UNSW Course Outline

SOLA2051 Project in Photovoltaics and Renewable Energy - 2024

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General Course Information

Course Code : SOLA2051
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Photovoltaic and Renewable Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

The main emphasis of the second year group project course is hands-on project engineering. The course has a lecture component covering project engineering, report writing, presentation skills, occupational health and safety, and theoretical principles specific to the project work to be

undertaken. The project comprises a research component, a planning and design component, a significant hands-on component, and a presentation/reporting component all of which are put into practive during the laboratory sessions.

Lectures and laboratories will provide students with information and background knowledge about the project, hints and tips for managing projects and guidelines for writing technical reports and giving presentations.

The course will cover topics including:

- Testing & instrumentation methods using LabView and Arduino.
- Use of simulation and modelling software
- Basic electronic circuits and design
- Design and test procedures
- Safe work, safe design, and risk assessment
- PV cell and PV panel theory
- Concentrator design theory & optics
- Load-based system design
- System analysis & diagnostics
- Team management & collaboration skills
- Engineering report writing & presentations

Course Aims

At the completion of this course students will be able to identify, acquire and apply technical skills and knowledge required to solve an engineering problem including both theoretical and practical aspects. The students will also develop an awareness of skills and tasks required to successfully manage and complete an engineering project practicing their teamwork and leadership skills. The students will develop written and verbal communication skills and gain

experience in giving presentations and writing a project report.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Analyse simple data acquisition systems based on debugging and designing simple electronic circuits.
CLO2 : Calculate and explain the functioning and engineering aspects of photovoltaic cells and modules, concentrators, boost converters and systems for thermal management.
CLO3 : Demonstrate awareness of occupational health and safety concerns while undertaking tasks on a technical project.
CLO4 : Design a PV/Thermal system by building and evaluating the performance of a solar panel and thermal management system.
CLO5 : Demonstrate effective communication skills by preparing a documentary video and writing a project report.

Course Learning Outcomes	Assessment Item
CLO1 : Analyse simple data acquisition systems based on debugging and designing simple electronic circuits.	
CLO2 : Calculate and explain the functioning and engineering aspects of photovoltaic cells and modules, concentrators, boost converters and systems for thermal management.	
CLO3 : Demonstrate awareness of occupational health and safety concerns while undertaking tasks on a technical project.	
CLO4 : Design a PV/Thermal system by building and evaluating the performance of a solar panel and thermal management system.	
CLO5 : Demonstrate effective communication skills by preparing a documentary video and writing a project report.	

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Learning and Teaching in this course

Please check lecture1 notes for the outline of the lecture topics and timing of assessments

Other Professional Outcomes

https://www.unsw.edu.au/engineering/student-life/student-resources/program-design

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Design: Final report	25%	
Design project (Demonstration)	15%	
Individual lab reports Short Extension: Yes (2 days)	20%	
Individual Prelabs	20%	
Final Exam (Video documentary)	20%	

Assessment Details

Design: Final report

Assessment Overview

The final report provides an analysis of the actual performance of the system compared to the expected (simulated performance) .The report also includes an introspective (self assessment) section detailing the lessons learned. The marks for this activity are weighted by peer assessment.

Detailed Assessment Description

•The final report will be due on Wk11 (exact date dependent of Wk10 testing date)

Assessment Length

2hr demonstration plus 7500 word report

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Design project (Demonstration)

Assessment Overview

Students demonstrate a working system as at team at the end of the term. The demonstration is done outdoors for one hour simultaneously with all other teams in the course. The performance of the teams is monitored in real time and recorded for later analysis. All teams have access to the real-time performance of all other teams so they can assess their own performance and adapt their systems if necessary to match the performance of the best performing team. After analysis of the data, all teams get feedback on their performance in comparison to all other teams within a week of the demonstration. The marks for this activity are weighted by peer

assessment.

