



## 1. General Course Information

### 1.1 Course Details

<b>Course Code:</b>	<b>1501ENG</b>
<b>Course Name:</b>	<b>Engineering Mechanics</b>
<b>Trimester:</b>	<b>Trimester 2, 2021</b>
<b>Program:</b>	Diploma of Engineering
<b>Credit Points:</b>	10
<b>Course Coordinator:</b>	Masoumeh Akbari
<b>Document modified:</b>	11 February 2021

### Course Description

Engineering Mechanics is both a foundation and a framework for most engineering disciplines. This course provides a basic knowledge of Newtonian mechanics, rigid-body mechanics, elasticity and structural analysis. In particular, the principles of statics and their applications in engineering, the methods of static analysis, and techniques of engineering computation are expounded. Students are expected not only to acquire a good grasp of the principles but also to develop the computational and analytical skills which are vital in obtaining correct engineering solutions. In practice, a wrong solution can lead to an engineering disaster. This course is designed to enable students to acquire fundamental knowledge in engineering.

Engineering Mechanics is a 10 credit point course within the Diploma of Engineering. The course is situated within the second trimester of the program. The Diploma of Engineering is designed to provide students with a pathway to: further university studies in Engineering and related degrees; or direct employment.

### Assumed Knowledge

Students are required to have completed 1018ENG Engineering Science before undertaking this course.

## 1.2 Teaching Team

Your teacher can be contacted via the email system on the portal.

Name	Email
Masoumeh Akbari	<a href="mailto:masoumeh.akbari@staff.griffithcollege.edu.au">masoumeh.akbari@staff.griffithcollege.edu.au</a>

## 1.3 Staff Consultation

Your teacher is available each week for consultation outside of normal class times. Times that your teacher will be available for consultation will be found on the Moodle Course Site.

## 1.4 Timetable

Your timetable is available on the Griffith College Portal at Class Timetable in Student and Services.

## 1.5 Technical Specifications

All students must have access to a computer or suitable mobile device.

## 2. Aims, Outcomes & Generic Skills

### 2.1 Course Aims

Engineering mechanics is an elective engineering subject which defines a foundation for most engineering disciplines. This course aims to familiarize students with the principles of static equilibrium by applying Newton's laws to solve engineering problems. Topics include introduction to statics equilibrium of particles and rigid bodies, centre of gravity and centroid, moment of inertia, analysis of truss in 2D, analysis of frames in 3D space, shear forces and bending moment diagrams.



### 2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Apply the fundamentals of mechanics to analyse the equilibrium, stability and determinacy of simple systems in 2D and 3D space.
2. Evaluate structural stability and determinacy of 2D trusses and analyse internal forces in trusses.
3. Apply the concepts of sectional properties and internal force characteristics of beams to solve real world engineering problems.



## 2.3 Generic Skills and Capabilities

For further details on the Generic Skills please refer to the [Graduate Generic Skills and Capabilities policy](#).

Griffith College aims to develop graduates who have an open and critical approach to learning and a capacity for lifelong learning. Through engagement in their studies, students are provided with opportunities to begin the development of these and other generic skills.

Studies in this course will give you opportunities to begin to develop the following skills:

Generic Skills and Capabilities		Taught	Practised	Assessed
Acquisition of discipline knowledge and skills with critical judgement		✓	✓	✓
Communication and collaboration			✓	✓
Self-directed and active learning		✓	✓	
Creative and future thinking		✓	✓	✓
Social responsibility and ethical awareness		✓	✓	✓
Cultural competence and awareness in a culturally diverse environment			✓	



## 3. Learning Resources

### 3.1 Required Learning Resources

Loo, Y.C. and Guan, H. (2016). Statics and Structures, Griffith School of Engineering, Griffith University Gold Coast Campus, 3rd Edition, in conjunction with Loo, Y.C., A Concise Reference Book for Mechanics & Structures, School of Engineering, Griffith University Gold Coast Campus, 2nd Edition, 1998.

