UNSW Course Outline

ZEIT8011 Space Systems Technology - 2024

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General Course Information

Course Code : ZEIT8011
Year : 2024
Term : Semester 2
Teaching Period : Z2
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Engineering and Technology
Delivery Mode : Online
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course introduces the technologies associated with space systems employed for applications such as communications, navigation and remote sensing. An overview is provided of the technologies employed in all aspects of space systems, including both ground and space

segments. It introduces the role and operation of satellite subsystems, satellite propulsion subsystems, satellite attitude determination and control subsystems, aerospace structures, and satellite integration issues.

Course Aims

This course aims to:

1. Critically evaluate past, current, and future technologies to meet emerging space applications needs
2. Introduce the role, operation, and limitations of various satellite subsystems across a range of satellite architectures and applications
3. Provide students with the technical knowledge to select appropriate satellite susbsystems to perform a mission task
4. Highlight the impact that technical advances will generate for the provision of space-based applications

Course Learning Outcomes

Course Learning Outcomes
CLO1 : On successful completion of this course, students will be able to critically analyse the applicability of different satellite technologies to achieve a mission goal using a range of theoretical analysis techniques.
CLO2 : On successful completion of this course, students will be able to apply knowledge and expert judgement to construct and defend a coherent and sustained argument regarding the future of space technology development.
CLO3 : On successful completion of this course, students will be able to appraise and critique industry trends to formulate an argument for the use of satellite sub-system technologies to meet space mission requirements.
CLO4 : On successful completion of this course, students will be able to research the different spacecraft subsystems types and explain their role in achieving a set of mission goals.

Course Learning Outcomes	Assessment Item
CLO1 : On successful completion of this course, students will be able to critically analyse the applicability of different satellite technologies to achieve a mission goal using a range of theoretical analysis techniques.	• Quizzes throughout session • Forum posting • Assignment • Final Test • Assignment peer assessment
CLO2 : On successful completion of this course, students will be able to apply knowledge and expert judgement to construct and defend a coherent and sustained argument regarding the future of space technology development.	• Forum posting • Assignment • Assignment peer assessment
CLO3 : On successful completion of this course, students will be able to appraise and critique industry trends to formulate an argument for the use of satellite sub-system technologies to meet space mission requirements.	• Assignment • Assignment peer assessment
CLO4 : On successful completion of this course, students will be able to research the different spacecraft subsystems types and explain their role in achieving a set of mission goals.	• Quizzes throughout session • Final Test • Forum posting • Assignment • Assignment peer assessment

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

Teaching Strategies

Moodle is the core platform for the course. Each week read the course readings provided in Moodle and complete the review (quiz) questions. You must demonstrate your understanding of the course content through successfully completing the quizzes before access to the next section of course materials is granted.

The guided reading is designed to provide you with the background to undertake the principal components of the course—the forum postings and the assignment. The forum postings will test your ability to ***critically analyse and evaluate*** *articles found from a* ***focussed literature search*** *on topics aligned with the course material. You are expected to* ***synthesize*** *this information with your own insights into how space technology has shaped and affected society to present a* ***coherent and sustained argument*** *to your peers. The major design assignment requires you to pull together all of the material from the course.*

All assessment items must be completed independently. You are required to construct insightful responses to your peers' forum posts and ***actively engage in the online community****. Additionally, a formal peer review activity is required following the assignment submission. The peer review activities provide an avenue to learn from each other; generate active discussion within the group; and offer an opportunity for reflection on your understanding of the course concepts.*

Developing Graduate Capabilities

Successful completion of this course contributes to the acquisition of UNSW graduate capabilities. UNSW aspires to develop globally focused graduates who are **rigorous scholars**, capable of **leadership** and **professional practice** in an **international** community.

The Learning Management System

Moodle is the Learning Management System used at UNSW Canberra. All courses have a Moodle site which will become available to students at least one week before the start of semester. Please find all help and documentation (including Blackboard Collaborate) at the Moodle Support *page.*

UNSW Moodle supports the following web browsers:

» Google Chrome 50+

» Safari 10+

*** Internet Explorer is not recommended*

*** Addons and Toolbars can affect any browser's performance.*

Operating systems recommended are:

Windows 7, 10, Mac OSX Sierra, iPad IOS10

For further details about system requirements click here.

Log in to Moodle here.

