CIVL1001

Introduction to Civil Engineering

Session 3, In person-scheduled-weekday, North Ryde 2024

School of Engineering

Contents

General Information

Unit convenor and teaching staff
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Credit points
10

Prerequisites
(PHYS1510 or PHYS140) and (MATH1010 or MATH135 or MATH1015 or MATH132)

Corequisites

Co-badged status

Unit description
This unit covers fundamental mechanics knowledge that is required to analyse forces in both static and dynamic physical system and also to perform fundamental fluid mechanics analysis. At the end of the unit, students are expected to demonstrate the ability to analyse and solve basic mechanics problems fluently.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Perform structural analysis of three-dimensional machine frames and structures

ULO2: Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamics problems

ULO3: Solve problems in both static and dynamic systems

ULO4: Demonstrate proficiency in the presentation of introductory level civil engineering solutions

General Assessment Information

Requirements to Pass

To successfully complete this unit, a student must obtain a numerical overall mark of 50 or more for the unit.

For further details about grading, please refer to Part F of the Assessment Procedure.

Students must also pass any hurdle assessments as stipulated in the Assessment Section of this Unit Guide.

Grading

Students will be awarded common result grades as specified in the Assessment Policy.

Students will receive criteria and standards for specific assessment tasks, which will be aligned with the grading descriptors given in Part F of the Assessment Procedure.

Note – Other grades, such as I, IS, UD, UJ may be allocated and these grades are outlined in Appendix A of the Assessment Policy.

Where to find information about assessments

General assessment information, such as the number and nature of assessments, due dates and weightings, has been provided in this unit guide.

Specific assessment information including assignment instructions, questions, marking criteria and rubrics as well as examples of relevant and related assessment tasks and responses will be available in the Assessment section on iLearn.

Submission of Assessment Tasks

Assessments must be submitted in accordance with instructions provided in this Unit Guide and via iLearn. Any tasks that are not submitted as per the assessment instructions may be considered a non-submission and a zero mark may be awarded for the task.

Late Submissions and Penalties (applicable to non-time limited assessment tasks)

Late submissions are allowed but they will attract a late submission penalty unless the student has an approved special consideration application (see the Special Consideration Policy).

Late penalties are calculated based on the total possible marks allocated to the specific assessment task. The penalty for late submission is as follows:

- 5% of the total possible marks will be deducted if it is late by up to 24 hours.
- A further 5% of the total possible marks will be deducted for each 24-hour period up to 3 days (including weekends).
- 100% of the marks will be deducted after 3 days and zero marks will be awarded.

Please note that online submissions are time stamped and this is used to determine late penalties which means that submitting an assessment even a few seconds after the deadline

results in a late submission penalty as noted above. There is no flexibility regarding the application of the late submission penalties. **It is students' responsibility to allow sufficient time for submission of their work and uploading any documents.**

Examples:

If the assessment task is due on a Friday at 11.55pm

Submission day/time	Deduction penalty
Before/at 11:55pm Friday	0%
After 11:55pm Fri to 11:55pm Saturday	5%
After 11:55pm Sat to 11:55pm Sunday	10%
After 11:55pm Sun to 11:55pm Monday	15%
After 11.55pm Monday	100%

If the assessment task is due on a Wednesday at 11.55pm

Submission day/time	Deduction penalty
Before/at 11:55pm Wednesday	0%
After 11:55pm Wed to 11:55pm Thursday	5%
After 11:55pm Thurs to 11:55pm Friday	10%
After 11:55pm Fri to 11:55pm Saturday	15%
After 11.55pm Saturday	100%

Please see "In-class assessments" section for further information on assessments that take place during class time.

The above late submission penalties do not apply to time-limited assessment tasks (i.e. assessments with a time-limit of less than 24 hours). A time-limited assessment task must be submitted by its deadline. Any time-limited task that is not submitted as required will be considered a non-submission and a zero mark will be awarded for the task.

Extensions (applicable to non-time limited assessment tasks)

Extensions are allowed only if the student is granted a special consideration. To apply for an extension, students must submit their application via the Service Connect portal.

An **approved** extension will not incur late penalties. However, where a student has been granted

an extension and then submits late, i.e., after the stipulated new due date following extension, late penalties will be applied.

