ENGR 2001 AUTOMATED MANUFACTURING

Credit Points 10

Legacy Code 300735

Coordinator Leo Zhang (https://directory.westernsydney.edu.au/search/name/Leo Zhang/)

Description Automated manufacturing is about increasing the capacity of productivity through a range of integrated technologies, such as digital transformation platforms so that manufacturing operations can run simultaneously. These processes are used in industrial settings. Students will be introduced to the fundamentals of manufacturing operations, automation, and control technologies, including numerical control and industrial robotics. This subject aims to deepen the understanding of the material selection process and enables students to identify appropriate manufacturing processes in a product manufacturing design. Various manufacturing processes such as material removal, bulk deformation, sheet-metal forming, and non-traditional processes will be examined. Through problem-solving activities, students will enhance their manufacturing engineering skills in the computer-aided design (CAD) and computer-aided manufacturing (CAM) areas and acquire the skills to machine their CAD models on a computer numerical control (CNC) machine.

School Eng, Design & Built Env

Discipline Manufacturing Engineering

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 2 subject

Pre-requisite(s) Students must have passed the two subjects MATH 1016 Mathematics for Engineers 1 and ENGR 1018 Fundamentals of Mechanics OR must have passed the two subjects MATH 1034 Mathematics for Engineers 1 (Advanced) and ENGR 1018 Fundamentals of Mechanics before they can enroll in this subject

Equivalent Subjects ENGR 3002 - Automated Manufacturing

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Apply knowledge of manufacturing processes and automation control technologies to solve problems and design components.
2. Use CAD software to create and modify components designs and CAM software to generate code files for manufacturing those components.
3. Use suitable problem-solving techniques for problems and contexts in manufacturing design.
4. Discuss the advantages of computer integrated manufacturing, flexible manufacturing processes and their applications in the manufacturing industries.
5. Apply mathematical techniques in a manufacturing engineering problem.
6. Conduct work safely and responsibly in the manufacturing lab.

Subject Content

Material properties and product attributes
Engineering materials
Solidification processes
Particulate processing of metals and ceramics
Metal forming and sheet metalworking
Material removal processes
Property enhancing and surface processing operations
Joining and assembly processes
Manufacturing systems
Manufacturing support systems
Manual and CNC machining processes and tools
CAD/CAM technologies, applications and programming
Cost estimation in manufacturing
Flexible and fixed automation
Applications of robotics in automated manufacturing
Computer-integrated manufacturing & processing planning

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task
Numerical Problem Solving	3 x assignments	30	N	Individual
Practical	8 x practicals	30	N	Individual
Final Exam	2 hours	40	Y	Individual

Prescribed Texts

- Groover, MP 2017, Groover's principles of modern manufacturing : materials, processes, and systems, Global, SI edn, John Wiley & Sons, Inc., Hoboken, New Jersey.

Teaching Periods

Sydney City Campus - Term 1 (2024)

Sydney City

On-site

Subject Contact Leo Zhang (https://directory.westernsydney.edu.au/search/name/Leo Zhang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR2001_24-SC1_SC_1#subjects)

Spring (2024)

Penrith (Kingswood)

On-site

Subject Contact Leo Zhang (https://directory.westernsydney.edu.au/search/name/Leo Zhang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR2001_24-SPR_KW_1#subjects)

Parramatta City - Macquarie St

On-site

Subject Contact Leo Zhang (https://directory.westernsydney.edu.au/search/name/Leo Zhang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR2001_24-SPR_PC_1#subjects)

Sydney City Campus - Term 3 (2024)

Sydney City

On-site

Subject Contact Leo Zhang (https://directory.westernsydney.edu.au/search/name/Leo Zhang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ENGR2001_24-SC3_SC_1#subjects)