UNSW Course Outline

CEIC3006 Process Dynamics and Control - 2024

Published on the 12 May 2024

General Course Information

Course Code : CEIC3006
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 : Postgraduate, Undergraduate
Units of Credit : 6

Useful Links
Handbook Class Timetable

Course Details & Outcomes

Course Description

Modern chemical plants are managed via complex control systems. It is crucial, that you, as an aspiring chemical engineer have a working knowledge of process dynamics and how control systems manage plant operations. Mastering this field will enable you to improve process safety, ensure product quality and increase cost-effectiveness of process operations.

In the first part of the course, you will learn to develop models and analyse the dynamic behaviour of a range of processes. Using the language of Laplace transforms, you will express the dynamics of linear control systems in terms of transfer functions, a form of models that facilitate the analysis of process dynamics and control design.

The second part is concerned with control system design incorporating both qualitative (building on earlier studies on P&IDs) and quantitative (i.e., control algorithm design) approaches. You will learn stability analysis and control system design approaches. You will also learn the basics of digital control systems, including data acquisition, signal filtering, discrete-time modelling and digital controller design. Some widely used advanced control strategies will also be introduced. By making extensive use of the specialist software, students will be able to quickly apply the concepts of process control and design control strategies.

Course Aims

The objective of this course is to provide students with the fundamental background to process control theory and a working knowledge of automatic control systems for the control of chemical processes. Students will develop proficiency in the analysis of process dynamics and control system design.

Relationship to Other Courses

This course requires background in Engineering Mathematics and is closely related to CEIC3000 Process Modelling and Analysis, CEIC3005 Process Plant Design and CEIC4001 Process Design Proejct. It also serves as a rerequest course for CEIC8102 Advanced Process Control.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Develop linear dynamical process models in ordinary differential equations (ODEs) / transfer functions (including discrete time versions) from first principles and experimental data
CLO2 : Analyse features of process dynamics (e.g., stability, inverse response, oscillations, damping) from process transfer functions (including discrete time transfer functions)
CLO3 : Design qualitative control schemes for common process units and piping and instrumentation diagrams (P &ID), including plantwide control considerations
CLO4 : Design control algorithms based on process models (using transfer functions) for both continuous time and discrete time cases, including PID control tuning, Internal Model Control, Direct Synthesis, feedforward control and cascade control.

Course Learning Outcomes	Assessment Item
CLO1 : Develop linear dynamical process models in ordinary differential equations (ODEs) / transfer functions (including discrete time versions) from first principles and experimental data	• Assignments • Quizzes • Final Examination
CLO2 : Analyse features of process dynamics (e.g., stability, inverse response, oscillations, damping) from process transfer functions (including discrete time transfer functions)	• Assignments • Quizzes • Final Examination
CLO3 : Design qualitative control schemes for common process units and piping and instrumentation diagrams (P &ID), including plantwide control considerations	• Assignments • Quizzes • Final Examination
CLO4 : Design control algorithms based on process models (using transfer functions) for both continuous time and discrete time cases, including PID control tuning, Internal Model Control, Direct Synthesis, feedforward control and cascade control.	• Assignments • Quizzes • Final Examination

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams | Echo 360 | Mathworks MATLAB with Control Toolbox and Simulink

Learning and Teaching in this course

To encourage a deep approach to learning, emphasis is placed on the understanding of the control theory via problem solving. This subject has two main components: lectures and workshops (problem solving) sessions. Whilst the key theory and concepts will be taught during lectures, you will gain a deeper understanding of the theory by engaging with the problem solving workshop questions and assignment problems. Each week there are lectures and workshops (for demonstration and problem solving) per week.

The beauty of process control theories is that they are universal and can be used to analyse and control a class of processes. This implies that this subject involves a significant level of mathematics and many abstract concepts. This subject is about quantitative and rigorous control analysis and development, based on mathematical derivations. Therefore, the philosophy behind mathematical theory will be emphasized in lectures, such as, what motivates the approach, how it works and why. The relevance of this subject to chemical engineering practice will also be highlighted.

Experience shows that the absence of one or two lectures could create significant difficulties in understanding subsequent lectures – so make sure to attend all classes. Class discussion and student participation are greatly encouraged. You can ask the lecturer questions at any time during the class.

Practice is the best way to enhance your understanding of the concepts taught in this course. Please make sure that you actively participate the workshops and attempt assignments independently as this will provide you with an opportunity to assess your skills and improve your understanding of the content.

