COURSE DETAILS

Course Code: B59RM
Full Course Title: Robotic Mechanical Systems 1
SCQF Level: 9
SCAF Credits: 15
Available as Elective: Yes

DELIVERY LEVEL

Undergraduate: Yes  Postgraduate Taught: Yes  Postgraduate Research: No

COURSE AIMS

This module aims to
- introduce computer integrated manufacturing and develop methods related to computer numerical control (CNC)
- provide fundamental knowledge and skills in robot kinematics and the essential training in robotic mechanical system design with the focus on the simulation of kinematic motion.

LEARNING OUTCOMES – SUBJECT MASTERY

On completion of this module, students will be able to:
- understand the integration of computer-based technologies within the ‘Engineering a Product’ cycle and the importance of data dependency and systems integration.
- understand the importance of the integration of the design and associated manufacturing processes.
- acquire specific knowledge related to computer numerical control (CNC).
- describe the motion characteristics for a given architecture of robots.
- select appropriate architecture(s) of robots to satisfy the motion requirement for a number of applications.
- perform the motion analysis of robots.
- simulate the motion of robots using CAD software.

LEARNING OUTCOMES – PERSONAL ABILITIES

On completion of this module, students will be able to:
- give effective presentations on the mechanical design of a robot or other mechanical systems involving motion.
- further develop technical writing skills through writing presentation.
- develop the ability to criticise and evaluate design information.

SYLLABUS

- Computer integrated manufacturing (CIM)
- Shop floor layout
- CNC manufacturing
- Classification of industrial robots
B59RM Robotic Mechanical Systems 1

- 3D modelling of robots
- Direct kinematics
- Inverse kinematics
- Workspace analysis
- Motion simulation of robots
- Repeatability and accuracy
- Robot calibration

COURSE RELATIONSHIPS
N/A

LOCATION AND ASSESSMENT METHODS

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