Guan, H. (2016), Engineering Mechanics-Supplementary Material & Workbook, Griffith School of Engineering, Griffith University Gold Coast Campus.

### 3.2 Recommended Learning Resources

Hulse, R. and Cain, J.A., (2000), Structural Mechanics, Palgrave Macmillan, N.Y., 2nd Edition.

Hibbeler, R.C.(2007).Engineering Mechanics - Statics, Prentice-Hall, N.J., 11th Edition

Meriam, J.L. and Kraige, L.G., (2008) Engineering Mechanics, V.1 Statics, Wiley, New York, 6th Edition.

Beer, F. P.; Johnston, Jr., E. R.; Flori, Jr, R. E. (2008). Mechanics for Engineers Statics, McGraw Hill, 5 th Edition.

### 3.3 College Support Services and Learning Resources

The College provides many facilities and support services to assist students in their studies. Links to information about College support resources that are available to students are included below for easy reference.

[Digital Library](#) – Databases to which Griffith College students have access to through the Griffith Library Databases.

MyStudy – there is a dedicated website for this course via MyStudy on the Griffith College Portal.

Griffith College is committed to ensuring academic integrity is understood and maintained by all staff and students. All students learn about academic integrity through engagement with the weighted Epigeum modules within the suite of Academic and Professional Studies courses.

Services and Support provides a range of services to support students throughout their studies including academic advice and assignment help from Student Learning Advisors, and personal and welfare support from Student Counsellors.

[Jobs and Employment](#) in the Student Hub can assist students with career direction, resume and interview preparation, job search tips, and more.

[IT Support](#) provides details of accessing support, information on s numbers and internet access and computer lab rules.

### 3.4 Other Information about your Learning

#### Attendance

You are expected to actively engage in all learning experiences and learning activities which underpin the learning content in this course. You are expected to engage with the learning content and learning activities outside of timetabled class times. This requires you to be an active agent of your learning. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook. In addition, you are encouraged to BYOD (bring your own device) to class such as a laptop or tablet. This is not a requirement as computer lab facilities are available on campus, however, the use of such devices in the classroom is encouraged with appropriate and considerate use principles being a priority.

#### Preparation and Participation in Learning

In order to enhance your learning, you need to prepare before participating in the learning experiences. Absorb the learning content and complete the learning activities that are provided online before you attend the scheduled learning experiences. Make sure you complete the learning activities set each week, they are designed to support your learning. Active participation in your learning will enhance your success. Ask questions when something is unclear or when you want to bring some issue to your lecturer or tutor's attention; respond to questions to test your knowledge and engage in discussion to help yourself and others learn.

#### Consultation Sessions

Teachers offer extra time each week to assist students outside the classroom. This is known as 'consultation time.' You may seek assistance from your teacher on email or in person according to how the teacher has explained this to the class. Attendance during consultation time is optional but you are encouraged to use this extra help to improve your learning outcomes.

#### Course Learning Materials

Learning materials are made available to you in MyStudy on the Griffith College Portal. The learning materials are arranged in Modules. In each Module you will find Learning Content, Learning Experiences and Learning Activities. **Learning Content** will be engaged with prior to the scheduled **Learning Experience (your weekly class)**. This will ensure you are prepared for the scheduled Learning Experience by being aware of the content to be covered and therefore will be able to actively participate in the session. **Learning Activities** are accessed after the scheduled session for purposes of review, consolidation of learning, and preparation for the Evidence of Learning tasks (assessment) in the course.

In addition, **Anytime Anywhere** learning material is provided in the course. This learning material provides support, interactive tools and directions for students who occasionally cannot attend the weekly scheduled Learning Experience (either in person or on Zoom) perhaps due to illness or other commitments. The Anytime Anywhere learning material should also be used in conjunction with Learning Content and Learning Activities resources.

