



# WENG150

## Electromechanics

MUIC Term 3 2016

*Macquarie University International College*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	2
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	7
<a href="#"><u>Delivery and Resources</u></a>	9
<a href="#"><u>Unit Schedule</u></a>	12
<a href="#"><u>Policies and Procedures</u></a>	13
<a href="#"><u>Graduate Capabilities</u></a>	15

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#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

Unit convenor and teaching staff

Teacher

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Credit points

3

Prerequisites

Corequisites

WMAT135

Co-badged status

Unit description

This unit introduces engineering principles and practices. It describes laws and theories in electronic engineering and their application to basic linear analogue circuits. Electrical circuit variables and circuit elements are introduced. Resistive circuits are analysed by applying a range of circuit theorems and analysis methods. Energy storage elements and operational amplifiers are introduced. Engineering practices, including record keeping, documenting and searching for information, are emphasised and practised in workshops and laboratory sessions.

## 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:

Review of basic mathematics and physics knowledge required for this unit.

Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.

Demonstrate ability to analyse electronic circuits.

Demonstrate ability to understand the commonality between problems in Mechanical and

Electronic engineering and how they can be related in engineering systems.

Demonstrate self-learning, time-management, and project management.

Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## General Assessment Information

WENG150 teaches fundamental knowledge in Mechanical and Electronics engineering which is important for students to undertake advanced engineering subjects in their second year of studies onward. Students need to pass both the Mechanical and Electronics sections in WENG150 in order to pass this unit.

### Requirements to Pass

In order to pass this unit a student must:

- Pass the final examination or final assessment task
- Achieve a Standard Numerical Grade (SNG) of 50 or more in the unit
- Attend at least 80% of scheduled classes
- Pass both the Mechanical and Electronics sections in the unit: Students are expected to get at least 50% of the collective total mark from all assessment tasks.

For further details about grading, please refer to the [Grading Policy](#).

### Submission of Assessment Tasks

Assessments must be submitted following instructions provided. Assessment tasks which have not been submitted as required will not be marked. They will be considered a non-submission and zero marks will be awarded.

### Turnitin

Turnitin compares electronically submitted papers to a database of academic publications, internet sources and other papers that have been submitted into the system to identify matching text. It then produces an Originality Report which identifies text taken from other sources, and generates a similarity percentage to judge whether plagiarism has occurred (see Academic Honesty section below).

Multiple submissions may be possible via Turnitin prior to the due date of an assessment and originality reports may be made available to students. In such cases they should be used to check work for plagiarism prior to a final submission.

Where there is a requirement for assessment tasks to be submitted through Turnitin, it is the student's responsibility to ensure that work is submitted correctly prior to the due date. Hard copies will not be accepted unless indicated otherwise by a teaching staff member. Records in Turnitin will be taken as records of submission. For assistance submitting through Turnitin, you may approach your teacher, lodge a [OneHelp](#) Ticket, refer to the [IT help page](#) or seek assistance from [Student Connect](#).

Students should note that for a first time submission the Originality Report will be available immediately post submission but for any subsequent submissions it may take 24 hours or more for the report to be generated. This may be after the due date so students should plan their submission carefully.

### Missed Assessments

The University recognises that students may experience unexpected events and circumstances that adversely affect their academic performance in assessment activities, for example illness. In order to support students who have experienced a serious and unavoidable disruption, the University will provide affected students with an additional opportunity to demonstrate that they have met the learning outcomes of a unit. An additional opportunity provided under such circumstances is referred to as special consideration.

The [Disruption to Studies Policy](#) applies only to *serious and unavoidable* disruptions that arise after a study period has commenced. Students with a pre-existing disability/health condition or prolonged adverse circumstances may be eligible for ongoing assistance and support. Such support may be sought through [Campus Wellbeing](#) and [Support Services](#).