If you need further assistance with Moodle:

For enrolment and login issues please contact:
IT Service Centre
Email: itservicecentre@unsw.edu.au
Phone: (02) 9385-1333
International: +61 2 9385 1333

For all other Moodle issues please contact:
External TELT Support
Email: externalteltsupport@unsw.edu.au
Phone: (02) 9385-3331
International: +61 2 938 53331

Opening hours:
Monday – Friday 7:30am – 9:30 pm
Saturday & Sunday 8:30 am – 4:30pm

Additional Course Information

Study at UNSW Canberra

https://www.unsw.adfa.edu.au/study

Study at UNSW Canberra has lots of useful information regarding:

- Where to get help

- Administrative matters
- Getting your passwords set up
- How to log on to Moodle
- Accessing the Library and other areas.

Additional Information as required

CRICOS Provider no. 00098G

The University of New South Wales Canberra.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes throughout session Assessment Format: Individual	0%	
Forum posting Assessment Format: Individual	25%	Due Date: 11/08/2024 11:55 PM
Assignment Assessment Format: Individual	50%	Due Date: 13/10/2024 11:55 PM
Final Test Assessment Format: Individual	15%	Due Date: 29/09/2024 11:55 PM
Assignment peer assessment Assessment Format: Individual	10%	Due Date: 25/08/2024 11:55 PM

Assessment Details

Quizzes throughout session

Assessment Overview

Online revision (practice) quizzes are provided throughout the course to provide on-going feedback to the student and course convenor. These will provide you with a chance to confirm your understanding of the content of the text chapters and prepare you for the timed online test. Each quiz may be attempted a maximum of 3 times. No marks are awarded for their completion and no time limit is applied, however you are required to achieve a mark of 75% to unlock the next section of the course. If you fail to reach 75% after 3 attempts, you are required to contact the course convenor to discuss any problems before access to the next section of the course is granted.

Course Learning Outcomes

- CLO1 : On successful completion of this course, students will be able to critically analyse the applicability of different satellite technologies to achieve a mission goal using a range of

theoretical analysis techniques.
- CLO4 : On successful completion of this course, students will be able to research the different spacecraft subsystems types and explain their role in achieving a set of mission goals.

Forum posting

Assessment Overview

The forum post is intended to guide your literature search for the assignment and provide a platform for discussion within the group around the broader issues affecting space technology into the future. A question will be posted, and you are required to identify relevant articles from the literature and provide a critical summary in the designated online Moodle Forum.

Posting is expected to be around 1200 words, excluding references. Post must be a minimum of 800 words and not exceed 1500 words (excluding references). Post outside these limits will receive a grade of 0%. The forum-posting grade will be awarded for the quality of your forum post: engagement, discussion, critical analysis, and additional literature referenced in your response. Both your post and your replies are expected to adhere to the APA 6 or 7 referencing style and demonstrate a mastery of ***critical and/or analytical academic writing***.

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Assignment

Assessment Overview

The assignment (posted in the online site) provides you with an opportunity to demonstrate your ability to apply the knowledge and understanding you have gained throughout the course. The assignment requires higher order independent thinking beyond the ability to remember the information provided in the textbook. Along with the forum postings, it will help you draw together all of the discrete areas studied in each section and demonstrate your mastery of the discipline.

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Final Test

Assessment Overview

The timed online test can be attempted only once. The test covers the lecture material in weeks 1-11; the online quizzes providing the necessary revision, review, and feedback opportunities. The test deadline is set to provide several weeks of study if required, however the test can be attempted earlier if desired. The online quizzes are designed to provide the required revision and feedback to prepare you for the test, but please utilise the course Q&A forums and/or contact the course convenor if there are concepts that require further clarity. **Note that the test due date cannot be extended under any circumstances.**

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- CLO4 : On successful completion of this course, students will be able to research the different spacecraft subsystems types and explain their role in achieving a set of mission goals.

Assignment peer assessment

Assessment Overview

You are required to formally assess 2 forum post submissions from your peers. No feedback on the assignment is available from the course convenor until the peer assessment activity is complete. You must complete the peer assessment activity independently. The grade for this assessment item will be governed by the quality of the critical evaluation and analysis within each peer assessment. The peer assessment activity is designed to demonstrate that you have attained the following UNSW graduate attributes: “the skills involved in scholarly enquiry”, “an in-depth engagement with the relevant disciplinary knowledge in its interdisciplinary context”, and“the ability to engage in independent and reflective learning”.

