UNSW Course Outline

CEIC3004 Process Equipment Design - 2024

Published on the 29 Jan 2024

General Course Information

Course Code : CEIC3004
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : School of Chemical 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

Conceptualising the transformation of raw materials into valuable products in terms of unit operations is one of the key distinctives of chemical engineering. Translating these unit operation concepts into reality involves selecting and designing the appropriate equipment. This

course will prepare you to make and justify equipment selection decisions and then prepare detailed designs of selected equipment.

Various methods of equipment selection will be explored, including Multiple-Criteria Decision Analysis (MCDA), and Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis. You will also be introduced to how equipment selection is approached in different contexts, including water treatment and mineral processing. In particular, you will explore how priorities vary across industries and how this influences equipment selection.

Finally, you will be introduced to a range of process equipment for different unit operations and will study different aspects of detailed equipment design. These designs will encompass design criteria specification, assessment of required/optimum size, materials selection (especially for processes with special requirements such as food processes), the importance of relevant design standards and legal requirements, and detailed mechanical design. These aspects will be illustrated using heat exchangers, pressure vessels and separation equipment ranging from distillation columns to centrifuges.

Course Aims

The overall aim of this course is to enable students to select and design equipment relevant to a wide range of industrial applications. This course will teach students to define the different characteristics, configurations and operating conditions of the equipment and be familiar with the terms used in their design. Students will also be taught how to advise a third party of the most appropriate equipment type based on a good understanding of the advantages and limitations of the equipment for a given application.

Relationship to Other Courses

The group project for this course is aligned with the CEIC3005 Process Plant Design assessments and hence students may find it useful to complete both courses in the same term. However, the tasks have been designed so your group can complete the project/s independently (in the case that you are only completing one of the courses in T1, 2024).

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Select equipment used to carry out chemical reactions, to separate phases and to separate the components within phases.
CLO2 : Apply various methods for the detailed design of process equipment.
CLO3 : Identify physical property data and other data needed for equipment design from a variety of sources.
CLO4 : Apply teamwork and project managements skills within the preliminary design phase of an engineering project.

Course Learning Outcomes	Assessment Item
CLO1 : Select equipment used to carry out chemical reactions, to separate phases and to separate the components within phases.	• Online quizzes • Group design project • Individual design portfolio
CLO2 : Apply various methods for the detailed design of process equipment.	• Online quizzes • Group design project • Individual design portfolio
CLO3 : Identify physical property data and other data needed for equipment design from a variety of sources.	• Online quizzes • Group design project • Individual design portfolio
CLO4 : Apply teamwork and project managements skills within the preliminary design phase of an engineering project.	• Group design project • Individual design portfolio

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

This course is divided into five sub-topics:

1. Equipment Selection (ES)
2. Separation Equipment Design (SED)
3. Heat Exchanger Design (HXD)
4. Pressure Vessel Design (PVD)
5. Distillation Column Design (DCD)

Learning and teaching activities associated with each of these topics will vary depending on the

topic. Broadly, the course will comprise of some pre-class online activities, interactive lectures and face-to-face tutorials. Formal summative quizzes will be provided at specific timepoints to give both you and your lecturer an indication of how your learning is progressing. Where possible, the incorporation of process simulation and modelling software, for example Aspen, will be incorporated to enable you to learn how to use modern approaches to speed up the design process as would be undertaken in industry.

The group design assignment will run throughout the first half of the term giving you the opportunity to experience an industry-relevant design problem that will allow you to put your learning into practice. This design problem is common to CEIC3005 and hence it is recommended that CEIC3005 is taken concurrently. This will also provide you the opportunity to practice collaborative learning skills. This project will involve both a group design report as well as an individual design portfolio. It will prepare you directly for the 4th year capstone project, CEIC4001, for which this course is a pre-requisite. Tutorial sessions will be used to troubleshoot issues that you are facing in your group assignment and to provide feedback on proposed solutions. These tutorial sessions also support the individual design assignment in the second half of the term.

Other Professional Outcomes

Other Professional Outcomes - Engineers Australia Stage 1 Competencies

This course contributes to your development of the following EA Professional Engineer competencies:

- PE2.1 Application of established engineering methods to complex engineering problem solving.
- PE2.2 Fluent application of engineering techniques, tools and resources.
- PE2.3 Application of systematic engineering synthesis and design processes.
- PE3.2 Effective oral and written communication in professional and lay domains.
- PE3.4 Professional use and management of information.
- PE3.6 Effective team membership and team leadership.