**Serious and Unavoidable Disruption** The University classifies a disruption as **serious and unavoidable** if it:

- could not have reasonably been anticipated, avoided or guarded against by the student; and
- was beyond the student's control; and
- caused substantial disruption to the student's capacity for effective study and/or completion of required work; and
- occurred during an event critical study period and was at least three (3) consecutive days duration, and / or
- prevented completion of a final examination.

To be eligible for Special Consideration, a student must notify the University of a *serious and unavoidable* disruption within five (5) working days of the commencement of the disruption (Disruption to Studies notification). All Disruption to Studies notifications are to be made online via the University's [Ask MQ](#) system. A Disruption to Studies notification must be supported by documentary [evidence](#).

In submitting a Disruption to Studies notification, a student is acknowledging that they may be required to undertake additional work. The time and date, deadline or format of any required extra assessable work as a result of a disruption to studies notification is not negotiable and in submitting a disruption to studies notification, a student is agreeing to make themselves available to complete any extra work as required.

Please refer to the [Disruption to Studies Policy](#) for further details.

### Extensions & Late Submissions

To apply for an extension of time for submission of an assessment item, students must submit a

Disruptions to Studies notification via [ask.mq.edu.au](https://ask.mq.edu.au).

Late submissions without an approved extension are possible but will be penalised at 20% per day up to 4 days (weekend inclusive). If a student submits an assessment task 5 or more days after the due date without grounds for special consideration (See [Disruptions to Studies Policy](#)) a record or submission will be made but the student will receive zero marks for the assessment task.

### Final Examinations and Final Assessment Tasks

Final exams and final assessments will typically take place in Week 6 or Monday of Week 7. All students enrolled in a teaching session are expected to ensure they are available up until and including Monday of Week 7 to undertake examinations. Passing the final exam or final assessment task is a requirement to pass this unit.

Details of teaching session dates can be found on the [Important Dates](#) calendar. Due dates for assessments will be available in the unit guide and final examination timetables will be released to students prior to Week 5.

Planning for an exam is very important. All students should be familiar with the [Exam Rules](#). In addition, students should refer to the below links for other important examination related information.

- [Talk to your lecturer](#)
- [Revision tips](#)
- [What to bring with you](#)
- [What not to bring with you](#)
- [Where to get help](#)
- [Tips for Success](#)

It is not uncommon for students to have two examinations in one day.

### Conduct During Assessments and Examinations

Students must adhere to the [Student Code of Conduct](#) and [Academic Honesty Policy](#) at all times.

Students will be provided with instructions relating to conduct during in-class assessment tasks. For all examinations, students will be required to:

- provide photographic proof of identity for the duration of the examination. This must be visible at all times during the examination.
- leave mobile phones, electronic devices, bags, computers, notes, books and similar items outside a final examination venue or in a designated space
- ensure any water brought into the examination room is in a clear and unmarked bottle
- obey all instructions provided by an Examination Supervisor
- refrain from communicating in any way with another student once they have entered the

examination venue.

Students are NOT permitted:

- into an examination venue once one hour from the time of commencement (excluding any reading time) has elapsed
- to leave an examination venue *before* one hour from the time of commencement (excluding any reading time) has elapsed
- to be readmitted to an examination venue unless they were under approved supervision during the full period of their absence
- to obtain or attempt to obtain assistance in undertaking or completing the examination script
- to receive or attempt to receive assistance in undertaking or completing the examination script.

Students should also ensure they follow all requirements of the [Final Examination Policy](#).

### **Supplementary Examinations**

Supplementary final examinations are held during the scheduled Supplementary Final exam Period. This may fall in Week 7 or within the first week of the subsequent teaching term. Results for supplementary exams may not be available for up to two weeks following the supplementary examination. Students in their final term of study who undertake supplementary final exams should note that formal completion of their Diploma Program will not be possible until supplementary results are released and this may impact on their ability to enrol in subsequent programs of study on time.

### **Retention of Originals**

It is the responsibility of the student to retain a copy of any work submitted and produce another copy of all work submitted if requested. Copies should be retained until the end of the grade appeal period each term.

