically solved. It will cover the following topics; Problems and Wicked Problems, Influence Diagrams and Decision Trees, Morphological analysis and Mind Mapping, so-called soft methods, Strategic choice approaches, robustness analysis, Drama Theory, Multi-methodology, and Case studies.

ZEIT3406 Quantitative Operations Research
Prerequisite: ZEIT2403
Operations research - a topic conceived in the Second World War by the US military - is the science of understanding and analysing problems to come up with a recommended course of action. It mimics the Military Appreciation Process. This course carries on from the course entitled “Operations Research” and trains students on the selection of appropriate techniques by describing the strengths and weaknesses of models and simulation, so that fit-for-purpose methods are applied to soluble problems. It will cover the algorithms used to solve hard OR problems including linear programming, transportation, assignment, integer programming, computational complexity including the theory of NP-completeness, combinatorial optimisation, nonlinear optimisation, dynamic programming, goal programming, multi-objective optimisation, and heuristics.

ZEIT3500 Engineering Structures
Prerequisite: ZEIT2504
This course extends the concepts of Mechanics of Solids to applications of Structural Mechanics in Aeronautical and Mechanical Engineering. The topics treated will include bending of indeterminate beams and unsymmetric beams, torsion and transverse loading of thin walled and stiffened structures, energy methods of structural analysis, failure analysis of metallic structures, introduction to fracture mechanics and fatigue behaviour.

ZEIT3501 Engineering Materials
This course deals with the selection and use of engineering materials for aerospace, civil and mechanical applications. Major topics include metals, timber, polymers, composites and concrete as engineering materials. The course covers the properties and behaviour, selection and use of these materials in broad engineering practice. It discusses the relationships between decisions made in design, materials selection, fabrication and sustainability of engineering structures. It provides guidance in the use of Codes and Standards in engineering practice and links with relevant design courses in Years 3 and 4.

ZEIT3502 Vibration and Control Engineering
Prerequisite: ZPEM2309
This course provides a foundation in modelling dynamics of engineering systems and leads to solution of practical problems in vibration and automatic control. Free body diagrams and energy methods will be shown. Solution of free and forced response will be investigated. Basic vibration analysis will be used to apply vibration isolation methods. Multiple degree of freedom systems including lumped parameter systems will be introduced leading to the eigenvalue problem and modal analysis. The course will enable students to design effective feedback control using a broad range of control design tools including mathematical modelling of system components, block diagram manipulation, linearisation, Laplace transform, root locus, frequency domain and state space techniques. Students will study practical controllers such as the PID controller.

ZEIT3503 Aerodynamics
Prerequisites: ZEIT2500, ZEIT2503, ZPEM2309, ZPEM2310
This course examines the behaviour of airfoils, wings, slender bodies and aircraft in incompressible and compressible subsonic as well as transonic and supersonic flows. Two dimensional flows over airfoil sections and other lifting bodies are explored using potential flow, and concepts such as superposition, vorticity, and circulation are developed.
Three-dimensional flows over wings and propellers are explored with lifting line theory, panel methods, and blade element theory. Compressible flow effects, shock-expansion theory, method of characteristics are explored.

**ZEIT3504 Aircraft and Systems Design 1**
This course introduces the requirements of designing to relevant standards and regulations. The phases of aircraft design are discussed before design specification development is undertaken. Students will undertake project planning, design report writing and technical presentations. Students will develop fixed wing aircraft using initial sizing parameters, to determine weight estimates, performance parameters, aerodynamic coefficients and physical dimensions. Students can then construct aircraft performance charts, and prepare initial stability and control plots. Refined sizing allows improvements of the design. Aircraft cost estimation methods are investigated. Trade studies can then ensure that the best design is achieved. Students will undertake an aircraft design project during this course.

**ZEIT3505 Flight Dynamics and Aircraft Control**
*Prerequisite: ZEIT2502*
This course will introduce the basic forces acting on the aircraft and their relevance to statics and dynamics of aircraft. The initial part of the course will deal with the static force and moment balance on the aircraft that leads to static stability concepts, the location of centre of gravity and the necessity for control surfaces for the aircraft. The second part of the course will deal with the dynamics of the aircraft under the influence of aerodynamic forces and moments. The mathematical modelling of the aircraft, its transfer functions, and aerodynamic stability derivatives are discussed. Stability augmentation and autopilots along with Handling Qualities of the aircraft as specifications for control design will be discussed. The effects of gust and practical implementation of control systems in aircraft will also be introduced.

**ZEIT3600 Structural Analysis**
*Prerequisite: ZEIT2504*
In this course, students will learn the fundamentals of the behaviour of elastic structures composed of line elements, i.e. skeletal structures, when subjected to various actions. They will become familiar with commonly used structures and will be able to analyse the effects of forces on various components such as frames, trusses, beams and beam-columns. Students will learn of the significance of deflections for structures and how they may be assessed using a variety of techniques. Students will also learn techniques to assess the post-yield behaviour of sections and how this behaviour may be used to assess the failure response of simple structural systems.

**ZEIT3601 Environmental Engineering**
*Prerequisites: ZEIT2602*
This course introduces the principles and applications of environmental engineering. It includes the fundamentals of environmental chemistry, microbiology, single species kinetics, interacting species and unit operations. Applications include studies of jets, wakes and plumes, dispersion of pollutants, surface water pollution, soil and groundwater contamination, air pollution and noise pollution.

**ZEIT3602 Geotechnical Design**
*Prerequisite: ZEIT1500*
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.

**ZEIT3603 Design of Steel and Timber Structures**
*Prerequisite: ZEIT3600*
This course introduces students to the design of common civil engineering structures in steel and timber. It sets out the design philosophy adopted by the Australian loading and material standards and relates these requirements to the physical behaviour of elements and assemblages. Students will develop the capacity to use codes of practice to determine the appropriate types of loads and combinations of loads affecting structures. They will learn how to design simple steel and timber structures for tension, bending and compression. Students will learn methods to achieve stability in frames, design for combined actions and also for torsion. Students will develop the capacity to assess and design a range of connections and also assess the fatigue resistance of components. They will discuss cases of structural failure as well as examples of safe and sustainable design.

**ZEIT3604 Project Management Civil Engineering**
*Prerequisite: ZEIT1501 or ZEIT1901*
This course introduces students to the underlying principles and practice of managing a variety of civil engineering design and construction projects. It covers tender document analysis, evaluation and production, quantity surveying, cost budgets, variations, reporting, building codes, project reporting, tools for programming, control and claims, and political as well as social and environmental dimensions. Students will learn facility design, information and management systems. They will also gain knowledge and skills in dispute resolution from a contractor and arbitrator perspectives.

**ZEIT3700 Mechanical Design 1**
*Prerequisite: ZEIT2504*
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 and damage tolerance are discussed. Students will be exposed to conceptual design of systems and subsystems and to design as a constructive, systematic, integrative process. Other topics to be covered include methods for design selection, requirement analysis and mathematical modelling and optimization. Relevant project-based domain topics will be covered. The course will be a blend of lectures, tutorials and studio-based design activity with individual and group activities.
ZEIT3701  Heat Transfer and Refrigeration
Prerequisite: ZEIT2503

This course develops an understanding of the heat transfer mechanisms of conduction, convection and electromagnetic radiation, as well as the thermodynamics of gas mixtures, humidification and air stream mixing.

These concepts are applied to ideal and real refrigeration and air conditioning cycles. A range of engineering applications involving steady and non-steady heat conduction, forced and free convection, and emission and heat transfer between black and grey bodies are examined with analytical and numerical techniques.

ZEIT3801  Advanced Aviation Safety
Prerequisite: ZEIT2803

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.

ZEIT3802  BTech Project and Practical Experience
Prerequisite: ZEIT1500, ZEIT1502

This project will take the form of a minor piece of research or investigation, feasibility study, or a literature review. The course will enhance students’ skills in research, task management and technical communication. Students must also have completed Practical Experience before being awarded any credit.

ZEIT3803  Air Traffic Management

The aim of this course is to introduce students to Air Traffic Management (ATM). Students will be introduced to fundamental concepts in ATM, including communications, navigation and surveillance (eNS) infrastructure, regulatory frameworks, and operational procedures. Students will also be introduced to contemporary issues in ATM, including concepts of ‘free flight’ and associated changes in ATM systems.

ZEIT3804  Behavioural Science Project and Practical Experience

This course centres on a project in the form of a minor piece of research or investigation applying behavioural science approaches in the field of aviation and human factors. The course will enhance students’ skills in research, task management and technical communication. Students must also have completed Practical Experience before being awarded any credit.

ZEIT3901  Engineering Research 3A

This course is restricted to students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Elec)(CDF), BE(Mech)(CDF), or BTech(Aero)(CDF) programs. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT3902  Engineering Research 3B

This course is restricted to students undertaking the BE(Aero)(CDF), BE(Civil)(CDF), BE(Elec)(CDF), BE(Mech)(CDF), or BTech(Aero)(CDF) programs. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT3903  IT Research Project 3

This course is restricted to those students undertaking the BIT(CDF) program. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT3904  IT Research Project 4

Prerequisite: ZEIT3903

This course is restricted to those students undertaking the BIT(CDF) program. Students undertake problem-based learning or research project on a nominated topic approved by the course authority 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, will manage each project. Final assessment will be based on a written paper and an oral presentation, with appropriate weighting.

ZEIT4001  Engineering Structures 2

Prerequisite: ZEIT3500

This course will provide an introduction to the Finite Element Method (FEM) and analysis. The theory section will consist of the application of the Direct Method, Energy Methods, Variational Methods and Weighted Residual Methods to structural analysis. Matlab will be used to solve simple FEM problems using the Direct Method. The students will be experimenting with modern FEM techniques using ANSYS to solve linear and non-linear structural and heat transfer problems, transient problems and modal analysis.

ZEIT4002  Sustainability of Concrete Structures

Prerequisite: ZEIT4602

This course is designed to demonstrate the role of durability in achieving sustainable concrete structures using real-life examples. Students will learn to apply and analyse the key principles of durability to create innovative sustainable concrete structures. Students will be able to demonstrate the ability to work and communicate efficiently in an engineering project team that aims to create the best sustainable solutions.
ZEIT4003  Computational Fluid Dynamics  
Prerequisite: ZEIT2500, ZEIT2503, ZEIT2602  
This course provides a hands-on introduction to Computational Fluid Dynamics using Matlab and a variety of commercial CFD codes such as Fluent, CFX, or Flowizard. Treatment of different flow regimes such as incompressible/compressible, steady/unsteady, laminar/turbulent is examined. Numerical techniques such as panel methods, finite difference and finite volume methods are developed. Numerical error, stability, convergence, and automatic and manual grid generation strategies are examined in the application of CFD to engineering problems.

ZEIT4004  Geosynthetics and Ground Improvement  
Prerequisite: ZEIT3602  
This course presents the design and implementation of a range of ground improvement technologies including the use of geosynthetics. It addresses: soft soil engineering; PVD and surcharging; soil reinforcement; geosynthetics; drainage and filtration design using geosynthetics; design of unsealed roads using geosynthetics; reinforced soil wall, reinforced soil slope; reinforced embankment on soft clay; and case histories.

