AERO3110

Aerospace Design 1

Term 2, 2022

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Dr Sonya A Brown	sonya.brown@unsw.edu.au		Ainsworth 408D	

Demonstrators

Name	Email	Availability	Location	Phone
Benjamin Tynan	b.tynan@unsw.edu.au		Ainsworth 311	
Sophia Pablo	s.pablo@unsw.edu.au			
Ahmed Mahgoub	a.mahgoub@unsw.edu.au		Ainsworth 408	

School Contact Information

Location

UNSW Mechanical and Manufacturing Engineering

Ainsworth building J17, Level 1

Above Coffee on Campus

Hours

9:00–5:00pm, Monday–Friday*

*Closed on public holidays, School scheduled events and University Shutdown

Web

School of Mechanical and Manufacturing Engineering

Engineering Student Support Services

Engineering Industrial Training

UNSW Study Abroad and Exchange (for inbound students)

UNSW Future Students

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

(+61 2) 9385 4097 – School Office**

**Please note that the School Office will not know when/if your course convenor is on campus or available

Email

Engineering Student Support Services – current student enquiries

- e.g. enrolment, progression, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries

- e.g. admissions, fees, programs, credit transfer

School Office – School general office administration enquiries

- NB: the relevant teams listed above must be contacted for all student enquiries. The School will only be able to refer students on to the relevant team if contacted

Important Links

- Student Wellbeing
- Urgent Mental Health & Support
- Equitable Learning Services
- Faculty Transitional Arrangements for COVID-19
- Moodle
- Lab Access
- Computing Facilities
- Student Resources
- Course Outlines
- Makerspace
- UNSW Timetable
- UNSW Handbook

Course Details

Units of Credit 6

Summary of the Course

This course aims to provide students with a grounding in aerospace design, in terms of both structural design and aerospace systems. The course includes the design process, aerospace load cases, margins of safety, international units, regulations, detailed aerospace structural design, and an introduction to aerospace systems. The final project aims to provide an experiential learning opportunity and develop teamwork skills, with students completing a Design-Build-Test project in small teams by designing a representative aerospace part to meet a set of requirements, manufacturing the part, and testing it to failure.

Course Aims

This course aims to provide students with a grounding in aerospace design, in terms of both structural design and aerospace systems. The course includes the design process, aerospace load cases, margins of safety, international units, regulations, detailed aerospace structural design, and an introduction to aerospace systems. The final project aims to provide an experiential learning opportunity and develop teamwork skills, with students completing a Design-Build-Test project in small teams by designing a representative aerospace part to meet a set of requirements, manufacturing the part, and testing it to failure.

Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Design an aerospace structure to meet regulatory requirements and a given design brief.	PE1.3, PE1.5, PE2.3, PE3.2
2. Evaluate and justify systems selection and implementation for a variety of aerospace systems.	PE1.3, PE1.4, PE2.3, PE3.2
3. Identify appropriate engineering data sources and regulations and apply in the context of aerospace design.	PE1.6, PE3.1

Teaching Strategies

The course is divided into 3 modules:

- 1: Aerospace Structural Design
- 2: Aerospace Systems
- 3: Design-Build-Test

Lectures will cover the main theoretical course content for Modules 1 and 2, with Workshops providing time to work through the design problems relating to the lecture material with demonstrator support provided to assist understanding. Module 3 consists of a Design-Build-Test activity, linking back to the

structural design lecture material, but giving students the opportunity to develop further understanding via an experiential project. Teamwork will also form part of Module 3 to assist in developing the communication and interpersonal skills critical for industry.

Lectures

Lectures will cover the main theoretical course content. Team Based Learning (TBL) sessions will be used in some systems classes to encourage additional interaction with the content.

Workshops

Workshops will include an example problem or exercise, with additional time available to work through the required design problems, with demonstrator support available for consultation and questions regarding the design problems.

Design-Build-Test

The Design-Build-Test project is focused on experiential learning techniques. Each team will design an aircraft part to meet a detailed set of requirements. Each team will need to manufacture their own part, and this will be tested to failure, and hence allow teams to review the structural performance of their design.