Other Professional Outcomes

This subject will provide you with the basic knowledge of process control techniques applied in process industries: techniques for modelling and analysis of process dynamics, transfer functions, control design methods based on process models, the concept of discrete-time systems. It also helps develop:

- the skills required to communicate with experts and specialists in other disciplines (in particular instrumentation/electrical/electronic/control engineers);
- the vision of process systems and appreciation of the complexity of a plantwide process system.

CEIC3006 helps to develop your capacity for analytical and critical thinking. You will learn an integrated approach to problem-solving from both process (such as process improvement) and operation (such as better control) points of view. The ideas behind the process control theory covered in this subject (such as model-based optimization, operation and control and feedback mechanism) can be applied in engineering innovation. It helps to develop:

- the ability to think critically and rigorously;
- the ability to formulate engineering problems;
- the ability to conceptualize the observations and findings;
- the ability to apply systematic approaches to solve engineering problems.

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
- PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline

- PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline
- PE1.4 Discernment of knowledge development and research directions within the engineering disciplin
- PE1.5 Knowledge of engineering design practice and contextual factors impacting 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
- PE3.3 Creative, innovative and pro-active demeanour

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Assignments Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 3: 10 June - 16 June, Week 7: 08 July - 14 July
Quizzes Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 4: 17 June - 23 June, Week 8: 15 July - 21 July
Final Examination Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: Exam Period

Assessment Details

Assignments

Assessment Overview

Students will complete two assignments that are designed to ensure that lecture material is understood through practice and learning outcomes are achieved. The assignments will consist of a series of problems based on course content. Feedback will be provided in the form of a mark and comments on (or corrections of) incorrect answers.

Course Learning Outcomes

- CLO1 : Develop linear dynamical process models in ordinary differential equations (ODEs) / transfer functions (including discrete time versions) from first principles and experimental data
- CLO2 : Analyse features of process dynamics (e.g., stability, inverse response, oscillations, damping) from process transfer functions (including discrete time transfer functions)
- CLO3 : Design qualitative control schemes for common process units and piping and instrumentation diagrams (P &ID), including plantwide control considerations

- CLO4 : Design control algorithms based on process models (using transfer functions) for both continuous time and discrete time cases, including PID control tuning, Internal Model Control, Direct Synthesis, feedforward control and cascade control.

Assignment submission Turnitin type

This is not a Turnitin assignment

Quizzes

Assessment Overview

Students will complete two quizzes. The quizzes provide an opportunity to measure progress throughout the term and provide a source of feedback, while encouraging students to keep up with lecture content. These quizzes are closed book and will be marked based on the understanding of concepts demonstrated and technical accuracy of calculations. Feedback will be provided in the form of a mark and comments on (or corrections of) incorrect responses.

Course Learning Outcomes

- CLO1 : Develop linear dynamical process models in ordinary differential equations (ODEs) / transfer functions (including discrete time versions) from first principles and experimental data
- CLO2 : Analyse features of process dynamics (e.g., stability, inverse response, oscillations, damping) from process transfer functions (including discrete time transfer functions)
- CLO3 : Design qualitative control schemes for common process units and piping and instrumentation diagrams (P &ID), including plantwide control considerations
- CLO4 : Design control algorithms based on process models (using transfer functions) for both continuous time and discrete time cases, including PID control tuning, Internal Model Control, Direct Synthesis, feedforward control and cascade control.

Final Examination

Assessment Overview

The final exam is designed to ensure that students can apply the principles of process control and dynamics taught throughout the course. The exam environment ensures that students are individually competent in the essential elements of process control and contemporary safety practice.

Course Learning Outcomes

- CLO1 : Develop linear dynamical process models in ordinary differential equations (ODEs) / transfer functions (including discrete time versions) from first principles and experimental data
- CLO2 : Analyse features of process dynamics (e.g., stability, inverse response, oscillations, damping) from process transfer functions (including discrete time transfer functions)

- CLO3 : Design qualitative control schemes for common process units and piping and instrumentation diagrams (P &ID), including plantwide control considerations
- CLO4 : Design control algorithms based on process models (using transfer functions) for both continuous time and discrete time cases, including PID control tuning, Internal Model Control, Direct Synthesis, feedforward control and cascade control.

