UNSW Course Outline

SOLA5052 Bioenergy and Renewable Fuels - 2024

Published on the 03 Sep 2024

General Course Information

Course Code : SOLA5052
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, Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course will introduce a range of biomass energy sources, including forestry, wastes and crops, as well as various technologies for their conversion into useful fuels or power. The course will cover liquid and gaseous fuels, emphasizing major fuels such as syngas, biogas, ethanol and

biodiesel. Combustion and gasification systems, biogas and landfill gas systems, as well as high efficiency combined heat and power production are introduced. Hydrogen and its uses in the field of renewable fuels is described.

Course Aims

The course aims to introduce biomass (i.e. material of recent biological origin) as an energy carrier and the technologies associated with its exploitation. In particular, the course will help to develop students' ability to compare and contrast the possible pathways for conversion of different biomass resources into heat, electricity and fuels, and evaluate business opportunities for biomass energy conversion. The course will help strengthening and broadening of renewable energy engineering knowledge.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products
CLO2 : Perform simple biomass resource assessments for different types of resources and evaluate business opportunities
CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources
CLO4 : Apply the fundamental governing and operating principles of key conversion options, in enough depth to be able to perform idealised calculations and derivations relating to these principles

Course Learning Outcomes	Assessment Item
CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products	• Assignment • Weekly Online Quizzes • Final Exam • Laboratory activities
CLO2 : Perform simple biomass resource assessments for different types of resources and evaluate business opportunities	• Assignment • Weekly Online Quizzes • Final Exam
CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources	• Laboratory activities • Assignment • Weekly Online Quizzes • Final Exam
CLO4 : Apply the fundamental governing and operating principles of key conversion options, in enough depth to be able to perform idealised calculations and derivations relating to these principles	• Laboratory activities • Assignment • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Echo 360

Other Professional Outcomes

The course aims to introduce biomass (i.e. material of recent biological origin) as an energy carrier and the technologies associated with its exploitation.

Several sources of raw biomass will be considered including forestry, wastes, energy crops, crop residues, and algae. Methods of production, collection, processing these different sources will be covered. Agriculture and silviculture are largely outside of the scope of the course and are only discussed as a means to estimate biomass production.

Several technologies for the conversion of raw biomass into heat, electricity and fuels will be considered. Specifically the following will be introduced:

- Combustion of raw biomass and biomass-derived liquid and gaseous fuels to produce heat and electricity.
- Thermochemical conversion technologies to produce gas fuels, including pyrolysis and gasification, and to produce liquid fuels such as methanol, biodiesel, or hydrocarbons similar to gasoline (petrol) or Diesel fuels.
- Biochemical conversion options to produce gaseous fuels including anaerobic digestion and to produce liquid fuels including via fermentation.

As can be seen in the previous section, a large breadth of topics will be considered. The aim is not to become an expert on all of these topics. Rather, the goal is to obtain a broad understanding of various types of biomass resource and various conversion technologies.

At the same time, in key areas, a basic level of understanding of underlying physical, chemical, and biological processes involved will be taught. This approach will enable both interactions with experts in the area and further learning at greater depth.

On scuessful completion of the course, students will be able to:

- Explain how the characteristics of biomass resources determine the methods of production, collection, processing and potential conversion to energy or higher grade energy products (syn-gas, biogas).
- Compare and contrast the possible pathways for conversion of different biomass resources into heat, electricity and fuels.
- Solve quantitative engineering problems and perform algebraic derivations relevant to biomass conversion utilizing the governing and operating principles of biomass conversion.
- Evaluate business opportunities for biomass energy conversion using simple biomass resource assessments and fundamental engineering design and problem solving.

This course is designed to address the learning outcomes indicated and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown.

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

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Assignment Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: Not Applicable
Weekly Online Quizzes Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Not Applicable
Final Exam Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Not Applicable
Laboratory activities Assessment Format: Individual	15%	Start Date: Not Applicable Due Date: Not Applicable

Assessment Details

Assignment

Assessment Overview

Students are guided through a numerical solution to a non-stoichiometric thermochemical gasification problem, where wood is converted to syn-gas.

You will submit a written report answering the questions posed plus a MS Excel spreadsheet used to perform the calculations.

Work will be marked against assessment criteria. Feedback with be provided within ten days of the submission date through the learning management system.

Course Learning Outcomes

- CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products
- CLO2 : Perform simple biomass resource assessments for different types of resources and evaluate business opportunities
- CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources
- CLO4 : Apply the fundamental governing and operating principles of key conversion options, in enough depth to be able to perform idealised calculations and derivations relating to these principles

Detailed Assessment Description

Worth 25% of the course.

On equilibrium products of biomass gasification (chemical thermodynamics)

Submission of assignments: can be done electronically/online through the Moodle page.