### Self-Directed Learning

You will be expected to learn independently. This means you must organise and engage with the course learning content even when you are not specifically asked to do so by your lecturer or tutor. The weekly guide will be helpful to organise your learning. This involves revising the weekly course learning material and completing the learning activities. It also means you will need to find additional information to evidence your learning (assessment) beyond that given to you, and to construct your own response to a question or topic. All of this requires careful planning of your time. Expect to spend, on average, at least 10 hours per week including class time for each of your courses.

### Program Progression

You are reminded that satisfactory Program Progression requires that attendance in classes is maintained at equal to or greater than 80%, and that GPA is maintained at equal to or greater than 3.5 [please see Griffith College Policy Library - [Program Progression Policy](#) - for more information].






### Teacher and Course Evaluation

Your feedback is respected and valued by your lecturers and tutors. You are encouraged to provide your thoughts on the course and teaching, both positive and critical, directly to your lecturer and tutor or by completing course and lecturer evaluations via Griffith College's evaluation tool whenever these are available.



## 4. Learning Content, Learning Activities and Learning Experiences

### 4.1 Modules for Learning and Weekly Learning Content, Learning Activities and Learning Experience

	Learning Content 	Learning experiences 	Learning activities 	Evidence of learning 	Learning outcome 
	<b>Module 1: Fundamentals of statics (equilibrium, determinacy and stability)</b>				
<b>1</b>	Introduction to Engineering Mechanics, Fundamentals of statics (I)  Online mini lessons	Revise the weekly content  Practice problem solving questions on statics (I)	Extra practice questions as homework activities	-	<b>1</b>
<b>2</b>	Fundamentals of statics (II)  Online mini lessons	Revise the weekly content  Practice problem solving questions on statics (II)	Extra practice questions as homework activities	-	<b>1</b>





<b>3</b>	Supports and support reactions, determinacy and stability  Online mini lessons	Revise the weekly content  Practice problem solving questions on reactions	Extra practice questions as homework activities	-	<b>1</b>
<b>4</b>	Analysis of forces and moments in three-dimensional space  Online mini lessons	Revise the weekly content  Practice problem solving questions on forces and moments in three-dimensional space	Extra practice questions as homework activities	-	<b>1</b>
<b>Module 2: Analysis and design of 2D trusses</b>					
<b>5</b>	Analysis of trusses (I): determinacy and stability, zero-force members, method of joints  Online mini lessons	Revise the weekly content  Practice problem solving questions on method of joints	Extra practice questions as homework activities	Module 1 Statics quiz	<b>1, 2</b>
<b>6</b>	Analysis of truss (II): Method of sections Working on truss project  Online mini lessons	Revise the weekly content  Practice problem solving questions on method of sections	Truss Project  Truss laboratory session	-	<b>2</b>
<b>7</b>	Working on truss project  Online mini lessons	Revise the weekly content  Practice problem solving questions on Trusses	Truss Project	-	<b>2</b>
<b>Module 3: Analysis and design of 2D beams</b>					
<b>8</b>	Centroids, centre of gravity and moments of inertia, Deflection of simply supported beams  Online mini lessons	Revise the weekly content  Practice problem solving questions on centroids and moments of inertia	Extra practice questions as homework activities	Truss Project	<b>2, 3</b>
<b>9</b>	Beams (I): Shear force and bending moment  Online mini lessons	Revise the weekly content  Practice problem solving questions on shear force and bending moment	Beam Project	-	<b>3</b>
<b>10</b>	Beams (II): Shear force and bending moment	Revise the weekly content	Extra practice questions as	Module 2 and 3 Statics quiz	<b>3</b>