Resubmissions (applicable to non-time limited assessment tasks)

It is students' responsibility to upload their assessments as per the instructions provided on iLearn. Following an initial submission, students may resubmit their work up to 3 days after the due date* if, for example, they have submitted the incorrect document or forgotten to include information.

*If you make a resubmission after the due date, your submission will be counted as late, and penalties will be applied.

Retention of Originals

It is students' responsibility to retain a copy of any work submitted. Students may be required to produce these documents upon request.

Requests for original documentation will be sent to the student's Macquarie University email address. Students must retain all original documentation for a six (6) month period and must supply original documents to the University within ten (10) working days of such a request being made.

In-Class Assessments (time-limited assessments)

Assessments could be administered during scheduled lessons and students may be asked to produce their Macquarie University Student ID Card or any other official photo ID if required. Students may not be allowed sit an in-class assessment task if they cannot produce a valid photo ID.

Students are expected to be in class for the whole duration of their scheduled lesson to take the assessment task. No additional time or adjustment will be made for late arriving students or students not ready to submit an assessment at the start of the lesson. Any time-limited task that is not submitted as per assessment instructions will be considered a non-submission and a zero mark will be awarded for the task.

For example, if a one-hour test or quiz is due to take place in a 2-hour lesson, the test or quiz may start at any time in the first hour or at the start of the second hour, so students must be ready to take the test at the beginning of the lesson. No additional time will be given, or adjustment made for students who arrive late. While they may still be permitted to take the assessment, depending on the task, the student will only have the remaining time to complete the task.

Final Examinations

The final examinations will be held during the Macquarie University Final Examination period for Group A units. Students must be available to sit final exams or submit assessments throughout this period.

Final Examination Timetable

The University will publish the Final Examination Timetable before the commencement of the

final examination period.

Final Examination Requirements

Details of the structure and format of the final examination will be made available to students via iLearn prior to the start of the final examination period.

For additional information regarding examination requirements refer to the Assessment Policy, Assessment Procedures, Section 3, Part E - Examinations.

Missed assessments and examinations

For any missed assessment tasks, please refer to the Special Consideration Policy and Special Consideration Eligibility Requirements.

Supplementary Tests and Examinations

When a student is granted a supplementary test or examination, they will be advised of the time, date and location for the supplementary task.

Supplementary interim assessments, i.e., assessments held during the Session, will be held throughout the Session and students who are to sit a supplementary exam will be informed of times and dates via the Service Connect portal.

Supplementary final examination period for formal, end-of-session examinations will be the fortnight following Week 7. Students who need to sit a supplementary final examination are required to be available to undertake examinations during the supplementary examination period.

No more than one (1) supplementary assessment will be offered to a student in each affected unit, so it is essential that students make themselves available for alternative assessment activities. Please refer to the Special Consideration Policy for further details.

Results for supplementary final examinations may not be available for up to two weeks following the supplementary examination.

Due to the timing and administration of the supplementary final exams, students in their final Session of study should note that formal completion of their studies may not be possible until supplementary results are released. Similarly, students who are enrolled in a unit which is a prerequisite to another unit should note that they may not be able to enrol in a subsequent unit/ course/program of study on time.

Hurdle Assessments

A hurdle assessment mandates a minimum level of academic performance as a condition of successful completion of a unit. A student who has obtained a numerical mark of at least 50 yet failed all available attempts of a hurdle, fails the unit and receives a FH grade.

Accessing your Results

Students will be able to view their results for interim assessments via the Grades section in iLearn.

Marks for all assessment tasks will be released to students once marking and all relevant checks

are concluded.

Students will be able to view their overall result of a unit via eStudent when results are ratified.

Calculating your WAM

Weighted Average Mark (WAM) will be the average of the actual marks students achieved in all units of their program/course and is a mark out of 100. WAM also incorporates ALL marks, including those from a fail grade. For more information, please refer to the Understanding your WAM page.

Obtaining Feedback

Feedback is an important part of student development and opportunities for feedback are built into the curriculum at key points throughout the Session. Students who complete the homework and classwork assigned to them will receive constructive feedback from teaching staff about their academic progress and performance in assessment tasks or a unit of study. When relevant, other staff such as Senior Teachers, Education Managers and members of the Student Administration and Services Team will provide feedback and advice to students about their academic performance in a course/program of study. Feedback may be provided to individual students, a group of students or a whole class and it may be written or verbal in nature.