Additional Course Information

Time commitment

UNSW expects students to spend approximately 150 hours to successfully complete a 6 UOC course. For CEIC3004, we expect approximately 80 hours to be spent developing your knowledge, e.g. through attending lectures, completing pre-class lessons and post-class quizzes;

approximately 30 hours to be spent on a group assignment, including participation at associated tutorials; and approximately 40 hours developing your individual design portfolio, again including participation at the relevant tutorials.

Competence

Students are expected to enter CEIC3004 having developed competencies in all the material covered in the pre-requisite courses, at least. Little time is available to remediate any deficiencies in your knowledge of those topics. Over the course of the term, you will be developing new competencies and to illustrate the standards we expect. Marking rubrics or guidelines will be provided for all assessments. The teaching staff will apply these marking guides fairly and provide you with feedback so you can continue to improve over the term and beyond.

Participation

When you attend face-to-face classes, we expect you to actively participate in the activities organised. This may mean listening, taking notes, asking questions or engaging in peer discussions. It may also mean working by yourself or in groups on tutorial exercises.

To complete the Design Assignment, you are required to work in a team. We expect all team members to agree on how they will manage the team (e.g. making and documenting decisions), to assign the project work equitably and contribute to the delivery of project outputs to the best of their ability.

Students are expected to contribute to online discussions through MS Teams. You may wish to discuss challenges faced through this course, ask questions about course content, discuss solutions to tutorial and practice questions. It is expected that students will help each other, and the lecturers will contribute as required.

Attendance and punctuality

We expect students to be punctual and attend all lectures and tutorials. University commitments take precedence over regular work activities, holidays etc. Students who attend less than 80% of their possible classes may be refused final assessment. If you miss a class, we expect you to catch up in your time, lectures will be recorded and made available through MS Teams and Moodle.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Online quizzes Assessment Format: Individual	25%	Due Date: Week 3, Week 5, Week 10
Group design project Assessment Format: Group	25%	Due Date: 28/03/2024 06:00 PM
Individual design portfolio Assessment Format: Individual	50%	Due Date: 28/04/2024 06:00 PM

Assessment Details

Online quizzes

Assessment Overview

Students will complete online quizzes designed to provide rapid, two-way feedback on student learning across the various topics. Students will be assessed on the technical accuracy of calculations and proper application of engineering design principles with appropriate assumptions. Feedback will be provided upon completion of each quiz.

Course Learning Outcomes

- CLO1 : Select equipment used to carry out chemical reactions, to separate phases and to separate the components within phases.
- CLO2 : Apply various methods for the detailed design of process equipment.
- CLO3 : Identify physical property data and other data needed for equipment design from a variety of sources.

Assessment information

Further information on these tasks will be made available via Moodle.

Assignment submission Turnitin type

This is not a Turnitin assignment

Group design project

Assessment Overview

Students will work in a team to complete the equipment selection aspects of an equipment design brief. Design workshops during the first half of term will support the completion of this task with marks awarded for various activities both in and out of class. Details of these tasks and associated feedback will be provided separately.

Course Learning Outcomes

- CLO1 : Select equipment used to carry out chemical reactions, to separate phases and to separate the components within phases.
- CLO2 : Apply various methods for the detailed design of process equipment.
- CLO3 : Identify physical property data and other data needed for equipment design from a variety of sources.
- CLO4 : Apply teamwork and project managements skills within the preliminary design phase of an engineering project.

Assessment information

This task will be supported by a number of tutorials designed to keep you on track and give you feedback as you progress in this assignment. Further information on the assessment task will be made available via Moodle.

Assignment submission Turnitin type

This is not a Turnitin assignment

Individual design portfolio

Assessment Overview

Students will complete an individual detailed design portfolio to demonstrate their technical skills in undertaking detailed equipment design. This assessment builds on work performed in the group design project. Design workshops during the second half of term will support the completion of the individual component of the design assignment with marks for various components of the portfolio. Details of these tasks and associated feedback will be provided separately.

Course Learning Outcomes

- CLO1 : Select equipment used to carry out chemical reactions, to separate phases and to separate the components within phases.
- CLO2 : Apply various methods for the detailed design of process equipment.
- CLO3 : Identify physical property data and other data needed for equipment design from a variety of sources.
- CLO4 : Apply teamwork and project managements skills within the preliminary design phase of an engineering project.

Assessment information

This task will be supported by a number of tutorials designed to keep you on track and give you feedback as you progress in this assignment. Further information on the assessment task will be made available via Moodle.

Assignment submission Turnitin type

This is not a Turnitin assignment

General Assessment Information

Assessment criteria and standards

Students will be provided with further details of the assessment activities and the associated rubrics on Moodle and during class.

