UNSW AUSTRALIA

Course Outline

Semester 1 2016

Never Stand Still | Engineering | Mechanical and Manufacturing Engineering

AERO4110 / AERO4120

Aerospace Design Project A & B

Contents

1. Staff contact details

Position	Name	Email	Availability and location	Phone ext.
Course Convener	John Page	j.page@unsw.edu.au	As requested, J17/311J	54090
Lecturer/tutor	Con Doolan	c.doolan@unsw.edu.au	As requested, J17/408F	55696
Lecturer/tutor	John Olsen	j.olsen@unsw.edu.au	As requested, J17/311C	55217
Lecturer/tutor	Garth Pearce	g.pearce@unsw.edu.au	As requested, J17/208E	54127
Lecturer/tutor	Zoran Vulovic	z.vulovic@unsw.edu.au	As requested, J17/311D	56261

2. Course details

Credit points:

This course is worth 12 credit points - 6 for session 1, and 6 for session 2. Failure in session two results in the loss of the points achieved in session one and the whole year must be repeated.

The UNSW website states “The normal workload expectations of a student are approximately 25 hours per semester for each UoC, including class contact hours, other learning activities, preparation and time spent on all assessable work. Thus, for a full-time enrolled student, the normal workload, averaged across the 16 weeks of teaching, study and examination periods, is about 37.5 hours per week.”

This means that you should aim to spend about 9 h/w on this course. The additional time should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

Summary of the course

Course structure

The class is broken down into teams selected by the staff on the basis of past performance. Each team is provided with a different type of aircraft to carry out an initial design study on during the year. This study involves both analytical and experimental investigation. Individual team members work on different aspects of the project both singularly and in groups as allocated by the team as a whole. The aim being to encourage students to take both personal and collective responsibility for the project’s success.

Managing the project

The day-to-day management of the project will be the responsibility of the team members. They will be expected to ensure the best use of resources, human and physical, and that the

project reaches a satisfactory conclusion. In order to ensure that the success of the project can be gauged by the tutors, some management requirements are laid down.

Design group meetings

Each team will meet once a week in the presence of the tutors. All students in the team must attend every meeting of their team or provide written apologies to the chairperson. The roles of chairperson and secretary for the meetings will rotate round the team at its discretion but so as to ensure all contribute.

Chairperson: The chairperson will be responsible for the conduct of the meeting and should sign two copies of the previous meeting's minutes as a true record on behalf of the meeting. It is also the role of the chairperson to rule as to the validity of any team member's excuse for non-attendance.

Secretary: The secretary should produce the minutes for the meeting and deal with any other administrative tasks for the week following the meeting.

Project file

A project file must be maintained by the group. This should be electronic and can be in a format of the team's choice. They should ensure it contains a copy of all minutes of meetings, technical reports and charts produced by the members of the team, any drawings produced and copies of all correspondence. All team members should have access to this file

Group report

The team will be expected to produce a report on progress to date in the second semester. The submission date will be two weeks before the industrial presentation. They will be expected to make a presentation of this report to staff and students from the School and experts from industry. This report will not mark the end of the project as the students will be expected to produce a portfolio of their individual work before the end of session two.

Industrial meeting

Each team will delegate a member to assist in the organisation of the industrial meeting. The aim of this meeting is for each team to present their design to a panel of practicing designers, regulators and other professionals from the industry such as lawyers, military commanders, etc. While this presentation is not marked it does ensure that the work done is relevant and to an acceptable standard. As a result of this meeting many of the best students are approached for employment.

Individual portfolio and logbook

Each member of the team must keep an individual design logbook. This should be a working book recording any tasks undertaken and data produced. It must plot the individual efforts, along with other useful data and should be written at the time containing working

information. It must be bound (not loose leafed) and penalties will be incurred if it appears to be compiled as a pseudo-report. Neatness, grammar and spelling are unimportant in this book as normally it would be for personal use only though for this exercise you will be expected to produce it on request to the tutors and submit it for final appraisal. Your logbook must be available at each meeting of your design group.

Each student must produce an individual portfolio at the conclusion of the project. This should contain a bill of claim for the particular work carried out including any special contribution, an appraisal of the final design, reference in the team report to work individually done, an appraisal of the team as a whole and an appraisal of the individual members of the team. Students are also encouraged to appraise the course and the staff involved with the course so as to generate improvements but this is kept separate from the portfolio to eliminate any perception of grade contamination. This portfolio must be submitted by the last teaching week of the year.

Aims of the Course

- To allow students to delve deeply into critical areas of the design.
- Develop skills in working in a goal oriented group.
- Experience some of the challenges of managing and co-operating in the design of high-tech products.
- Allow student to present their work to industrial based champions

Student learning outcomes

This course is designed to address the below learning outcomes and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successful conclusion of this course the student will be able:

Learning Outcome		**EA Stage 1 Competencies**
1.	Work cross discipline boundaries to define project	PE 1.1, PE 1.2, PE 1.4, PE 1.5 PE1.6
2.	Carry out a simple aerospace project design	PE 1.1, PE 1.2, PE1.3, PE2.1,PE2.2, PE.2.3
3.	Discriminate between reliable and unreliable information	PE1.4, PE2.1, PE3.1
4.	Produce a report of individual work to other team members	PE1.3, PE1.6, PE2.1, PE2.3. PE3.1, PE3.2, PE3.3
5.	Develop skills in using modern engineering tools	PE1.2,PE2.2, PE3.2,PE3.4

6.	Cooperatively manage and contribute to the team	PE2.1, PE2.3, PE2.4, PE3.3, PE3.4, PE3.5, PE3.6
7.	Have confidence and ability to present the team's work to industrial practitioners	PE1.5, PE1.6, PE3.1, PE3.2, PE3.3, PE3.5, PE3.6

3. Teaching strategies

This is a project based program with the students largely self-learning in a team with seven of their colleagues. A weekly meeting is held to provide guidance to each team. Experts from within the school also provide a lecture program directed towards the technical problems experienced by the individual groups.