Some examples of feedback include:

- A teaching staff member reviewing a draft submission and giving a student advice on how to improve their work before making a final submission
- A teaching staff member telling a class that they need to improve their editing of grammar in their recently submitted assignment
- A teaching staff member discussing progress of an individual student before census date to allow the student to decide whether they should remain enrolled in the unit
- Online feedback via announcements or forums, an online marking rubric or various iLearn activities employed in a unit. Please note that feedback on written assessments is usually provided via Feedback Studio in iLearn
- Written marks and comments on a marking sheet or essay
- Recorded voice comment in iLearn provided in response to an essay submitted online
- A student receiving advice that they should consider withdrawing from a unit because they have missed too many classes / too much work to be able to catch up or for other reasons

It is a student's responsibility to:

- attend sessions, be present and actively engaged during times when feedback is provided in scheduled class times
- organise an alternative time with the teacher so that they can receive their feedback if absent from an in-class feedback session due to unavoidable circumstances

- ensure that they have received sufficient feedback prior to their next assessment task and/or final assessment in the unit
- act promptly on feedback provided, e.g., incorporate advice provided into their work and study habits)

Students who are unsure how or when feedback was or will be provided, or feel that feedback provided is not sufficient, should approach relevant teaching or administrative staff and request additional feedback in a timely manner during the Session and prior to any subsequent assessment task or the final assessment task. Claims that not enough feedback was provided are not grounds for a grade appeal, especially when a student did not make any effort to approach staff about obtaining additional feedback in a timely manner. Students may seek general feedback about performance in a unit up to 6 months following results release.

If a student has any problems contacting their teacher, they should seek help from a member of the Student Administration and Services team.

Contacting Teaching Staff to Obtain Help

For all University-related correspondence, students must use their official Macquarie University student email account. Students may contact teaching staff at any time during the Session by using the teacher contact details provided in iLearn or this Guide. Students should expect a response within 1-2 business days.

Assessment Tasks

Name	Weighting	Hurdle	Due
Problem Sets	20%	No	Ongoing
Tests	25%	No	Lesson 6, Weeks 2 and 5
Mid-term Exam	20%	No	Lesson 6, Week 4
Project Report	10%	No	Lesson 6, Week 6
Final Exam	25%	No	Final Examination Period

Problem Sets

Assessment Type [1]: Problem set
Indicative Time on Task [2]: 20 hours
Due: **Ongoing**
Weighting: **20%**

Students are required to complete a set number of problem sets during the term. The problem sets will cover any of the topics studied until the date on which the problem sets are provided.

Information about the number of problem sets and further details can be found on iLearn.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamics problems
- Solve problems in both static and dynamic systems
- Demonstrate proficiency in the presentation of introductory level civil engineering solutions

Tests

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 20 hours
Due: **Lesson 6, Weeks 2 and 5**
Weighting: **25%**

Students are required to complete two tests during the term. The tests will cover any of the topics studied until the date on which the test is held.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamics problems
- Solve problems in both static and dynamic systems
- Demonstrate proficiency in the presentation of introductory level civil engineering solutions

Mid-term Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 8 hours
Due: **Lesson 6, Week 4**
Weighting: **20%**

The Mid-term Exam may include any topic covered until the end of Week 4.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamics problems
- Solve problems in both static and dynamic systems
- Demonstrate proficiency in the presentation of introductory level civil engineering solutions

Project Report

Assessment Type [1]: Report
Indicative Time on Task [2]: 15 hours
Due: **Lesson 6, Week 6**
Weighting: **10%**

Students are required to work on a basic civil engineering project. Each student is required to write an individual report on the project and submit it online.

On successful completion you will be able to:

- Demonstrate proficiency in the presentation of introductory level civil engineering solutions

Final Exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 15 hours
Due: **Final Examination Period**
Weighting: **25%**

The Final Examination may include any topic covered in this unit.

On successful completion you will be able to:

- Perform structural analysis of three-dimensional machine frames and structures
- Demonstrate proficiency in applying mathematical knowledge to solve fundamental engineering dynamics problems
- Solve problems in both static and dynamic systems

- Demonstrate proficiency in the presentation of introductory level civil engineering solutions

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Session Dates & Calendar

Details of key dates during Session 3 can be found on the Key Dates calendar (refer to the **Group A** unit dates).

Enrolment and Timetables

General enrolment and timetable information is available via Macquarie University's unit enrolment page.