ZEIT4006  Structural Integrity Assessment  
Prerequisite: ZEIT3500  
This course provides an overview of structural integrity assessment for Aerospace and Mechanical engineers, starting with an introduction to Non-Destructive Inspection techniques. The traditional NDI techniques employed in the ADF for structural integrity assessment including liquid penetrants, ultrasonics, magnetic particle, radiography and eddy current testing will be covered and some new and emerging health monitoring methods will be introduced. This will be followed by an introduction to Fracture Mechanics and Fatigue and their applications to damage tolerance and durability assessment.

ZEIT4008  Integrated Mechanical Design  
Prerequisite: ZEIT3700  
This course consists of a module on road vehicle dynamics and an integrated design module using CATIA Mastering the use of this package is a required outcome. Individual students will each design one component of the FSAE car as part of a real design team. Individual designs must be acceptable to the design leaders.

ZEIT4011  Occasional Elective 1  
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.

ZEIT4012  Occasional Elective 2  
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.

ZEIT4013  Hypersonics and Advanced Propulsion  
Prerequisite: ZEIT2500, ZEIT2503  
This course presents an overview of the important elements of hypersonic aerodynamics and propulsion. It builds upon the foundations of the compressible flow course but concentrates upon those aspects that are specific to flows at speeds greater than Mach 5.

The overall purpose of the course is to provide students with the background required to appreciate the current state of hypersonic research and to anticipate future developments in the field. Knowledge of compressible flows as covered in ZEIT3503 is very helpful, but not essential. Some computer programming experience in the Matlab environment is also desirable.

ZEIT4014  Impact Dynamics  
Prerequisite: ZEIT2504  
Impacts (where two or more bodies collide at velocity) are generally undesirable! During a high-velocity collision, structures will bend, materials can fail and people can get hurt. Therefore, understanding the mechanics of impact is important for both civilian and defence communities. In this course we will review how the science of impact has helped us understand ways of making better protective structures. We will also examine the effects that shock waves have on materials and how knowledge of the material failure mechanisms can help us design stronger structures.

ZEIT4101  Computer Science Honours Special Topic 1  
UOC12  
The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student's Honours dissertation will be framed.

ZEIT4102  Computer Science Honours Special Topic 2  
The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student's Honours dissertation will be framed.

ZEIT4103  Computer Science Honours Special Topic 3  
The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student's Honours dissertation will be framed.

ZEIT4104  Computer Science Honours Special Topic 4  
UOC12  
The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student's Honours dissertation will be framed.

ZEIT4215  Occasional Option 1: Underwater Communications  
ZEIT4216  Occasional Option 2
The syllabus for these courses 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.

ZEIT4217  Occasional Option 3
The syllabus for these courses 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.

ZEIT4218  Occasional Option 4
The syllabus for these courses 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.

ZEIT4222  Systems Engineering
Systems Engineering provides a framework within which to develop an understanding of the processes and management practices 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).

ZEIT4224  Electrical Power, Machines and Power Electronics
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.
Power Semiconductor Devices; AC to DC converters; DC to DC switch-mode converts. Rotating mmf waves in AC machines, synchronous machines, principles of operation and equivalent circuit, steady-state behaviour; real and reactive power; induction motors - rotating mmf, basic principles of operation, equivalent circuit, torque-speed characteristics. DC to AC inverters; induction motor drives - speed control by varying stator frequency and voltage; variable reluctance and stepper-motor drives; synchronous servomotor drives.

ZEIT4225  Satellite Communications
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 calculate digital transmission rates with respect to line codes, intersymbol interference, pulse shaping and equalisation, bit energy-to-noise density and error probabilities.

ZEIT4226  Digital Image Processing and Enhancement
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; interactive image restoration; blind deconvolution; 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.

ZEIT4227  Radar Techniques and Applications
Radar Fundamentals: Range, backscatter, noise, clutter, range equation, radar cross section (RCS). Backscatter characteristics of targets (eg. aircraft, ship and tanks) and clutters (eg. sea, land and rain). Low reflection materials. Radar Systems: CW/FM radar, Doppler, range and frequency resolution. Pulse radar, pulse width, PRF, signal spectrum, ambiguities in range/Doppler, pulse integration. MTI radar, non-coherent and coherent detection, matched filter, pulse compression. Imaging radar, range and cross-range resolution, image formation and characteristics, distributed and point targets, inverse imaging, focussed and unfocussed SAR and ISAR system design, airborne/ spaceborne SAR platforms. Data Analysis: noise removal, error correction, feature selection and feature extraction, data fusion and image segmentation, Gaussian maximum likelihood classification. Applications: stationary and moving targets detection, targets recognition, tracking and surveillance, earth resources monitoring.

ZEIT4229  Navigational Systems: Theory and Practice
This course examines current navigation systems. Focussing specifically on inertial and GPS sensors it initially explores how these sensors work, and the requirements levied on navigation systems. The course then delves into the techniques that are used to improve navigation performance in the face of noise and bias in several inputs. These techniques employ the class of estimation algorithms known as Kalman filters and extended Kalman filters. The course provides an in-depth introduction into these techniques and is supported by appropriate laboratory and simulation exercises to illustrate the behaviour or application of each system or technique. The course concludes by examining the benefits that estimation techniques provide in real world systems.
ZEIT4230  Electrical Engineering Design Practice
Prerequisites ZEIT1206, ZEIT2207, ZEIT3216

In this course the knowledge and skills gained in the three Design of Electronic Circuits (DEC) courses and other specialist Electrical Engineering courses throughout the first three years of the Electrical Engineering program are applied to solve a specified electronic system design task. Students work individually and in small groups to design, construct and test various sub-systems, and then integrate these components to produce the final system solution. A strong project management philosophy underpins the engineering approach adopted in this course. The final stage of the course focuses on an evaluation of the design methodology, the completed system’s performance as compared to the initial requirements, and a reflection of the overall project experience and lessons learned.

ZEIT4297  Electrical Engineering Project Extension
Prerequisite: ZEIT4298
Corequisite: ZEIT4299

This course is an expansion into the second semester of the Project-Thesis topic ZEIT4299. Students must have completed ZEIT4298 and be enrolled in ZEIT4299. The approval of the School is required for enrolment in this course. It extends the amount of time and credit associated with the major research task in the final year of the degree, whereby students who have a suitable project topic and who have shown very good progress in their first semester of ZEIT4298 may be invited to expand the scope of their work. As with ZEIT4299, the Project affords the opportunity to take the skills and knowledge from other courses in the degree, and forge a contribution by research and/or development to the discipline. Students can take significant ownership of an expanded body of research, and reflect this to the wider community by presentation and written thesis. Evidence of sufficient progress may be required from time to time.

ZEIT4301  Information Systems Honours Honours Special Topic 1
UOC12

In the Combined Honours programs students 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, students are required to complete coursework as approved by the Head of School. Students will enrol in this course for two semesters and receive a total of 24UOC upon successful completion.

ZEIT4302  Information Systems Honours Special Topic 2

The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student’s Honours dissertation will be framed.

ZEIT4303  Information Systems Honours Special Topic 3
UOC12

The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student’s Honours dissertation will be framed.

ZEIT4304  Information Systems Honours Special Topic 4

The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student’s Honours dissertation will be framed.

ZEIT4401  Operations Research Honours Special Topic 1
UOC12

The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student’s Honours dissertation will be framed.

ZEIT4402  Operations Research Honours Special Topic 2

The student will undertake coursework within the School that will inform them on topics that are relevant to the research area in which the student’s Honours dissertation will be framed.

ZEIT4500  Engineering Project A

This is a capstone course in the degree. The Project affords the opportunity to take skills and knowledge from other courses in the degree, and forge a contribution to the student’s discipline by a research investigation, a feasibility study, a design project or a comprehensive literature review and analysis project, chosen from a list of topics approved by the Head of School. Where appropriate, a topic may be of a military nature. Students can take significant ownership of an original piece of work, and reflect this to the wider community by presentations and a written thesis. A staff member is nominated as a supervisor to provide guidance and general supervision. Project management techniques will be adopted and assessed in the implementation of the project. A series of briefings will be used to expose the students to basic research strategies and techniques. Evidence of sufficient progress may be required from time to time.

ZEIT4501  Engineering Project B

This is the second half of a year-long course. Students must also have completed ZEIT4500 Engineering Project A before being awarded any UOC.

ZEIT4502  Aircraft and Systems Design 2
Prerequisite: ZEIT3504

Students in Aircraft and Systems Design 2 will be introduced to the design of aircraft structures and integration of aircraft systems into an aircraft. The course first develops an understanding and application of aircraft loading actions and the construction of the V-n diagram. The course will then cover the methods of sizing typical aircraft structures. Details of military and civilian aircraft airworthiness and certification requirements, and the associated legal issues in aircraft design, with particular emphasis to structural requirements, are presented by specialist guest lecturers. Basic principles and practices of aircraft systems design and integration will follow. Students will develop their skills in this phase of aircraft design with project work.
ZEIT4503 Applied Thermodynamics and Propulsion
Prerequisite: ZEIT2500

Thermodynamic analysis is used to examine a range of power cycles including internal combustion engines and gas turbines. Different levels of analysis will be used including air-standard and cold-air-standard. The thermodynamics of gaseous combustion processes will be explored.

The majority of the course will apply these analysis techniques to the gas turbine cycle, and its range of applications including aircraft and marine propulsion and power generation.

ZEIT4505 Mechanical and Aeronautical Engineering Management

This course covers engineering management activities and the engineer's professional responsibilities, during development, acquisition and sustainment of aeronautical and mechanical hardware systems.

The engineer's role in a project team, scope development, task and schedule management, resource planning, procurement and financial management are explored through practical exposure to developing work breakdown structures, sequencing of tasks, scheduling resources and quality and risk management. Sustaining hardware in service is addressed through use of technical integrity based maintenance management techniques including maintenance strategies, repair or replacement decision making, condition monitoring and technical management information systems. Learning areas are reinforced by participation in a product life cycle team project and analysis of in-service maintenance case studies.

ZEIT4600 Civil Design Practice

HPW5

Scrutiny of the Bachelor of Civil Engineering (Hons) reveals that it is currently highly focussed on engineering science and technical courses with limited integration of topics in comparison with real world practice. Engineers today must constantly deal with regulatory uncertainty, data limitations, and evolving methodologies, as well as a range of conflicting demands and opinions from clients, governments, public authorities and the community. Consequently, they need to understand (and be able to apply) sound engineering principles to the projects they undertake.

These principles involve technical competence, ethical practice, appropriate management, professionalism, courtesy, safety awareness and thoroughness of task execution. Relevant skills include (but are not limited to) problem solving expertise, proficiency in liaison and negotiation (with both professional bodies and individuals), research and report preparation competence, and good communication ability.

In addition, engineers must be able to cope with continual technological and organisational change in the workplace and the commercial realities of industry practice. They should also be generally aware of the legal and environmental consequences of their professional actions, and exhibit a commitment to ongoing learning and contributions to their organization, profession, and the community.

In order therefore to facilitate the transition of the final year students and prepare them for the tasks they will likely face once they join their respective services, an Integrated Design Platform course (6 UOC) is offered as an alternative to final year thesis work for qualifying students who wish to undertake it.