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Introduction to process control; Control system instrumentation; Qualitative control schemes; Process dynamics (Chapters 1 + additional materials)
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
Week 2 : 3 June - 9 June	Lecture	Mathematical modelling; Laplace transform (Chapters 2& 3); Transfer functions; Linearization (Chapter 4); Dynamic behaviour of first order systems.
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
Week 3 : 10 June - 16 June	Lecture	Time Delay and Integrating processes (Chapter 5); Dynamic behaviours of second order; Dynamic response of more complicated processes (Chapters 5& 6); Empirical modelling (Chapter 7).
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
	Assessment	Assignment 1 due.
Week 4 : 17 June - 23 June	Lecture	Basic feedback control system analysis (Chapters 7& 8); Dynamic behaviour of closed loop systems (Chapter 11).
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
	Assessment	Quiz 1
Week 5 : 24 June - 30 June	Lecture	Stability of closed-loop systems; Dead-time approximation (Chapters 11& 12); Controller design, tuning, and troubleshooting (Chapter 12).
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
Week 6 : 1 July - 7 July	Other	Flexibility week.
Week 7 : 8 July - 14 July	Lecture	Feedforward control design; Cascade control (Chapters 15& 16); Introduction to digital control; Digital control & sampling; Filtering and signal processing; (Chapter 17).
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
	Assessment	Assignment 2 due.
Week 8 : 15 July - 21 July	Lecture	Design & implementation of digital PID controllers; Discrete-time models (Chapter 17); Dynamic response of discrete-time systems (Chapter 17 with extensions).
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
	Assessment	Quiz 2
Week 9 : 22 July - 28 July	Lecture	Control design based on discrete-time system models (Chapter 17 with extensions)
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.
Week 10 : 29 July - 4 August	Lecture	Batch process control & PLC (Chapter 22); Plantwide control (appendices uploaded on Moodle + additional materials); Revision.
	Workshop	Demonstrations and solving questions (questions are available on Moodle) that are relevant to the teaching materials covered in this week lectures.

Attendance Requirements

The lectures of this course are very systematic. Students are required to attend all classes and review lecture recordings. Experience shows that the absence of one or two lectures could create significant difficulties in understanding subsequent lectures – so make sure to attend all classes. Random attendance check may be conducted during classes.

In-person assessments during timetabled classes

This course has in person assessments during timetabled classes, including quizzes.

Your health and the health of those in your class is critically important. You must stay at home if you have COVID-19 or have been advised to self-isolate by NSW health or government authorities.

Course Resources

Prescribed Resources

Textbook

D. E Seborg, T. F. Edgar, D. A. Mellichamp and Francis J. Doyle III, Process Dynamics and Control, (3rd or 4th Edition) John Wiley & Sons. (ISBN-13: 978-0470128671)

The textbook is available from the University bookshop and the UNSW library. The bookshop is still operating online for delivery and collection.

Print: https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781119285915

Digital: https://unswbookshop.vitalsource.com/products/-v9781119285953

Online resources

Videos, lecture slides and suggested readings, workshop materials (questions and solutions), plus links to other online resources will be provided on the course page. These will be progressively released as the semester progresses.

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).

You can download MATLAB through: https://www.it.unsw.edu.au/students/software/matlab.html

You should sign up a mathworks account with your UNSW email. @student.unsw.edu.au

https://au.mathworks.com/academia/tah-support-program/eligibility.html

Once you have a mathworks account you can access the MATLAB Onramp training via the self-paced courses in a browser. https://matlabacademy.mathworks.com/

And for the Simulink training you will need to access this via the Desktop/Laptop version of your downloaded MATLAB. Once in the program you can click on ÔSimulink' and ÔSimulink Onramp'.

MATLAB and Simulink are also available online through https://www.myaccess.unsw.edu.au/.

Recommended Resources

Luyben, W. L. Process Modeling, Simulation and Control for Chemical Engineers (2nd Edition) McGraw Hill International (ISBN 0-07-100793-8).

Course Evaluation and Development

Course delivery is influenced by student feedback in order to ensure continuous improvement. This is done through the administration of UNSW's Course and Teaching Evaluation questionnaires during the course as well as direct feedback to the lecturer/tutors in any time. Several improvements of this course, for example, greater emphasis on control applications and a better assessment scheme have been made based on previous student feedback. Your constructive suggestions would help in securing a better teaching and learning experience for future students.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Jie Bao		Room 301, SEB	93856755	Email, MS Teams, by appointment	No	Yes
Demonstrator	Jun Wen Tang		Room 304, SEB	MS Teams	Email, MS Teams, Workshop sessions	No	No
	Shuangyu Han		Room 304, SEB	MS Teams	Email, MS Teams, Workshop sessions	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 / 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.

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.

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.