



## COURSE OUTLINE

# ENG101 Foundations of Engineering

**Course Coordinator:** Adrian McCallum (amccallu@usc.edu.au) **School:** School of Science, Technology and Engineering

2021 | Semester 1

USC Sunshine Coast  
USC Moreton Bay

**ON CAMPUS**

Most of your course is on campus but you may be able to do some components of this course online.

*Please go to the USC website for up to date information on the teaching sessions and campuses where this course is usually offered.*

## 1. What is this course about?

### 1.1. Description

This course is an introduction to the professional life of an engineer. The curriculum will be primarily delivered in a 'flipped' manner supported by weekly hands-on activities; 'real-world' problems will be examined via two 'day field trips. Topics investigated include: types of engineering, ethics and sustainability, life as a professional engineer, working in groups, written and oral communication and problem solving.

### 1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
<b>ON CAMPUS</b>			
Lecture	1hr	Week 1	3 times
Tutorial/Workshop	2hrs	Week 1	13 times
Fieldwork	8hrs	Week 5	2 times

### 1.3. Course Topics

Working in Engineering Teams  
Engineering Approach to Problem Solving  
Ethics & Sustainability  
Practical Problem Solving  
What is civil engineering?  
What is mechanical engineering?  
What is mechatronic engineering?  
What is electrical engineering?  
Practical tools and communication skills for Engineers

## 2. What level is this course?

100 Level (Introductory)

Engaging with discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Limited or no prerequisites. Normally, associated with the first full-time study year of an undergraduate program.

### 3. What is the unit value of this course?

12 units

### 4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...
1 Use an engineering tool (eg. EXCEL) to demonstrate the sustainability and ethical nature of engineering and its limitations by solving an engineering problem	Knowledgeable Creative and critical thinker
2 Communicate engineering solutions and aspects of the engineering profession	Empowered Engaged
3 Develop and apply your knowledge of the external factors that need to be considered in all engineering activities	Ethical Sustainability-focussed
4 Lead, participate in and support the development of a team to investigate an engineering problem.	Knowledgeable
5 Critically reflect upon an engineering outcome within the context of the material presented in this course.	Creative and critical thinker

### 5. Am I eligible to enrol in this course?

Refer to the [USC Glossary of terms](#) for definitions of “pre-requisites, co-requisites and anti-requisites”.

#### 5.1. Pre-requisites

Not applicable

#### 5.2. Co-requisites

Not applicable

#### 5.3. Anti-requisites

Not applicable

#### 5.4. Specific assumed prior knowledge and skills (where applicable)

Not applicable

### 6. How am I going to be assessed?

#### 6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

#### 6.2. Details of early feedback on progress

Formative feedback for both written and oral communication tasks is provided weekly during tutorials, from Week #1; oral communications skills in particular will be practised and discussed weekly.

### 6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Report	Group	30%	2000 word report + evaluation of solution using an engineering tool (e.g. Excel)	Week 7	Online Assignment Submission with plagiarism check
All	2	Report	Individual	50%	3000 word report + evaluation of solution using an engineering tool (e.g. Excel)	Refer to Format	Online Assignment Submission with plagiarism check
All	3	Oral	Group	20%	15 min oral presentation.	Week 12	In Class

#### All - Assessment Task 1: Engineering Problem Solving I (30%)

<b>GOAL:</b>	Demonstrate, as a group, your understanding of the problem presented on the initial Field Trip and communicate via written report your solution/s to this problem, supported by an appropriate engineering tool.															
<b>PRODUCT:</b>	Report															
<b>FORMAT:</b>	You will be required to clearly articulate the problem statement, identify the inputs and outputs and clearly distinguish between the optimal solution and possible solutions with the given time and resource constraints.															
<b>CRITERIA:</b>	<table border="1"> <thead> <tr> <th>No.</th> <th>Learning Outcome assessed</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Identification of external factors that impact engineering practice</td> </tr> <tr> <td>2</td> <td>Use of key engineering terms in the appropriate context</td> </tr> <tr> <td>3</td> <td>Critical review of engineering practice</td> </tr> <tr> <td>4</td> <td>Critical review of the engineering outcome</td> </tr> <tr> <td>5</td> <td>Grammar and structure suitability for an engineering report</td> </tr> <tr> <td>6</td> <td>Assessment criteria are mapped to the course learning outcomes. <span style="float: right;">1 2 3 4 5</span></td> </tr> </tbody> </table>	No.	Learning Outcome assessed	1	Identification of external factors that impact engineering practice	2	Use of key engineering terms in the appropriate context	3	Critical review of engineering practice	4	Critical review of the engineering outcome	5	Grammar and structure suitability for an engineering report	6	Assessment criteria are mapped to the course learning outcomes. <span style="float: right;">1 2 3 4 5</span>	
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#### All - Assessment Task 2: Engineering Problem Solving II (50%)