Assessment information

First submission, Q1-6 completed, 11.55pm on Monday of Week 7.

Final submission Q7-8 completed, 11.55pm on Friday of Week 9.

Assignment submission Turnitin type

This is not a Turnitin assignment

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Weekly Online Quizzes

Assessment Overview

Weekly online quizzes testing general qualitative knowledge and quantitative problem solving skills, performed online through Moodle. Feedback will be provided after the respective submission date through the learning management system.

Course Learning Outcomes

- CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products
- CLO2 : Perform simple biomass resource assessments for different types of resources and evaluate business opportunities
- CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources

Detailed Assessment Description

A ‘Primer Quiz’, will be given online in week 1. This quiz will provide a re-introduction to concepts necessary for the biomass course that are expected to have been learned previously including dimensional reasoning, thermodynamics, fundamental chemistry and the basics of solving biomass questions.

Weekly quizzes (weeks 2-5 and 7-10) will be posted on Moodle just after the weekly lecture and will be due (e.g. set to close) just before the start of the next lecture.

Important: No late quizzes will be accepted!

Assignment submission Turnitin type

Not Applicable

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Final Exam

Assessment Overview

The course final exam, covering all topics presented in the course (unless otherwise specified in the lecture slides). Quantitative aspects of the exam are most similar to the tutorial problems.

Course Learning Outcomes

- CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products
- CLO2 : Perform simple biomass resource assessments for different types of resources and evaluate business opportunities
- CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources
- CLO4 : Apply the fundamental governing and operating principles of key conversion options, in enough depth to be able to perform idealised calculations and derivations relating to these principles

Detailed Assessment Description

The exam will consist of typed short answer questions, calculations and derivations. About half of the marks will be available for short answer questions that mainly assess the breadth of your knowledge, while the other half will include more involved calculations that assess the depth of your ability to solve relevant engineering problems. All material presented in the course (including via Moodle) is examinable unless otherwise explicitly stated.

The exam will be in the exam period in week 11 or 12.

Hurdle rules

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 both theory and practices relevant to bioenergy and renewable green fuels. A minimum mark of 50% must be obtained for both parts (Part A, qualitative and Part B, quantitative) of the final exam 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.

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Laboratory activities

Assessment Overview

Students typically attend 3 laboratory sessions in 3 of the 10 weeks of the term. After performing the experiment, students then choose one laboratory and write up a brief semi-formal lab report. The minimum expected length of the report is 4 pages. There is no limit on the maximum length of the report. It is expected that 6-10 pages would be sufficient to write a complete report.

The work will be marked against assessment criteria and feedback will be provided within 10 days of the submission ate through the learning management system.

Course Learning Outcomes

- CLO1 : Describe different biomass resources (eg, forestry, municipal waste, etc), in terms of their unique characteristics that determine methods of production, collection, processing and options for conversion into higher grade energy products
- CLO3 : Assess various options for conversion of biomass into heat, electricity and fuels, and be able to match these with different resources
- CLO4 : Apply the fundamental governing and operating principles of key conversion options, in enough depth to be able to perform idealised calculations and derivations relating to these principles

Detailed Assessment Description

The laboratory activities are designed to convey real world experience making biofuels and extracting energy from biomass. There are three (3) laboratory activities. They are intended to show you:

Hydrogen production: using your own miniature electrolyser you will measure its efficiency of splitting water into hydrogen and oxygen. You will measure the electrical power inouts and the gaseous outputs of the reactor and calculate the power to hydrogen efficiency. This is an excellent way to produce a clean energy carrier in the form of hydrogen from Renewable Electricity that can be used for storage, transport or for processing into other fuels.

Biodiesel production: make your own biodiesel from waste vegetable oils, as well as new oils (optional, student may provide ~50 mL of oil). You will estimate the total energy in your product biodiesel after following an optimized synthesis recipe and so estimate an overall efficiency for the oil-to-biodiesel conversion process. The International Energy Agency (IEA) projects that advanced biodiesel will play a significant role in future sustainable transport fuels, growing in production out to 2050.

Direct carbohydrate fuel cells: Simple carbohydrates, or sugars, can be obtained from cellulose, which is the most abundant polymer on the planet and a major component of wood. In this lab you will obtain electricity directly from sugar in an electrochemical fuel cell. You will measure the characteristic “warm-up” time and the electrical power output. Electricity directly from sugar has significant potential to replace sugar fermentation to bio-ethanol, providing an energy dense fuel for future long-range electric vehicles.