Feedback on assessment

Where possible, self-assessment questions are incorporated into on-line learning material to assist students gain feedback to gauge their understanding as they work through the lessons. Students will receive rapid feedback through undertaking on-line quizzes which will be available at regular intervals throughout the course, providing students with information as to where they can improve their learning while simultaneously providing data to the lecturers on how well students are understanding on-line and class material. Tutorials have been developed to support the design assignment in which students will have the opportunity to gain feedback from peers, class lecturers and tutors on their designs.

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Workshop	Tuesday 10-11am (Mathews 103) - Design assignment orientation Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): Course Introduction and Equipment Selection (ES) 1: Introduction and Methods
	Lecture	Wednesday 2-4pm (O'Shane G02): Distillation Column Design (DCD) 1: Multicomponent flash Calculations
	Lecture	Thursday 12-2pm (O'Shane G03): DCD 2: Shortcut methods
	Assessment	Gantt Chart due as a group submission on Friday 16th, 6pm
Week 2 : 19 February - 25 February	Workshop	Tuesday 10-11am (Mathews 103) - Design assignment examples Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): ES2: Water treatment
	Lecture	Wednesday 2-4pm (O'Shane G02): DCD 3: Rigorous solution
	Lecture	Thursday 12-2pm (O'Shane G03): DCD 4: Process simulation on distillation column
Week 3 : 26 February - 3 March	Assessment	Prepare Fishbowl contribution by workshop Tuesday 27th, 10am
	Workshop	Tuesday 10-11am (Mathews 103) - Fishbowl Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): ES 3: Mining
	Lecture	Wednesday 2-4pm (O'Shane G02): DCD 5: Plate efficiency; Approximate column sizing
	Lecture	Thursday 12-2pm (O'Shane G03): DCD 6: Plate contactors; plate hydraulic design
Week 4 : 4 March - 10 March	Assessment	Prepare Group Presentation by workshop Tuesday 5th, 10am
	Workshop	Tuesday 10-11am (Mathews 103) - Group design presentation and reflection Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): ES 4: Air Pollution Abatement
	Lecture	Wednesday 2-4pm (O'Shane G02): DCD 7: Enhanced distillation
	Lecture	Thursday 12-2pm (O'Shane G03): DCD 8: Residue curve maps
	Assessment	Team Evaluation due Thursday 7th 6pm; Group reflection due Friday 8th 6pm; Draft group report due Sunday 10th 6pm
Week 5 : 11 March - 17 March	Workshop	Tuesday 10-11am (Mathews 103) - Peer assessment of draft group report Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): Separation Equipment Design (SED) 1: Clarifiers
	Lecture	Wednesday 2-4pm (O'Shane G02): Heat exchange (HED 1): Intro to Heat Exchange
	Lecture	Thursday 12-2pm (O'Shane G03): HED 2: Heat Transfer Coefficients
	Assessment	ES & DCD Quizzes due Thursday 14th 6pm
Week 6 : 18 March - 24 March	Assessment	Peer assessment due Monday 18th 6pm
Week 7 : 25 March - 31 March	Workshop	Tuesday 10-11am (Mathews 103) - Individual design examples Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): SED 2: Filters
	Lecture	Wednesday 2-4pm (O'Shane G02): HED 3: Pressure Drop
	Lecture	Thursday 12-2pm (O'Shane G03): HED 4: Heat Exchangers Advanced
	Assessment	Group Design Project due Thursday 28th 6pm
Week 8 : 1 April - 7 April	Assessment	Prepare Presentation by workshop Tuesday 2nd 10am
	Workshop	Tuesday 10-11am (Mathews 103) - Individual design presentation and reflection Workshop attendance is compulsory
	Assessment	Team Evaluation due Tuesday 2nd 6pm
	Lecture	Tuesday 2-4pm (O'Shane G05): SED 3: Dryers
	Lecture	Wednesday 2-4pm (O'Shane G02): Pressure Vessel Design (PVD 1): Introduction