In the event that a student is asked to produce another copy of work submitted and is unable to do so, they may be awarded zero (0) for that particular assessment task.

The University may request and retain the originals of any documentation or evidence submitted to support notifications of disruptions to studies. Requests for original documentation will be sent to the applicant's student email address within six (6) months of notification by the student. Students must retain all original documentation for the duration of this six (6) month period and must supply original documents to the University within ten (10) working days of such a request being made.

### **Contacting Teaching Staff and Obtaining Help and Feedback**

Students may contact teaching staff at any time during the term by using the contact details provided in this guide.

For all university related correspondence, students are required to use their official Macquarie University student email account which may be accessed via the [Macquarie University Student Portal](#). Inquiries from personal email accounts will not be attended to.

Students may seek additional feedback at any time during the term and general feedback about their performance in a unit up to 6 months following results release. It is the student's responsibility to approach teaching staff in a timely manner if they feel that additional feedback is required.

## Assessment Tasks

Name	Weighting	Due
<a href="#">Assignments</a>	15%	Week 4 and Week 6
<a href="#">Lesson Work and Logging</a>	15%	Ongoing
<a href="#">Tests</a>	15%	Week 4 and Week 6
<a href="#">Final examination</a>	55%	MUIC final examination period

### Assignments

Due: **Week 4 and Week 6**

Weighting: **15%**

There will be two assignments and each assignment is worth 7.5%. The first assignment will consist of Mechanical Engineering related problems and the second assignment will consist of Electronics Engineering related problems.

Illegible or poorly presented assignments and assignments with no cover sheet will not be marked.

The first assignment is due to Week 4 Lesson 2, and second assignment is due to Week 6 Lesson 1.

On successful completion you will be able to:

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and

Electronic engineering and how they can be related in engineering systems.

- Demonstrate self-learning, time-management, and project management.

## Lesson Work and Logging

Due: **Ongoing**

Weighting: **15%**

Lesson and laboratory attendance is compulsory.

Students will be given a set of questions to work on every week. Students with attendance less than 80% will not be able to pass the unit.

Each student must have a bound notebook to be used as a laboratory/lesson log (A4 size preferred, graph pages are not required). This logbook should also be used for any preliminary work. It should contain all results recorded during these sessions and student's detailed comments on how a problem can be solved. On the completion of each session, log book entries must be signed and dated by a teacher. At the end of the term the logbooks will be collected and marked to note the degree of importance of the recording of pertinent information.

Food and drink are not permitted in the laboratory. Students will not be permitted to enter the laboratory without appropriate footwear. Thongs and sandals are not acceptable.

On successful completion you will be able to:

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Tests

Due: **Week 4 and Week 6**

Weighting: **15%**

There will be two tests worth 7.5% each. Tests are compulsory assessment components and will be completed in class.

In Class Test 1 due date: Week 4 Lesson 2

In Class Test 2 due date: Week 6 Lesson 1



On successful completion you will be able to:

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.

## Final examination

Due: **MUIC final examination period**

Weighting: **55%**

Students must demonstrate their knowledge on the content of WENG150. At the end of the term, a 3 hour long, closed book exam will be given to students that covers both the mechanics and the electronics component of this unit.

Final exams and final assessments will typically take place in Week 6 or Monday of Week 7. All students enrolled in a teaching session are expected to ensure they are available up until and including Monday of Week 7 to undertake examinations. Passing the final exam or final assessment task is a requirement to pass this unit.

On successful completion you will be able to:

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.

## Delivery and Resources

### Scheduled Class Time & Timetables

Weekly face to face contact for this unit will be 12 hours each week consisting of 3x4=12 hour lessons in each week (72 hours per term).

Students will be able to enrol in their classes and view their personal timetable via eStudent and may also view general timetable information via Macquarie University's [Timetable page](#).

If any scheduled class falls on a public holiday a make-up lesson may be scheduled. Where appropriate, the instructor may instead organise an online make-up lesson or require students to complete activities outside of class. Scheduled make-up days will be announced in class and

attendance will be taken where relevant.

