

## Liverpool John Moores University

Title: ROBOTICS  
Status: Definitive  
Code: **5507NCCG** (129440)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Nelson Campus

Team	Leader
Christian Matthews	Y

**Academic Level:** FHEQ5  
**Credit Value:** 20  
**Total Delivered Hours:** 60  
**Total Learning Hours:** 200  
**Private Study:** 140

### Delivery Options

Course typically offered: S1, S2, Sum, NS2 (S2 for Jan)

Component	Contact Hours
Lecture	48
Practical	12

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Assignment	100	

Competency	NCC Group Pass/Fail
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### Aims

*This module will develop students' understanding of the operation and control of industrial robots and will give them the knowledge and skills needed to work safely when designing, working with and producing programs for robots and or robot work cells.*

*The module will cover robot control systems and the different types of sensors, drive systems and end effectors used and their application when used as part of an*

*industrial robot production systems. Students will gain an understanding of the programming methods used and will be involved in applying a range of mechatronics technologies for the design, development, and control of advanced robots. The module will also give learners an understanding of the health and safety and maintenance requirements associated with modern industrial robots.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Demonstrate an understanding of sensor motor coordination and apply the concept to robotics
- 2 Develop a system to control a simple robot arm, being aware of the kinematic aspects.
- 3 Navigate a simple mobile robot using appropriate software.

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

Assignment	1		
NCC Group Pass/Fail		2	3

## **Outline Syllabus**

*Types of robots: mobile robotics, tools and end effectors, programming methods, robot manipulators (kinematics, design, dynamics and control, vision systems, user interfaces)*

*Safety: Cell safety features Operating envelope Operational modes User interfaces  
Robot arm control system design*

## **Learning Activities**

### **Lectures**

These will not normally be traditional didactic lectures in which the student plays little active part, but will be delivered in small groups of up to 20 students in which their interaction with their tutor is a key ingredient of their learning experience.

The material of this module requires the development of significant practical skill. This will be taught within the lecture time, making these sessions a blend of lecture and workshop time. The sessions will be timetabled in spaces with physical resources appropriate to the delivered content.

Students will receive approximately 30 hours of taught material, supported by in-class exercises and discussions designed to help student assimilate learning and to provide early informal feedback on their progress.

## Practical Work

This module contains directed practical work that students will undertake under the supervision of teaching staff and/or technicians. Some elements of this practical work will form part of the assessment for this module.

## Independent Study

Students are expected to undertake personal reading and research into topic areas that have been stimulated from the lectures and seminars. This reading will enhance their academic work and enable valid contribution to lectures and seminars.

## VLE support

This will provide links to academic web-sites and on-line journals, facilitate group discussion outside of the classroom, access to outline lecture notes, and provide students with assessment details.

## Notes

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