

ELEC9765

Space Law and Radio Regulations

Term 3, 2021



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Elias Aboutanios	elias@unsw.edu.au		EEB 445	61 2 9385 5010

School Contact Information

Consultations: Lecturer consultation times will be advised during the first lecture. You are welcome to email the tutor or laboratory demonstrator, who can answer your questions on this course and can also provide you with consultation times. **ALL** email enquiries should be made from your student email address with **ELEC/TELExxxx** in the subject line; otherwise they will not be answered.

Keeping Informed: Announcements may be made during classes, via email (to your student email address) and/or via online learning and teaching platforms – in this course, we will use Moodle <https://moodle.telt.unsw.edu.au/login/index.php>. Please note that you will be deemed to have received this information, so you should take careful note of all announcements.

Student Support Enquiries

[For enrolment and progression enquiries please contact Student Services](#)

Web

[Electrical Engineering Homepage](#)

[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)

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

Course Details

Units of Credit 6

Summary of the Course

This course belongs to the Masters Program: ELECTS8338 - Master of Engineering Science in Space Systems Engineering. The masters provides a comprehensive grounding in space systems engineering including an understanding of space systems and their components, the engineering processes involved in successfully carrying out space missions, and the legal aspects that govern space activities. It is in this context that Space Law and Radio Regulations fits.

Space is a realm for humankind and human space activities that transcends national boundaries. Hence there is a need for space regulation to be implemented at both international and national levels. This unique and exciting course gives engineering students seeking a future in the space industry a solid grounding in space law and radio regulations. The course starts with an introduction to legal frameworks and the formulation of laws. It then covers the international treaties that comprise the international regulatory framework for space activities, leading to the study of national legislative systems with a focus on the Australian Space Activities Act. As it is aimed at engineers, a unique feature of the course is that the various engineering, environmental, and regulatory implications of these legal systems to space systems engineering and space activities will be discussed. The course will therefore include a treatment of the interaction between the relevant laws on the one hand, and the engineering and technology on the other.

Course Aims

1. Learn about the fundamental legal frameworks and how they are developed.
2. Learn about the historical context of space law and the International Space Treaties governing human space activities.
3. Study the specific 'hard' and 'soft' law principles that have been developed for the regulation of activities in outer space, as well as the unique complexities inherent in designing regulatory principles and guidelines for the space environment.
4. Learn about national space legislations and in particular the Australian space legal framework.
5. Learn about the radio regulations frameworks and their application to space systems.
6. Learn about the environmental aspects of space law (e.g. space debris).
7. Learn about the implications of space law to engineering decisions of space systems.
8. Learn about the interaction of technology and space law (how each impacts the other).
9. Take a look at the future of Space from a legislative perspective (e.g. cubesats, space tourism...).

Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. Describe the legal systems governing space activities.	PE1.3, PE1.5, PE3.4, PE3.5
2. Describe the radio regulations of space activities.	PE1.3, PE1.5, PE2.3, PE3.1, PE3.4, PE3.5
3. Describe the treaties on the use of outer space and their	PE1.3, PE1.5

Learning Outcome	EA Stage 1 Competencies
implications for the nations that are signatory to them.	
4. Explain the need for national space legislation and describe the Australian Space Activities Act.	PE1.3, PE1.5, PE2.3, PE3.1, PE3.4, PE3.5
5. Describe the legal processes that engineers carrying out space missions have to navigate.	PE1.3, PE1.5, PE1.6, PE2.3, PE2.4, PE3.1, PE3.3, PE3.4, PE3.5, PE3.6
6. Describe the various uses of outer space, the engineering decisions involved, and the legal principles that govern them.	PE1.4, PE2.3, PE3.1

Teaching Strategies

The delivery of material in this course will be primarily via Moodle (reading material), forum discussions, and the targeted assessment. This is not a standard technical subject, and as such it cannot be taught in the standard lecture delivery format. Instead, reading material will be given and should be read by the students. Laws are subject to interpretation and although there often is a generally accepted or dominant interpretation, legal opinions can vary. Therefore, the research and discussions are essential in this course. It is extremely important that students do their readings and preparation and engage in the learning activities.