Additional Course Information

Prerequisites

DESN2000 Engineering Design and Professional Practice ***OR*** MMAN2100 Engineering Design 2
AND
ENGG2400 ***OR*** MMAN2400 Mechanics of Solids 1

Assumed Knowledge

Students are expected to have a sound understanding of engineering design and drawing, statics and free body diagrams, manufacturing, aerospace structural analysis, and flight performance prior to attempting this course.

Platforms and Communication

Aerospace Design 1 will use a combination of Microsoft Teams and Moodle. The primary communication channel will be Microsoft Teams. Please ensure you check Teams regularly for any important announcements. Questions are best addressed in class or via Teams. I will do my best to respond to all queries in two business days.

Class Times

Please refer to your class timetable for the learning activities you are enrolled in and attend only those classes.

	Day	Time	Location
Lectures	Monday	12pm - 1pm	Online (Weeks 1-2,4-5,7-10) Video (Week 3)
	Tuesday	4pm - 6pm	F2F - CLB 6 (Weeks 3, 5, 7, 8) Online (Weeks 1-2,4)
	Tuesday	4pm - 5pm	Online (Weeks 9-10)
Workshops (*)	Thursday	12pm - 2pm	Ainsworth 201 (Weeks 1-5,7)
	Thursday	12pm - 2pm	Ainsworth 202 (Weeks 1-5,7)
	Thursday	12pm - 2pm	Streamed Face-to-Face Class (Weeks 1-5,7)
Lab Inductions	Thursday	2pm - 4pm (Wk 2)	Willis Annexe J18 214 UTL
	Friday	10am - 12pm (Wk 2)	
	Thursday	2pm - 4pm (Wk 3)	
	Friday	10am - 12pm (Wk 3)	
	Thursday	2pm - 4pm (Wk 4)	
	Friday	10am - 12pm (Wk 4)	
	Wednesday	2pm - 4pm (Wk 3)	Online Video (Week 3)
Labs	Thursday	9am - 12pm (Wk 8-9) 9am - 1pm (Wk 10)	Willis Annexe J18 214 UTL (Weeks 8-10)
	Thursday	2pm - 5pm (Wk 8-9) 2pm - 6pm (Wk 10)	
	Friday	9am - 12pm (Wk 8-9) 9am - 1pm (Wk 10)	
	Thursday	2pm - 6pm (Wk 10)	Streamed Face-to-Face Class (Week 10)

***** Note: If you are unwell or are required to self-isolate - please do not attend campus or class. Advise the course convenor (Dr Sonya Brown) **prior**, and we will attempt to stream the class.

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Design Problems	45%	See below	1, 2, 3
2. Quizzes	20%	See below	1, 2, 3
3. Design-Build-Test (Team)	35%	15/08/2022 11:50 PM	1, 3

Assessment 1: Design Problems

Submission notes: Submission via Moodle.
Due date: See below
Deadline for absolute fail: Five (5) days after relevant due date.
Marks returned: Two weeks after due date (on time) or submission (late work).

Design Problem 1 (15%) - Truss - Due *11:50pm Wednesday Week 4*
Design Problem 2 (15%) - Doubler - Due *11:50pm Wednesday Week 7*
Design Problem 3 (15%) - Systems - Due *11:50pm Wednesday Week 10*

Assessment criteria

Per Design Problem Marking Schemes and Rubrics.
Includes, but not limited to:
FBDs, diagrams and drawings, calculations and working, design justifications, reasoning and explanations, results and discussion, communication, completeness, thoroughness and correctness, units and significant figures, sources of information and referencing, presentation and report structure.

Assessment 2: Quizzes

Submission notes: In-class (Structures and Systems TBL), and including Moodle submission for Structures TBL.
Due date: See below
Deadline for absolute fail: N/A
Marks returned: For Structures Quiz - Marks returned two weeks after quiz. For Systems TBL Quizzes - Marks returned by one week after quiz.

