UNSW Course Outline

ZEIT4230 Electrical Engineering Design Project 2 - 2024

Published on the 14 Feb 2024

General Course Information

Course Code : ZEIT4230
Year : 2024
Term : Semester 1
Teaching Period : Z1
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Engineering and Technology
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Undergraduate
Units of Credit : 6

Useful Links

[Handbook](#) [Class Timetable](#)

Course Details & Outcomes

Course Description

In this course the knowledge and skills gained in the first three years of the Electrical Engineering program are applied to solve a specified electronic system design task. Students work individually and in small groups to design, construct and test various sub-systems, and then

integrate these components to produce the final system solution. A strong project management philosophy underpins the engineering approach adopted in this course. The final stage of the course focuses on an evaluation of the design methodology, the completed system's performance as compared to the initial requirements, and a reflection of the overall project experience and lessons learned.

Course Aims

The purpose of this course is to further develop your skills with the electronic system design process, entailing the analysis, design, construction, test and evaluation of electronic systems to achieve a user need, from which you will articulate a set of specifications or performance goal(s). The details vary depending on the project, but range from the high level functional design and milestone identification to component level analysis, design and development engineering (part selection, component pin out and ratings identification, component value calculation, operating point selection, etc). In this course you will draw on the knowledge and skills you have acquired in previous courses. On completion of the course you will have had the opportunity to apply electrical engineering discipline and project management skills to achieve the project outcomes.

Relationship to Other Courses

Prerequisites: ZEIT2209 and ZEIT3221

Students are expected to combine the practical skills learnt in ZEIT2209 (Electrical Engineering Design Project 1) with their core 3rd year electrical engineering courses.

Course Learning Outcomes

Course Learning Outcomes	Engineers Australia - Professional Engineer (Stage 1)
CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.	• PEE1.3 : In-depth understanding of specialist bodies of knowledge within the engineering discipline • PEE2.1 : Application of established engineering methods to complex engineering problem solving
CLO2 : Select the most suitable design methodologies and technologies in developing engineering solutions.	• PEE1.4 : Discernment of knowledge development and research directions within the engineering discipline • PEE1.5 : Knowledge of engineering design practice and contextual factors impacting the engineering discipline • PEE1.6 : Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline • PEE2.2 : Fluent application of engineering techniques, tools and resources
CLO3 : Develop, apply and document comprehensive test and characterisation procedures to capture system performance.	• PEE2.3 : Application of systematic engineering synthesis and design processes • PEE2.4 : Application of systematic approaches to the conduct and management of projects within the technology domain
CLO4 : Communicate appropriate design information verbally and through documents, using the language of the discipline, mathematics and drawings.	• PEE3.2 : Effective oral and written communication in professional and lay domains • PEE3.4 : Professional use and management of information
CLO5 : Work effectively in a team environment to achieve the project's goals.	• PEE3.1 : Ethical conduct and professional accountability • PEE3.3 : Creative, innovative and pro-active demeanour • PEE3.5 : Orderly management of self, and professional conduct • PEE3.6 : Effective team membership and team leadership

Course Learning Outcomes	Assessment Item
CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.	• Planning Presentation • Prototype Report • System Demonstration • Final Report
CLO2 : Select the most suitable design methodologies and technologies in developing engineering solutions.	• Planning Presentation • Prototype Report • Final Report
CLO3 : Develop, apply and document comprehensive test and characterisation procedures to capture system performance.	• Progress Review Presentation • System Demonstration • Final Report
CLO4 : Communicate appropriate design information verbally and through documents, using the language of the discipline, mathematics and drawings.	• Progress Review Presentation • Prototype Report • Final Report
CLO5 : Work effectively in a team environment to achieve the project's goals.	• Planning Presentation • Progress Review Presentation • System Demonstration • Final Report

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

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

Referencing

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

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	Engineers Australia - Professional Engineer (Stage 1)
Planning Presentation Assessment Format: Group	5%	Due Date: 18/03/2024 12:10 PM	• PEE1.3 : In-depth understanding of specialist bodies of knowledge within the engineering discipline • PEE1.4 : Discernment of knowledge development and research directions within the engineering discipline • PEE1.5 : Knowledge of engineering design practice and contextual factors impacting the engineering discipline • PEE1.6 : Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline • PEE2.1 : Application of established engineering methods to complex engineering problem solving • PEE2.2 : Fluent application of engineering techniques, tools and resources • PEE2.3 : Application of systematic engineering synthesis and design processes • PEE2.4 : Application of systematic approaches to the conduct and management of projects within the technology domain • PEE3.1 : Ethical conduct and professional accountability • PEE3.2 : Effective oral and written communication in professional and lay domains • PEE3.3 : Creative, innovative and pro-active demeanour • PEE3.4 : Professional use and management of information