The lectures will still be held and will take various formats depending on the need. These may involve the presentation of lecture slides, holding discussions, answering questions, etc...

As detailed in the table above, the course comprises 4 modules covering the major areas that will be learned. This subject is aimed at giving engineers a grounding in space law in order to empower them to better and more efficiently carry out space missions. As such, the topics start with an introduction to international law, moving through the framework and applications of space law and finally finishing with interaction between space law and technology. This last aspect is a key element of the course as we discuss the impact of space law on engineering decisions and on the way space missions are undertaken.

Each module comprises a number of topics. The following will be provided for each module:

- 1. Study guide:** A study guide that gives the topic breakdown will be provided. This study guide effectively lists subtopics, ideas, concepts, words, and items that are to be researched and studied.
- 2. A reading guide:** Suggested readings will be given for each module. These readings may be chapters of books, papers, articles, websites, videos, etc... Whenever possible, the article will be posted. But in general, you are expected to be able to source them from relevant databases. The readings are provided as a starting point and you are expected to do your own research beyond the suggested materials. Note that whenever a reading is marked as required, you are expected to complete that reading.
- 3. Module Exercises:** For each module, you will need to compile a glossary of terms and definitions. You will also have a number of questions to answer. These reflect the study and reading guides and will ensure that you can keep track of and evaluate your learning.

Additional Course Information

This is a masters course that forms part of the ELECTS8338 Satellite Systems Engineering Stream. It is also available to Undergraduate students as a substitution for an L4 elective (subject to approval by the Course and Program Authorities).

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Module Assessment Tasks	40%	Not Applicable	1, 2, 3, 4, 5, 6
2. Assignment	20%	18/11/2021 12:00 AM	1, 2, 3, 4, 5
3. Final Exam	40%	Not Applicable	1, 2, 3, 4, 5, 6

Assessment 1: Module Assessment Tasks

For each module, you will need to compile a glossary of terms and definitions. You will also have a number of questions to answer. These reflect the study and reading guides and will ensure that you can keep track of and evaluate your learning.

The aims of these exercises are:

1. to ensure you actively engage in your learning,
2. to allow you to test your learning for each module, and
3. to provide opportunities for you to get feedback on your learning.

Assessment 2: Assignment

Start date: 07/10/2021 12:00 AM

Due date: 18/11/2021 12:00 AM

In this assignment students are required to overview and discuss an area of Space Law: e.g. pick two national space legislations and compare and contrast them focusing on their effectiveness in regulating the national space activities of the country they belong to.

Feedback on the student's idea through assessment and grading of submission.

This is not a Turnitin assignment

Assessment criteria

The assignment allows self-directed study leading to the solution of partly structured problems. Marks will be assigned according to how completely and correctly the questions have been answered, and the understanding of the course material demonstrated by the report.

Assessment 3: Final Exam

The exam in this course is a standard two-hour open-book examination. University approved calculators are allowed. The examination tests critical thinking and general understanding of the course material in a controlled fashion. Questions may be drawn from any any material delivered during the course, unless

specifically indicated otherwise by the lecturer. Marks will be assigned according to the correctness of the responses. Please note that you must pass the final exam in order to pass the course.

Attendance Requirements

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

Course Schedule

Weeks	Module	Indicative Topic Breakdown
1-3	Introduction to International and Space Law	<ol style="list-style-type: none"> 1. Introduction to International Law 2. Historical development of space law 3. International legal framework of space
4,5	Applications of Space Law	<ol style="list-style-type: none"> 1. Space Sustainability: Environmental aspects of space activities 2. Commercial uses of outer space 3. Remote Sensing 4. Navigation 5. Military uses of outer space
6	Flexibility Week	
7,8	National Space Legislations	<ol style="list-style-type: none"> 1. Relationship between international and national laws 2. Relationship between international and national space laws 3. History of Australia's space activities 4. Overview of Australia's Space Laws
9,10	Interaction between Space Law and Technology	<ol style="list-style-type: none"> 1. The Impact of Space Law on Engineering Decisions 2. The impact of Engineering and Technology on Space Law 3. Recent developments and emerging challenges 4. Space Law and the Future