Detailed Assessment Description

The performance test will be on Wk 10, during Thursday lab session. If weather doesn't allow it, test will be done on Friday of Wk 10 during the scheduled lab session. In case of bad weather on both testing days, we will test indoors.

Hurdle rules

The final project should satisfy at least 50% of the performance expected on the day of the test. The actual performance will depend on the weather and will be adpated accordingly,

Individual lab reports

Assessment Overview

Lab reports are done individually. They consist of self guided laboratories with a corresponding online lab report. The report is marked automatically when the answers are numerical and by tutors and course convenor for essay type answers. The students receive feedback on their answers within a week of submission via the same online report.

Detailed Assessment Description

Lab reports are due at the end of the week (Sunday very close to midnight, 11:55pm).

Assessment Length

5 weeks

Hurdle rules

A large percentage of the mark recieved for this course is based on team work. This hurdle is in place to ensure a pass grade is achieved not just based on team work but also based on the individual effort you've put into the course.

Individual Prelabs

Assessment Overview

Prelabs are done individually. They consist of online quizzes that the student will complete before a laboratory session that utilises concepts covered in the prelab. The online quizzes are automatically marked.

Detailed Assessment Description

- Prelabs will be due at 11am on Thursday.
- Prelab submission is required before starting a lab. You need to finish a prelab before you can start the corresponding lab.

Submission notes

Week 2 -5 before the lab session

Assessment information

Prelabs need to be completed to unlock the corresponding lab activity.

Final Exam (Video documentary)

Assessment Overview

Each team prepares a 5 minute video that details the work undertaken to complete the project. The video has a documentary flavour but students are encouraged to make the video entertaining as well as educational. The video is presented on the day of the final exam and is evaluated by all teams as well as tutors and course convenor.

Detailed Assessment Description

•The video presentations will constitute your final exam. You will be required to attend the session to rate everyone's videos.

Assessment Length

3hrs

General Assessment Information

This course will include the following hurdle requirements that are closely linked to a set of learning outcomes which demonstrate that you have acquired the required skills and competencies within this discipline:

¥ Students must demonstrate understanding of circuit building and debugging, circuit simulation and analysis using LTSpice, basic LabVIEW programming, Arduino use as a data acquisition system, extraction of information from measured data and practical use of all aforementioned**. A minimum mark of 50% must be obtained for the individual lab reports and individual final demonstration in order to pass this subject**. Failure to achieve this minimum mark will result in an unsatisfactory fail (UF) grade, regardless of the performance in the rest of the course.

Grading Basis

Standard

Requirements to pass course

A minimum mark of 50% must be obtained for the individual lab reports and individual final demonstration in order to pass this subject. Failure to achieve this minimum mark will result in an unsatisfactory fail (UF) grade, regardless of the performance in the rest of the course.

Course Schedule

Attendance Requirements

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

Course Resources

Recommended Resources

While there is no compulsory textbook for this course some useful reference materials includes:

SOLA2051 Moodle on-line handbook.

Report Writing, The Learning Centre UNSW: https://www.student.unsw.edu.au/report-writing-support

Harvard Referencing for electronic sources: (https://www.student.unsw.edu.au/harvard-referencing)

UNSW Library website: https://www.library.unsw.edu.au/

Moodle: https://moodle.telt.unsw.edu.au/login/index.php

Additional Costs

You will be provided with a lab kit that you will keep for the term and return to us at the end of the course. However, you will need to buy consumable for the lab from CREATE that they will have ready for you to purchase as a SOLA2051 lab kit.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Ivan Perez Wurfl		TETB 128	+61 2 9065 1037		No	Yes

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

SPREE Student Information Hub

Students are welcome to visit the SPREE Student Information Hub for information such as sample study plans, course outlines, thesis project, industrial training etc.

School Contact Information

For course-related matters, please contact course convenor directly via emails. Please email spreeteaching@unsw.edu.au for any other matters.