**COURSE DETAILS**

**Course Code:** F21RO  
**Full Course Title:** Intelligent Robotics  
**SCQF Level:** 11  
**SCAF Credits:** 15  
**Available as Elective:** No

**DELIVERY LEVEL**

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<th>Undergraduate:</th>
<th>No</th>
<th>Postgraduate Taught:</th>
<th>Yes</th>
<th>Postgraduate Research:</th>
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**Additional Information:**

**COURSE 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.

**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.

**LEARNING OUTCOMES – 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.

**SYLLABUS**
F21RO Intelligent Robotics

Fundamentals of Manipulators - Geometry, kinematics, control and programming.

Basics of Mobile Robots - Mapping, path planning and navigation.

Behaviour Based Robotics - Evolutionary, swarm and other bio-inspired robotics.


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<th>COURSE RELATIONSHIPS</th>
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