F20RO Intelligent Robotics

**COURSE DETAILS**

**Course Code:** F20RO  
**Full Course Title:** Intelligent Robotics  
**SCQF Level:** 10  
**SCAF Credits:** 15  
**Available as Elective:** No

**DELIVERY LEVEL**

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<th>Undergraduate:</th>
<th>Yes</th>
<th>Postgraduate Taught:</th>
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<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**

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.  
### COURSE RELATIONSHIPS

<table>
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<th>Course Code</th>
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<tbody>
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<td>F29AI</td>
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### LOCATION AND ASSESSMENT METHODS

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