The course is a project based learning (PBL) option, and aims to enhance the process of learning through authentic problem solving.

Students pursuing this course will be required to work in teams and to attend seminars and possible occasional field visits external to timetabled course sessions, during both semesters. These may include both professional meetings and leadership seminars.

Scheduled session contact is 6 hours per week, but up to a further 8 hours per week of additional designated consultation periods for individuals or groups will normally be available at flexible times to be advised and agreed to during the sessions.

ZEIT4601 Civil Design Practice Extension

HPW5 Prerequisite: ZEIT4600, ZEIT3600

This is the second half of a year-long course. Students must also have completed ZEIT4600 Integrated Design A and Practical Experience (now called Civil Engineering Practice) before being awarded any UOC.

ZEIT4602 Design of Concrete and Prestressed Concrete Structures

Prerequisite: ZEIT3600

This course starts by introducing and discussing concepts and methods of reinforced concrete design. Students will learn how to analyse and design rectangular and flanged reinforced concrete beams. The acquired skills will be used by the students to design one-way slabs. Deflections of beams and one-way slabs will be analysed and designed for. The skills developed at this stage enable students to learn correct detailing and presentation of their design work.

Students will then learn the philosophy and methods of design of two-way reinforced concrete slabs which includes designing for punching shear in flat plates and flat slabs. Students will then be introduced to the design of short and slender reinforced concrete columns and will develop the capacity to design columns for a axial and biaxial effects. This part naturally concludes with principles and methods used in designing reinforced concrete footings. Prestressed concrete will be introduced to the extent of familiarising students with its concepts through simple design examples.

ZEIT4603 Finite Element Methods

Prerequisite: ZEIT3600

These days the analysis of all but the simple structures is carried out with the aid of computer programs based on the finite element method (FE). The user of the FE method has to decide what kind of elements should be used, and how many of them? Where should the mesh be fine and where may it be coarse? Can the model be simplified? How accurate will the answers be, and how can they be checked? One need not understand all the mathematics of the finite element to answer these questions. However a competent user must have an understanding of the preliminary mathematics and must be able to understand how elements behave in order to choose suitable kinds, sizes and shapes of elements, and to guard against misinterpretations and unrealistically high expectations. This course is a balanced theoretical and practical introduction to the use of the FE method. The first chapter deals with matrix structural analysis, which is the ancestor of the finite element method. The second chapter deals with finite element approximation and numerical integration.
The third chapter is an application of the finite element method to linear plane elasticity problems. The fourth chapter deals with the analysis of thin and thick plates, which are commonly used in civil engineering as floor slabs. All the chapters include computational work in which problems are to be solved using Matlab and specialised software, such as Multiframe and ABAQUS.

**ZEIT4604 Hydrology and Environmental Engineering Practice**

Prerequisite: ZEIT1502

This course exposes students to principles and practice of importance to environmental and water resource management. Topics include: hydrological processes in surface and groundwater, precipitation, runoff, evapotranspiration, infiltration, recharge and discharge, practical applications of hydrology, principles of water resources assessment, engineering solutions to environmental problems.

This course also examines studies of wastewater and water treatment unit processes, air pollution management, contamination investigation and monitoring, environmental management, economics, legislation and environmental impact assessment.

**ZEIT4605 Foundation and Pavement Engineering**

Prerequisite: ZEIT3602

This course consists of two modules. Students have to pass in both modules.

Module 1: Geotechnical design. It covers: nonlinear stress-strain-strength relationship; unsaturated soil mechanics; sheetpile wall; limit state design in geotechnics; shallow footing subject to significant horizontal load; and deep foundation.

Module 2: Pavement Design. It covers: natural materials for road and airfield pavement construction; investigation and field testing for pavements; bituminous materials; rigid and flexible roads and airfield pavements; structural design of unsealed and sealed pavements; pavement evaluation and maintenance, and introduction to pavement management.

**ZEIT4700 Mechanical Design 2**

Prerequisite: ZEIT2501

The course will involve the application of engineering knowledge and methods to the design of complete machines. The course will be delivered as a blend of lectures, tutorials and studio based design activity with individual and group activities.

**ZEIT4702 Instrumentation**

Prerequisite: ZEIT1502

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; and 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.

**ZEIT4901 Engineering Research 4A (12UOC)**

Students will undertake a problem-based learning project of scope commensurate with the level of attainment expected of a final-year 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. Students will be assessed through their seminar presentations, attended by other students and members of staff, and the project thesis. Evidence of sufficient progress may be required from time to time. The thesis, which will have a nominal length of 20,000 words, is to be presented both typed and suitably bound and in electronic form.

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.

This is the first half of a year-long course.

**ZEIT4902 Engineering Research 4B (12UOC)**

Prerequisite: ZEIT4901

Students will undertake a problem-based learning project of scope commensurate with the level of attainment expected of a final-year 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. Students will be assessed through their seminar presentations, attended by other students and members of staff, and the project thesis. Evidence of sufficient progress may be required from time to time. The thesis, which will have a nominal length of 20,000 words, is to be presented both typed and suitably bound and in electronic form.

This is the second half of a year-long course.

**ZEIT6521 Digital Signal Processing and Control**

Signal Interpretation in Time and Frequency; Sampling Techniques; Interpolation and Decimation; Sampling from frequency domain and state-space perspectives; Review of Z and Laplace transform techniques; Transfer Functions; Poles and Zeros; Observability; Convolution, Correlation; Disturbance models and random processes.

Digital Filters: FIR and IIR filter design and implementations; State-Space design of filters and observers; Pole placement techniques; Fast Fourier Transform algorithms; FFT based filter implementations; Advanced filtering techniques and applications. Design of Digital Feedback Control Systems: State feedback control design; State estimation and observers; Output feedback controller design; Linear quadratic optimal control; Kalman Filters and modern optimal filtering theory.
ZEIT6552  Electrical and Mechanical Plant  
Prerequisite: ZEIT2501  
This course gives students a practical understanding of electrical and mechanical plant.  
Topics include:  
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, electrical power distribution.  
Mechanical plant: principles of design and machine selection. Mechanical power for electric generators and alternators. Prime movers; water turbines; constant-speed drives. Heating, ventilation and air conditioning plant:  
water-handling and air-handling plant; environmental control.  
Lifting and carrying plant: cranes, gantries, forklift and straddle trucks; surface and air vehicles for heavy transport. Manufacturing plant: processing of raw materials through to assembly of finished products.  
ZEIT6551  Rotorcraft Engineering  
Prerequisite: ZEIT1502  
Students will be exposed to a number of topics in rotorcraft engineering. Basic helicopter configurations, such as co-axial, tandem and autogyro, are compared. The course starts with actuator disc theory and moves to more sophisticated blade element techniques for both vertical and forward flight. Special cases include autorotation and flight in ground effect. Students are introduced to the use of dimensional analysis to reduce rotorcraft flight test data and standardise test results.  
Design considerations such as ground resonance, crash worthiness and fatigue safe life will also be discussed.  
Linearised models of helicopter dynamics are developed proceeding to useful conclusions regarding helicopter stability and flight control.  
ZEIT6552  Advanced Rotorcraft Engineering  
Prerequisite: ZEIT6551  
This course aims to develop an understanding of the dynamics of the helicopter and how improvements in the dynamics can be made. The course covers helicopter flight dynamics, modelling, simulation, vibration and the stability and control of helicopters. The causes, identification and rectification of helicopter vibration problems will be examined. Introduction of aerelastic effects in the rotor system will be provided so that students are able to understand dynamic effects such as flap-lag flutter, ground and air resonance.  
To begin with, a brief review of helicopter aerodynamics will be carried out. Equations of motion of the helicopter will be derived. The structural and inertial coupling terms in the equation of motion will be identified. The aerodynamic stability derivatives and their relations to the stability and performance of the helicopter will be analysed. Dynamics of the helicopter will be studied in the presence of wind disturbances. To provide better understanding of the subject, students will be asked to develop a simulation model of the helicopter in the Matlab Simulink environment.  
The approach will be to build individual components of the helicopter using first principles method and then combine the individual components to form a complete nonlinear simulation model.  
The course assumes that the students have a preliminary knowledge of helicopter aerodynamics. Some computer programming experience in the Matlab environment is highly recommended.  
ZEIT6571  Land Mobility and Weapons  
Prerequisite: ZEIT1502  
This course provides an introduction to the principles of military land mobility and the impact of weapons on these platforms. Students will be exposed to a range of issues including general design requirements, terramechanics, mobility, counter mobility, reliability, vulnerability and survivability. The course will be delivered through a combination of lectures and tutorials. The course is a hybrid course in which enrolments by students in undergraduate and postgraduate programs is permitted.  
ZEIT6572  Land Vehicles  
Prerequisite: ZEIT1502  
This course, following on from Land Mobility and Weapons provides an analytical foundation for Land Vehicle Design. Students will be exposed to a range of issues including propulsion choices and vehicle dynamics. The course will be delivered through a combination of lectures and tutorials. The course is a hybrid course in which enrolment by students in undergraduate and postgraduate programs is permitted.  
ZEIT6573  Naval Architecture  
Prerequisite: ZEIT1502  
This course provides an introduction to the principles of naval architecture and ship design. Students will be exposed to a range of vessels and their behaviours. Key topics include ship stability, ship structures and the ship performance. The course will be delivered through a combination of lectures and tutorials. The course is a hybrid course in which enrolment by students in undergraduate and postgraduate programs is permitted.  
ZEIT6574  Marine Project  
Prerequisite: ZEIT1502  
This course provides an introduction to the principles of Marine Engineering and ship operations. Students will be exposed to a range of system configurations and their characteristics. Key topics include ship propulsion systems and auxiliary ship systems and equipment. The course will be delivered through a combination of lectures and tutorials. The course is a hybrid course in which enrolment by students in undergraduate and postgraduate programs is permitted.  
ZGEN2215  Law, Force and Legitimacy  
School of Humanities and Social Sciences  
Pre-Req 36 UOC  
The course will provide a detailed overview of international humanitarian law, and the legal obligations it imposes on states and armed forces prior to and during conflict. It provides a detailed introduction to the historical development of international humanitarian law, its key obligations, and the debate surrounding its creation.
It then surveys a series of related ethical, legal and operational challenges raised by new forms of conflict and military operations including counterinsurgency and counter-terrorism, stability and reconstruction operations, humanitarian interventions and complex emergencies, conventional war-fighting, and air operations. Rather than narrowly treating ethical issues in terms of legal obligations, it explores how ethical questions have become central to strategic success.

ZHSS1102 English 1B: Literature and Power

Writers have always addressed political issues, from supporting or resisting revolution, to analysing the ethics of war or the sophistries of diplomatic language, to attacking the class politics of industrialisation, the exploitative dimensions of empire, sexual inequalities, prejudice and domestic violence. Literature has also drawn attention to the nexus between power and language: the ways in which language masks ideology, normalises inequality and stifles dissent. This course is designed to spotlight a series of central political issues with which writers have engaged from the Renaissance to the present.

ZGEN2222 Introduction to Strategic Studies

School of Humanities and Social Sciences

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.

ZGEN2240 Introduction to Military Ethics

School of Humanities and Social Sciences

Pre Req 36 UOC

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.