	Online mini lessons	Practice problem solving questions on shear force and bending moment	homework activities Beam Project Beam laboratory session		
<b>11</b>	Introduction to stress Working on beam project  Online mini lessons	Revise the weekly content  Practice problem solving questions on stress	Beam Project	-	<b>3</b>
<b>12</b>	Revision Module 1, 2 and 3 Extra practice problems	Practice problem solving questions on Module 1, 2 and 3	Beam Project	Beam Project	<b>1, 2, 3</b>



## 5. Evidence of Learning (Assessment Plan)

### 5.1 Evidence of Learning Summary

	 Evidence of learning	 Weighting	 Learning outcome	 Due Date
<b>1</b>	Module 1 Statics quiz	15%	1	Week 5
<b>2</b>	Truss project	20%	2	Week 8 (Submit via TurnItIn)
<b>3</b>	Module 2 and 3 Statics quiz	15%	2, 3	Week 10
<b>4</b>	Beam project	20%	3	Week 12 (Submit via TurnItIn)
<b>5</b>	Final Exam- Hurdle 40%	30%	1,2,3	Final examination period

### 5.2 Evidence of Learning Task Detail

#### Module 1 Statics Quiz

#### Module 2 and 3 Statics Quiz

These open book quizzes will help students to keep up to date with their work. They will also provide feedback to both the students and the teaching team regarding progress and conduct of the course. Marks will be awarded according to correctness of the procedure, accuracy of the solution and clarity of the presentation.

#### Truss and Beam project

Type: Written Assignments

Task description: These project-based group assessment tasks require students to identify, describe and reflect on existing real life structures constructed using truss and beam members. Students will analyse simple statically determinate systems to find the axial member forces (in truss members) and internal force characteristics and deflection (in beams) with accurate calculations. This will lead to the design of truss members and beam using

simplified formulae or tables within various design constraints. They will present a formal report with calculations and justifications.

There are two learning activities (laboratory sessions) available for each project. Truss laboratory session will be in Week 6 and Beam laboratory session will be in Week 10. Students are expected to use these activities towards the completion of their Truss and Beam projects.

Truss laboratory session:

This session aims at familiarising students with the determination of forces into the members of a truss. Students will reflect on their observation and relevant conceptualisation to back support the Truss project.

Beam laboratory session

This session aims at familiarising students with the deflection of beams impacted by load, load position, second moment of area of beams, span and boundary condition. Students will reflect on their observation, and abstract the relevant conceptualisation to back support the Beam Project.

Marking Criteria: The project reports will be marked based on 1) Critical reflection, 2) Problem solving ability, 3) Justification, 4) Written presentation. The projects will be assessed based on group work and individual contribution.

### **Final Examination**

The open book final examination will assess the student's knowledge and understanding of the topics covered in the course and the ability to apply that understanding to the solution of practical problems. The examination paper is devised also to test the student's computational skills, as well as the ability to apply that knowledge to engineering design problems. Marks will be awarded according to correctness of the procedure, accuracy of the solution and clarity of the presentation.

### **Other Assessment Information**

Assessment is based on the student's grasp of the underlying principles of the course matters and their ability to apply such principles to practical engineering problems.

Students are required to attempt and complete all types of assessment and must demonstrate a reasonable degree of competence in the required learning objectives for each type of assessment.

To receive a pass grade or better for the course, the student must:

- 1) achieve an aggregate mark of at least 50% overall
- 2) achieve at least 40% for final examination

## **5.3 Late Submission**

An evidence of learning (assessment) item submitted after the due date, without an approved extension from the Course Coordinator, will be penalised. The standard penalty is the reduction of the mark allocated to the assessment item by 5% of the maximum mark applicable for the assessment item, for each working day or part working day that the item is late. Evidence of learning items submitted more than five working days after the due date are awarded zero marks.

Please refer to the Griffith College website - Policy Library > [Assessment Policy](#) for guidelines and penalties for late submission.



## 5.4 Other Information about Evidence of Learning

### Retention of Originals

You must be able to produce a copy of all work submitted if so requested. Copies should be retained until after the release of final results for the course.