			• PEE3.5 : Orderly management of self, and professional conduct • PEE3.6 : Effective team membership and team leadership
Prototype Report Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: 05/04/2024 11:59 PM	• PEE1.3 : In-depth understanding of specialist bodies of knowledge within the engineering discipline • PEE1.4 : Discernment of knowledge development and research directions within the engineering discipline • PEE1.5 : Knowledge of engineering design practice and contextual factors impacting the engineering discipline • PEE1.6 : Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline • PEE2.1 : Application of established engineering methods to complex engineering problem solving • PEE2.2 : Fluent application of engineering techniques, tools and resources • PEE2.3 : Application of systematic engineering synthesis and design processes • PEE2.4 : Application of systematic approaches to the conduct and management of projects within the technology domain • PEE3.1 : Ethical conduct and professional accountability • PEE3.2 : Effective oral and written communication in professional and lay domains • PEE3.3 : Creative, innovative and pro-active demeanour • PEE3.4 : Professional use and management of information • PEE3.5 : Orderly management of self, and

			professional conduct • PEE3.6 : Effective team membership and team leadership
Progress Review Presentation Assessment Format: Group	0%	Start Date: Not Applicable Due Date: 06/05/2024 12:10 PM	
System Demonstration Assessment Format: Group	25%	Start Date: Not Applicable Due Date: Week 13: 03 June - 07 June	• PEE1.3 : In-depth understanding of specialist bodies of knowledge within the engineering discipline • PEE1.4 : Discernment of knowledge development and research directions within the engineering discipline • PEE1.5 : Knowledge of engineering design practice and contextual factors impacting the engineering discipline • PEE1.6 : Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline • PEE2.1 : Application of established engineering methods to complex engineering problem solving • PEE2.2 : Fluent application of engineering techniques, tools and resources • PEE2.3 : Application of systematic engineering synthesis and design processes • PEE2.4 : Application of systematic approaches to the conduct and management of projects within the technology domain • PEE3.1 : Ethical conduct and professional accountability • PEE3.2 : Effective oral and written communication in professional and lay domains • PEE3.3 : Creative, innovative and pro-active demeanour • PEE3.4 : Professional use and management of

			information • PEE3.5 : Orderly management of self, and professional conduct • PEE3.6 : Effective team membership and team leadership
Final Report Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: 17/06/2024 11:59 PM	• PEE1.3 : In-depth understanding of specialist bodies of knowledge within the engineering discipline • PEE1.4 : Discernment of knowledge development and research directions within the engineering discipline • PEE1.5 : Knowledge of engineering design practice and contextual factors impacting the engineering discipline • PEE1.6 : Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline • PEE2.1 : Application of established engineering methods to complex engineering problem solving • PEE2.2 : Fluent application of engineering techniques, tools and resources • PEE2.3 : Application of systematic engineering synthesis and design processes • PEE2.4 : Application of systematic approaches to the conduct and management of projects within the technology domain • PEE3.1 : Ethical conduct and professional accountability • PEE3.2 : Effective oral and written communication in professional and lay domains • PEE3.3 : Creative, innovative and pro-active demeanour • PEE3.4 : Professional use and management of information • PEE3.5 : Orderly

			management of self, and professional conduct • PEE3.6 : Effective team membership and team leadership

Assessment Details

Planning Presentation

Assessment Overview

Formative Assessment

Course Learning Outcomes

- CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.
- CLO2 : Select the most suitable design methodologies and technologies in developing engineering solutions.
- CLO5 : Work effectively in a team environment to achieve the project's goals.

Assessment Length

10 minutes

Assignment submission Turnitin type

Not Applicable

Prototype Report

Assessment Overview

n/a

Course Learning Outcomes

- CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.
- CLO2 : Select the most suitable design methodologies and technologies in developing engineering solutions.
- CLO4 : Communicate appropriate design information verbally and through documents, using the language of the discipline, mathematics and drawings.

Assessment Length

5 pages (references and acknowledgements don't count towards limit)

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity

reports.

Progress Review Presentation

Assessment Overview

Formative Assessment

Course Learning Outcomes

- CLO3 : Develop, apply and document comprehensive test and characterisation procedures to capture system performance.
- CLO4 : Communicate appropriate design information verbally and through documents, using the language of the discipline, mathematics and drawings.
- CLO5 : Work effectively in a team environment to achieve the project's goals.

Assessment Length

10 minutes

Assignment submission Turnitin type

Not Applicable

System Demonstration

Assessment Overview

n/a

Course Learning Outcomes

- CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.
- CLO3 : Develop, apply and document comprehensive test and characterisation procedures to capture system performance.
- CLO5 : Work effectively in a team environment to achieve the project's goals.

Assessment Length

20 minutes

Assignment submission Turnitin type

Not Applicable

Final Report

Assessment Overview

n/a

<u>Course Learning Outcomes</u>

- CLO1 : Apply Electrical Engineering foundational knowledge, techniques and tools and to meet a user requirement.
- CLO2 : Select the most suitable design methodologies and technologies in developing engineering solutions.
- CLO3 : Develop, apply and document comprehensive test and characterisation procedures to capture system performance.
- CLO4 : Communicate appropriate design information verbally and through documents, using the language of the discipline, mathematics and drawings.
- CLO5 : Work effectively in a team environment to achieve the project's goals.

