Course descriptor F21RO

Course code	F21RO
Course title	Intelligent Robotics
Credits	15
School	Maths and Computer Sciences
SCQF Level	11
Semester	2
Aims	• To introduce students to concepts and techniques used in robotics and applications ranging from industrial automation to robotic companions. • To understand the basic concepts used in evolutionary, swarm and other bio-inspired robotics. • To understand the basic concepts used in developmental robotics and human-robot interaction. • To gain exposure to the main issues involved in building intelligent robot controllers.
Syllabus	• Fundamentals of Manipulators - Geometry, kinematics, control and programming. • Basics of Mobile Robots - Mapping, path planning and navigation. • Sensing Technologies - Tactile, visual, auditory and multi-modal sensing. • Behaviour Based Robotics, Evolutionary, swarm and other bio-inspired robotics. • Cognitive Robotics - Developmental robotics and human-robot Interaction.

Learning Outcomes	
Subject Mastery	• To appreciate the basic concepts of automation and intelligent robotics. • To develop detailed understanding of the geometries of industrial manipulators. • To develop detailed understanding of the architectures of autonomous guided vehicles (AGVs). • To develop detailed understanding of interfacing & control issues of manipulator arms and AGVs. • To explore the applications and implications of automation and human-robot interaction. • To appreciate the different forms and uses of various sensor technologies, including multi-modal sensing. • To develop detailed understanding of the architecture of behaviour-based robotics (BBR), evolutionary robotics and swarm robotics.

	• To explore the collaboration and ethical issues of human-robot interaction. • To make informed judgements about appropriate methodologies for developing and evaluating robotics applications.
Personal Abilities	• To critically analyse various paradigms and architectures. • To appreciate the real-world constraints imposed on technical skills. • To offer professional insights into the financial imperatives which apply to the introduction of new technology. • To offer ethical insights into the introduction of new robotics technology.

Assessment method	60% written examination, 40% coursework