Students will be able to enrol and register for classes via eStudent and view their personal timetable. It is a student's responsibility to ensure that classes they have registered for do not clash.

Students are only permitted to attend classes in which they have registered via eStudent.

The last day to enrol, add or change units is Monday, 9 December 2024. Changing class groups is not possible after the enrolment period has concluded.

Attendance Requirements – All Students

Attendance is not compulsory and does not contribute towards your final grade in this unit. However, our experience has shown that students who regularly attend classes tend to be more successful learners, therefore attendance will be monitored in each lesson. Students are able to see their current attendance percentage to date and potential attendance percentage for each unit they have enrolled in via iLearn.

- **Current Attendance Percentage** will reflect the percentage of classes a student has attended so far (based only on the lessons held to date).
- **Potential Attendance Percentage** will reflect the percentage of classes a student can potentially attend by the end of the session, taking into consideration lessons attended and assuming the student also attends all future lessons scheduled (based only on the total number of lessons in the Session).

When a student is present for a part of a lesson (for example arrives late, leaves early, leaves the class frequently, particularly for lengthy periods), the teacher reserves the right to mark a student absent for that part of the lesson.

Please also note that some assessment tasks may require you to attend class in order to complete them.

Public Holidays and Make-up Lessons

If any scheduled class falls on a public holiday, a make-up lesson may be scheduled. Please check the iLearn announcements and your emails for details of the make-up lessons.

In Session 3, there will be a recess starting from 23 December 2024 up to and including 3 January 2025, there will be no classes during this period and the University will be closed. Classes will resume on Monday, 6 January 2025.

Technology Used and Required

- Access to internet
- AppStream is a fully managed application streaming service that provides MQ users both staff and students with instant access to their applications from anywhere enabling students to use Microsoft Windows applications they require to do their university work from anywhere, anytime, on any device (BYODs).
- Access to iLearn.
- Access to Macquarie University Library catalogue (MultiSearch); and
- Macquarie students can download the Microsoft Office Suite of software for free. For access and download instructions, please visit Macquarie University's Microsoft applications page.

Using your Own Device

Macquarie University students are entitled to free access to the Microsoft Office Suite, which can be accessed here. For any problems related to this link and Microsoft Office Suite please contact OneHelp.

Students are required to use Windows or Mac devices to study. They will need to have access to Office applications (Word, Excel and PowerPoint) and Internet browsers.

iLearn

iLearn is Macquarie's online learning management system and a principal teaching and learning resource which will be used throughout the Session.

For any resource related iLearn questions contact your teacher. For any technical or support issues using iLearn, please contact the IT helpdesk (Ph. 02 9850 4357) or lodge a ticket using OneHelp.

Microsoft Teams

Microsoft Teams is now readily available for download and use, offering a secure platform for

student-to-student communication and collaboration at Macquarie University.

Teams facilitates seamless communication among students and streamlines student group work within academic units. Additionally, students can leverage specific apps within Teams, such as Whiteboard and Planner, to enhance collaboration and planning efforts.

Useful Study Resources

StudyWise is an iLearn resource created by the Academic Literacies Unit. This resource is specifically designed to help you to manage your studies, strengthen your study techniques, write effective assignments and improve your English language proficiency. Once you enrol in StudyWise, you can access it from your iLearn course list under the category "Student Support".

Lib Guides provide students with links to electronic sources and websites that are good starting points for research in different fields or disciplines.

MultiSearch will connect you to Macquarie University Library and allow you to search library resources, databases, unit readings and past exam papers.

Macquarie University Library has released a mobile device app called libMQ. The app allows students to easily access MyLibrary (be notified about loans, renewals, holds and fees owing), book a computer, Library floor maps, see new books lists and search MultiSearch.

It can be downloaded from either Google Play or the App store.

Assignment and Study Support provide information about:

- Researching for your assignments
- How to manage your references
- Referencing style guides
- Subject and research guides

Numeracy Support is provided by the Numeracy Centre. Students can attend these support classes on a drop-in basis as required.

Studiosity is a one-to-one personal study support service which may be made available via iLearn. If available, students may use this service to get online study help and/or feedback on an assignment usually within 24 hours. Students who are unsure whether this service is available in their unit or how to use this service should check with their teacher. Please note that this is an external service and feedback provided is generic in nature (for example comments on grammar and cohesion) and may not be specific to the requirements of the task. If students require specific feedback on how their work aligns with the expectations of the unit or marking criteria, they should consult their teacher.

