Course Outline

Semester 1, 2015

AERO4620

Dynamics of Aerospace Vehicles and Systems

Contents

UNSW expects that you will put in, on average, 40 h/w for 24 UoC (including both in-class and out-of-class time) for an effective 14 weeks of the session. This means that, for this course, you should aim to spend not less than an additional four hours per week of your own time. This should be spent in making sure that you understand the lecture material, further reading about the course material, and revising and learning for the examinations.

Timetable

Lecture 1:	Mon 15:00	13:00	Valentine Annexe 121
Lecture 2:	Tue 16:00	18:00	TBC
Lecture 3:	Thu 16:00	18:00	Chemical Sc M11 (ex Applied Sc)

Parallel teaching

There is no parallel teaching in this course.

How the course relates to other course offerings and overall program(s) in the discipline

For ease of management the course is organised into three separate parts: Aerospace Systems, Avionics and Flight Dynamics, and they will form Modules A, B and C respectively. Module A will run in Weeks 1 4 and Modules B and C in Weeks 5 12.

The Aerospace Systems part deals with the so-called airframe systems as well as

electronic systems as well as other systems that directly interface with avionics. The Flight Dynamics covers different aspects of aircraft stability and the parameters that affect it. The wind tunnel experiment demonstrates the longitudinal stability, understanding of which is crucial for flight control systems. It also provides a link between the Flight Dynamics and Avionics modules. Finally, the flight simulation experiment demonstrates the operations of auto-pilots and various navigation and communication systems.

AERO4620 is an important stepping stone in aerospace engineering education. The knowledge acquired during this course is directly applicable to the group design in AERO4110/4120. On the other hand, Module C of this course directly relates to the performance part of AERO3660; at the same time the stability analysis of flying vehicles presented in this module is based on methods learned in MMAN3200 Linear Systems and Control. The large majority of this class was involved in flight experiments that provided a crucial link between the theoretical knowledge gained during the class time and real flight situations. Students were also able to observe the functioning of systems found in General Aviation aircraft. All these components largely contribute to developing necessary engineering skills and knowledge.

Expected student learning outcomes

The course is largely based on previously gained knowledge in core engineering subjects and students will be able to understand functioning of various airframe and avionics systems as well as aircraft stability. The two experiments will give you an opportunity to have a practical insight into the problems addressed in lecture, as well as to demonstrate some analytical skills in obtaining the required results.

By the end of this course it is expected that you will:

learn what most of the systems and their components are and how they work;

components;

performance;
understand the regulatory aspects of static stability;
learn the analytical aspects of static stability;
learn the analytical aspects of dynamic stability;
learn how to apply methodologies learnt in MMAN3200 to aerospace applications.

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)

4. TEACHING STRATEGIES

Lectures in the course are designed to provide the basic theory behind the concepts