



COURSE OUTLINE

MEC335 Production Engineering

Course Coordinator: Rezwanul Haque (rhaque@usc.edu.au) **School:** School of Science, Technology and Engineering

2021 | Semester 1

USC Sunshine Coast

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

In our consumer-driven society the success or failure of a product depends on its design and cost. The products cost is influenced by the manufacturing cost; which in turn is determined by effective use of raw materials and the efficiency of production systems. This course provides the fundamental theory of production systems and practices of world class manufacturers. Most modern manufacturers have adopted various aspects of Computer Integrated Manufacture. The course provides knowledge, technology and applications of CIM in both large multi-national companies and small, medium enterprises.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
ON CAMPUS			
Lecture – Lecture	2hrs	Week 1	13 times
Tutorial/Workshop – Tutorial	1hr	Week 2	11 times
Laboratory – Workshop	2hrs	Week 2	4 times

1.3. Course Topics

- Total Quality Assurance
- Metrology – Traditional and Automated
- Production Systems – Lean, Just-in-time
- Inventory Control
- Computer Integrated Manufacturing (CIM)
- Computer Numerical Control (CNC)
- Group Technology
- Plant layout
- Industrial Robotics
- Automated Process Control

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth 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 Demonstrate an understanding of the principles of production systems, Storage Systems, manufacturing processes and quality management systems	Knowledgeable Empowered
2 Analyse various methods used in metrology, and undertake accurate, reliable, and repeatable measurements.	Knowledgeable
3 Specify flexible manufacturing systems, based on lean (Just-in-Time), group technologies, Computer integrated Manufacturing (CIM).	Knowledgeable Creative and critical thinker
4 Demonstrate an understanding of Group Technology and Line Balancing algorithms by analysing case studies.	Knowledgeable
5 Interpret experimental and test results and present these in an appropriate engineering report format.	Knowledgeable Creative and critical thinker
6 Collaborate with others in a team project environment to conduct engineering investigations and produce engineering reports.	Empowered Engaged

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

ENG226 or MEC226 or MEC2202 (USQ) and enrolled in Program SC410, SC411

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

ENG335 or MEC3204 (USQ)

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

In all tutorials, throughout semester, students will be asked to complete sample examination questions. Students will then discuss possible answers before being shown sample answers. Students will also be encouraged to raise any issues they have regarding any assessment task.

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	Essay	Individual	35%	Answers to ALL assignment questions	Refer to Format	Online Assignment Submission with plagiarism check
All	2	Report	Group	15%	Practical output and associated report	Week 10	In Class
All	3	Examination - Centrally Scheduled	Individual	50%	2 hrs	Exam Period	Exam Venue

All - Assessment Task 1: Assignments

GOAL:	The assignments allow you to demonstrate your understanding of the theory and also enable you to identify any problem areas in your understanding													
PRODUCT:	Essay													
FORMAT:	Submit: Monday Week 5 (5%); Tuesday Week 8 (20%); Monday Week 11 (10%). Questions will be set for each of the assignments, from the material covered in the lectures up to and including the week prior to the submission. You are required to use the theory introduced in the lectures to respond to the assignment questions. The assignments will be provided to you on Blackboard. You are required to complete the assignments and submit by the Monday of each submission week. The assignments have varying weighting:- Assignment 1 = 5%; Assignment 2 = 20% and Assignment 3 = 10%. Assignment submissions must be word-processed, showing all working and calculations (where relevant). You must submit your assignment online (Instructions will be provided on Blackboard).													
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All - Assessment Task 2: Workshop Project

GOAL:	The project is designed as two hands-on activities that demonstrate the theory presented in the lectures and tutorials and help you to gain a deep understanding of the underlying processes and production systems
PRODUCT:	Report
FORMAT:	The practical are completed by groups of 2-4 students. The report is to be submitted by the group. The report should NOT be longer than 10 pages excluding appropriate diagrams (see Report Writing Guidelines in Practical folder on Portal).

CRITERIA:	No.	Learning Outcome assessed
	1	Completeness and Accuracy of results and subsequent analysis;
	2	Degree to which the report adheres to the specified structure
	3	Completeness of all components of the report within specified word count
	4	Depth of discussion and reflection on the project.

All - Assessment Task 3: Final Examination

GOAL:					
PRODUCT:	Examination - Centrally Scheduled				
FORMAT:	The final exam will assess the content of lectures covered in the whole course. The duration of the final exam will be 2 hours (during centrally scheduled exam period, closed book, programmable calculators are NOT permitted to be used). You will be required to provide responses to a number of typical problems similar to those given in the tutorial and assignment questions throughout the semester. Your exam solutions will be used to evaluate your understanding of the total course material.				
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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
Required	Mikell P. Groover	2015	Automation, Production Systems, and Computer-Integrated Manufacturing	Pearson

8.2. Specific requirements

Fully enclosed shoes (preferably safety shoes/boots) must be worn in the engineering laboratory. If you do not have the correct shoes you will not be allowed to do the workshop practical. You must also undertake the laboratory induction before you can undertake any practical. It is advisable to use a dust-coat (or overall) when in the laboratory.

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. 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.

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 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 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