ZGEN2801 Strategy, Management and Leadership

School of Business

Pre Req 36 UOC

This course explores the ways that organisations set their strategic objectives (strategy), organise themselves to achieve those objectives (management) and secure the willing support of people who can effect mission accomplishment (leadership). During their careers, ADF officers can expect to play important roles in the management of Defence, but they will also have to interact with business firms, government departments and volunteer organisations.

This multi-sector ‘mini-MBA’ course prepares them for doing so, by developing a broad understanding of strategy, management and leadership in military, business, government and volunteer organisations.

ZHSS1101 English 1A: Literary Studies

This course is designed to develop the critical thinking and writing skills needed to study English at university.

We will read material from a range of written and audiovisual material. We will consider, in particular, the way that language and metaphor influences our understanding of the world.
ZHSS1303 Intermediate Indonesian 1C

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.

Prerequisite: ZHSS1101 and ZHSS1102

ZHSS1304 Intermediate Indonesian 1D

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 an understanding of Indonesian cultures and societies.

Prerequisite: ZHSS1303

ZHSS1401 IPS1A: Ideals, Interests and Power

Ideals, Interests and Power are central concerns in the study of Politics. This course offers you the opportunity to gain insights into these concerns. You will learn to think critically about power: what is it, and how is it allocated? How do people and countries struggle for it? What values motivate them? What are national interests? How are these interests pursued domestically and in the international arena? How ought we to organise our collective lives? You will be exposed to the discipline’s best answers to these and other questions. This course draws on Australian and international examples to help you gain an overview of ‘Who gets what, when and how’ – the fundamental questions of International and Political Studies. Students are not required to have any specific background qualifications in International and Political Studies.

Prerequisite: ZHSS1402

ZHSS1402 IPS1B: World Politics

This course introduces 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?

Prerequisite: ZHSS1101 and ZHSS1102

ZHSS2104 Studies in the Media

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.

Prerequisite: ZHSS1101 and ZHSS1102

ZHSS2108 Dream and Disillusionment: American Literature

This course is designed to familiarise students with some of the most significant and influential authors and works of American literature. The question of what it means to be ‘an American’ will be explored from a range of perspectives, against a background of the history, culture and politics of the United States from white settlement to the present.

Prerequisite: ZHSS1101 and ZHSS1102

ZHSS2120 Heroism, Banditry and Manhood: Adventures in Film

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.

Prerequisite: ZHSS1101 and ZHSS1102

ZHSS2133 Another Country: Australian Literature

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.

Prerequisite: ZHSS1201 and ZHSS1202

ZHSS2201 East Asia: Between Tradition and Modernity

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.

Prerequisite: ZHSS1201 and ZHSS1202

ZHSS2204 Rise of Modern Navies and Sea Power

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
Prerequisite: ZHSS1201 and 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.

ZHSS2209 The Making of Contemporary Society
Prerequisite: ZHSS1201 and 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, gender and protest in Australia, the United States, and the United Kingdom. We will also examine the impact of the Vietnam War and political and social movements on the making of contemporary society.

ZHSS2210 The Origins of Modern War
Prerequisite: ZHSS1201 and 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.

ZHSS2217 Genocide: Crime of Crimes
Prerequisite: ZHSS1201 and ZHSS1202

Genocide is known as ‘the crime of crimes’. This course gives students an understanding of the history of genocide in the modern world from the early twentieth century to the present. Students explore the origins of the concept and its definition in humanitarian law (the UN Convention). The course compares several case studies to examine various themes: the changing face of genocide; motivation of perpetrators; moral dilemmas of victims and bystanders; the link with war and ideology; and how intervention, prevention and punishment challenge the international community. Students engage with many primary sources and interdisciplinary debates in a rich scholarship.

ZHSS2221 Ireland and Britain: 1798-1998
Prerequisite: ZHSS1201 and ZHSS1202

This course examines conflicts over nationality and identity in Ireland since 1798. 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 United Irish rebellion of 1798 to the Good Friday Agreement 200 years later, which appears to have laid the basis for a lasting peace.

Throughout, we will focus on the changing relationship between politics and violence in the conduct of these conflicts. 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 India: From the Mughals to the Mall, 16th-21st Century
Prerequisite: ZHSS1201 and 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 The Road to Ruin? Germany1870-1933
Prerequisite: ZHSS1101 and ZHSS1202

This course will examine the rise of the state of Prussia from the 18th century; the unification of Germany by Bismarck, the development of the German Empire and its destruction in World War I. It will study the growth and influence of German military, political, economic and cultural power, and examine the role of this period in the long-term causes of Nazism.

ZHSS2229 Russian History: Medieval to Modern Times
Prerequisite: ZHSS1201 and ZHSS1202

This course explores Russia’s dramatic history from medieval to contemporary times. It features fearsome leaders from Ivan the Terrible to Stalin and reformers from Peter the Great to Gorbachev. Thematically, it examines the centrality of war, geopolitics, and revolution in Russia’s history. As a case study of geopolitics in action, the course investigates the dangerous “Great Game” played between Russia and other Great Powers for dominance in Central Asia. The Revolution of October 1917 ushered in Lenin’s utopian socialist experiment. Stalin’s collectivisation, forced industrialisation and the purges, however, destroyed the economy utopian dreams. For all its flaws, the USSR still played the critical role in defeating Hitler in World War 2. Studying Russia’s history provides important clues for understanding the challenges Russia faces today in a new geopolitical scenario.

ZHSS2230 Contemporary African History
Prerequisite: ZHSS 1201 and ZHSS 1202 or approval of Head of School HASS

This course is an introductory survey to the history of contemporary Africa. It studies the main historical forces that have shaped African lives over the last two centuries. It uses specific country case studies to develop students’ knowledge of the region. It will examine the major epochs of colonialism, decolonization and post-colonial independence, combining chronological and conceptual approaches. It will give students an understanding of the key themes of modern African history including the role and nature of the state in Africa; national identity, ethnicity and religion; economic development and underdevelopment; nation building and ‘failed states’; national sovereignty and international interference. It will give students an understanding of the complex historical background to contemporary crises and conflicts in Africa.
ZHSS2231  US Military History: Colonial Times to the Present
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 warmaking, and the political economy of the US military, amongst others. It will conclude with consideration of developments since the September 11 attacks.

ZHSS2232  The British Empire at War: 1750-1971
Prerequisite: ZHSS1201 and ZHSS1202
This course examines the military history of the British Empire from its rise during the wars with France (1750-1815) to its dissolution in the 1960s. Concentrating mostly on wars outside Europe, the course covers a diverse range of conflicts including India and the West Indies in the 1790s, Afghanistan and South Africa in the 1830s, China and New Zealand in the 1860s, Iraq and Ireland in the 1920s and Cyprus and Borneo in the 1960s. The course will consider the military factors that both enabled the creation of the world’s greatest empire and led to its demise. As well, the military history of British Empire provides the context for the Australian experience of war and the development of Australian military institutions.

ZHSS2233  Assault from the Sea: The History of Amphibious Warfare
Prerequisite: ZHSS1201 and ZHSS1202
We will study the history and nature of amphibious warfare from the advent of global maritime power projection to the post-Cold War era of expeditionary and littoral warfare. The emphasis will be on the strategic and especially the operational level of warfare in understanding what makes for successful amphibious capability. The approach will utilise case studies progressing chronologically from the age of sail up to contemporary and current regional developments, and drawing on the maritime conflicts of early modern Europe, the Napoleonic Wars, the two World Wars, Korea, Vietnam, the Falklands, and the Iraq War. This will provide the opportunity to address such issues as why amphibious operations succeed or fail, the developing theory of amphibious warfare, amphibious command and commanders, the experience of amphibious warfare, the contrasting effects of geography on amphibious warfare (e.g. the European and Pacific theatres in WW2), the development of a specialist amphibious military culture, and the potential of amphibious warfare to change history (e.g. Normandy 1944).

ZHSS2234  Civil War: Societies in Conflict
Prerequisite: ZHSS1201 and ZHSS1202 or with permission from HoS
Civil wars are inherently complex and hard to define, spanning wars of national liberation, insurgency, and sucession as well as political and social violence involving non-state actors in weak, fragile or failed states.

The real determinants of violence are often overlapping, including ethnic and religious division, economic inequalities, class, social or political exclusion, and competition for scarce natural resources. Drawing on a selection of case studies from different historical periods and regions, this course investigates the dynamics and drivers of civil wars, the course and conduct of particular conflicts including the strategies used by armed factions to sustain conflict, and their localised and international impact.

ZHSS2301  Indonesian 2A
Prerequisite: 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.

ZHSS2302  Indonesian 2B
Prerequisite: 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
Prerequisite: 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 courses 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
Prerequisite: ZHSS2303
This 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.

ZHSS2403  Politics of China
Prerequisite: ZHSS1401 and ZHSS1402
China is an emerging world superpower ruled by a communist regime. It is currently the world’s second largest economy, has the largest standing army in the world, and is an increasingly consequential power in international affairs. Whatever developments occur in Chinese politics are bound to affect Australia along with the whole Asia-Pacific region. This course aims to introduce students to the politics and government of contemporary China. Part one examines China’s political history from the collapse of the imperial Chinese system to the present day. Part two explores China’s current political system, focusing especially on the main players, the policy-making process and the role of the military. Part three examines major challenging issues in China’s current domestic politics and foreign relations.
ZHSS2408  Civil-Military Relations in the Asia-Pacific Region
Prerequisite: ZHSS1401 and 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
Prerequisite: ZHSS1401 and ZHSS1402
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 political ideologies. 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.

ZHSS2412  Politics of Australian Security
Prerequisite: ZHSS1401 and 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.

ZHSS2416  The Comparative Politics of Southeast Asia: Political Transition and Political Change
Prerequisite: ZHSS1401 or ZHSS1402
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.

ZHSS2423  Key Political Thinkers
Prerequisite: ZHSS1401 and ZHSS1402
What is a good life? How should we live together with others? When and how is the use of power justified? These fundamental questions of how human relations should be structured and managed have a long and important history, and continue to engage people today in the quest to overcome authoritarianism and tyranny. By focusing on some of the most important and influential political thinkers over the last two and a half millennia, this course will examine how they both introduced and addressed the fundamental questions of politics.

We will see how these thinkers not only have an enduring legacy in the fields of domestic politics, security and international relations, but also how they have helped shape our view of the world today.

ZHSS2424  The Application of Air Power
Prerequisite: ZHSS1401 and ZHSS1402
In the history of organised conflict, the use of air power is a relatively recent development. Nevertheless, air power has proved to be a major element of conflicts over the past seven decades, and has now become a critical part of the national security strategies of many states. This course will examine the changing roles of air power in 20th century wars, the place of air power in achieving military and national strategic objectives, and the challenges of applying air power in current and future conflicts, especially those where force may not be the deciding factor.

ZHSS2427  Politics of the Great Powers
Prerequisites: ZHSS1201 and ZHSS1202, or ZHSS1401 and ZHSS1402
This course studies the role of great powers - established and emerging powers - in shaping regional and world orders. The policies and strategies of great powers are examined as are the interactions between them. Attention is given to the theory and history of great power behaviour, the distinction between ‘hard’ and ‘soft’ conceptions of power, and the key issues confronting the great powers in contemporary global politics.

