Contact hours

	Day	Time	Delivery Mode
Lectures	N/A	2 hrs/wk	Moodle Recorded Lectures & Moodle Lessons
Teams Chat/ Office Hours	Monday (Weeks:1,3-5,7-11)	13:00 - 15:00	MECH 9720 Team
Demonstrations	Weekly	1 hr/wk	Moodle Recorded Demonstrations
Lab (Group Assessment)	N/A	2 hrs (excluding analysis/reporting)	Moodle Recorded Lab Videos; Raw Data Provided.

All classes in T2 2020 will be online. Please consult this course's Moodle module for details about delivery.

Summary and Aims of the course

Solar thermal energy is created when radiation from the sun is converted to heat energy (directly) or into electrical energy (indirectly via heat) for applications in the residential, industrial, and commercial sectors. This course will give you an engineering perspective of how solar thermal technology is designed, constructed, and operated. The first section of the course deals with the characteristics of sunlight, along with some methods of analysis and measurement of solar radiation. The second section of the course covers the working principles of solar thermal technology (low and high tech) and gives you the general tools necessary to analyse heat and mass transfer within these devices. Lastly, we will cover how these technologies can be integrated into systems including control, circulation, and storage. The content reflects the experience of the lecturer/guests in the research, development, and

conducting solar thermal collector efficiency evaluations and for the prediction of long-term performance of solar thermal systems. Thus, the course will include energy storage and system modelling via computer simulation of the performance and economic worth of solar thermal systems.

Student learning outcomes

The objectives of the course are to:

- Use engineering terminology associated with solar thermal energy systems (information literacy)
- Obtain a basic understanding of how to measure and calculate salient radiation

Week	Topic	Location	Suggested Readings
5	Flat Plate Collectors / **2** Moodle Lessons: *Absorber Plates and Reflection; Collector Efficiency and Operation* Solar Collector Analysis I / **2** Moodle Lessons: *Solar Collector Heat Losses; Evaluating the Solar Collector Efficiency Factor*	Moodle (content delivery) Teams (course staff interaction)	Class readings by Moodle week
6	Flexibility Week (Revision Only)	N/A	N/A
7	Solar Collector Analysis II / **2** Moodle Lessons: *Collector Stagnation Temperature, Part 1 & Part 2*	Moodle (content delivery) Teams (course staff interaction)	Class readings by Moodle week
8	Engineering Trade-Offs / **3** Moodle Lessons: *Flat Plate Solar Collector Optimisation; TRNSYS & Other Solar Modelling Software; Solar Hot Water Systems Part 1*	Moodle (content delivery) Teams (course staff interaction)	Class readings by Moodle week
9	Evacuated Tube Collectors / **2** Moodle Lesson: *Evacuated Tubes; Solar Hot Water Systems Part 2*	Moodle (content delivery) Teams (course staff interaction)	Class readings by Moodle week
10			

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the

9. 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:

Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of PE1.5