[Note that the assignment grade is decided solely on the grade awarded by the course convenor and is independent of the peer assessment process]

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General Assessment Information

Late Submission of Assessment

Unless prior arrangement is made with the lecturer or a formal application for special consideration is submitted, a penalty of 5% of the total available mark for the assessment will apply for each day that an assessment item is late up to a maximum of 5 days (120 hours) after which an assessment can no longer be submitted and a grade of 0 will be applied. Please note that lecturer support will **NOT** be available after the original submission date.

All the quizes will have feedback and answers provided after the complete attempt. Quiz 1-3 are scheduled before the census date and therefore, instant feedback upon completion.

Academic Integrity and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to this principle of academic integrity. All students are expected to adhere to UNSW's Student Code of Conduct. https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Plagiarism undermines academic integrity and is not tolerated at UNSW. *It is defined as using the words or ideas of others and passing them off as your own, and* can take many forms, from deliberate cheating to accidental copying from a source without acknowledgement.

Use of Generative Artificial Intelligence (AI) – such as ChatGPT – in UNSW Assessments: PLANNING ASSISTANCE allowed. As this assessment task involves some planning or creative processes; you are permitted to use software to generate initial ideas. However, you must develop or edit those ideas to such a significant extent that what is submitted is your own work, i.e., only occasional AI generated words or phrases may form part of your final submission. It is a good idea to keep copies of the initial prompts to show your lecturer if there is any uncertainty about the originality of your work. If the outputs of generative AI such as ChatGPT form a part of your submission, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

For more information, please refer to the following:

https://student.unsw.edu.au/plagiarism

Referencing

In this course, students are required to reference following the APA 6 or 7 referencing styles. Information about referencing styles is available at: https://guides.lib.unsw.adfa.edu.au/c.php?g=472948&p=3246720

Grading Basis

Standard

Requirements to pass course

Assessment Requirements

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark.**

Allocation of Marks

There are four formal assessment items in this course: one forum posting (25%), a multiple-choice test (15%), a major design assignment (50%), and a peer-review activity (10%). You are not required to pass any one piece of assessment; you simply need to achieve at least 50 marks out of a total 100 marks to pass this course.

Course Schedule

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

Week	Date	Topic
1	15-21 Jul.	Introduction to Spacecraft Quiz 1 (Feedback of all online Quizes provided upon attempt.)
2	22-28 Jul.	Launch and Satellite Propulsion. Quiz 2
3	29 Jul. -4 Aug.	Position, Navigation, and Timing Quiz 3
4	5-11 Aug.	Assignment Focused ***FORUM POSTING 1 DUE 23:55 11th August.***
5	12-18 Aug.	Attitude Determination and Control Quiz 4
6	19-25 Aug.	Satellite Communications Quiz 5 ***FORUM 1 REPLY DUE 23:55 25th August***
7	26Aug.- 1st Sep.	Satellite Bus: Mechanical (thermal, structural, manufacture) Quiz 6
8	2-8 Sep	Payloads (Sensing) Quiz 7
9	9-15 Sep	Payloads (Data and Processing) Quiz 8
10	16-22 Sep	Electrical Power Systems Quiz 9
11	23 Sep -29 Sep	Assignment Focused ***Final Test DUE 23:55 29th Sep***
12	30 Sep - 6 Oct	Assignment Focused
13	7–13Oct	Assignment Focused ***Major Assignment DUE 23:55 13th Oct***

28th Nov UNSW Results release – feedback and grade for assignment released

Course Resources

Recommended Resources

There is no prescribed textbook for this course, with information taken from several sources. All reading material will be provided digitally via library resources, with appropriate links provided in Moodle.

Course Evaluation and Development

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via direct contact with the lecturer, the "On-going Student Feedback" link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Important note: *Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct Policy*

https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Other Information

Throughout this course, you are expected to apply yourself to the tasks set within these instructions and other guidance on the course online site. The University expects that you would devote to this course approximately 150 hours of effort throughout the session. The effort will be reflected in the knowledge you demonstrate in your responses to the quizzes, forum postings, and in the depth and rigour of your assignments.

We expect all students to use their UNSW email for any correspondence with the Course Convenor.

All messages generated from the course Moodle page will be sent to your UNSW email. If you use a private or work email, you must have your emails automatically forwarded to the alternate address. This can be set up by auto forwarding your incoming emails. This avoids confusion and missing information.

Please always use Moodle Q/A discussion forums as the first point of access for course related matters, but for your personal matters, please email your Course Convenor directly.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Rabbia Saleem		UNSW Canberra		Consultation Times: Available during normal working hours. Consultation Modes: Email, Virtual/Online via Teams or Zoom. Please include the course code ZEIT8011 in your email subject.	No	Yes