UNSW Course Outline

ELEC3114 Control Systems - 2024

Published on the 22 May 2024

General Course Information

Course Code : ELEC3114
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Electrical Engineering & Telecommunications
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate, Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Control systems engineering, a highly interdisciplinary field in Engineering, draws extensively from foundational courses in Electrical Engineering due to the complex nature of modern control systems. These systems integrate multiple components including electromechanical, hydraulic, and embedded systems into a unified structure. The design of control systems exemplifies the fusion of theory and practice, as mathematical tools from control theory are effectively utilized to address real-world engineering challenges. Studying control theory equips engineers with the ability to transform practical problems into feasible engineering solutions.

The control systems engineering course covers a range of essential topics. It begins with understanding control systems and distinguishing between simple and complex systems. Students learn analysis and design tools for simple control systems, including concepts such as differential equations, Laplace transforms, transfer functions, poles and zeros, state space models, and modeling techniques for first and second-order systems. Fundamental characteristics and performance aspects of feedback control systems are explored, such as transient response analysis, steady-state errors, and the root locus method. Additionally, the course includes topics on PID control, basic frequency response techniques, and ensuring stability in feedback control systems through analyzing transfer functions and state-space models.

Course Aims

The objective of this course is to provide you with fundamental tools of control theory necessary for designing and implementing control systems. These tools have broad applications across various disciplines, including financial systems, unmanned vehicles, and disease spread control. While the course covers only a portion of this vast field, it aims to impart transferable skills applicable to diverse engineering problems.

The laboratory component is meticulously designed to foster the ability to develop control systems from scratch, considering practical constraints like hardware limitations and external disturbances. Through lectures, tutorials, and labs, the course aims to cultivate skills in analyzing and implementing effective control strategies for real-world systems.

The course acknowledges its challenges but promises tailored learning experiences to encourage active participation and critical thinking. Various in-class and out-of-class activities aim to keep students engaged, motivated, and equipped with lifelong learning skills. Laboratory exercises play a crucial role in providing hands-on experience.

In summary, the course aims for students to attain true competence in control theory fundamentals and learn how to abstractly represent physical processes, assess controllability, specify control performance, design controllers, and deploy and tune them on real hardware. The key fundamentals enabling these objectives include feedback and feedforward concepts, response of linear time-invariant systems to standard inputs, stability and robustness analysis, and design of feedback systems meeting performance criteria.

Relationship to Other Courses

Pre-requisites and Assumed Knowledge

The pre-requisites for this course are:

- MATH2069 Mathematics 2A
- MATH2099 Mathematics 2B
- ELEC2134 Circuits and Signals

Although not an official prerequisite, it is crucial to have completed **ELEC3104 Digital Signal Processing** before attempting this course. Additionally, completing **DESN2000 (Electrical Engineering Stream)** is beneficial.

Following Courses

This course serves as a pre-requisite for the following courses:

- ELEC4631 Continuous-Time Control System Design
- ELEC4632 Computer Control Systems
- ELEC4633 Real-Time Engineering
- ELEC4123 Electrical Design Proficiency
- ELEC9731 Robust and Linear Control Systems
- ELEC9732 Analysis and Design of Non-linear Control.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.
CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain
CLO3 : Explain the concept of control systems stability and feedback control systems.
CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems
CLO5 : Apply control systems theories through hands-on and in-depth experience in laboratory.
CLO6 : Utilize software tools to help with analysis, design, evaluation, and implementation of control systems for real-world applications in both simulation and real-time environment.

Course Learning Outcomes	Assessment Item
CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.	• Lab Work • Final Examination • Quizzes • Midterm Examination
CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain	• Lab Work • Final Examination • Quizzes • Midterm Examination
CLO3 : Explain the concept of control systems stability and feedback control systems.	• Lab Work • Final Examination • Quizzes • Midterm Examination
CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems	• Lab Work • Final Examination • Quizzes • Midterm Examination
CLO5 : Apply control systems theories through hands-on and in-depth experience in laboratory.	• Lab Work
CLO6 : Utilize software tools to help with analysis, design, evaluation, and implementation of control systems for real-world applications in both simulation and real-time environment.	• Quizzes • Lab Work

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Review - Assessment/Feedback Tool

Other Professional Outcomes

Engineers Australia (EA), Professional Engineer Stage 1 Competencies

The Course Learning Outcomes (CLOs) contribute to your development of the following EA competencies