Structures (10%) - *Tuesday Week 3* (individual) during the scheduled lecture
Systems (10%) - Team Based Learning (TBL) sessions (individual and team (4-5 students) components) during scheduled lectures:
Tuesday Week 5, Tuesday Week 7, Tuesday Week 8

Assessment criteria

Per Quiz Marking Schemes.
Includes, but not limited to:
Structures: FBDs, diagrams, calculations and working, reasoning and results, correctness, units and

significant figures, communication and referencing.
For TBL: Correctness: Individual and Team results.

Additional details

Quizzes will occur in scheduled face-to-face classes.

Assessment 3: Design-Build-Test (Team) (Group)

Assessment length: 20 pages (maximum)
Due date: 15/08/2022 11:50 PM
Deadline for absolute fail: Five (5) days after due date.
Marks returned: Release of final results

Team project (3-4 students per team).
Design-Build-Test of typical aerospace structure.
Test piece physical submission: In-class.
Report submission via Moodle.

Assessment criteria

Per Design-Build-Test Marking Scheme.
Includes, but not limited to:
Design report - diagrams and drawings, calculations and working, design justifications and reasoning, results and discussion, communication, completeness, thoroughness and correctness, units and significant figures, sources of information and referencing, presentation and report structure; engineering drawing; strength, weight and cost of designed part.
Individual contributions and peer evaluation.

Additional details

The team assessment mark will be moderated by academic review and peer evaluation to give an individual mark for the assessment.

For the team assessment, an individual statement of claim of contributions must be submitted electronically by the assessment due date. Failure to submit an individual statement of claim for the assessment will result in an individual penalty of 10% of the maximum mark possible for the assessment.

For the team assessment, a peer evaluation must be completed electronically. Peer evaluations for the Design-Build-Test project must be completed by 4:00pm Friday 19th August. Failure to complete the peer evaluation by the required deadline for the assessment will result in an individual penalty of 10% of the maximum mark possible for the assessment.

Maximum page numbers exclude front matter, references and appendices.

Attendance Requirements

Students are strongly recommended to attend all lectures or review lecture recordings. Attendance is required at all workshops and labs. If your absence equates to more than 20% of workshops and labs, you may fail the course, or be denied special consideration.

Course Schedule

View class timetable

Timetable

Date	Type	Content
Week 1: 30 May - 3 June	Lecture	A: Introduction to Aerospace Design, Design Process and Reviews B: Structures - Regulations and Load Factors (FAR 23) C: Structures - Structural Loads and Free Body Diagrams (FAR 23)
Week 2: 6 June - 10 June	Lecture	A: Structures - Aerospace Structural Design (FAR 23) B: Structures - Failure Types and Material Data (MMPDS & CMH-17) C: Structures - Trusses (Bruhn A2.9 & A2.10 & Flabel 1.10)
Week 3: 13 June - 17 June	Lecture	A: Structures - Beams (Flabel 1.4, 1.5, 1.6, 1.7, Ch 2) B: Structures - Cut Outs & Doublers (Niu Ch 6 & Flabel Ch 9) C: Structures - **Quiz** - Structural Design
Week 4: 20 June - 24 June	Lecture	A: Structures - Joints & Fasteners (Bruhn D1 & Flabel Ch 3) B: Structures - Lugs (Bruhn D1) C: Structures - Structural Design Review
Week 5: 27 June - 1 July	Lecture	A: Systems - Types of Aircraft Systems (Moir & Seabridge 2013 Ch 2) B: Systems - Systems Design Considerations (FAR §23.2510, FAR §23.1309, Moir & Seabridge

