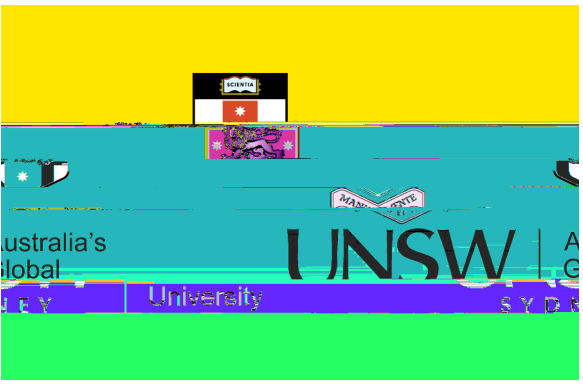

Photovoltaic and Renewable Energy Engineering

Course Outline

Term 2 2021

SOLA3020

Photovoltaic Technology and Manufacturing

Contents

1. Staff contact details

Contact details and consultation times for course convenor :

Name: Prof Bram Hoex
Office location: TETB 132
Tel: (02) 9385 7934
Email: b.hoex@unsw.edu.au
Microsoft Teams Video Chat Hours: 11 am – 1 pm Tuesday (you can always send a message in MS Teams)

Contact details and consultation times for additional lecturers/demonstrators/ lab staff

Demonstrator:
Name: Mr Alvin Mo
Email: Mr Alvin Mo
Microsoft Teams Video Chat Hours: Workshop time.

Please see the course Moodle.

2. Important links

- Moodle
- Health and Safety
- Student Resources
- UNSW Timetable
- UNSW Handbook
- Engineering Student Support Services Centre
- UNSW Photovoltaic and Renewable Energy Engineering

3. Course details

Credit points

	Day	Time	Delivery Mode
Lectures	N/A	2 hrs/wk	Moodle links/MS Teams videos
Q&A session	Tuesday	11 am to 1 pm	MS Teams
Workshop	Thursday	3 pm – 5 pm	MS Teams

All classes in T2 2021 will be online. Please consult this course's Moodle module for details about delivery.

Summary and Aims of the course

Silicon photovoltaic modules comprise ~90% of the photovoltaic modules manufactured and sold worldwide. This course introduces students to the technology used to manufacture screen-printed silicon solar cells and important manufacturing concepts such as device design, yield, throughput, process optimisation, reliability, in-line quality control and fault diagnosis. Using the versatile SunSolve platform, the students will explore various aspects of solar cell optimisation and directly assess its impact on the PV module performance. Optionally, the students can also fabricate aluminium back surface field (Al-BSF) solar cells using the virtual producation line "PV Factory".

The aims of this course are:

- To introduce students to the technologies used to manufacture silicon photovoltaic modules;
- To expose students to a solar cell manufacturing environment and important manufacturing concepts such as device design, yields, throughput, process optimisation, reliability, in-line quality control and fault diagnosis; and
- To develop students' ability to optimise a solar cell production line involving many inter-related processes and processing parameters.

Student learning outcomes

After successful completion of this course, you are able to:

1. Apply an understanding of the physics and chemistry underlying the main photovoltaic manufacturing processes to the optimisation of screen-printed solar cell production lines;
2. Analyse solar cell performance and losses through the use of common testing and characterisation techniques;
3. Use an experimental methodology and apply important manufacturing concepts such

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4. Teaching strategies

Delivery Mode :

The teaching strategy for this course comprises online content (videos & website) and blended workshop sessions. The online video series will present theory related to manufacturing technology and processes and up-to-date information about available equipment, costing and quality control resources. Also, some select seminars from the School of Photovoltaic and Renewable Energy Engineering (SPREE) are included which will go into detail in some important aspects of the course.

All workshop sessions require the use of SunSolver.

5. Course schedule

Indicative online course content schedule:

Period	Summary of Content
Week 1	Current status of the photovoltaic market
Week 2	

6. Assessment

Assessment overview

Assessment	Group Project? (# Students per group)	Length	Weight	Learning outcomes assessed	Assessed material	Due date and submission requirements	Deadline for absoluT 0004 Tc 0.01 Tw 8.04 9f 0 Tw a 0.01 Tw 8.04 9f#

Assignments

Presentation

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Submission

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of 30% of the maximum possible mark for the assessment item on the due date, plus 10% per 24 hours after that.

Examinations

You must be available for all quizzes, tests and examinations.

Final examinations for each course are held during the University examination periods: February for Summer Term, May for T1, August for T2, and November/December for T3.

Please visit myUNSW for Provisional Examination timetable publish dates.

For further information on exams, please see the Exams webpage.

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 submitting an assessment or sitting an exam.

Please note that UNSW now has a Fit to Sit / Submit rule, which means that if you attempt an exam or submit a piece of assessment, 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.

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

8. Course evaluation and development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the School's Student/Staff meetings. 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:

- The development of PV-Manufacturing.org.
- The development of animations to explain key processes.
- The introduction of weekly quizes as formative feedback.
- The development of the SunSolve workshops.

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

Appendix A: Engineers Australia (EA) Competencies

	PE3.5 Orderly management of self, and professional conduct PE3.6 Effective team membership and team leadership /TT1