PE1: Knowledge and Skill Base:

PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals: CLO 1, 2, 3, 4, 5, 6

PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing: CLO 1, 2, 3, 4, 5, 6

PE1.3 In-depth understanding of specialist bodies of knowledge: CLO 1, 2, 3, 4, 5, 6

PE1.4 Discernment of knowledge development and research directions: N/A

PE1.5 Knowledge of engineering design practice: CLO 1, 2, 3, 4, 5, 6

PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice: N/A

PE2: Engineering Application Ability:

PE2.1 Application of established engineering methods to complex problem solving: CLO 1, 2, 3, 4, 5, 6

PE2.2 Fluent application of engineering techniques, tools and resources: CLO 1, 2, 3, 4, 5, 6

PE2.3 Application of systematic engineering synthesis and design processes: CLO 1, 2, 3, 4, 5, 6

PE2.4 Application of systematic approaches to the conduct and management of engineering projects: N/A

PE3: Professional and Personal Attributes:

PE3.1 Ethical conduct and professional accountability: N/A

PE3.2 Effective oral and written communication (professional and lay domains): CLO 5

PE3.3 Creative, innovative and pro-active demeanour: CLO 5

PE3.4 Professional use and management of information: N/A

PE3.5 Orderly management of self, and professional conduct: N/A

PE3.6 Effective team membership and team leadership: N/A

Additional Course Information

Syllabus

Please see **Course Schedule** page.

Contacting Course Authority

For various queries related to the course, please follow these guidelines:

- **Staff Page:** Refer to the Staff page for names and contact details.
- **Lecture and General Course Queries:**
  - Contact the course convenor.
  - Use "ELEC3114 Lec/Gen Query" in your email subject if using email.
  - Use relevant channel in course MS Teams to post your queries.
- **Lab Matters:**
  - Contact the head lab demonstrator/lab staff.
  - Use "ELEC3114 Lab Query" in your email subject if using email.
  - Use Laboratory channel in course MS Teams to post your queries.
- **Tutorial/Workshop Matters:**
  - Contact the head tutor. If the head tutor is unavailable, contact the course convenor.
  - Use "ELEC3114 Lab Query" in your email subject if using email.
  - Use Tutorial-Workshop channel in course MS Teams to post your queries.

Important Notes:

- Ensure your queries are directed to the appropriate personnel for efficient resolution.
- Emails with incorrect subjects or sent to the wrong contact will not receive a reply.
- All queries must be made via official UNSW email or on a relevant course MS Teams channel.
- Please do not contant course staff using personal MS Teams chat for any course-related queries.
  - This option is only reserved for private communication with course coordinator.

These procedures help maintain clear and effective communication throughout the course.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Lab Work Assessment Format: Individual	35%	Start Date: See Course Schedule Due Date: See Course Schedule
Final Examination Assessment Format: Individual	35%	Start Date: Not Applicable Due Date: Announced by UNSW
Quizzes Assessment Format: Individual	5%	Start Date: Week 2 Due Date: One week from the release date of each quiz
Midterm Examination Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: See Course Schedule

Assessment Details
Lab Work

Assessment Overview

The laboratory component of the course aims to reinforce theoretical knowledge and practical skills through 6 assessable lab experiments. Each weekly lab session spans 3 hours. While pre-lab and post-lab activities are provided to enhance preparation and reflection, they are not formally assessed but are crucial for successful completion of each experiment. Additionally, there is a lab project, the details of which will be outlined in the project manual.

Students are required to maintain records of their observations and calculations for both lab work and the lab project, either digitally or in paper-based format, and present them during assessment. This ensures accountability and thorough documentation of the practical work undertaken.

While the laboratory component of this course is a group work activity, students are assessed individually.

Course Learning Outcomes

- CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.
- CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain
- CLO3 : Explain the concept of control systems stability and feedback control systems.
- CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems
- CLO5 : Apply control systems theories through hands-on and in-depth experience in laboratory.
- CLO6 : Utilize software tools to help with analysis, design, evaluation, and implementation of control systems for real-world applications in both simulation and real-time environment.

Detailed Assessment Description

1. Pre-lab Exercises

You **MUST** complete the pre-lab exercises before attending the lab. These exercises include both simple analytical questions and simulation tasks using MATLAB and Simulink, which are crucial for preparing for the actual lab experiments. Completion of the pre-lab exercises is mandatory, as failure to do so will prevent you from successfully completing the lab experiments.

