AERO4110/4120

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, F21 Rm 107H	54090
Lecturer/tutor	N.A. Ahmed	n.ahmed@unsw.edu.au	As requested, G17 Rm 1464K	54080
Lecturer/tutor	John Olsen	j.olsen@unsw.edu.au	As requested, F21 Rm 107J	55217
Lecturer/tutor	Nathan Kinkaid	n.kinkaid@unsw.edu.au	As requested, G17 Rm 467	54180
Lecturer/tutor	Garth Pearce	g.pearce@unsw.edu.au	As requested, G17 Rm 464B	54127
Lecturer/tutor	Zoran Vulovic	z.vulovic@unsw.edu.au	As requested, F21 Rm 107D	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

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 subject 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. <u>This portfolio must be submitted by the last teaching week of the year.</u>

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

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

- Research a specific part of the design both individually and cooperatively
- Discriminate between reliable and unreliable information
- Produce a report of work to other team members
- Express themselves in design team meetings
- Develop skills in using modern engineering tools
- Have confidence to present the team's work to industrial practitioners

Graduate Attributes

Please refer to UNSW graduate attributes:
https://my.unsw.edu.au/student/atoz/GraduateAttributes.html

UNSW aspires to develop graduates who are rigorous scholars, capable of leadership and professional practice in a global community. The university has, thus, articulated the following Graduate Attributes as desired learning outcomes for ALL UNSW students. UNSW graduates will be:

1. Scholars who are:
   a) understanding of their discipline in its interdisciplinary context
   b) capable of independent and collaborative enquiry
   c) rigorous in their analysis, critique, and reflection
   d) able to apply their knowledge and skills to solving problems (*)

e)   ethical practitioners (*)
f)   capable of effective communication
g)   information literate
h)   digitally literate (*)

2. Leaders who are:

a)   enterprising, innovative and creative (*)
b)   capable of initiating as well as embracing change
c)   collaborative team workers (*)

3. Professionals who are:

a)   capable of independent, self-directed practice
b)   capable of lifelong learning
c)   capable of operating within an agreed Code of Practice (*)

4. Global Citizens who are:

a)   capable of applying their discipline in local, national and international contexts (*)
b)   culturally aware and capable of respecting diversity and acting in socially just/responsible ways
c)   capable of environmental responsibility

Graduate attributes targeted and developed in this course are marked with an asterisk (*).

By working in a professional type environment the students are not only expected to develop skills and experience but also how to conduct themselves in an appropriate professional manner.

At the conclusion of this course the successful student will be able to:

- Use their creative ability in a productive way
- Use modern engineering tools
- Work in a non-hieratical goal oriented team
- Compete on a world scale with other graduate aerospace engineers
- Produce collectively a creditable advanced project design

3.   RATIONALE FOR THE INCLUSION OF CONTENT AND TEACHING APPROACH

The aim of this learning structure is to enable the students to experience a working environment similar to that they would encounter in an aerospace company. It is designed to develop the ability to work in a team and to discriminate between valid an invalid material. Due to the project nature of the process there is not a fixed diet of topics to be covered. An understanding of the use of modern computer based engineering tools is also encouraged as a necessary skill base.

4. 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.

5. ASSESSMENT

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.

Task	Mark	Submission Date	Assessed By	Student Informed
AERO4110	Satisfactory	N\A	JRP & Staff	Exam results Session 1
Group Mark	40%	Session 2 Week 9	JRP	Exam results Session 2
Individual Portfolio	40%	Session 2 Week 13	JRP	Exam results Session 2
Logbook	10%	As requested	N.A	As Marked
Special Contribution	10%	Through year	JRP & Staff	Exam results Session 2

6.   ACADEMIC HONESTY AND PLAGIARISM

Plagiarism is using the words or ideas of others and presenting them 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 booklet which provides essential information for avoiding plagiarism: https://my.unsw.edu.au/student/academiclife/Plagiarism.pdf

There is a range of resources to support students to avoid 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. Information is available on the dedicated website Plagiarism and Academic Integrity website: http://www.lc.unsw.edu.au/plagiarism/index.html

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 a honours thesis) even suspension from the university. The Student Misconduct Procedures are available here: http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Further information on School policy and procedures in the event of plagiarism is presented in a School handout, *Administrative Matters for All Courses*, available on the School website.

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7.   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 NA)
2 and 3	Applicable Material JP	Specific Flight Dynamics (JRP
4 – 6 inclusive	Applicable Material JP	Specific Aerodynamics NA
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.

8.   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.

9.   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 tutorial 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.

10.   ADMINISTRATIVE MATTERS

You are expected to have read and be familiar with *Administrative Matters*, available on the School website. This document contains important information on student responsibilities and support, including special consideration, assessment, health and safety, and student equity and diversity.

The Student Equity and Disabilities Unit is located on the Ground Floor of the Goodsell building (F20). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

John Page
15/01/2015