The following themes and questions will be explored throughout the course: What role have great powers played in maintaining or destabilising order and justice in international society? What do we mean by ‘power’ and what makes one ‘great’: is it military strength, economic strength, or something more? How should great powers behave? What ought to be the rights and responsibilities of great powers?

ZHSS2428  The Great Clashes that Define Us: Ideology in Australia
Prerequisite: ZHSS1401 and ZHSS1402
This course introduces students to the great controversies of Australian politics. It will give you the opportunity to understand the debates, the history, and to decide where you stand.

The course introduces the big debates through a historical approach. Most of the key divisions in Australian politics have evolved over many years. Whether we are debating democracy, the beliefs of the major parties, economic equality, free markets, unions, race, multiculturalism or feminism, there is a long history. We start at Federation and we follow the debates through, watching how they evolve to the current day. This allows you to follow the big personalities, the big issues and the big ideas through time.
The course also takes a theory approach, introducing you to the major schools of western political thought that have driven these debates. It gives you an overview of the major schools of political theory and explains how they developed in response to practical politics. It allows you to compare these different schools of thought, explore the ideas in their real life context, and learn how the ideas played out in practice when reforms were rolled out in Australia.

ZHSS2503 State Systems in Pre-Colonial Southeast Asia
Prerequisites: 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 in International and Political Studies. It may be taken as part of a major in History with the permission of the Head of School.

ZHSS2504 Popular Culture in Indonesia
Prerequisites: Any two of ZHSS1102, ZHSS1202, ZHSS1302, ZHSS1304, ZHSS1402 and ZPEM1202

This course covers Indonesian popular culture such as literature, independent film and sinetron soap opera, as well as other Asian popular genres that are influential in Indonesia, such as Indian Bollywood films, Japanese manga comics and Hong Kong martial art movies.

It will analyse the role of these genres as commercial commodities, works of popular art, and mediators of historical events and identities. Themes include the Indonesian media business; the circulation of foreign Asian pop culture in Indonesia; the mediation of daily life, politics, gender, religion and ethnicity; and critiques of and alternatives to the pop culture industry.

The course will demonstrate both the potential of and limits to popular culture for promoting and representing various aspects of Indonesian civil society. Indonesian major students will be required to read some materials in Indonesian.

ZHSS2506 Indonesian Peripheries
Prerequisites: Any two of ZHSS1102 or ZHSS1202 or ZHSS1302 or ZHSS1304, ZHSS1402 and ZPEM1202

Indonesian peripheries were created out of anti-colonial nationalism. The fragile territorial boundaries and the artificial sense of belonging have led to the implementation of centralistic government policies for more than half a century. Jakarta has become the socio-economic and political power centre, marginalising various ethnicities and regions. This course will critically examine the process of making of various socio-economic and political peripheries in Indonesia through various government policies and development projects. It will also analyse how marginalised regions and ethnicities have struggled to challenge the state authority and have affected Malay-speaking neighbouring countries. Indonesian Major students will be required to read some Indonesian materials in this course.

ZHSS2600 Practical Ethics for the 21st Century
Prerequisites: Any 2 of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1401, ZHSS1402, ZBUS1101, ZBUS1103 or ZGEN2240 with Head of School consent.

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 students and may include discussion of topics such as cloning, euthanasia, the environment, global poverty, terrorism, capital punishment, privacy and ethical issues in counter-terrorism.

ZHSS2601 Introductory Business Ethics

Business managers in the modern, global economy are routinely faced with challenging ethical issues. Do managers who sacrifice profits for the sake of mitigating social and environmental problems breach the trust of the shareholders that they have been appointed to serve? What are the moral requirements that marketing campaigns must adhere to? What rights do employees hold against their employers? Under what circumstances is it ethically appropriate to file for bankruptcy? Is it permissible to use bribery in cultures and markets where it is normal and widely accepted? To what extent should free and voluntary commercial exchanges be coercively regulated by the state? In answering such questions, the law often provides little guidance. Students enrolled in Introductory Business Ethics will learn to apply traditional ethical theories and principles to modern-day business decisions in a wide range of contexts.

ZHSS2604 Problems of Modern Philosophy

This course is designed to introduce students to basic philosophical concepts and ways of thinking about problems and does so in a manner which also demonstrates why some of these problems troubled people for centuries. Modern examples, including ideas from films and other works of fiction, may be used to illustrate particular problems in a modern context. Problems discussed in the course cover a range of issues which have been examined by philosophers over the years and will include discussion of the following questions. Is it logically possible to travel through time and, if so, are there things which a time traveller logically could or could not do? For example, is it logically possible to change the past, or even the future? Do people really have free will, or are all our choices in life determined by factors outside our own control? Am I really the same person I was when I was a child? What is the relationship between a person's mind and their body? Is it logically possible for two people to 'swap' bodies? Or could a person's mind be downloaded into a computer, and if so, would that person still exist? Can we really be sure that the world we see around us actually exists, or could everything that we believe to be true actually be an illusion? Could computers really think?

The course is designed to help provide all students with skills and knowledge which will assist them in any further studies they may undertake, regardless of whether or not they intend to continue with further studies in the field of ethics and philosophy. A primary aim of the course in this respect is to equip all students with an understanding of the main principles of reasoning and logic and of the manner in which arguments are constructed, attacked, and defended.
ZHSS2902 Humanities and Social Sciences Research Project 1
This course is restricted to students enrolled in the CDF program, which aims to develop critical thinking and independent research skills. Students will undertake a research project commensurate with their year of study in a specific discipline area. The project will involve “hands-on” research experience in collaboration with a staff member or research team. The supervisor will work closely with, and define a topic in discussion with, the student and will manage the project. Students will present a short introductory seminar by week 4 of semester. Final assessment will be based on a written paper and an oral presentation.

ZHSS3103 English Literature 1485-1700: Period Study 1
Prerequisite: ZHSS1101 and ZHSS1102
This course focuses on the evolution of literary, dramatic and some cultural works of the period; of the reign 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.

ZHSS3105 Modernism and Postmodernism
Prerequisite: ZHSS1101 and ZHSS1102
This course explores some of the major authors, works, movements and reading theories of the twentieth and early twenty-first centuries. A select of key literary texts will be read within, and/or against, a background of preceding and contemporary literary, political and artistic movements, focussing on Modernism and Postmodernism, the two most transformative cultural movements of the twentieth century. Both of these movements have been articulated in response to global conflicts, from the Great War to the (first) Gulf War. The course examines literature and culture as at once an expression of this history and a key means by which to reflect on it.

ZHSS3109 Romanticism and Revolution
Prerequisite: ZHSS1101 and ZHSS1102
The Romantic era was one of the most creative periods in British literature, coinciding with unprecedented upheavals in world history associated with the French and the industrial revolutions that profoundly shaped the modern world. Romantic authors, however, were often deeply ambivalent about these developments and this course examines the various and conflicted ways that they responded to these momentous developments. The course will also explore central thematic issues and literary approaches within Romantic literature, such as the imagination, nature, history, revolution, and questions of what is poetry. Authors examined include William Wordsworth, Charlotte Smith, Mary Wollstonecraft, Samuel Taylor Coleridge, Mary Shelley, Lord Byron, Thomas De Quincey and John Keats.

ZHSS3121 Classic Literary Texts
Prerequisite: ZHSS1101 and 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.

ZHSS3136 Prose Fiction and Non-Fiction
This course is a study of selected war literature (prose, poetry, personal memoir) and some film texts, and examines such concepts as mateship and masculinity, representations of the soldier and the enemy, violence and pain, and the ideological function of works about war.

ZHSS3138 War Literature
Prerequisite: ZHSS1101 and ZHSS1102
How does meaning work? Reading Theory explores the concepts underpinning our understanding of representation. It surveys the major literary and cultural theories of the last century, examining and applying methodological approaches one by one. This course is recommended for students intending to major in English.

ZHSS3140 Literatures of the World
Prerequisites: ZHSS1101 and ZHSS1102
This course examines writing in English or in English translation from the formerly colonised nations of the world. It explores the rich literature generated by a confrontation with political and global forces, and the influence of more than one literary tradition on the formation of texts. The course examines literature, film and popular culture, within the context of local histories, politics and cultural patterns.

ZHSS3201 Preliminary Honours History

ZHSS3202 Preliminary Honours History: Methodology, Research and Writing
This 6 UOC course is based on the development and completion of an individual research project. The student will select the project in conjunction with me and develop it through various stages of a proposal to submission of a research essay at the end of the session. In addition, weekly course work will explore historical method and sources.

ZHSS3211 The Second World War
Prerequisite: ZHSS1201 and ZHSS1202
This course will give the student an understanding of the greatest global conflict in history through the analysis of the military, social, political, economic, ideological and moral issues that shaped it. Students will study the strategic decisions, the major air, sea and land campaigns and the key turning points of the military struggle.
The course also examines the impact of the war and mobilization on the home fronts, raising questions of leadership, morale and social change. Students will study life under foreign occupation and the difficulties this imposed on the defeated. The study of the Second World War raises many moral issues: amongst them, the barbarisation of warfare; the Final Solution; the choices of resistance and collaboration; the dropping of the first atomic bomb; and the trials and punishment at the end of the war. Students will examine different historical interpretations of these issues and engage in the arguments surrounding them.

**ZHSS2322  Insurgency/Counterinsurgency**

**HPW3**

Prerequisite: ZHSS1201 and ZHSS1202

Insurgency is a form of warfare as old as war itself, and insurgencies and their counterinsurgencies provide some of the most difficult challenges in the current strategic and operational environments. This course provides an introduction to insurgencies across time and place, and will introduce students as well to the theoretical literature of both insurgency and guerrilla warfare, and of counterinsurgency and counter-revolutionary warfare. It will conclude with consideration of the complex environments created by what some have described as a ‘global insurgency’ waged by extremist jihadism against the West.

**ZHSS3235  Britain 1776-1877: Empire, Nation and Society**

Prerequisite: ZHSS1201 and ZHSS1202

This course begins with the American Declaration of Independence, which heralded the disastrous loss of Britain’s most important colonies, and ends in 1877 with Queen Victoria’s proclamation as Empress of India. The intervening century saw Britain emerge from decades of global war, revolution and unprecedented change as the world’s first modern industrial nation, possessing wealth, power and prestige without parallel. This course examines the social, economic, political, diplomatic and military developments which brought about this state of affairs. In particular, it will focus on the driving forces behind Britain’s imperial expansion, and the ways in which empire shaped Britain itself; the transition from the social turmoil which accompanied the early Industrial Revolution to the social and political harmony which characterised the later period, and the effective adaptation of the British political and social order to demands for political equality.

**ZHSS3301  Indonesian 3A**

Prerequisite: 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.

**ZHSS3302  Indonesian 3B**

Prerequisite: 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.

**ZHSS3402  Political Cultures in Asia and the Pacific**

Prerequisite: ZHSS1401 and 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 International and Political Studies course may be taken as part of the Indonesian-Malay studies minor.
ZHSS3414 Regional Security Issues
Prerequisite: ZHSS1401 and ZHSS1402
The regional security environment is rapidly changing. This course examines the key elements shaping the Asia-Pacific security environment in the early 21st century. It will consider the nature and dynamics of a range of contemporary security challenges facing the region, the capacity of regional security structures to manage these challenges, and the influence of major regional powers on the evolving regional order. Particular attention is given to analyzing regional security flashpoints and to emerging non-traditional threats to security in the era of globalisation. The impact of key developments in regional security on Australia’s national interests will also be examined.

