



UNSW Course Outline

SOLA9105 Renewable Energy System Design - 2024

Published on the 03 Sep 2024

General Course Information

Course Code : SOLA9105

Year : 2024

Term : Term 3

Teaching Period : T3

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 : Postgraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

In this course you will undertake major design tasks in renewable energy engineering. You will apply knowledge and skills learned in the degree to develop design solutions for real world renewable energy related problems. Working in team you will strengthen your technical

communication, project management and problem solving skills.

Course Aims

The aim of this course is to provide knowledge and skills to undertake design of real world renewable energy (RE) system related problems. During the course students will work on individual and team design projects to provide full design solutions for renewable energy system related problems. This course is thus expected to extend students exposure to the design of RE systems and reinforce their knowledge and skills in these areas.

Relationship to Other Courses

SOLA9105 is a core design course for 8621 Master of Engineering in Renewable Energy.

The following assumed knowledge is expected for the students undertaking this course: SOLA2540 Applied Photovoltaics or SOLA9001 Photovoltaics, and GSOE9017 Managing Energy Efficiency.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Demonstrate an ability to produce designs to solve renewable energy system related problems.
CLO2 : Demonstrate effective oral and written communications to technical audience
CLO3 : Demonstrate an ability to work in teams and learn from peers and mentors.
CLO4 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.

Course Learning Outcomes	Assessment Item
CLO1 : Demonstrate an ability to produce designs to solve renewable energy system related problems.	<ul style="list-style-type: none">• Preliminary design report• Design presentation• Final design report
CLO2 : Demonstrate effective oral and written communications to technical audience	<ul style="list-style-type: none">• Oral examination• Preliminary design report• Design presentation• Final design report
CLO3 : Demonstrate an ability to work in teams and learn from peers and mentors.	<ul style="list-style-type: none">• Preliminary design report• Design presentation• Final design report
CLO4 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.	<ul style="list-style-type: none">• Oral examination• Preliminary design report• Design presentation• Final design report

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Learning and Teaching in this course

Moodle: [SOLA9105 - Renewable Energy System Design - 2024 T3](#)

MS Teams: [SOLA9105 RE System Design \(T3 2024\)](#)

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Preliminary design report Assessment Format: Group	15%	Start Date: Week 1: 09 September - 15 September Due Date: Week 7: 21 October - 27 October
Design presentation Assessment Format: Group	25%	Start Date: Week 7: 21 October - 27 October Due Date: Week 10: 11 November - 17 November
Final design report Assessment Format: Group	30%	Start Date: Week 7: 21 October - 27 October Due Date: 25/11/2024 11:59 PM
Oral examination Assessment Format: Individual	30%	Due Date: Week 12: 25 November - 01 December

Assessment Details

Preliminary design report

Assessment Overview

You will work in groups of around 4 students on a given project. Project details and assessment criteria will be provided in a project brief.

You will present your group's design solution/s in a 10-20 min presentation. The work will be assessed based on marking criteria provided. Team evaluation will be used to allocate individual student's marks based on their contributions. Feedback will be provided after the presentation.

Course Learning Outcomes

- CL01 : Demonstrate an ability to produce designs to solve renewable energy system related problems.
- CL02 : Demonstrate effective oral and written communications to technical audience
- CL03 : Demonstrate an ability to work in teams and learn from peers and mentors.

- CL04 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.

For more information on Generative AI and permitted use please see [here](#).

Design presentation

Assessment Overview

You will work in groups of around 4 students on a given project. Project details and assessment criteria will be provided in a project brief.

You will present your group's design solution/s in a 15-20 min presentation. The work will be assessed based on marking criteria provided. Team evaluation will be used to allocate individual student's marks based on their contributions. Feedback will be provided after the presentation.

Course Learning Outcomes

- CL01 : Demonstrate an ability to produce designs to solve renewable energy system related problems.
- CL02 : Demonstrate effective oral and written communications to technical audience
- CL03 : Demonstrate an ability to work in teams and learn from peers and mentors.
- CL04 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.

For more information on Generative AI and permitted use please see [here](#).

Final design report

Assessment Overview

You will work in groups of around 4 students on a given project. Project details and assessment criteria will be provided in a project brief.