	Lecture	Thursday 12-2pm (O'Shane G03): PVD 2: Welding and Wall thickness
	Assessment	HED Quiz due Thursday 4th 6pm
	Assessment	Submit Reflection by Friday 5th 6pm
Week 9 : 8 April - 14 April	Assessment	Prepare Design Manual by workshop Tuesday 9th 10am
	Workshop	Tuesday 10-11am (Mathews 103) - Equipment Design 101 Workshop attendance is compulsory
	Lecture	Tuesday 2-4pm (O'Shane G05): SED 4:Combined processes – Membrane bioreactors
	Lecture	Wednesday 2-4pm (O'Shane G02): PVD 3: Vessels Ends
	Lecture	Thursday 12-2pm (O'Shane G03): PVD 4: Load and Vessel Support
	Assessment	Draft individual report due Sunday 14th 6pm
Week 10 : 15 April - 21 April	Workshop	Tuesday 10-11am (Mathews 103): Peer assessment of draft individual reports. Workshop attendance is compulsory
	Workshop	Individual design workshop (TBA)
	Assessment	SED & PVD quizzes due Thursday 18th 6pm
Week 11 : 22 April - 28 April	Assessment	Peer assessment due Monday 22nd 6pm
	Assessment	Individual Design Portfolio due Sunday 28th 6pm

Attendance Requirements

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

Course Resources

Prescribed Resources

Online resources

Videos, lecture slides and suggested readings, tutorial exercises and solutions, plus links to other online resources will be provided on the course Moodle page. These will be progressively released as the semester progresses OR These are all currently available on the course website.

Recommended textbooks

Towler, Gavin & Sinnott, Ray K. (2013). Chemical Engineering Design - Principles, Practice and Economics of Plant and Process Design (2nd Edition). Elsevier. Online version available at:

http://app.knovel.com/hotlink/toc/id:kpCEDPPEP4/chemical-engineering/chemical-engineering

J.D. Seader & E.J. Henley, Separation Process Principles, John Wiley & Sons, 2nd or 3rd ed.

R.H. Perry & D.W. Green, Perry's Chemical Engineer's Handbook, latest edition, McGraw-Hill (available online in Library).

Additional material will be distributed on Moodle.

Other resources

You can access the full text of online resources available from the UNSW library using the UNSW VPN Service (https://www.it.unsw.edu.au/staff/vpn/#AccessingLibraryJournals).

Course Evaluation and Development

Student feedback will be gathered during the course using in-class polling and post-class questionnaires to gather rapid feedback that can be used to adapt the course to your needs as we move through the term. Towards the conclusion of the term, you will be sent a link to the more formal MyExperience survey which you can use to describe how you found the course and the lecturers. The results of the MyExperience survey are examined extensively to identify ways in which we can improve the course. Examples of ways in which this survey has been used to improve CEIC3004 include the addition of tutorials, the modification of peer review to better motivate students, and the inclusion of pre-class lessons.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Helen Rutli dge		Rm 519 HILMER (Enter via SEB E8)	+612 8071 9864	Tuesday and Friday also via MS Teams	Yes	Yes
Lecturer	Jason Scott					No	No
	Xiaoran Chu					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

Course Workload

Course workload is calculated using the Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture

material, completing the set assignments, further reading, and revising for any examinations. Most 6 UoC courses will involve approximately 10-12 hours per week of work on your part. If you're not sure what to do in these hours of independent study, the resources on the UNSW Academic Skills pages offer some suggestions including: making summaries of lectures, read/ summarise sections from the textbook, attempt workshop problems, reattempting workshop problems with some hints from the solutions, looking for additional problems in the textbook.

Full-time enrolment at university means that it is a *full-time* occupation for you and so you would typically need to devote 35 hours per week to your studies to succeed. Full-time enrolment at university is definitely incompatible with full-time employment. Part-time/casual employment can certainly fit into your study schedule but you will have to carefully balance your study obligations with that work and decide how much time for leisure, family, and sleep you want left after fullfilling your commitments to study and work. Everyone only gets 168 hours per week; overloading yourself with both study commitments and work commitments leads to poor outcomes and dissatisfaction with both, overtiredness, mental health issues, and general poor quality of life.

On-campus Class Attendance

Most classes at UNSW are "In Person" and run in a face-to-face mode only. Attendance and participation in the classes is expected. As an evidence-driven engineer or scientist, you'll be interested to know that education research has shown students learn more effectively when they come to class, and less effectively from lecture catch-up recordings. If you have to miss a class due to illness, for example, we expect you to catch up in your time, and within the coming couple of days.

For most courses that are running in an "in person" mode:

- Lectures are normally recorded to provide an opportunity to review material after the lecture; lecture recordings are not a substitute for attending and engaging with the live class.
- Workshops/tutorials are not normally recorded as the activities that are run within those sessions normally cannot be captured by a recording. These activities may also include assessable activities in some or all weeks of the term.
- Laboratories are not recorded and require in-person attendance. Missing laboratory sessions may require you to do a make-up session later in the term; if you miss too many laboratory sessions, it may be necessary to seek a Permitted Withdrawal from the course and reattempt it next year, or end up with an Unsatisfactory Fail for the course.
- Assessments will often require in-person attendance in a timetabled class or a scheduled examination.

