UNSW Course Outline

CEIC2005 Chemical Reaction Engineering - 2024

Published on the 21 May 2024

General Course Information

Course Code : CEIC2005
Year : 2024
Term : Term 2
Teaching Period : T2
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 : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Chemical reaction engineering concerns the implementation of chemical reactions on a commercial scale. Its goal is the design and operation of chemical reactors to achieve safe, economic, scalable and energy-efficient production of chemicals. More than any other activity, it likely defines chemical engineering better as a distinct branch of the engineering profession. Starting with understanding what changes are expected to occur in a chemically reacting system by explaining the thermodynamics of the process, you will look into analyses of the rate kinetics of different reactions and, finally, the choice and design of reactors where those reactions can be carried out for optimal production at scale.

This course provides the knowledge base and critical thinking essential to the further learning of unit operations in CEIC3001, process modelling in CEIC3000, and process design in CEIC3005 and CEIC4001. The material in this course is taught from an engineering design perspective.

Course Aims

Chemical Reaction Engineering is one of the core subjects that differentiate chemical engineers and chemical product engineers from other engineering disciplines. The majority of chemical processes involve at least one chemical reaction. In this subject students will learn how to use thermodynamics to determine if a given reaction is possible. Students will also learn how to use reaction kinetic models to determine how fast a reaction is and to develop mathematical models, design equations, to simulate the progress of chemical reactions in a variety of reactor types. The course is principally a problem solving course, and requires considerable student interaction and participation.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Apply basic thermodynamic principles to determine if a chemical reaction is feasible.
CLO2 : Use mathematical models to simulate the progress of chemical reactions.
CLO3 : Design ideal chemical reactors.
CLO4 : Predict the performance of non-ideal reactors.
CLO5 : Critically evaluate analyses and designs for chemical reaction systems.

Course Learning Outcomes	Assessment Item
CLO1 : Apply basic thermodynamic principles to determine if a chemical reaction is feasible.	• Quizzes • Final Exam
CLO2 : Use mathematical models to simulate the progress of chemical reactions.	• Homework Assignments • Quizzes • Final Exam
CLO3 : Design ideal chemical reactors.	• Homework Assignments • Quizzes • Final Exam
CLO4 : Predict the performance of non-ideal reactors.	• Final Exam
CLO5 : Critically evaluate analyses and designs for chemical reaction systems.	• Team Project • Homework Assignments

Learning and Teaching Technologies

Moodle - Learning Management System

Other Professional Outcomes

Engineers Australia, Professional Engineer Stage 1 Competencies

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

- PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline
- PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline
- 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
- PE3.5 Orderly management of self, and professional conduct
- PE3.6 Effective team membership and team leadership

Additional Course Information

Requisite knowledge and relationships to other courses

This course is about continuing to build your knowledge of reactions and energy, with an application of this knowledge to the design of chemical reactors. It builds upon the skills base from CEIC2000 (Material and Energy Systems), the mathematical underpinning of MATH1131 (Mathematics 1A) and MATH2089 (Numerical Methods and Statistics).

The learning from this course is utilised in CEIC2007 (Chemical Engineering Lab A), CEIC3000 (Process Modelling and Analysis), CEIC3005 (Process Plant and Design), CEIC3006 (Process Dynamics and Control) and CEIC4001 (Process Design Project).

Expectations

Integrity and Respect

The UNSW Student Code of Conduct (https://student.unsw.edu.au/conduct), among other things, expects all students to demonstrate integrity in all academic work and to treat all staff, students and visitors to the University with courtesy, tolerance, and respect.

Time commitment

UNSW expects students to spend approximately 150 hours to complete a 6 UOC course like CEIC2005 successfully. Success in CEIC2005 means continual work through the term, completing all online lessons and all the problem-solving workshop questions in the corresponding week rather than getting behind and then hoping to catch up.

A typical week in CEIC2005 consists of approximately 12 hours of work on the material in this course:

- 6 h of in-class/online lessons, videos, live lectures, etc
- 2 h working on the problem-solving workshop material (preparation and participation)
- 1 h working on the team assignment
- 2 to 4 h to review, study, or work on assignments

Moodle has the activities for each week laid out to help you keep pace.

Don't leave activities until the night before; doing so greatly increases the chance of failure in this course or the next course, which assumes that you know the CEIC2005 material. Given the pivotal role of chemical reaction engineering within the chemical engineering curriculum, a solid understanding of this work is absolutely required to permit progression to later theory, laboratory, and design courses.

Team project

Work for the team project should be carefully delegated. Be careful not to spend an hour a week talking about what you might do or significant time figuring out who will do what. Do not fall into the trap of all "working together" somewhat inefficiently. A critical point of this team project is to practice your team management skills. It is not possible to complete these tasks efficiently by trying to get each member of the team to work on one "sub-question" within the weekly task and then trying to stitch the fragments together at the end.