You will submit your group's design solution/s in the form of a report. The work will be assessed based on marking criteria provided. Team evaluation will be used to allocate individual student's marks based on their contributions. Feedback will be provided within 10 days of the submission due date through the learning management system.

Hurdle: Students must achieve at least 50% in the final design report to pass the course.

Students may re-submit their final report in which case the mark this assessment will be capped to 50%.

Course Learning Outcomes

- CL01 : Demonstrate an ability to produce designs to solve renewable energy system related problems.
- CL02 : Demonstrate effective oral and written communications to technical audience
- CL03 : Demonstrate an ability to work in teams and learn from peers and mentors.
- CL04 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.

Assessment Length

20 - 25 pages

Assignment submission Turnitin type

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

Hurdle rules

Students must demonstrate that they can provide satisfactory solutions for given renewable energy problems. A minimum mark of 50% must be achieved in assessment task "The final design report" to pass this course. Failure to achieve this minimum mark will result in an unsatisfactory fail (UF) grade, regardless of the performance in the rest of the course. If a student fails in the first attempt, he/she may re-submit the assessment within 5 days of the release of marks. The maximum mark for the re-submission will be capped at 50%.

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.

For more information on Generative AI and permitted use please see [here](#).

Oral examination

Assessment Overview

The oral examination will be around 20-30 minutes and questions will be based on their preliminary design and final design report.

Hurdle: Students must achieve at least 50% in the oral exam to pass the course. Students may re-attempt the oral examination in which case the mark this assessment will be capped to 50%.

Course Learning Outcomes

- CL02 : Demonstrate effective oral and written communications to technical audience
- CL04 : Demonstrate ability to select an effective problem solving approach that is deliverable in practice and justify the selection.

Hurdle rules

A minimum mark of 50% must be achieved in assessment task to pass this course. Failure to achieve this minimum mark will result in an unsatisfactory fail (UF) grade, regardless of the performance in the rest of the course. If a student fails in the first attempt, he/she may re-attempt the assessment within 7 days of the release of marks. The maximum mark for the re-attempt will be capped at 50%.

Generative AI Permission Level

Not Applicable

Generative AI is not considered to be of assistance to you in completing this assessment. If you do use generative AI in completing this assessment, you should attribute its use.

For more information on Generative AI and permitted use please see [here](#).

General Assessment Information

Grading Basis

Standard

Course Schedule

Attendance Requirements

Please note that lecture recordings are not available for this course. Students are strongly encouraged to attend all classes and contact the Course Authority to make alternative arrangements for classes missed.

General Schedule Information

There are two scheduled classes per week. You will primarily work in your assigned team on developing solutions for the given renewable energy related problem. Lectures will be limited and will be focused on providing critical materials related to the project.

Tuesday 11:00 - 13:00 Science & Engineering B27 (K-E8-B27)

Thursday 12:00 - 15:00 Webster 250 (K-G14-250)

Course Resources

Recommended Resources

Design Tools:

- RETScreen - Clean Energy Management Software system for energy efficiency
- SAM - System Advisory Model
- PVSYST - Software for photovoltaic Systems

Online recourses:

- Australian Bureau of Meteorology - <http://www.bom.gov.au/climate/>
- NASA (weather data) - <https://power.larc.nasa.gov/>
- NREL National Solar Radiation Database (weather data) - <https://nsrdb.nrel.gov/>

Standards:

Building Code of Australia

- AS/NZS 1170.2:2011 - Structural design actions - Wind actions
- AS/NZS 1768:2007 - Lightning Protection
- AS/NZS 3000:2007 - Electrical Wiring Rules
- AS/NZS 3008.1.1:2017 - Electrical installations - Selection of cables
- AS/NZS 4777.1:2016 - Grid connection of energy systems via inverters - Installation requirements
- AS/NZS 4777.2:2015 - Grid Connections of Energy Systems via Inverters - Inverter requirements
- AS/NZS 5033:2014 - Installation and safety requirements for photovoltaic (PV) arrays

Course Evaluation and Development

Feedback on the course is gathered mainly using the UNSW myExperience process and informal discussion during the term. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback. In this course, recent improvements

resulting from student feedback include removal of non-critical lectures and thus increasing time for team work.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Santosh Shrestha		TETB Room 243	+61 2 9065 9594		No	Yes
Demonstrator	Ayush Pratik				Please contact via MS Teams or email	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 policies. 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 Plagiarism

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.