Submission of Assessment Tasks

In the School of Chemical Engineering, all written work will be submitted for assessment via Moodle unless otherwise specified. Attaching cover sheets to uploaded work is *not* required unless specifically requested for a specific assessment task; when you submit work through Moodle for assessment you are agreeing to uphold the Student Code.

Some assessments will require you to complete the work online and it may be difficult for the course coordinator to intervene in the system after the due date. You should ensure that you are familiar with assessment systems well before the due date. If you do this, you will have time to get assistance before the assessment closes.

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 respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect. Please make it easy for the markers who are looking at your work to see your achievement and give you due credit.

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.

Academic Integrity

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage (International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013). At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and plagiarism can be located at:

- The Current Students site
- The ELISE training site

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

To help describe what we are looking for, here are some things that we consider to be quite acceptable (even desirable!) actions for many assessments, and some that we consider to be unacceptable in most circumstances. Please check with the instructions for your assessments and your course coordinator if you're unsure. As a rule of thumb, if you don't think you could look the lecturer in the eye and say "this is my own work", then it's not acceptable.

Acceptable actions

 reading/searching through material we have given you, including lecture slides, course notes, sample problems, workshop problem solutions

 reading/searching lecture transcripts

 reading/searching resources that we have pointed you to as part of this course, including textbooks, journal articles, websites

 reading/searching through your own notes for this course

 all of the above, for any previous courses

 using spell checkers, grammar checkers etc to improve the quality of your writing

 studying course material with other students

Unacceptable actions

 asking for help completing an assessment from other students, friends, family

 asking for help on Q&A or homework help websites

 searching for answers to the specific assessment questions online or in shared documents

 copying material from any source into your answers

 using generative AI tools to complete or substantially complete an assessment for you

 paying someone else to do the assessment for you

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words,

ideas or research. Not referencing other people's work can constitute plagiarism. Further information about referencing styles can be located at https://student.unsw.edu.au/referencing.

For assessments in the School of Chemical Engineering, we recommend the use of referencing software such as Mendeley or EndNote for managing references and citations. Unless required otherwise specified (i.e. in the assignment instructions) students in the School of Chemical Engineering should use either the APA 7th edition, or the American Chemical Society (ACS) referencing style as canonical author-date and numbered styles respectively.

Artificial intelligence tools such as ChatGPT, CodePilot, and built-in tools within Word are modern tools that are useful in some circumstances. In your degree at UNSW, we're teaching you skills that are needed for your professional life, which will include how to use AI tools responsibly plus lots of things that AI tools cannot do for you. AI tools already are (or will soon be) part of professional practice for all of us. However, if we were only teaching you things that AI could do, your degree would be worthless, and you wouldn't have a job in 5 years.

Whether the use of AI tools in an assessment is appropriate will depend on the goals of that assessment. As ever, you should discuss this with your lecturers – there will certainly be assessments where the use of AI tools is encouraged, as well as others where it would interfere with your learning and place you at a disadvantage later. Our goal is to help you learn how to ethically and professionally use the tools available to you. To learn more about the use of AI, see this discussion we have written where we analyse the strengths and weaknesses of generative AI tools and discuss when it is professionally and ethically appropriate to use them.

While AI may might provide useful tools to help with some assessments, UNSW's policy is quite clear that taking the output of generative AI and submitting it as your own work will never be appropriate, just as paying someone else to complete an assessment for you is serious misconduct.

Asking Questions

Asking questions is an important part of learning. Learning to ask good questions and building the confidence to do so in front of others is an important professional skill that you need to develop. The best place to ask questions is during the scheduled classes for this course, with the obvious exception being questions that are private in nature such as special consideration or equitable learning plans. Between classes, you might also think of questions — some of those you might save up for the next class (write them down!), and some of them you might ask in a

Q&A channel on Teams or a Q&A forum on Moodle. Please understand that staff won't be able to answer questions on Teams/Moodle immediately but will endeavour to do so during their regular working hours (i.e. probably not at midnight!) and when they are next working on this particular course (i.e. it might be a day or two). Please respect that staff are juggling multiple work responsibilities (teaching more than one course, supervising research students, doing experiments, writing grants, …) and also need to have balance between work and the rest of their life.

School Contact Information

For assistance with enrolment, class registration, progression checks and other administrative matters, please see the Nucleus: Student Hub. They are located inside the Library – first right as you enter the main library entrance. You can also contact them via http://unsw.to/webforms or reserve a place in the face-to-face queue using the UniVerse app.

For course administration matters, please contact the Course Coordinator.

Questions about the this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.