## Lessons

For lesson times - See web timetable.

This unit consists of three different formal types of activities:

1. Lessons in which new material is presented, discussed and illustrated by examples and demonstrations.

Attending these lessons is an important part of studying engineering because it allows students to gain insight into the subject matter that reading a textbook alone cannot provide. These lessons can explain the concepts from several points of view, can point out and explain the most important aspects of the material and, very importantly, can illustrate the relationships and connections between the different concepts that are studied in WENG150 – no subject in engineering stands on its own.

2-3. Practical lessons in which examples illustrating the material are presented for discussion and problem solving methods are applied. **Practical lessons are compulsory and students who do not attend practical classes will be deemed to have failed to meet the learning outcomes of the unit and will therefore receive a failing grade.**

Outside the face-to-face lesson times, **students should aim to spend an average of 12 hours per week understanding the material and working on assigned problems.** Students are free to discuss the assigned problems with classmates as this is a good way to learn and understand the concepts involved. It is by applying knowledge learned from lessons and textbooks to solve problems that students are best able to test and develop their skills and understanding of the course material.

### Attendance Requirements - All students

All students are required to attend at least 80% of scheduled class time to pass this unit.

Attendance will be monitored in each lesson & students will be able to see their attendance records for a unit via iLearn.

Where a student is present for a part of a lesson (for example arrives late, leaves early, leaves the class frequently or for lengthy periods, engages in inappropriate or unrelated activities or does not participate actively in the majority of the lesson) the teacher reserves the right to mark a student absent for that part of the lesson.

**Because of the intensive nature of this program, students should be aware that their attendance in this unit may fall below 80% relatively quickly.**

In cases of unavoidable non-attendance due to illness or circumstances beyond control, students should lodge a [Disruption to Studies](#) Notification via [ask.mq.edu.au](http://ask.mq.edu.au) within 5 working days and supply relevant supporting documentation, even if they have not missed a formal assessment task. This will ensure that appropriate records of unavoidable absences can be made.

For further information on attendance, please refer to the [Attendance and Study Load Policy](#).

## iLearn

[iLearn](#) is Macquarie's online learning management system and a principal resource which will be used throughout the term. Students should access iLearn at least 3 times per week as it will contain important information including:

- Announcements - Teaching staff will communicate to the class using iLearn announcements.
- A link to the unit guide for the unit and staff contact details
- Lecture notes and recordings where available
- Learning and teaching activities and resources
- Assessment information
- Tutorial questions and solutions
- Assessment submission tools such as Turnitin
- Other relevant material

For any technical or support issues using iLearn, please contact the IT helpdesk (Ph. 02 9850 4357) or lodge a ticket using [OneHelp](#).

## Required and Recommended Texts and/or Materials:

### Required Texts

1. JL Meriam and LG Kraige, "Engineering Mechanics", Volume 1: Statics, Wiley (2012).  
Chapters: 1, 2, 3, 4.1-4.5, 5.1-5.3, 6.1-6.3, and 7.1-7.3.
2. Dorf & Svoboda, "Introduction to Electric Circuits", 9th Edition, Wiley (2010).  
Chapters: 1.1-1.7, 2.1-2.6, 2.9, and 3.1-3.6.

An electronic version of the textbook is available from the publisher- check their web site ([www.wileydirect.com.au](http://www.wileydirect.com.au)) or the internet.

### Technology used and required

Making use of slides, videos or other audio visual resources outside class time is not equivalent to attending face-to-face lessons; these resources are good for review and revision but they are no substitute for face-to-face lessons.