Unit Schedule

Week	Lesson Material	Practical, in class, and Project work	Assessments, Tests Schedules and Textbook Readings

1	Vector operations and forces in 2D and 3D.	**Problem Set 1 in-class work**	**There will be a recess starting from 23 December 2024 up to and including 3 January 2025, there will be no classes during this period and the University will be closed. Classes will resume on Monday, 6 January 2025.** Textbook Reading: From Vector Mechanics: Ch1-3. OR Statics and Mechanics: Ch1-3.
2	Moments and force-couple systems.	**Problem Sets 1 and 2 in-class work** Project individual prework.	Textbook Reading: Vector Mechanics: Ch3-4. OR Statics and Mechanics: Ch3. **Problem Set 1 due Tuesday 11:55pm** **In-class Test 1 in Lesson 6**
3	Equivalent systems of forces, statics of objects, actions and reactions, free-body-diagrams (FBDs), equilibrium of rigid bodies, plane trusses, and method of joints.	**Problem Sets 2 and 3 in-class work** Form project groups.	Textbook Reading: Vector Mechanics: Ch4 and Ch6. OR Statics and Mechanics: Ch4 and Ch6. **Problem Set 2 due Tuesday 11:55pm**
4	Method of sections, frames and machines, and internal forces.	**Problem Set 3 in-class work**	Textbook Reading: Vector Mechanics: Ch6-7. OR Statics and Mechanics: Ch6. **Mid-Term Exam in Lesson 6**
5	Static friction, centroids, centre of gravity, and distributed loads.	**Problem Sets 3 and 4 in-class work**	Textbook Reading: Vector Mechanics: Ch 5 and Ch 8 Statics and Mechanics: Ch4-5. **Problem Set 3 due Tuesday 11:55pm** **In-Class Test 2 in Lesson 6**
6	Moment of inertia and particle kinematics.	**Problem Set 4 in-class work** **Project presentation**	Textbook Reading: Vector Mechanics: Ch9 and Ch11. **Problem Set 4 due Thursday 11:55pm** **Project Report due Friday Week 6 (Lesson 6)**
7	Final Exam Period	**Final Exam**	

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit connect.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via the Service Connect Portal, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes from Previous Offering

Learning activities and assessments have been revised for Session 3 delivery.

Learning and Teaching Activities

Lessons

Lessons will include a mixture of activities. New content and topics will be presented during lessons, and students will be given problems, practice questions and other interactive activities to apply the knowledge and the skills gained in the lesson. Students will be required to take notes, complete set tasks and engage in discussions and individual and group activities.

In class, specific time may be dedicated to work on assessment tasks and students will be given guidance and feedback to complete these. Certain lessons may be dedicated to independent research and reading related to the unit whether in the classroom or a computer lab.

Active Participation

In the workplace, at university and in the surrounding community, a person's contributions are important. Students will be required to not only attend but also actively participate in lessons.

Active participation entails:

- active engagement in class activities;
- contribution to class discussions by asking and answering questions;
- coming to class prepared and having completed required pre-readings and activities;
- completion of set class and homework activities;
- collaboration with other students; and
- adhering to Macquarie University's Student Code of Conduct.

Unit Contact Hours

Weekly face-to-face contact for this unit will be 12 hours (72 hours per term).

There will be 6 lessons per week consisting of 2 hour lessons.

Unit Specific Texts and Materials

The following texts have been recommended for this unit.

Required Textbooks:

- Phillip Cornwell, David Mazurek, Jr. E. Russell Johnston, Ferdinand Beer, " Vector Mechanics for Engineers: Statics and Dynamics", 11th Edition, MacGraw-Hill Education, 2016.
- Ferdinand Beer and E. Johnston and John DeWolf and David Mazurek, "Statics and Mechanics of Materials", 2nd Edition, McGraw-HillEducation 2017.

Additional Resource:

- Halliday, Resnick, and Walker, "Fundamentals of Physics", extended 10th edition (with

Wiley Plus), Wiley 2014.

All students should ensure that they have access to the recommended text(s) from the start of the Term as failure to do so could jeopardise their academic progress in this unit.

Other editions or formats of the above resource(s) may be acceptable, but students must consult teaching staff prior to purchasing these.

Unit information based on version 2024.03 of the Handbook