ZHSS3417 Ethnic Conflict and World Politics
Prerequisite: ZHSS1401 or ZHSS1402
This course introduces students to the study of ethnic conflict as a major challenge in contemporary world politics. It develops analytical skills in assessing the political dynamics of conflict management, resolution and reconciliation of specific case studies. 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 led 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.

ZHSS3421 Topics in Political Philosophy
Pre-requisites: ZHSS1401, ZHSS1402 or ZHSS2600
The ideals of freedom, equality, and justice are commonly invoked. But what does it actually mean to be free? Or to be equal? Or to live in a just society? This course will examine these and other fundamental questions of political philosophy using both contemporary and historical thinkers. Topics to be addressed include: justifications for the existence of the state, political obligation and civil disobedience, freedom, private property, equality and justice, and whether we have obligations to those who live in other societies.

ZHSS3422 Politics of Globalisation
Prerequisites: ZHSS1401 and ZHSS1402
This course is an in-depth exploration of the phenomenon of globalisation. It covers the good, the bad, and the ugly. It surveys the idea of globalisation from a wide range of perspectives and evaluates its diverse impacts. It considers the significance of globalisation and weighs its appropriate place in global history. It addresses the globalisation of ideas and ideology, politics and culture, society and economy, and issues of global governance. The experiences of globalisation are explored from a variety of levels across time and space, from the individual to the local, the national to the international.

ZHSS3425 Air Power in Small and Irregular Wars
Prerequisite: ZHSS1401 or ZHSS1402
Almost from the inception of powered flight, Western states have found air power to be an especially useful means of dealing with irregular forces. Whether quelling rebellious tribes in far flung colonies or pursuing bandits across border regions, air power in its many forms has been an important component of irregular warfare. In this course our underlying concern is to explore the use of force in the international environment, particularly its use by states against non-state actors. The context for this examination is the use of air power in small, irregular and unconventional wars, since 1917.

Wars against bandits, rebels, insurgents, terrorists and guerrillas. The course will investigate the historic use of air power through colonial and post-colonial settings to consider finally the challenges such wars pose for the employment of air power today (This course may be taken as an IPS or a History unit at stage 2 or stage 3).

ZHSS3426 Politics of Crisis in the South Pacific
Prerequisite: ZHSS1401 and ZHSS1402
Australia considers the Southwest Pacific an area of vital strategic importance with the ADF and other government agencies playing an active role in what is seen as an increasingly unstable region.

This course explores the political dynamics of the Southwest Pacific with particular emphasis on explaining recent events in the region that have been represented as crises of governance. Case-studies will include the Bougainville rebellion, the Fiji coups, the Solomon Islands disturbances and the riots in Tonga. The validity of concerns about the implications of these events and about the collapse of the island states more generally will be discussed as will the responses of the regional powers, Australia and New Zealand.

ZHSS3431 The Politics of International Human Rights
Prerequisites: ZHSS1401 and ZHSS1402
This course examines the political struggle to define and implement international human rights norms, which protect people against abusive states and support international peace and stability. The first part describes the evolution of the international human rights regime since the traumatic events of the Second World War and the major controversies that have shaped it. The second part examines the continuing gap between states’ human rights commitments and practices. The third part evaluates ongoing international efforts to close that gap and considers alternative ways forward. The course mixes broad comparative discussions with in-depth case studies of Burma, Cambodia and Vietnam to help bring the issues to life. Students will be given the opportunity through tutorial discussions and course assessments to focus on other countries that they might have a particular interest in.

ZHSS3432 Who Counts in World Politics? Justice, Norms Practice
This course will address the crucial question of ‘who counts’ in international politics – and what practical difference such judgments make in the context of particular policies and practices. Assuming that certain groups ‘don’t matter’ can mean that they are not shown restraint in war, are not considered bearers of rights or subjects under international law, and are not party to - or beneficiaries of - deliberation over distributive justice.
Through this course, students will be introduced to an important area of International Relations (IR) and develop a critical understanding of important issues that are central to world politics in the 21st century, including global poverty; restraint in war; cultural diversity and the status of women; terrorism and responses to terrorism; proposed responsibilities to protect vulnerable populations from gross human rights violations; indigenous peoples and cultural heritage; nuclear deterrence and the proliferation of weapons; historical injustice and claims to reparation; immigration and freedom of movement; global health and the treatment of diseases such as HIV/AIDS; climate change and environmental degradation; and, the rights and treatment of non-human animals.

The course will be delivered through two lectures and one tutorial per week and will be assessed by means of tutorial participation, two essays, and one examination.

**ZHSS3433 International Politics and Ethics of War**

This course will address the crucial question of who counts in international politics and what practical difference such judgments make in the context of particular policies and practices. Assuming that certain groups ‘don’t matter’ can mean that they are not shown restraint in war, are not considered bearers of rights or subjects under international law, and are not party to - or beneficiaries of - deliberation over distributive justice. Through this course, students will be introduced to an important area of International Relations (IR) and develop a critical understanding of important issues that are central to world politics in the 21st century, including global poverty; restraint in war; cultural diversity and the status of women; terrorism and responses to terrorism; proposed responsibilities to protect vulnerable populations from gross human rights violations; indigenous peoples and cultural heritage; nuclear deterrence and the proliferation of weapons; historical injustice and claims to reparation; immigration and freedom of movement; global health and the treatment of diseases such as HIV/AIDS; climate change and environmental degradation; and, the rights and treatment of non-human animals.

The course will be delivered through two lectures and one tutorial per week and will be assessed by means of tutorial participation, two essays, and one examination.

**ZHSS3344 Australia: Who Really Holds Power?**

This course gives students an applied, hands-on, understanding of how the Australian political system works and how government policy making works in practice.

**ZHSS3501 Contemporary Muslim Identity in Indonesia and Beyond**

Prerequisites: Any two of ZHSS1201, ZHSS1202, ZHSS1301, ZHSS1302, ZHSS1304, or ZHSS1401 or ZHSS1402

The course examines transformations in contemporary Muslim communities around the world with a focus on Indonesia. It introduces students to Muslim religious belief and practices and their historical development. It also explores the status of women and the relations between Muslim organisations and the state, and highlights activities of trans-national Muslim communities. Indonesian major students will be required to read materials in Indonesian.

**ZHSS3505 Women, Class, Society in Indonesia**

Prerequisites: Any two of ZHSS1201 or ZHSS1202 or ZHSS1301, ZHSS1302, ZHSS1304, or ZHSS1401 or ZHSS1402

In past Indonesian state ideology, women were predominantly confirmed in their roles as loyal companions to their husbands, educators and guides for their children, and procurators for the nation.

In reality, women’s contribution to Indonesian society has been in much wider fields and more diverse roles. This course will analyse women’s thoughts about and experiences in both mainstream and alternative categories of marriage, family life and sexuality; politics, professional work and the informal sector; and culture, art and media representation. The course will identify class as one of the key factors determining the social conditions of individual Indonesian women and men. Indonesian major students will be required to read some Indonesian materials in this course.

**ZHSS3602 God, Reason, Society and Science**

Despite regular proclamations of the ‘death of God’ and the ‘end of religion’ by intellectuals, religious belief remains stubbornly popular. This course offers a philosophically informed exploration of this phenomenon. Questions addressed include: Are there any good arguments for - or against - the existence of God? Would it be rational to believe in God even if God really existed? Is religious belief ethical? What impact has Christianity had on the Western moral identity? Are science and religion friends or enemies? How should we think about the place of religious belief in multicultural liberal democracies?

**ZINT1006 Academic and Professional Writing**

This course develops students’ academic writing and research skills. Students will critically analyse academic and professional texts in order to learn about the ways in which academic and professional writers communicate their arguments for different audiences. They will practice planning and writing a range of different text types such as essays and reports, using content from their own disciplines wherever possible, and applying appropriate strategies to improve their writing, strengthen their argument and express their meaning more clearly.

**ZINT2100 Introduction to Cyber-Security: Policy and Operations**

Cyber-security is headline news and a growing challenge for national and global security, while computer technology now pervades every aspect of the personal and professional lives of our graduates. This technology underpins enormous performance improvements but also brings serious vulnerabilities. The many forms of cyber-threats – such as data theft, surveillance, and system compromise - have become tools of activism, corporate and state espionage, warfare, counter-proliferation, and intelligence gathering. This course provides an in-depth introduction to the strategic and national security challenges of cybersecurity, and provides students with the skills to defend their organisation and their personal computers from the most common forms of attack.
ZINT2501 Engineering Materials and Chemistry
School of Physical, Environment and Mathematical Sciences
This course provides the foundation for understanding material and environmental properties and behaviour in engineering and technology. It includes electronic structure of atoms and molecules, intermolecular forces, thermodynamic driving forces for chemical reactions, chemical equilibria, electrochemistry, corrosion and redox reactions, solution chemistry, acids and bases, kinetics and rates of reactions, complex molecular structures in metals, polymers and ceramics, crystalline lattices, yielding and plastic flow, strengthening mechanisms in metals, phase systems and alloys, ferrous and non-ferrous metallurgy, mechanical behaviour and properties of materials.

ZPEM1101 Chemistry 1A
The course commences with chemical reactions, concepts involved in chemical equations and an introduction to nomenclature of inorganic and organic substances.

ZPEM1102 Chemistry 1B
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.

ZPEM1201 Geography 1A: Introduction to Global Change
What are the major global challenges and how will these affect you?

ZPEM1202 Geography 1B: Contemporary Global Change
Exploring the contemporary global changes and their local implications provides insights into the drivers of change and resource conflicts. Successful management and resilience depends on understanding how change happens and ways it can be managed. Topics may include the historical origins of contemporary global processes, the changing global economy, emerging and current environmental issues including land degradation, drought and climate change, adaptation in agriculture, weed management, ways of analysing and managing environmental change, patterns of health and disease, and the nature of discourse and debates around global processes. As with Introduction to Global Change in first semester, the emphasis is on the linkages between social and physical geographies across a range of scales.

ZPEM1301 Mathematics 1A
Exclusion: ZPEM1303
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. This course will also cover material from complex numbers. 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
Prerequisite: ZPEM1301, Exclusion: ZPEM1304
This course covers material from ordinary differential equations, statistics and multi-variable calculus. These are important tools when mathematics is applied to situations in science and engineering. Students will study first-order and second order ODEs analytically, graphically and numerically. Statistics concerns the use of data to obtain information about real-life situations and problems. There are various statistical tools that help extract useful information from data. Topics covered are: measures of location, variability in data, histograms and distributions of discrete and continuous variables.

ZPEM1303 Engineering Mathematics 1A
Exclusion: ZPEM1301
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  
**Prerequisite:** ZPEM1303, **Exclusion:** ZPEM1302  
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.