		2013 §6.5 & Moir & Seabridge 2008 Ch 8) C: Systems - **TBL Quiz** Hydraulic Systems (Moir & Seabridge 2008 Ch 4)
Week 7: 11 July - 15 July	Lecture	A: Systems - Flight Control Systems (Moir & Seabridge 2008 Ch 1) B: Systems - Electrical Systems (Moir & Seabridge 2008 Ch 5) C: Systems - **TBL Quiz** Avionics Systems (Moir & Seabridge 2008 Ch 12)
Week 8: 18 July - 22 July	Lecture	A: DBT - DBT Support - Manufacture + Consultation (Bruhn D1 & FAA-H-8083) B: Systems - Fuel Systems (Moir & Seabridge 2008 Ch 3) C: Systems - **TBL Quiz** Communication Systems (Pisacane Ch 9)
Week 9: 25 July - 29 July	Lecture	A: DBT - DBT Support - Testing + Consultation B: Systems - Case Study - Boeing 737 MAX (Lion Air Flight 610 Preliminary Report & Ethiopian Airlines Flight 302 Preliminary Report)
Week 10: 1 August - 5 August	Lecture	Guest Lecture TBC Consultation

Resources

Prescribed Resources

- Jean-Claude Flabel, Practical Stress Analysis for Design Engineers, First Edition, Lake City Publishing Company 1997
- Ian Moir and Allan Seabridge, Aircraft Systems: Mechanical, electrical, and avionics subsystems integration, Third Edition, AIAA Education Series 2008

Recommended Resources

- E. F. Bruhn, Analysis and Design of Flight Vehicle Structures, Jacobs Publishing, Inc. 1973
- Ian Moir and Allan Seabridge, Design and Development of Aircraft Systems, Second Edition, AIAA Education Series 2013
- Vincent L. Pisacane, Fundamentals of Space Systems, Second Edition, Oxford University Press 2005
- FAA-H-8083 Aviation Maintenance Technician Handbook - Airframe
- Michael C. Y. Niu, Airframe Structural Design, Second Edition, Hong Kong Conmilit Press Ltd. 2006
- Warren C. Young and Richard G. Budynas, Roark's Formulas for Stress and Strain, Seventh Edition, 2002
- Federal Aviation Regulations, FAR 23, Airworthiness Standards: Normal Category Airplanes
- Federal Aviation Regulations, FAR 25, Airworthiness Standards: Transport Category Airplanes
- DOT/FAA/AR-MMPDS, Metallic Materials Properties Development and Standardization (MMPDS), (previously MIL-HDBK-5)
- CMH-17, Composite Materials Handbook, (previously MIL-HDBK-17)

Leganto Reading List available via the course Moodle.

UNSW Library website: https://www.library.unsw.edu.au/

Moodle: https://moodle.telt.unsw.edu.au/login/index.php

Course Evaluation and Development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussions with students inside and outside of class, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

In this course, recent improvements resulting from student feedback include:

- Development of a variety of workshop activities to support the design problems.
- CATIA module removal as a formal component of the course.

Laboratory Workshop Information

An **induction** will be **required** for the labs supporting the Design-Build-Test project.

Prior to your in-person induction (Weeks 2-4), you need to read the SWP and pass a quiz, these are

available at:
https://www.making.unsw.edu.au/badges/b/mech-metal-badge/

In-person inductions are scheduled in Weeks 2-4, see your timetable for your specific induction time.

Submission of Assessment Tasks

Assessment submission and marking criteria

Should the course have any non-electronic assessment submission, these should have a standard School cover sheet.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

Late policy

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For example:

- Your course has an assessment task worth a total of 100 marks.
- You submit the assessment 2 days (or part thereof) late (i.e. from 24-48 hours after the deadline).
- The submission is graded and awarded a mark of 65/100.
- A late penalty of 10 marks is deducted from your awarded mark (2 days @ 5% of 100 marks).
- Your adjusted final score is 55/100.

For some assessment items, a late penalty may not be appropriate. These are clearly indicated in the course outline, and such assessments receive a mark of zero if not completed by the specified date. Examples include:

1. Weekly online tests or laboratory work worth a small proportion of the subject mark, or
2. Online quizzes where answers are released to students on completion, or
3. Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
4. Pass/Fail assessment tasks.