### Requests for extension

To apply for an extension of time for an evidence of learning item, you must submit an [Application for Extension of Assignment](#) form to your teacher at least 24 hours before the date the assignment is due. Grounds for extensions are usually: serious illness, accident, disability, bereavement or other compassionate circumstances and must be able to be substantiated with relevant documentation [e.g. [Griffith College Student Medical Certificate](#)]. Please refer to the Griffith College website - [Policy Library](#) - for guidelines regarding extensions and deferred assessment.

### Return of Evidence of Learning Items

1. Marks awarded for in-trimester evidence of learning items, except those being moderated externally with Griffith University, will be available on the Student Portal within fourteen [14] days of the due date. This does not apply to the final evidence of learning item in this course (marks for this item will be provided with the final course result).
2. Students will be advised of their final grade through the Student Portal. Students can review their final exam papers after student grades have been published. Review of final exam papers will not be permitted after the final date to enrol.
3. Marks for **all** evidence of learning items including the final exam (if applicable) will be recorded in the Moodle Course Site and made available to students through the Moodle Course Site.

*The sum of your marks of evidence of learning items in this course does not necessarily imply your final grade for the course. Standard grade cut off scores can be varied for particular courses, so you need to wait for the official release of grades to be sure of your grade for this course.*

## 6. Policies & Guidelines

Griffith College assessment-related policies can be found in the [Griffith College Policy Library](#) which include the following policies:

[Assessment Policy](#), [Special Consideration](#), [Deferred Assessment](#), [Alternate Exam Sittings](#), [Medical Certificates](#), [Academic Integrity](#), [Finalisation of Results](#), [Review of Marks](#), [Moderation of Assessment](#), [Turn-it-in Software Use](#). These policies can be accessed within the [Policy Library](#)

**Academic Integrity** Griffith College is committed to maintaining high academic standards to protect the value of its qualifications. Academic integrity means acting with the values of honesty, trust, fairness, respect and responsibility in learning, teaching and research. It is important for students, teachers, researchers and all staff to act in an honest way, be responsible for their actions, and show fairness in every part of their work. Academic integrity is important for an individual's and the College's reputation.

All staff and students of the College are responsible for academic integrity. As a student, you are expected to conduct your studies honestly, ethically and in accordance with accepted standards of academic conduct. Any form of academic conduct that is contrary to these standards is considered a breach of academic integrity and is unacceptable.

Some students deliberately breach academic integrity standards with intent to deceive. This conscious, pre-meditated form of cheating is considered to be one of the most serious forms of fraudulent academic behaviour, for which the College has zero tolerance and for which penalties, including exclusion from the College, will be applied.

However, Griffith College also recognises many students breach academic integrity standards without intent to deceive. In these cases, students may be required to undertake additional educational activities to remediate their

behaviour and may also be provided appropriate advice by academic staff.

As you undertake your studies at Griffith College, your lecturers, tutors and academic advisors will provide you with guidance to understand and maintain academic integrity; however, it is also your responsibility to seek out guidance if and when you are unsure about appropriate academic conduct.

In the case of an allegation of a breach of academic integrity being made against a student he or she may request the guidance and support of a Griffith College Student Learning Advisor or Student Counsellor.

Please ensure that you are familiar with the Griffith College Academic Integrity Policy; this policy provides an overview of some of the behaviours that are considered breaches of academic integrity, as well as the penalties and processes involved when a breach is identified.

For further information please refer to the Griffith College website - Policy Library > [Academic Integrity Policy](#)

### **Reasonable Adjustments for Assessment – The Disability Services policy**

The Disability Services policy (accessed using the Document Search' feature with the [Policy Library](#)) outlines the principles and processes that guide the College in making reasonable adjustments to assessment for students with disabilities while maintaining academic robustness of its programs.

### **Risk Assessment Statement**

There are no out of the ordinary risks associated with this course.

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