Important Points:

- **Formative Assessment:** The pre-lab exercises are not graded but serve as essential

preparation.
- **Verification:** Lab demonstrators (lab demos) will check if you have completed the pre-lab exercises at the beginning of each lab session.
- **Time Management:** If you run out of time to complete the lab checkpoints due to not having done the pre-lab exercises, you will **NOT** be eligible for catch-up labs in Week 6 and Week 10.

Tools and Support:

- **MATLAB Grader:** This tool will be used to automate the marking process of the pre-lab exercises, providing you with immediate feedback.
- **Lab Demonstrators:** You can discuss any questions about the pre-lab exercises with a lab demo at the start of your lab session.

2. Lab Exercises

Each lab session includes 3 checkpoints that must be completed and assessed. Here are the key points regarding the lab exercises and the assessment process:

Checkpoint Assessment:

- **Requesting Marking:** After finishing a checkpoint, submit a request for marking through a dedicated MS Form available as a Tab on your MS Teams course page.
- **Queue Visibility:** You can see your position in the marking queue via another Tab. While waiting, continue working towards the next checkpoint if the queue is long.
- **General Queries:** The Form can also be used for submitting general queries about the experiments.

Assessment Criteria:

- **Task Requirements (Req):** Worth 40% of the lab mark. Assesses if you have met the task requirements.
- **Understanding (Und):** Worth 60% of the lab mark. Assesses your comprehension of the experiment through various questions related to the lab exercises and pre-lab questions.

Marking Details:

- **Req Mark Capped by Und Mark:** If you fail to satisfactorily answer the understanding questions, particularly those from the pre-labs, your Req mark will be reduced regardless of the correctness of your results.

LabVIEW Software:

- **Software Usage:** In addition to **MATLAB** and **Simulink**, which are used for 3 experiments, you will use LabVIEW software for the other 3 experiments. It is assumed that you are already familiar with MATLAB and Simulink before taking this course.

- **LabVIEW Training:** Completing the non-assessable LabVIEW training module is crucial for success in the experiments that use this software. Failure to satisfactorily complete this module will make those experiments very challenging.

Important Notes:

- **Pre-lab Completion:** Ensure pre-lab exercises are completed as they form the basis for the understanding questions during the lab.
- **Continuous Progress:** Keep working towards the next checkpoint if there is a wait for marking to optimize lab time.
- **MATLAB, Simulink and LabVIEW Proficiency:** Ensuring proficiency in LabVIEW, along with MATLAB and Simulink, is essential for effectively tackling the practical components of the course.

3. Lab Project

Objective: The lab project aims to provide a deeper learning experience by integrating both theoretical and practical aspects of the course.

Components:

- **Dynamic Modeling:** One of the primary tasks in the project.
- **Control System Design and Implementation:** The second major task.

Details and Timeline:

- **Project Manual:** Detailed information will be provided in Week 5.
- **Collaboration:** You will work on the project with your lab partner.

Assessment:

- **Oral Examination:** The final assessment will take place through an oral examination on Monday of Week 11.
- **Scheduling:** Additional details on the oral examination and its scheduling will be provided at the beginning of Week 10.

This project allows for comprehensive application of course concepts, fostering both individual understanding and collaborative skills.

These steps and criteria ensure that you are well-prepared and thoroughly understand the lab exercises, reinforcing both theoretical knowledge and practical skills.

<u>Assignment submission Turnitin type</u>

Not Applicable

Hurdle rules

Students must achieve at least 40% of the total Lab Work Assessmnet mark.

Final Examination

Assessment Overview

The final exam for this course is a standard 2-hour written examination. University-approved calculators are permitted. It consists of 5 compulsory questions,

The examination aims to assess analytical and critical thinking skills, as well as general comprehension of the course material in a controlled setting. It will be conducted in person, with UNSW providing further details on the exam time and venue.

Questions in the final exam may cover any aspect of the course, including material from the labs, unless otherwise specified by the lecturer. Marks will be allocated based on the accuracy of responses.

Course Learning Outcomes

- CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.
- CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain
- CLO3 : Explain the concept of control systems stability and feedback control systems.
- CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems

Detailed Assessment Description

Format and Coverage:

- **In-person Exam:** The final exam will be held in person.
- **Content:** It covers all course material taught except Lecture 2: Mathematical Models of Systems (see Course Schedule for the course content).