<b>GOAL:</b>	Demonstrate, as an individual, your understanding of the problem presented on the 2nd Field Trip (or another acceptable problem) and communicate via written report your solution/s to this problem, supported by an appropriate engineering tool.
<b>PRODUCT:</b>	Report
<b>FORMAT:</b>	You will be required to clearly articulate the problem statement, identify the inputs and outputs and clearly distinguish between the optimal solution and possible solutions with the given time and resource constraints. Individual submission, .pdf and engineering tool file (eg. Excel, Matlab etc) submitted via Blackboard (approximately 3000 word report + implementation of solution in engineering tool). Due: week 15

CRITERIA:	No.	Learning Outcome assessed
	1	Identification of external factors that impact engineering practice
	2	Use of key engineering terms in the appropriate context
	3	Critical review of engineering practice
	4	Critical review of the engineering outcome
	5	Grammar and structure suitability for an engineering report

### All - Assessment Task 3: Collaborative Oral Presentation 20%

<b>GOAL:</b>	To learn to reflect upon and critique the processes that result in an engineering outcome.	
<b>PRODUCT:</b>	Oral	
<b>FORMAT:</b>	Use the Cave environment to present on the collaboration process. In the presentation students will demonstrate how they collaborated on an engineering activity, describe the administrative and practical tools that they used and utilise peer and self assessment techniques. 15 minute presentation in the Cave. A presentation template will be provided on Blackboard.	
CRITERIA:	No.	Learning Outcome assessed
	1	Written communication of engineering solutions (fluency, grammar and referencing)
	2	Application of external factors that impact engineering practice
	3	Implementation of engineering model
	4	Explanation of the nature of engineering and its limitations
	5	Use of engineering terms and reference to technological processes in engineering

## 7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit.

## 8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Blackboard site– Please log in as soon as possible.

### 8.1. Prescribed text(s) or course reader

Please note that you need to have regular access to the resource(s) listed below. Resources may be required or recommended.

REQUIRED?	AUTHOR	YEAR	TITLE	PUBLISHER
Recommended	Saeed Moaveni	0	Engineering Fundamentals	electronic versions may be purchased and will be available in limited number via the USC Library

### 8.2. Specific requirements

It is preferable that you bring along a Laptop computer to the tutorials and field trips.

## 9. How are risks managed in this course?

Risk assessments have been performed for all field activities and a low level of health and safety risk exists. Some risks concerns may include working in an unknown environment as well as slip and trip hazards. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the [online induction training for students](#), and following the instructions of the University staff.

## 10. What administrative information is relevant to this course?

### 10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

### 10.2. Assessment: Additional Requirements

#### Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

The final mark is in the percentage range 47% to 49.4%

The course is graded using the Standard Grading scale

You have not failed an assessment task in the course due to academic misconduct

### 10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.

- 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.

- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

### 10.4. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the [Learning Advisers](#) web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au).

### 10.5. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to [Student Hub](#), email [studentwellbeing@usc.edu.au](mailto:studentwellbeing@usc.edu.au) or call 07 5430 1226.

### 10.6. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, [AccessAbility Services](#) can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to [Student Hub](#), email [AccessAbility@usc.edu.au](mailto:AccessAbility@usc.edu.au) or call 07 5430 2890.

## 10.7. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website: <http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching>

## 10.8. General Enquiries

### In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **USC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **USC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **USC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **USC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

**Tel:** +61 7 5430 2890

**Email:** [studentcentral@usc.edu.au](mailto:studentcentral@usc.edu.au)