4. Course schedule

Along with the compulsory group meeting, where marks will be lost for non-attendance without good reason, there are two lectures a week. Attendance at the lectures is optional but strongly recommended.

Session 1

Weeks	**Lecture 1**	**Lecture 2**
1	Introduction JP	Project Allocation JP CD
2 and 3	Applicable Material JP	Specific Flight Dynamics JRP
4 – 6 inclusive	Applicable Material JP	Specific Aerodynamics CD
10 - 12 inclusive	Applicable Material JP	Specific Aircraft Systems ZV

Session 2

Weeks	**Lecture 1**	**Lecture 2**
1 - 9	Applicable Material JP	Specific Aerostructures GP

The particular material provided in the general and specialized lectures will be dependent on the specific aircraft being designed, the directions the teams choose to take the project and the progress made.

5. Assessment

Assessment overview

The assessment is in two parts one being based on the team's effort and success and the other on the individual's work. While most members of a group will achieve the full team mark, any that are deemed not to have contributed sufficiently will get a reduced mark. It is the whole team's responsibility to ensure that all resources available to the project are fully utilized and this is particularly true in terms of member's time and skills. This will be reflected in the team mark.

At the end of the first session a satisfactory mark has to be recorded for AERO4110 for the student to progress to AERO4120. If the tutors believe that a student has not contributed sufficiently to the team then an unsatisfactory mark is recorded. Members of a team are encouraged to bring to the attention of the tutors any underperforming student but at the same time they must indicate what actions they have taken to remedy the situation. Individual members of a team that have requested the successful removal of a member are expected to compete with the other, now larger, teams so they have to decide whether it is worth retaining the member with the chance of obtaining some useful work or whether the management effort will exceed any potential advantage.

There are a number of contributions to the mark obtained at the end of the program for AERO4120. Failure to pass AERO4120 results in the satisfactory mark in AERO4110 being downgraded to a fail as to pass this course one has to take the two courses the same year. In order to pass the course, you must achieve an overall mark of at least 50%.

Group mark 40%

This mark is based on how well the team has carried out its task. The group report which is produced by week nine Second Session forms the main basis for this mark along with the tutor's notes on how the team performed.

Individual portfolio 40%

At the end of session two each student provides an individual portfolio containing:

- A bill of claim – Outlining the work they have done
- A critique of the design
- A critique of their team
- An appraisal of the individual members of their team

Logbook 10%

Each student must maintain an up to date log book that can be collected and marked during formal meetings.

Special contribution 10%

This mark is based on the tutor's appraisal of any work the student may have contributed to the team. It is expected that all students will make some special contribution.

Assessment	Weight	Learning outcomes assessed	Due date and submission requirements	Marks returned
AERO4110	Satisfactory	1 – 7	N/A	Exam results Session 1
Group mark	40%	1 – 7	Session 2, week 9. Hard copy, in class	Exam results Session 2
Individual portfolio	40%	1 – 7	Session 2 week 13. Hard copy, in class.	Exam results Session 2
Logbook	10%	1 – 7	As requested. Hard copy, in class	As Marked
Special contribution	10%	1 – 7	Throughout year.	Exam results Session 2

Assignments

Submission

Late submissions will be penalised 5 marks per calendar day (including weekends). An extension may only be granted in exceptional circumstances. Where an assessment task is worth less than 20% of the total course mark and you have a compelling reason for being unable to submit your work on time, you must seek approval for an extension from the course convenor ***before the due date***. Special consideration for assessment tasks of 20% or greater must be processed through student.unsw.edu.au/special-consideration.

It is always worth submitting late assessment tasks when possible. Completion of the work, even late, may be taken into account in cases of special consideration.

Examinations

There are no examinations in this course.

Special consideration and supplementary assessment

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

6. Expected resources for students

There are a large number of resources available to the students. In terms of texts the students have to determine the reliability of material between sources. These include hard and electronic sources. They have to find a variety of sources to give some basis for confidence. They also have access to regulated texts that provide a high level of assurance such as Engineering Science Unit data sheets.

There are a large number of computer simulation computer programs available to the students and these are expected to be used in the project. CAD, FE, CFD and Flight simulation are expected to feature strongly in the design.

The teams are expected to use the schools laboratories as required. In particular most of the groups are expected to construct a model for testing in the wind tunnels.

The groups are expected to communicate as a team through a designated computer user group. There is no restriction placed on the students as to which system is used.

One of the teaching staff maintains a Moodle site.

7. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the Course and Teaching Evaluation and Improvement (CATEI) process, informal discussion in the final class for the course, 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.

Course development is taken very seriously and this course has developed over the years largely based on student input. To facilitate this along with the university based evaluation system the students produce a personal appraisal of the course and staff. Great care is taken to ensure that any critical comments cannot affect or be perceived to affect assessment.

8. 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: 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

Further information on School policy and procedures in the event of plagiarism is available on the intranet.

9. Administrative matters

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

- Attendance, Participation and Class Etiquette
- UNSW Email Address
- Computing Facilities
- Assessment Matters (including guidelines for assignments, exams and special consideration)
- Academic Honesty and Plagiarism
- Student Equity and Disabilities Unit
- Health and Safety
- Student Support Services

John Page
1 February 2016

Appendix A: Engineers Australia (EA) Professional Engineer Competency Standards

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex 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
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (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