Scheduling:

- **Date and Venue:** Centrally managed by USNW.

Assignment submission Turnitin type

Not Applicable

Hurdle rules

Students must achieve at least 40% of the total mark of the Final Exam paper.

Quizzes

Assessment Overview

The weekly online quizzes are designed to aid students in reviewing material from previous weeks of the course. These quizzes allow you to review at your own pace once they are made available online. Each quiz remains open for one week from its release date.

The length of each quiz may vary based on difficulty. However, correct answers are not provided until after the quiz closes. Your final mark for each quiz is determined by the highest score achieved across all attempts.

Course Learning Outcomes

- CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.
- CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain
- CLO3 : Explain the concept of control systems stability and feedback control systems.
- CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems
- CLO6 : Utilize software tools to help with analysis, design, evaluation, and implementation of control systems for real-world applications in both simulation and real-time environment.

Assignment submission Turnitin type

Not Applicable

Midterm Examination

Assessment Overview

The mid-term exam for this course is a standard 2-hour written examination conducted in person. You are allowed to use of university-approved calculators. It consists of 4 to 5 compulsory questions designed to assess your general understanding of the course material and provide feedback on your progress midway through the term.

Questions in the exam may encompass any material covered in the course schedule, including some knowledge of laboratory material, although not extensively. Expect numerical and analytical questions. Marks will be allocated based on the accuracy of responses.

Course Learning Outcomes

- CLO1 : Identify an approximate linear/linearized model for a physical dynamic system.
- CLO2 : Analyse linear time-invariant (LTI) systems in both time domain and frequency domain
- CLO3 : Explain the concept of control systems stability and feedback control systems.
- CLO4 : Apply time-domain and frequency-domain techniques to analytically design linear control systems

Detailed Assessment Description

Format and Coverage:

- **In-person Exam:** The mid-term exam will be held in person.
- **Content:** It covers the material taught up to the end of **Week 4**.

Scheduling:

- **Week 5:** The exam is scheduled during the last tutorial/workshop session of Week 5.
- **Venue Announcement:** The venue will be announced by the middle of Week 5.
- **Changes:** Any unexpected changes to the scheduled time will be communicated one week in advance.

This mid-term exam provides an opportunity to assess your understanding of the course material covered in the initial weeks and offers valuable feedback on your progress.

Assignment submission Turnitin type

Not Applicable

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 20 May - 26 May	Reading	Laplace and Fourier Transforms Refresher
Week 1 : 27 May - 2 June	Lecture	Lec 1: Introduction to Control Systems Lec 2: Mathematical Models of Systems
Week 2 : 3 June - 9 June	Lecture	Lec 3: Permanent Magnet DC Motor Lec 4: State Variable Models
	Laboratory	Lab 1: MATLAB & Simulink Refresher
Week 3 : 10 June - 16 June	Lecture	Lec 5: Time Response of LTI Systems Lec 6: Feedback Control System Characteristics
	Laboratory	Lab 1.1: LabVIEW Training
Week 4 : 17 June - 23 June	Lecture	Lec 7: Stability of LTI Systems Lec 8: Steady State Error
	Laboratory	Lab 2: DC Motor Modelling with Load
Week 5 : 24 June - 30 June	Lecture	Lec 8: Steady State Error (continued) Lec 9: PID Controllers
	Laboratory	Lab 3: Flexible Joint Robotic Arm Modelling
	Assessment	Mid-term Examination (Friday during Tutorial/Workshop time)
Week 6 : 1 July - 7 July	Other	Flexibility Week: • Catch up on W1-W5 contents • Catch–up lab for Labs 1 to 3 (upon approval only for valid reasons) • Release of the Lab Project
Week 7 : 8 July - 14 July	Lecture	Lec 9: PID Controllers (continued) Lec 10: State Feedback Systems
	Laboratory	Lab 4: DC Motor Speed Control
Week 8 : 15 July - 21 July	Lecture	Lec 10: State Feedback Systems (continued) Lec 11: Root Locus Technique
	Laboratory	Lab 5: DC Motor Position Control
Week 9 : 22 July - 28 July	Lecture	Lec 11: Root Locus Technique (continued)
	Laboratory	Lab 6: Flexible Joint Robotic Arm Control
Week 10 : 29 July - 4 August	Lecture	Optional lectures (if time permits): Lec 12: Frequency Response Method Lec 13: Sensitivity Analysis
	Laboratory	Catch–up lab for Labs 1 to 3 (upon approval only for valid reasons)
Week 11 : 5 August - 11 August	Assessment	Lab Project Oral Examination (Monday, schedule will be released a week before)