ZPEM1305 Engineering Problem Solving  
Engineers are often called upon to use knowledge of their engineering discipline, science, mathematics and logic to find suitable solutions to a wide range of problems. Understanding a given problem, and then developing an appropriate mathematical model to analyse solutions to this problem, are essential steps in the problem solving process. The emphasis of this course is on developing the mathematical reasoning ability needed to make these steps in problem solving. This will include the formulation of mathematical models and the development of the general skills needed to analyse these models, including both analytical and numerical techniques. Examples from a variety of practical engineering problems will be examined throughout the course.

ZPEM1402 Introduction to Oceanography  
This course is a broad introduction to the interconnected physical, chemical, biological and geological aspects of the oceans. Topics may include: physical and chemical properties of seawater, and what their distributions tell us about ocean circulation; the role of the oceans and ocean currents in Earth's climate and El Nino; an introduction to waves and tides; modern ocean measurement technologies such as robot gliders and satellites; plate tectonics and the formation and structure of the seafloor; marine biology and ecosystems; marine resources and environmental management. The fascinating interconnections between these different aspects of Oceanography are highlighted. An Oceanography excursion is usually part of the course.

ZPEM1501 Physics 1A: Mechanics, Waves and Thermodynamics  
Students will be introduced to the physics that underpins many science and engineering disciplines. The course syllabus includes the discussion of motion, forces, energy, oscillations, waves, temperature, heat and entropy. The course includes a laboratory program relating to and supplementing the lecture material.

ZPEM1502 Physics 1B: Electromagnetism and Modern Physics  
Students will be introduced to some of the fundamentals of contemporary physics through a selection of topics spanning important areas such as electromagnetism, optics, relativity, quantum physics, atomic and nuclear physics. The course includes a laboratory program relating to and supplementing the lecture material.

ZPEM1901 Contemporary Issues in Science  
This course for students in the CDF program introduces the philosophy, thinking, skills and techniques involved in the study of science. It draws on a number of topics from across the School’s various disciplines, and includes exposure to active areas of research.

Students will attend lectures and seminars, participate in tutorials and workshops, read from the scientific literature, and undertake small-scale experimental and/or theoretical projects.

ZPEM2102 Organic Chemistry 2  
**Prerequisite:** 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 methods for structure and determination such as Nuclear Magnetic Resonance (NMR) and infra-red (IR) and more. Organic reaction mechanisms are investigated using traditional functional groups and reagents, and the understanding of the chemical driving forces that lead to particular products will be gained.

ZPEM2113 Inorganic Chemistry and Spectroscopy  
**Prerequisite:** ZPEM1101 and ZPEM1102  
Spectroscopy is the chemist’s most powerful tool for observing atomic and molecular structure and behaviour of atoms and molecules. We will use quantum chemistry to describe electronic spectroscopy using simple models such as “electrons in a box”, as well as atomic and molecular orbital theory. The relationship between microscopic interactions and bulk thermodynamic properties will then be examined and the principles of these 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.
ZPEM2202  Ecological Biogeography
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. The course normally includes a five day residential field school in May.

ZPEM2207  Social Geography
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 Geography
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 International and Political Studies, History, Economics and Business. The course provides useful context for those seeking to understand conflict in the region.

ZPEM2212  Managing Environmental Change
The course is concerned with changes in natural resources (water, soil, plants and animals, landscapes) and their management. The course develops scientific skills and understanding to manage and sustain resource use.

The provision of services is examined in the field and through other activities in this course. Skills and knowledge will be developed in a diversity of natural resource settings or examples such as forestry, farming, floodplain, weed and mine management to give students an understanding of the scale of change and the ways good resource managers can achieve desirable outcomes. Integration of human and biophysical scientific approaches and field studies are integral parts of the course.

ZPEM2213  Eyes on the Ground: Applications of GIS & RS
Geospatial analysis is the exciting surveillance science that has developed from geography and the space industry. It includes the collection and interpretation of remotely sensed imagery and other geographical data and is used by almost all industries including the military, national parks, city planners and marine scientists. Remote sensing today involves the use of electromagnetic radiation sensors mounted on satellites, aircraft and UAVs to record images of the environment, which can yield invaluable spatial information. Modern geospatial technologies have radically changed our perceptions of the earth, our methods of data analysis, and our ability to solve social and environmental problems.

In this course we will study the following questions:
How do we acquire geospatial data?
What are the relationships between properties of the environment and geospatial data?
How do we process and interpret geospatial data to yield new information about the environment?
How do we integrate remotely sensed geospatial data with other data in Geographic Information Systems?

ZPEM2302  Mathematical Tools for Science
Prerequisite: ZPEM1302 or ZPEM1304
Exclusion: ZBUS2104

The emphasis of this course is on developing mathematical tools for a variety of different modelling contexts from the Sciences. The course is taught in two strands, Data Analysis and Multivariable Calculus. The Data Analysis strand uses data from simple experimental and observational studies, and introduces graphical methods for data presentation and exploration. It discusses the important concepts of populations, samples and randomness, and explains how to relate sample values to population values and test claims about population parameters. Association between different measurements is quantified, and methods of modelling the relationship between two variables are studied.

The Multivariable Calculus strand describes surfaces in three dimensions using contour plots, partial derivatives and the gradient vector. Of great importance is the location of maxima or minima of the function, leading to a discussion of the methods of optimisation for functions of several variables, especially when auxiliary constraints must also be satisfied. Case studies in both strands will illustrate how the mathematical tools operate in a wide range of disciplines including Geography, Chemistry, Physics and Oceanography. The computer package MATLAB will be used throughout the course, particularly for its powerful graphics capabilities.

ZPEM2309  Engineering Mathematics 2A
Prerequisite: ZPEM1304

The course covers two distinct topics. The first, Ordinary Differential Equations (ODEs), looks at the basics of mathematical modelling with ODEs, first-order and second-order ODEs, Laplace transform methods, series solutions, 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 examples from engineering and applied mathematics.

ZPEM2310  Engineering Mathematics 2B
Prerequisite: 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 several different coordinate systems (for example, Cartesian and polar coordinates). The course will cover 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: reliability analysis, hypothesis testing, failure data and regression analysis.
ZPEM2311 Mathematical Modelling
Prerequisites: ZPEM1302
A course extending the Linear Algebra and Calculus studied in first year, with particular emphasis on the application of Mathematics to problems in the Physical and Environmental Sciences. The course combines the study of first- and second- order differential equations, including partial differential equations, with the concepts of linearity and linear superposition to develop mathematical models in such areas as mechanics, population growth and harvesting, chemical reactions sound, diffusion and wave motion.

ZPEM2312 Fundamentals of Data Analysis
Exclusions: ZPEM1301, ZPEM1302, ZPEM1303, ZPEM1304, ZPEM2302, ZPEM2309, ZPEM2310, ZBUS2104
This course provides a foundation for quantitative methods applicable to students in their future careers. It teaches the fundamentals of data analysis with emphasis on the analysis of data arising from real-life situations across the disciplines. It focuses on the understanding of the concepts of statistics without overemphasizing the mathematical detail.

The course teaches the principles of good experimental design, as well as the interpretation and critical evaluation of statistical information presented in the media and in reports published by organisations. It introduces a computer software package, Excel, which is used for data exploration, presentation and analysis.

Main topics covered include: gathering, organising and summarising data; using graphical techniques to present statistical information; measures of location and spread; probability distributions such as the normal and binomial distributions; confidence intervals and hypothesis tests for a single sample; simple linear regression; contingency tables

ZPEM2313 Discrete Mathematics with Applications
Discrete Mathematics is a rapidly growing area of mathematics with many current and emerging applications. It is the study of mathematical structures that are discrete; in contrast with calculus which deals with continuous change.

The importance of Discrete Mathematics today lies in its numerous practical and relevant applications. It plays an essential role in modelling the natural world (e.g., the genome) and the technological world (e.g., the Internet), and in designing efficient solutions such as Internet routing protocols. It is commonly used in cryptography, computer security, electronic banking, algorithms, theory of computing, telecommunications, web search engines, to mention a few.

Emphasis will be placed on developing techniques and uses in applications. Modelling of processes and phenomena which occur in economics and the physical, environmental and life sciences will be used as a vehicle throughout. Topics to be covered include: combinatorics and counting, proof by induction and recurrence relations, graph theory and networks, matrix arithmetic and Markov chains, logic and finite set theory.

ZPEM2401 Australian Waters and their Dynamics
Prerequisites: ZPEM1302 or ZPEM1304; and ZPEM2302, ZPEM1501 and ZPEM1402
This course will examine the major currents around Australia and their influence on fisheries, coastal communities and climate. These currents include the Leeuwin Current, Eastern Australian Current, Antarctic Circumpolar Current, and the Indonesian Throughflow. Before investigating the currents, the basic principles of ocean properties (potential temperature, salinity, and density) and ocean forces (gravity, pressure, pressure gradients, Coriolis, friction) will be examined along with the primary ocean dynamics and their balances (geostrophic flow and Ekman transport). This will provide understanding of the forces causing and influencing the currents and provide a framework for the Australian currents to be discussed. The basics of waves and tides will also be outlined, including the tides around Australia.

There will be an Oceanography field school at Jervis bay.

ZPEM2502 Physics 2B: Electrons Photons and Matter
Prerequisites: ZPEM1301 or ZPEM1303, ZPEM1302 or ZPEM1304, ZPEM1501, ZPEM1502, ZPEM2302 or ZPEM2309
The course examines the physics of electromagnetism, quantum mechanics, condensed matter and semiconductors. Electrons are the sources of electric and magnetic fields and fundamentals to our information society. Electrons are considered particles but also have a wave nature, while electromagnetic waves also have a particle nature, the photon. This particle–wave dualism is unfamiliar to our personal macroscopic experience but is essential for the microscopic world. Electrons and photons also give rise to the functionality of the semiconductor materials that underpin our modern technology. The course includes a laboratory program relating to and supplementing the lecture material.

ZPEM2506 Physics 2A: Meteorology and Atmospheric Physics
Prerequisites: ZPEM1301 or ZPEM1303, ZPEM1302 or ZPEM1304, ZPEM1501, ZPEM1402 or ZPEM1502
In this course we investigate the fundamentals of atmospheric physics and meteorology. Topics covered include: hydrostatic balance and the vertical structure of the atmosphere; altimetry; thermodynamics of dry and moist air; stability; cloud formation and precipitation; geostrophic, gradient and ageostrophic balances; winds; synoptic scale weather systems, air masses and fronts; radiation and the general circulation of the atmosphere; boundary layer processes. Material will be illustrated with applications from areas such as aviation, the marine and land environments, and our everyday experience of weather. The course includes a laboratory program relating to, and supplementing the lecture material.
ZPEM2509 Nuclear Astrophysics and Cosmology
Prerequisites: ZPEM1301 or ZPEM1303, ZPEM1302 or ZPEM1304, ZPEM1501, ZPEM1502.

Human existence is directly linked to the age, structure and composition of the universe. Some of the big questions associated with this link are discussed in this course. In particular, the course will explore several topics in Nuclear Astrophysics and Cosmology selected from the following: (1) Cosmology and the Big Bang, (2) Particle Physics in the Early Universe, (3) Stellar Nucleosynthesis, (4) Nuclear Astrophysics. Throughout the course the important physics concepts from general relativity, statistical mechanics and nuclear physics underpinning these topics are emphasised.