During the course you will have the opportunity to carry out each of the above laboratory experiments. Each lab can be carried out in a weekly session of 2.5 hours. You will be assigned three weeks in which you can do the labs, for a maximum time commitment of 7.5 hours. There will be opportunities to repeat one or more labs in susequent weeks, depending on availability. Demonstrators will be on hand to explain what to do on each lab and help you carry out the experiments. There are recordings of these help sessions and other information available on Moodle.

You will choose one of your labs to write up for your final lab report. Lab submissions can be submitted through Moodle. Though work may be done in groups, an individual lab submission is required from each student at the end of week 10.

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

General Assessment Information

Major Assignment

On equilibrium products of biomass gasification (chemical thermodynamics)

Submission of assignments: can be done electronically/online through the Moodle page.

Work submitted late without an approved special consideration or extension by the course coordinator or delegated authority is subject to a late penalty of 5% mark reduction per day, capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, consistent with UNSW Assessment Implementation Procedure.

Weekly Quizzes

Consist of:

A 'Primer Quiz', will be given online in week 1. This quiz will provide a re-introduction to concepts necessary for the biomass course including dimensional reasoning, thermodynamics, fundamental chemistry and the basics of solving biomass questions.

Weekly quizzes (weeks 2-5 and 7-10) will be posted on Moodle just after the weekly lecture and will be due (e.g. set to close) just before the start of the next lecture.

Important: No late quizzes will be accepted!

Laboratory Demonstration Submissions

The laboratory activities are designed to convey real world experience making biofuels and extracting energy from biomass. There are several laboratory activities that can be run. They are intended to show you how to extract energy from biomass and give you some real experience making your own biofuels. Some examples of (current) laboratory activity topics include:

Hydrogen production: using your own miniature electrolyser you will measure its efficiency of splitting water into hydrogen and oxygen. You will measure the electrical power inouts and the gaseous outputs of the reactor and calculate the power to hydrogen efficiency. This is an excellent way to produce a clean energy carrier in the form of hydrogen from Renewable Electricity that can be used for storage, transport or for processing into other fuels.

Biodiesel production: make your own biodiesel from waste vegetable oils, as well as new oils (optional, student may provide ~50 mL of oil). You will estimate the total energy in your product biodiesel after following an optimized synthesis recipe and so estimate an overall efficiency for the oil-to-biodiesel conversion process. The International Energy Agency (IEA) projects that advanced biodiesel will play a significant role in future sustainable transport fuels, growing in production out to 2050.

Direct carbohydrate fuel cells: Simple carbohydrates, or sugars, can be obtained from cellulose, which is the most abundant polymer on the planet and a major component of wood. In this lab you will obtain electricity directly from sugar in an electrochemical fuel cell. You will measure the characteristic “warm-up” time and the electrical power output. Electricity directly from sugar has significant potential to replace sugar fermentation to bio-ethanol, providing an energy dense fuel for future long-range electric vehicles and sustainable chemical industry.

During the first few weeks of the course 3 online lab demonstrations will be made available to you, for a maximum time commitment of 6 hours. Demonstrators will perform the labs and answer questions. The sessions will be recorded and made available on MS Teams as well as Moodle if necessary.

Lab submissions can be submitted through Moodle. Though work may be done in groups, an individual lab submission is required from each student.

Final Exam

The exam will consist of written short answer questions, calculations and derivations. About half

of the marks will be available for short answer typed questions that mainly assess the breadth of your knowledge, while the other half will include more involved calculations that assess the depth of your ability to solve relevant engineering problems. All material presented in the course (including via Moodle) is examinable unless otherwise explicitly stated.

Hurdle requirments:

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 both theory and practices relevant to bioenergy and renewable green fuels. A minimum mark of 50% must be obtained for both parts (Part A, qualitative and Part B, quantitative) of the final exam 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.

Presentation:

All submissions are expected to be neat and clearly set out so that there is no ambiguity in their evaluation. Your submissions are the result of all your hard work and should be portrayed in the best light possible. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Marking:

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

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.

Calculators and Computers

You will need to provide your own calculator and/or computer.

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 sit 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.

Futher information:

Assessment 1: Assignment

Due date:

Part 1: Q1-6 11.55pm on the Monday of week 7;

Part 2 - Q7-8: 11.55pm on the Friday of week 9.

Students are guided through a numerical solution to a non-stoichiometric thermochemical gasification problem, where wood is converted to syn-gas.

Assessment 2: Weekly Online Quizzes

Due date: Weekly submission: Weeks 1 to 10 (except week 6).

Weekly online quizzes testing general qualitative knowledge and quantitative problem solving skills, performed online through Moodle.

Assessment 3:

Final Exam

Due date: To be confirmed

The course final exam, covering all topics presented in the course (unless otherwise specified in the lecture slides). Quantitative aspects of the exam are most similar to the workshop problems.