Detailed Topics

Applications of physical chemistry, kinetics, and reaction engineering. Thermodynamic concepts related to Gibbs free energy as applied to phase equilibria and kinetics are illustrated and expanded. In this course, the student will learn the key concepts of chemical reaction kinetics (such as order of reactions, elemental reactions, reaction mechanisms, steady state kinetics, the temperature dependence of chemical reactions, the influence of catalysts on the reaction kinetics, etc.) and how these kinetic concepts can be employed to choose and operate a suitable reactor for a certain reaction. Reaction kinetics and thermodynamics are interlinked: One tells you how fast a reaction is, and the other tells you whether the reaction will proceed at all. Finally, kinetics and thermodynamics are applied in reaction engineering.

Topics include Introduction to reactor design: ideal batch, steady state mixed flow, steady state plug flow, size comparisons of ideal reactors, optimisation of operating conditions. Multiple reactor systems: reactors series and parallel, mixed flow reactors of different sizes in series, recycle reactors, autocatalytic reactions. Multiple reactions: reactor design for reaction in parallel and reactions in series, series-parallel reactions. Temperature effects: the heat of reaction, equilibrium constants, optimum temperature progression, adiabatic and non-adiabatic operation, product distribution, and temperature. Kinetics of rate processes: significance of the rate laws and models for distributed and lumped parameter systems. Experimental measurement and correlation of process rates.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quizzes Assessment Format: Individual Short Extension: Yes (1 day)	10%	Due Date: Week 3: 10 June - 16 June, Week 5: 24 June - 30 June, Week 8: 15 July - 21 July, Week 10: 29 July - 04 August
Homework Assignments Assessment Format: Individual Short Extension: Yes (2 days)	20%	Due Date: Week 7: 08 July - 14 July, Week 10: 29 July - 04 August
Team Project Assessment Format: Group	20%	Due Date: Week 3: 10 June - 16 June, Week 5: 24 June - 30 June, Week 8: 15 July - 21 July, Week 10: 29 July - 04 August
Final Exam Assessment Format: Individual	50%	Due Date: Exam Period

Assessment Details

Quizzes

<u>**Assessment Overview**</u>

Four short quizzes (of equal value) during the term help measure progress through the content and provide feedback on the learning throughout the term.

The quizzes are intended primarily as formative assessment but are counted towards the final mark at a significant level to encourage you to take them seriously and to discourage last-minute cramming. These quizzes will be assessed based on technical accuracy of calculations and evidence of good engineering judgement with assumptions and problem simplification.

<u>**Course Learning Outcomes**</u>

- CLO1 : Apply basic thermodynamic principles to determine if a chemical reaction is feasible.
- CLO2 : Use mathematical models to simulate the progress of chemical reactions.
- CLO3 : Design ideal chemical reactors.

<u>**Detailed Assessment Description**</u>

The quizzes will be delivered through Moodle. Quizzes have a time limit which you will know before attempting. Only one attempt is allowed.

The due dates are Week 3, 5, 8, 10 (Sunday)

Homework Assignments

<u>Assessment Overview</u>

There are 2 parts to the assignment (each worth 10%), designed to let you tackle longer and more open-ended problems.

These problems will let you explore more deep aspects of thermodynamics, kinetics, and reaction engineering, putting theoretical knowledge into real engineering practice. The emphasis in the marking scheme is not only technical accuracy but also contextualisation of the results to the specific engineering problem being investigated.

<u>Course Learning Outcomes</u>

- CLO2 : Use mathematical models to simulate the progress of chemical reactions.
- CLO3 : Design ideal chemical reactors.
- CLO5 : Critically evaluate analyses and designs for chemical reaction systems.

<u>Detailed Assessment Description</u>

Due Dates:

Homework Assignment 1: Week 7 (Monday)

Homework Assignment 2: Week 10 (Sunday)

Team Project

<u>Assessment Overview</u>

Working in a team, you will investigate contexts of chemical reaction engineering, undertaking short case studies of how key concepts from the course can be seen in common industrial settings. There are approximately weekly tasks for this project that are assessed periodically through the term.

Your short team reports will be compiled, reviewed, and improved over the course of the term. Note that you will also be required to complete an evaluation of each member of your team, covering the contribution to the team output and the quality and style of interaction with other members in the team.

These team evaluations are used to moderate the final marks from the team project.

<u>Course Learning Outcomes</u>

- CLO5 : Critically evaluate analyses and designs for chemical reaction systems.

Detailed Assessment Description

There are four submissions, each worth 5%.