ZPEM2901 Research Project 1
Students in the CDF Program will undertake one or more research-based projects together with coursework as set by the School. As one of the aims of the CDF 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 project(s) will be chosen after discussion between the student, the supervisor and possibly other members of staff.

ZPEM3103 Quantum Theory and Applications in Spectroscopy
Prerequisites: ZPEM1301, ZPEM1302, ZPEM2113 or ZPEM2502

Since the work of Isaac Newton, the development of quantum theory at the beginning of the 20th century was the greatest advance in physical science. Arguably, quantum mechanics has now become the most successful theory of all time. This course for upper level students of physics and chemistry presents a brief history of quantum theory, followed by an introduction to the standard formalism of quantum mechanics, e.g. the postulates of quantum theory, the properties of linear operators, Dirac notation etc. The gained knowledge is then applied to the physics of atoms and molecules and a range of spectroscopic methods, including electron spin resonance, nuclear magnetic resonance and rotational, vibrational and electronic spectroscopy.

ZPEM3107 Explosives
Prerequisites: ZPEM2102 and ZPEM2113 or ZINT2501

Diverse aspects of explosives chemistry are covered, beginning with an introduction to explosive reactions and basic methods of estimating performance. Synthesis and properties of organic high explosives are discussed, and the relationship between structure and reactivity is explored. Various analytical detection methods are examined in the context of trace analysis of hidden explosives, including explosive output are investigated. Factors affecting sensitivity are discussed, along with insensitive munitions.

ZPEM3121 Supramolecular Chemistry
Prerequisites: ZPEM2102 and ZPEM2113

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 the interaction between discrete molecules and the collective properties of this interaction. Many supramolecular structures are found in the biological machinery of the cell and a number of emerging technologies employ molecular building blocks in the set of chemical applications now called nanotechnology.
ZPEM3215  Transport Geography
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.

ZPEM3222  Coastal Geomorphology
Australia has a very long coastline and more than 85% of our population is living along the coast. This course provides an introduction to coastal geomorphology which examines the development and evolution of coastal landscapes and the processes responsible for modifying our coasts. It deals with three components: coastal hydrodynamics, sediment and sediment transport, and landform features. Special emphasis is given to the interaction and feedbacks between these three components, plus human activities. Finally the response of the coastal zone to the contemporary climate and sea-level change, as well as coastal protection and management issues are also discussed. This course can contribute to either the geography or the oceanography major.

ZPEM3301  Topics in Mathematics
Prerequisite: ZPEM2311
This course introduces a variety of topics in mathematics, including the historical development of mathematics. Topics may be selected from the following: Newton’s “Principia” and the birth of classical mechanics; data analysis; calculus of variations; complex variables; projectiles; optimization techniques; nonlinear dynamical systems theory; industrial mathematics.

ZPEM3311  Mathematical Methods for Differential Equations
Prerequisite: ZPEM2311
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  Methods for Data Analysis
Prerequisite: ZPEM2302
This course explores the types of data encountered in statistical practice and examines some of the methods which can be used to analyse data, to draw inferences and test scientific hypotheses. The course reviews some foundational issues in probability theory and then examines methodological issues in data collection, statistical inference and hypothesis testing.

The course then introduces students to specific techniques for the analysis of different types of data via a variety of models. The course provides a general overview of statistical practice as well as a foundation for later specialization in particular types of data analysis, especially time-series analysis. Students will practise the relevant techniques by using statistical software to conduct data analysis.

ZPEM3313  Applied Nonlinear Dynamics
Many nonlinear equations do not have explicit solutions. This course shifts the focus from finding explicit solutions to discovering geometric properties of solutions. It also recognises that even a small amount of nonlinearity in a physical system can be responsible for very complicated chaotic behaviour.

The fact that nonlinear systems do not guarantee regular or predictable behaviour is having a major impact on many fields of science and engineering, as well as mathematics. The discovery of chaos in simple dynamical systems changes our understanding of physical processes and has many practical applications including the understanding of the dynamics of the weather and climate, excitable media such as cardiac tissue and nerve fibres, population dynamics, transport in complex flow fields, to mention a few.

This course introduces the fundamentals of nonlinear dynamics with applications to physics, engineering, biology, and chemistry. It takes an intuitive approach with emphasis on geometric thinking, analytic and computational methods and makes extensive use of software packages, such as Matlab.

ZPEM3401  Ocean Circulation and Mixing
Prerequisite: ZPEM2401 and ZPEM2506
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.
ZPEM3404 Ocean Waves and Modelling
Prerequisites: ZPEM2401, ZPEM2506 and ZPEM3312

This course covers three aspects of oceanography: waves, modelling and estuaries. Waves occur both on the surface of the ocean and within the ocean. Internal waves are important in mixing and sonar operations. After reviewing the basic principles of surface waves, this course presents the basics of internal waves, examining the dynamics, generation, propagation, and their impact on the ocean environment. Ocean modelling is a key component both in climate studies and naval operations. Basic modelling principles will be covered for both analytical and numerical ocean models with application to examples such as small-scale coastal systems, tsunamis, and the global ocean circulation. 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 may be introduced.

ZPEM3503 Electromagnetic Waves and Advanced Materials
Prerequisites: ZPEM2502, ZPEM2506

The first part of the course is concerned with the propagation and interaction of electromagnetic radiation as employed in remote sensing situations. Even before it reaches the antenna the radiation must pass through cables and waveguides, and this also involves propagation and interaction. Fundamental to all of this are Maxwell’s equations and an understanding of what they can tell us.

The second part of the course provides an introduction to advanced materials with an emphasis on their structural and magnetic properties. The various structural states and phase diagrams are considered in terms of microstructure and its influence on mechanical properties. Finally, the basic theories of magnetism and the different types of magnetic materials are described and the use of modern magnetic materials is discussed with particular reference to permanent magnets, transformers, and data storage.

ZPEM3532 Advanced Topics in Physics and Oceanography

In this course the basic physical principles behind, and the practical implementation of, selected important technologies such as sonar, lasers, etc. will be examined. In addition, the course will enable students to apply their scientific knowledge and understanding to a directed research project in either Physics or Oceanography.

ZPEM3901 Research Project 2
ZPEM3902 Research Project 3

Students in the CDF Program will undertake one or more research-based projects together with coursework as set by the School. As one of the aims of the CDF program is to develop critical thinking and independent research skills, the projects will involve ‘hands-on’ research experience in collaboration with staff members and their research teams. 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, the supervisor and possibly other members of staff.
Important dates for students in 2015

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>S1 commences</td>
<td>2 March</td>
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<tr>
<td>Last day to add S1 distance</td>
<td>27 February</td>
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<tr>
<td>Last day to add courses via</td>
<td>8 March</td>
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<td>myUNSW</td>
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<td>Last day to drop S1 courses</td>
<td>31 March</td>
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<td>without financial penalty</td>
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<tr>
<td>Provisional exam timetable for</td>
<td>17 April</td>
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<td>S1</td>
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<tr>
<td>Last day to drop S1 courses</td>
<td>24 April</td>
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<td>without academic penalty</td>
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<tr>
<td>Last day to report exam clashes for S1</td>
<td>1 May</td>
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<tr>
<td>Mid Semester Break</td>
<td>4 - 15 May</td>
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<tr>
<td>Final exam timetable released for S1</td>
<td>29 May</td>
</tr>
<tr>
<td>S1 study recess</td>
<td>15 - 19 June</td>
</tr>
<tr>
<td>Examinations (UG students only)</td>
<td>22 June - 3 July</td>
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<tr>
<td>Mid-Year leave</td>
<td>6 - 17 July</td>
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<tr>
<td>S1 results published on myUNSW</td>
<td>16 July</td>
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<tr>
<td>Last day to add S2 distance</td>
<td>17 July</td>
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<td>Last day to add courses via</td>
<td>26 July</td>
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<td>Last day to drop S2 courses</td>
<td>31 August</td>
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<td>Provisional exam timetable for</td>
<td>3 September</td>
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<td>Last day to drop S2 courses</td>
<td>11 September</td>
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<td>without academic penalty</td>
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<td>Last day to report exam clashes for S2</td>
<td>18 September</td>
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<tr>
<td>Mid Semester Break</td>
<td>28 September - 2</td>
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<td>October</td>
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<tr>
<td>S2 Study recess</td>
<td>26 - 30 October</td>
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<tr>
<td>Final exam timetable released for S2</td>
<td>9 October</td>
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<tr>
<td>Semester 2 ends</td>
<td>23 October</td>
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<tr>
<td>Examinations (UG students only)</td>
<td>2 - 13 November</td>
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<tr>
<td>S2 results published to myUNSW</td>
<td>26 November</td>
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2015 Public Holidays Compensations S1

<table>
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<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Canberra Day</td>
<td>9 March (Monday)</td>
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<tr>
<td>Good Friday</td>
<td>3 April (Monday)</td>
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<tr>
<td>Easter Monday</td>
<td>6 April (Monday)</td>
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<tr>
<td>ANZAC Day</td>
<td>25 April (Monday)</td>
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<tr>
<td>Queens Birthday</td>
<td>8 June (Monday)</td>
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2015 Public Holidays Compensations S2

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Labour Day</td>
<td>5 October (Monday)</td>
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Approved ADFA activities - Non Teaching Days for Undergraduate Students (Semester 2)

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Production Dress Rehearsal</td>
<td>Tues 11 Aug</td>
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<tr>
<td>XO / OC Day</td>
<td>Wed 2 Sept</td>
</tr>
<tr>
<td>Sports Carnival (incl Tug-of-War)</td>
<td>Thurs 24 Sept</td>
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<tr>
<td>Great Eagle (ARA) and/or XO / OC Day</td>
<td>Fri 16 Oct</td>
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Events

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<tr>
<td>ADFA Open Day</td>
<td>29 August</td>
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<tr>
<td>Conferring of degrees ceremony</td>
<td>9 December</td>
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<tr>
<td>Graduation Day</td>
<td>10 December</td>
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Important Dates for 2016

<table>
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<tbody>
<tr>
<td>Semester 1 commences</td>
<td>29 February</td>
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<td>Semester 1 break</td>
<td>2 - 13 May</td>
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<tr>
<td>Semester 1 ends</td>
<td>12 June</td>
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<tr>
<td>Study Period</td>
<td>13 - 17 June</td>
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<tr>
<td>June Examination period</td>
<td>20 June - 1 July</td>
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<tr>
<td>Sem 1 Results available</td>
<td>14 July</td>
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<tr>
<td>Mid-year recess</td>
<td>4 - 15 July</td>
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<tr>
<td>Semester 2 commences</td>
<td>16 July</td>
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<tr>
<td>Semester 2 break</td>
<td>19 - 23 September</td>
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<tr>
<td>Semester 2 ends</td>
<td>21 October</td>
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<tr>
<td>Study Period</td>
<td>24 - 28 October</td>
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<tr>
<td>Examination period</td>
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<td>Sem 2 Results available</td>
<td>24 November</td>
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<tr>
<td>Conferal ceremonies</td>
<td>7 December</td>
</tr>
<tr>
<td>Graduation Parade</td>
<td>8 December</td>
</tr>
</tbody>
</table>