Examinations

You must be available for all quizzes, tests and examinations. For courses that have final examinations,

these are held during the University examination periods: February for Summer Term, May for T1, August for T2, and November/December for T3.

Please visit myUNSW for Provisional Examination timetable publish dates. For further information on exams, please see the Exams webpage.

Special Consideration

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to submitting an assessment or sitting an exam.

UNSW now has a Fit to Sit / Submit rule, which means that if you attempt an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

Please note that students will **not** be required to provide **any** documentary evidence to support absences from any classes missed **because of COVID-19 public health measures such as isolation**. UNSW will **not** be insisting on medical certificates from anyone deemed to be a positive case, or when they have recovered. Such certificates are difficult to obtain and put an unnecessary strain on students and medical staff.

Applications for special consideration **will** be required for assessment and participation absences – but no documentary evidence **for COVID-19 illness or isolation** will be required.

Special Consideration Outcomes

Assessments have default Special Consideration outcomes. The default outcome for the assessment will be advised when you apply for Special Consideration. Below is the list of possible outcomes:

Outcome	Explanation	Example
Time extension	Student provided more time to submit the assessment	e.g. 1 more week of time granted to submit a report
Supplementary assessment	Student provided an alternate assessment at a later date/time	e.g. a supplementary exam is scheduled during the supplementary exam period of the term
Substitute item	The mark for the missed assessment is substituted with the mark of another assessment	e.g. mark for Quiz 1 applied also applied as mark for Quiz 2, meaning if a student achieved a mark of 20/30 for Quiz 1 and was granted Special Consideration for Quiz 2, a mark of 20/30 would be applied for Quiz 2, etc
Exemption	All course marks are recalculated excluding this assessment and its weighting	e.g. The course has an assessment structure of: - Assignments 30%, - Lab report 30%, - Final Exam 40%. If the Lab report is missed and student is granted Special Consideration, then the assessment structure may be reweighted as follows: - Assignments 50% - Final Exam 50% as though the Lab report did not exist
Non-standard	Course Coordinator is contacted for the outcome when special consideration is granted as the outcome differs on a case-by-case basis	e.g. typical for group assessments where time extension supplementary assessment could be granted to the group member, time extension could be granted to the whole group, etc. Clarify with your Course Convenor for

Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Academic Information

Credit points

Course credit is calculated in Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

On-campus class attendance

****T2-2022 UPDATE****
- -

Public distancing conditions must be followed for all face-to-face classes. To ensure this, only students enrolled in those classes will be allowed in the room. No over-enrolment is allowed in face-to-face classes. Students enrolled in online classes can swap their enrolment from online to on-campus classes by Sunday, Week 1. Please refer to your course's Microsoft Teams and Moodle sites for more information about class attendance for in-person and online class sections/activities.

Your health and the health of those in your class is critically important. You must stay at home if you are sick or have been advised to self-isolate by NSW health or government authorities. Current alerts and a list of hotspots can be found here. **You will not be penalised for missing a face-to-face activity due to illness or a requirement to self-isolate.** We will work with you to ensure continuity of learning during your isolation and have plans in place for you to catch up on any content or learning activities you may miss. Where this might not be possible, an application for fee remission may be discussed. Further information is available on any course Moodle or Teams site.

In certain classroom and laboratory situations where physical distancing cannot be maintained or there is a high risk that it cannot be maintained, face masks will be considered **mandatory PPE** for students and staff.

For more information, please refer to the
FAQs: https://www.covid-19.unsw.edu.au/safe-return-campus-faqs

Guidelines

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators

- Academic Honesty and Plagiarism

Note: This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.

Image Credit

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	✓
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	✓
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	
PE2.2 Fluent application of engineering techniques, tools and resources	
PE2.3 Application of systematic engineering synthesis and design processes	✓
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	✓
PE3.2 Effective oral and written communication in professional and lay domains	✓
PE3.3 Creative, innovative and pro-active demeanour	
PE3.4 Professional use and management of information	
PE3.5 Orderly management of self, and professional conduct	
PE3.6 Effective team membership and team leadership	