Attendance Requirements

Lectures: Students are strongly encouraged to attend all classes and review lecture recordings.
Laboratories: Compulsory attendance for **5 labs out of 7**. Special consideration for catch-up labs will only be granted if a valid reason provided to special consideration unit and approved by them.
Tutorial/Workshops: Students are strongly encouraged to attend all workshops and review the recordings.

General Schedule Information

This is the tentative course schedule.

Course Resources

Prescribed Resources

Prescribed textbooks

- R.C. Dorf and R.H., Bishop, Modern Control Systems, 14th Edition., Harlow: Pearson.
- N. S. Nise, Control Systems Engineering, 7th or 8th Edition, John Wiley & Sons.

The majority of the content presented in the lectures will be from the first textbook. Occasionally, some of the content will be adopted from the second textbook, and infrequently from some other reference textbooks.

On-line resources

Lecture slides and lecture recordings, lab guidance videos, tutorial questions and solutions, lab manuals and all related MATLAB and Simulink files will be available on Moodle and MS Teams.

Recommended Resources

Reference books

- M. W. Spong, S. Hutchinson, and M. Vidyasagar, Robot Modeling and Control. Hoboken, NJ: John Wiley and Sons, 2006.
- F. Golnaraghi and B. Kuo, Automatic Control Systems. 10th edition, MaGraw Hill, 2017.
- G. F. Franklin, J. D. Powell and A. Emami-Naeini, Feedback Control of Dynamic Systems, Addison Wesley, latest edition.
- G.C. Goodwin, S. F. Graebe and M. E. Salgado, Control System Design, Prentice Hall, latest edition.

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 online student survey myExperience. 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.

As part of these evaluations, in Term 2 of 2019, the following new improvements were introduced:

- There has been a complete overhaul of laboratory exercises. There are now total 6 completely redesigned lab experiments with increased focus on connecting theory to practical aspects of control systems.
- The lab guidance videos are integrated with the virtual lab tour allowing students to click on each piece of lab equipment to watch the related video and download/read relevant documents.
- Introduction of flipped tutorials for students to work on more challenging problems in a team-

based learning mode.
- Newly designed weekly online quizzes as a method of ongoing feedback for students as they progress through the course.
- An optional project for students who want to learn more about the practical implementation of control systems.

Due to COVID-19 in 2020, the entire in-person lab component has transitioned into a remotely accessed format developed by Dr. Arash Khatamianfar in collaboration with the professional staff of the School of EE&T and some top students.

- In this new delivery mode, all of the lab contents (which were completely redesigned in Term 2 2019) have been preserved, with new revisions to enhance the student learning experience.
- MS Teams is used to enable students get remote access to lab computers.
- The use of webcams allows students to access a live video feed of the equipment they are working with.
- The lab assessment structure is redesigned to better engage students with lab demonstrators and improve the learning and teaching experience in the lab by introducing reflective activities before and after the lab (the Pre-Lab and Post-Lab quizzes).
- The mid-term exam has been replaced with two assignments with more in-depth questions, enabling better assessment of student learning outcomes.

A new Lab project will be trialed in 2023 which aims at creating a deeper understanding of practical aspects of control system design and analysis, as well as better facilitating the connection between theory and practice for students.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Arash Khatamianfar		Room 313, EE&T Building (G17)	+61 2 9385 5231	By appointment via email only	No	Yes
Lab staff	Timothy Leask				By appointment via email only	No	No
Tutor	Cameron Jones				By appointment via email only	No	No

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

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

II. Administrative matters and links

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

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. 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.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date *class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/ Moodle/LMS applies.*

Academic Honesty and Plagarism

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, visit: 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.

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 or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, 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

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)

School-specific Information

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.

Use of AI for assessments

Your work must be your own. If you use AI in the writing of your assessment, you must acknowledge this and your submission must be substantially your own work. More information can be found on this website.

Workplace Health & Safety (WHS)

WHS for students and staff is of utmost priority. Most courses involve laboratory work. You must follow the rules about conduct in the laboratory. About COVID-19, advice can be found on this website.

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