- Calculators for laboratory lessons, when completing tests or assignments, and in the final examination. In accordance with the Science Faculty's policy, calculators *with a full alphabet* on the keyboard are not allowed in the tests or in the final examination.
- Access to internet (Available on Campus using Macquarie [OneNet](#))
- Access to [iLearn](#)
- Access to Macquarie University [Library catalogue](#)
- Access to Microsoft Office Word and Excel (available in Labs)

## Study Resources

Study material is hosted on the iLearn webpage for the unit <http://ilearn.mq.edu.au>

Students are also encouraged to sign up to the Wiley Plus website to make use of the extended learning resources available there - including interactive problem solving resources. Instructions will be provided in lessons.

## Engineering, Physics, and Mathematics Assistance at the Numeracy Centre

The Numeracy Centre offers a number of services including a free drop-in service and weekly workshops to assist students in 100-level units. The centre offers assistance with both mathematics (most days and times) and physics/engineering (limited days and times) problems, so be sure to check [the Numeracy Centre timetable](#) to see when the best time to access the centre is.

## Unit Schedule

### Lesson Plan:

This plan might change depending on student progress, and the availability of materials.

Week	Lesson Material	Practical Lessons	Assessment and Tests Schedules, and Textbook Read
1	Introduction to vectors, vector operations, units, rectangular components, force, Newton's laws, law of gravity, free-body diagrams, centre-of-mass.	Revision of basic mathematics for engineering  Practical-lesson work 1	Assignment 1 (out)  Textbook Reading: From Meriam and Kraige  Chapters: 1, 2.1-2.3, 5.1-5.3, 6.1-6.3, 7.1-7.3
2	Force systems, action and reaction, concurrent forces, moments, torques, Varignon's theorem, couple moments, force-couple systems, group of system of forces, equilibrium	Practical-lesson work 2 and 3	Textbook Reading: From Meriam and Kraige  Chapters: 2.4-2.10, Chapter 3

3	3D force systems, plane trusses, method of joints and method of sections.	Practical-lesson work 4	Assignment 2 (out) Test 1  Textbook Reading: From Meriam and Kraige Chapters: 4.1-4.5
4	DC current, voltage, resistance, Ohm's law, resistors in parallel and series Assignment 1 In Class Test 1	Practical-lesson work 5	Textbook Reading: From Dorf and Svoboda Chapters: 1.1-1.7, 2.1-2.6
5	Resistive circuits, Kirchhoff's laws	Practical-lesson 6 and 7	Test 2 Textbook Reading: From Dorf and Svoboda Chapters: 1.1-1.7, 2.1-2.6, 2.9, 3.1-3.4
6	Revision  Assignment 2 In Class Test 2  FINAL EXAM  The final exam may take place in the last lesson of Week 6 or on Monday Week 7, as per the final examination timetable.		Textbook Reading: From Dorf and Svoboda Chapters: 3.5-3.6

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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 [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

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

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](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.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

### Assessment tasks

- Assignments
- Lesson Work and Logging
- Tests
- Final examination

### Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

## Learning outcomes

- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assessment tasks

- Assignments
- Lesson Work and Logging
- Tests
- Final examination

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

## Learning outcomes

- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assessment task

- Lesson Work and Logging

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:



## Learning outcomes

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assessment tasks

- Assignments
- Lesson Work and Logging
- Tests
- Final examination

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## Learning outcomes

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## Assessment tasks

- Assignments

- Lesson Work and Logging
- Tests
- Final examination

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

### Learning outcomes

- Review of basic mathematics and physics knowledge required for this unit.
- Demonstrate ability to understand the concept of force transfer and analyse forces in members of machines and structures.
- Demonstrate ability to analyse electronic circuits.
- Demonstrate ability to understand the commonality between problems in Mechanical and Electronic engineering and how they can be related in engineering systems.
- Demonstrate self-learning, time-management, and project management.
- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

### Assessment tasks

- Assignments
- Lesson Work and Logging
- Tests
- Final examination

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### Learning outcomes

- Review of basic mathematics and physics knowledge required for this unit.

- Use discipline specific terminology to communicate concepts and ideas relevant to this unit

## **Assessment tasks**

- Assignments
- Lesson Work and Logging

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## **Assessment tasks**

- Assignments
- Lesson Work and Logging