Resources

Prescribed Resources

This course does not have a prescribed textbook and relevant reading from any source is encouraged. However, recommended text include (but are not limited to) the list below. Additional reference material may be posted on Moodle

Recommended Resources

1. I.H. Ph.Diederiks-Verscoor and P. Kopal, An Introduction to Space Law, Wolters Kluwer, 2008
2. F. Lyall and P.B. Larsen, Space Law: A Treatise, Ashgate Publishing, 2009
3. R.S. Jakhu, National Regulation of Space Activities, Springer, 2010

Course Evaluation and Development

This course is under constant revision in order to improve the learning outcomes for all students. Please forward any feedback (positive or negative) on the course to the course convener or via the Course and Teaching Evaluation and Improvement Process. You can also provide feedback to ELSOC who will raise your concerns at student focus group meetings. As a result of previous feedback obtained for this course and in our efforts to provide a rich and meaningful learning experience, we have continued to evaluate and modify our delivery and assessment methods.

Academic Honesty and Plagiarism

Academic Honesty and Plagiarism

Plagiarism is the unacknowledged use of other people's work, including the copying of assignment works and laboratory results from other students. Plagiarism is considered a form of academic misconduct, and the University has very strict rules that include some severe penalties. For UNSW policies, penalties and information to help you avoid plagiarism, see <https://student.unsw.edu.au/plagiarism>. To find out if you understand plagiarism correctly, try this short quiz: <https://student.unsw.edu.au/plagiarism-quiz>.

General Conduct and Behaviour

Consideration and respect for the needs of your fellow students and teaching staff is an expectation. Conduct which unduly disrupts or interferes with a class is not acceptable and students may be asked to leave the class.

Academic Information

COVID19 - Important Health Related Notice

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.

If you are required to self-isolate and/or need emotional or financial support, please contact the [Nucleus: Student Hub](#). If you are unable to complete an assessment, or attend a class with an attendance or participation requirement, please let your teacher know and apply for [special consideration](#) through the [Special Consideration portal](#). To advise the University of a positive COVID-19 test result or if you suspect you have COVID-19 and are being tested, please fill in this [form](#).

UNSW requires all staff and students to follow NSW Health advice. Any failure to act in accordance with that advice may amount to a breach of the Student Code of Conduct. Please refer to the [Safe Return to Campus](#) guide for students for more information on safe practices.

Dates to note

Important Dates available at: <https://student.unsw.edu.au/dates>

Student Responsibilities and Conduct

Students are expected to be familiar with and adhere to all UNSW policies (see <https://student.unsw.edu.au/policy>), and particular attention is drawn to the following:

Workload

It is expected that you will spend at least **15 hours per week** studying a 6 UoC course, from Week 1 until the final assessment, including both formal classes and *independent, self-directed study*. In periods where you need to complete assignments or prepare for examinations, the workload may be greater. Over-commitment has been a common source of failure for many students. You should take the required workload into account when planning how to balance study with employment and other activities.

Attendance

Regular and punctual attendance at all classes is expected. UNSW regulations state that if students attend less than 80% of scheduled classes they may be refused final assessment.

Work Health and Safety

UNSW policy requires each person to work safely and responsibly, in order to avoid personal injury and to protect the safety of others.

Special Consideration and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You can apply for special consideration when illness or other circumstances beyond your control interfere with an assessment performance. If you need to submit an application for special consideration for an exam or assessment, you must submit the application **prior to the start** of the exam or before the assessment is submitted, except where illness or misadventure prevent you from doing so. Be aware of the “fit to sit/submit” rule which means that if you sit an exam or submit an assignment, you are declaring yourself well enough to do so and cannot later apply for Special Consideration. For more information and how to apply, see <https://student.unsw.edu.au/special-consideration>.

Administrative Matters

On issues and procedures regarding such matters as special needs, equity and diversity, occupational health and safety, enrolment, rights, and general expectations of students, please refer to the School and UNSW policies:

<https://student.unsw.edu.au/guide>

<https://www.engineering.unsw.edu.au/electrical-engineering/resources>

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	✓