Assessment 4: Laboratory activities

Due date: 11:55 pm on the Friday of week 10

Laboratory activities are meant to provide students as much as possible with direct, hands on experience making renewable fuels.

Attendance: Typically, there have been 3 laboratory activities available to be completed as a part of the 10 week course. This means that students do not have to come to every laboratory session. They typically only attend 3 sessions total in 3 of the 10 weeks in the term. The maximum capacity for people in the laboratory (Rm 165 F10, Chemical Sciences) is 30 students. Students sign up to lab sessions in Week 1 on Moodle. Students may change their laboratory session later on, so long as their change does not exceed the laboratory session capacity (30 students) or if they are able to get another student to swap with them. If a student arrives unscheduled at the laboratory and the room is already at maximum capacity (30 people) then they will not be able to enter the lab.

Assessment: After performing the experiment, students then choose one laboratory and write up a brief semi-formal lab report. The minimum expected length of this assignment is ~4 pages. There is no maximum length limit but it is expected that 6-10 pages would be sufficient to write a complete report.

Grading Basis

Standard

Requirements to pass course

To pass the course students are required to achieve at least 50% in theior total marks for the course and to in addition to satisfy the following hurdle rquirement:

- Students must demonstrate understanding of both theory and practices relevant to bioenergy and renewable green fuels. A minimum mark of 50% must be obtained for both parts (Part A, qualitative and Part B, quantitative) of the final exam 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

Teaching Week/Module	Activity Type	Content
Week 1 : 9 September - 15 September	Lecture	Biomass Resources and Supply Chain
Week 2 : 16 September - 22 September	Lecture	Chemical Thermodynamics
Week 3 : 23 September - 29 September	Lecture	Gas and Steam Turbines, Power cycles
Week 4 : 30 September - 6 October	Lecture	Gasification and Pyrolysis
Week 5 : 7 October - 13 October	Lecture	Combustion of Solid Biomass Fuels
Week 6 : 14 October - 20 October	Other	Flexibility week
Week 7 : 21 October - 27 October	Lecture	Guest Lectures by Local Professionals from Industry
Week 8 : 28 October - 3 November	Lecture	Biochemical gasification and anaerobic digestion
Week 9 : 4 November - 10 November	Lecture	Liquid Biofuels for Transport and Green Hydrogen
Week 10 : 11 November - 17 November	Lecture	Exam Preparation Discussion (No Official Lecture)

Attendance Requirements

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

General Schedule Information

Lectures will be used to introduce the factual information, theory, and methods of the course. Learning during lectures should be later reinforced by reading reference materials and working through the assignments.

Workshops will be used to demonstrate how to apply the facts, theory and methods delivered in lectures to idealised problems, to work on assignments and exam practice questions, and for discussion of key points with demonstrators and/or lecturer.

Assignments then further develop (by calculation, critical analysis and discussion) and assess student learning by application to more complex and involved problems.

Laboratory activities will give “hands-on” experience making real biofuels and extracting energy from inexpensive, abundant and non-toxic bio-derived chemicals.

The final exam assesses student learning as a result of the course.

Course Resources

Prescribed Resources

All resources supplied on Moodle and MS Team's course pages.

Recommended Resources

There is a course reader and a primer document, supplied with the course materials on Moodle, as well as relevant exerpts from recent high quality thermodynamics textbooks and papers.

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

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

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.

This course was redeveloped in 2019 and the response from students was overwhelmingly positive. The major change made to the course at that time was the inclusion of the laboratory component. This year the labs are again a full and important component of the course, delivering real-world, hands-on experience with real biofuels to ensure that your experience is as industrially relevant as possible. This year the facts and figures in the lecture material have again been updated. A module on hydrogen production as an emerging green energy carrier has been added. Some sensible applications of this hydrogen have been suggested. We have learned from our previous experience to continually streamline the course delivery, submission and marking as well as improving lecturer/demonstrator-to-student feedback.

Please don't hesitate to come and chat at the end of a lecture or with your demonstrators about any constructive and useful suggestions.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Gavin Conibeer		Rm 245 Tyree Energy Technologies Building (TETB, H6)	9065 9553 (MS Teams)or contact	Office hours Mondays 2.30-3.30pm each week, online on Teams	No	Yes
Lecturer	Rob Patterson		Rm 246 Tyree Energy Technologies Building (TETB, H6)	Contact on MS Teams	During lab classes	No	No
Demonstrator	Zhuocheng Huang			Contact on MS Teams	During workshops	No	No
	Furqan Chaudhry			Contact on MS Teams	During workshops	No	No
	Martin Zlatinov			Contact on MS Teams	During lab classes	No	No
	Sumera Arshad				During lab classes	No	No
	Yingfei Huang				During lab classes	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 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.