Due dates: Weeks 3, 5, 8, 10 (Thursday)

Submission notes

via Moodle

Final Exam

Assessment Overview

The final exam is designed to ensure that students are able to apply the principles of thermodynamics, kinetics and reaction engineering to design problems where resources, including time, are constrained. The final exam also focuses on individual achievement and competence in the subject matter, in line with our obligations to Engineers Australia.

Course Learning Outcomes

- CLO1 : Apply basic thermodynamic principles to determine if a chemical reaction is feasible.
- CLO2 : Use mathematical models to simulate the progress of chemical reactions.
- CLO3 : Design ideal chemical reactors.
- CLO4 : Predict the performance of non-ideal reactors.

Detailed Assessment Description

The final exam will be held during the exam period.

Hurdle rules

To pass this course, you must be able to apply the course material in the final exam, and achieve at least 40% in the final exam.
Supplementary examination will only be granted via the normal special consideration mechanism.

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 20 May - 26 May	Other	Read the course outline. Check the Moodle page and make sure you have access to the Teams page for the course.
Week 1 : 27 May - 2 June	Lecture	Thermodynamics: Intro to course, 2nd and 3rd laws of thermodynamics; Gibbs function
	Workshop	Thermodynamics problems involving entropy, enthalpy, free energy, heat capacity, etc.
Week 2 : 3 June - 9 June	Lecture	Thermodynamics: Phase diagrams and phase equilibria, colligative properties, internal pressure, J-T coefficients
	Workshop	Thermodynamics problems concerning phase transformation, molar volume/ enthalpy change, heat of combustion, etc.
Week 3 : 10 June - 16 June	Lecture	Chemical kinetics: Extent of reaction, kinetics, rates of reaction, reversible reactions, equilibria, collision theory, rate laws, rate order, Arrhenius equation, diffusion controlled reactions
	Workshop	Problems involving reaction rates and describing reactions
Week 4 : 17 June - 23 June	Lecture	Chemical kinetics: reaction mechanisms, more complex reaction rates, case studies in homogenous and heterogenous catalysis
	Workshop	Complex reaction mechanisms and reaction kinetics problems
Week 5 : 24 June - 30 June	Lecture	Chemical kinetics: Enzyme reactions. Polymerisation reaction kinetics. Obtaining rate data. Chemical kinetics in the context of reaction engineering.
	Workshop	Complex reaction mechanisms and reaction kinetics problems
Week 6 : 1 July - 7 July	Homework	Flexibility Week Self revision/consolidation of thermodynamics and chemical kinetics concepts Homework of chemical kinetics problems from a reaction engineering perspective
Week 7 : 8 July - 14 July	Lecture	Reaction Engineering: Semi-Batch Reactor, Continuous Stirred Tank Reactors (CSTRs). Levenspiel plots. Residence time distributions.
	Workshop	Batch, semi-batch and CSTR design problems
Week 8 : 15 July - 21 July	Lecture	Reaction engineering: Plug Flow Reactors (PFRs). Comparison of CSTRs and PFRs. Residence time distributions
	Workshop	Tubular reactors and plug flow reactor design problems
Week 9 : 22 July - 28 July	Lecture	Reaction engineering: Sets of reactors. Relaxing assumptions. Non-ideal reactors. Axial dispersion model.
	Workshop	Using sets of reactors to solve design problems
Week 10 : 29 July - 4 August	Lecture	Reaction Engirerering: Diagnosing problems in reactors
	Workshop	Diagnosing faults in reactors and measuring improvement

Attendance Requirements

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

General Schedule Information

View the class timetable here.

Course Resources

Recommended Resources

- Atkins' Physical Chemistry, by Peter Atkins and Julio de Paula, any recent edition (7th onwards). Oxford University Press, New York. This is available in the library and provides an excellent resource for thermodynamics and the fundamentals of chemical kinetics.

- Elements of Chemical Reaction Engineering, by H Scott Fogler, any edition, Wiley. An e-book of this is available in the UNSW Library (see links from Moodle). It provides an excellent introduction to the application of chemical kinetics to the design of reactors, to the design of ideal and non-ideal reactors.

Course Evaluation and Development

The School of Chemical Engineering evaluates each course each time it is run through (i) myExperience Surveys, and (ii) Focus Group Meetings. As part of the myExperience process, your student evaluations on various aspects of the course are graded; the Course Coordinator prepares a summary report for the Head of School. Any problem areas are identified for remedial action, and ideas for making improvements to the course are noted for action the next time that the course is run. Focus Group Meetings are conducted each term. Student comments on each course are collected and disseminated to the Lecturers concerned, noting any points which can help improve the course.

All of the activities in this course, from the online lessons, and workshop problems through to the team project, have been designed in response to student feedback.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Dipan Kundu		E10, 222 (Hilmer)		via Teams or Email	Yes	Yes
Lecturer	Firoozeh Babayekhorasani				via 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 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 suceed. 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 an individual 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.