**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 | No | 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
• 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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