<u>Assessment Length</u>

8 pages (not counting references, acknowledgements or appendices)

<u>Assignment submission Turnitin type</u>

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

General Assessment Information

Students will receive written feedback on their planning presentation by the end of week 4

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.

Use of Generative AI in Assessments

The following policy applies to the use of generative AI in the written reports:

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. [Alternative wording: You are required to submit the original AI generated responses as set out below] (Consider what would be the minimum requirement for you to be satisfied of the originality of the submitted work, and the workload implications of any detailed examination as

part of the marking).

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.

<u>Grading Basis</u>

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	Introduction to the Project
	Laboratory	Introductory practical DSP exercise
Week 2 : 4 March - 8 March	Lecture	LEDs and Photodiodes Practical Op-amp circuits
	Laboratory	Working on Project Optional Soldering Practice
Week 3 : 11 March - 15 March	Lecture	Lecture lost due to Canberra Day Holiday
	Laboratory	Working on Project
Week 4 : 18 March - 22 March	Lecture	Group Planning Presentations will be held during Lecture slot
	Laboratory	Working on Project
Week 5 : 25 March - 29 March	Lecture	Practical Signal Processing
	Laboratory	Working on Project
Week 6 : 1 April - 5 April	Laboratory	Working on Project
	Assessment	Prototype Report Due
Week 7 : 22 April - 26 April	Lecture	Advanced microcontroller techniques
	Laboratory	Working on Project Wednesday Lab session lost due to military training day
Week 8 : 29 April - 3 May	Laboratory	Working on Project
Week 9 : 6 May - 10 May	Lecture	Group Progress Presentations will be held during lecture slot
	Laboratory	Working on Project
Week 10 : 13 May - 17 May	Laboratory	Working on Project
Week 11 : 20 May - 24 May	Laboratory	Working on Project
Week 12 : 27 May - 31 May	Laboratory	Working on Project Tuesday lab session lost due to Monday compensation day
Week 13 : 3 June - 7 June	Laboratory	System demonstrations will be held during lab sessions
	Assessment	Final Report is due on 17th of June

Attendance Requirements

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

Course Resources

Recommended Resources

Horowitz and Hill, "*The Art of Electronics*", 3rd edition, 2015

Students will need to have the lab tools and equipment from previous courses. An Analog Discovery or equivalent USB oscilloscope will enable you to work outside the lab environment.

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

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Haroldo Hattori		Building 32 Room SR102		Available by appointment during normal office hours	Yes	Yes
Lecturer	David Powell		Building 32 Room SR102		Available by appointment during normal office hours	No	No

Other Useful Information

Academic Information

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 each 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 (where applicable). Student opinions really do make a difference. Refer to the Moodle site for your 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.

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

Equitable Learning Services (ELS)

Students living with neurodivergent, physical and/or mental health conditions or caring for someone with these conditions may be eligible for support through the Equitible Learning Services team. Equitable Learning Services is a free and confidential service that provides practical support to ensure your mental or physical health conditions do not adversely affect your studies.

Our team of dedicated **Equitable Learning Facilitators** (ELFs) are here to assist you through this process. We offer a number of services to make your education at UNSW easier and more equitable.

Further information about ELS for currently enrolled students can be found at: https://www.student.unsw.edu.au/equitable-learning

Academic Honesty and Plagarism

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. Find relevant information at: Student Code of Conduct (unsw.edu.au)

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.

For more information, please refer to the following:

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

Submission of Assessment Tasks

Special Consideration

Special Consideration is the process for assessing and addressing the impact on students of short-term events, that are beyond the control of the student, and that affect performance in a specific assessment task or tasks.

Applications for Special Consideration will be accepted in the following circumstances only:

- Where academic work has been hampered to a substantial degree by illness or other cause;
- The circumstances are unexpected and beyond the student's control;
- The circumstances could not have reasonably been anticipated, avoided or guarded against by the student; and either:

    (i) they occurred during a critical study period and was 3 consecutive days or more duration, or a total of 5 days within the critical study period; or

    (ii) they prevented the ability to complete, attend or submit an assessment task for a specific date (e.g. final exam, in class test/quiz, in class presentation)

Applications for Special Consideration must be made as soon as practicable after the problem occurs and at the latest within three working days of the assessment or the period covered by the supporting documentation.

By sitting or submitting the assessment task the student is declaring that they are fit to do so and cannot later apply for Special Consideration (UNSW 'fit to sit or submit' requirement).

Sitting, accessing or submitting an assessment task on the scheduled assessment date, after applying for special consideration, renders the special consideration application void.

Find more information about special consideration at: https://www.student.unsw.edu.au/special/consideration/guide

Or apply for special consideration through your MyUNSW portal.

Late Submission of assessment tasks (other than examinations)

UNSW has a standard late submission penalty of:

- 5% per day,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Electronic submission of assessment

Except where the nature of an assessment task precludes its electronic submission, all assessments must be submitted to an electronic repository, approved by UNSW or the Faculty, for archiving and subsequent marking and analysis.

Release of final mark

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.