# Module Definition Form (MDF)

| Module code: MOD003416 | **Version:** 3 **Date Amended:** 07/Feb/2023 |
|---|---|

| 1. Module Title |
|---|
| Automation and Robotics |

| 2a. Module Leader |
|---|
| Mohamed Yehia |

| 2b. School |
|---|
| School of Engineering and the Built Environment |

| 2c. Faculty |
|---|
| Faculty of Science and Engineering |

| 3a. Level |
|---|
| 7 |

| 3b. Module Type |
|---|
| Standard (fine graded) |

| 4a. Credits |
|---|
| 15 |

| 4b. Study Hours |
|---|
| 150 |

**5. Restrictions**

| Type | Module Code | Module Name | Condition |
|---|---|---|---|
| Pre-requisites: | None | | |
| Co-requisites: | None | | |
| Exclusions: | None | | |
| **Courses to which this module is restricted:** | | | |

## LEARNING, TEACHING AND ASSESSMENT INFORMATION

### 6a. Module Description

In this module you will focus on the area of smart automation technology and robots in conjunction with intelligent systems and adaptive machine communication. You will gain a comprehensive overview of the technical aspects and state-of-the art methods in design and operation, acquiring knowledge and concepts for automation, programming and interaction of these intelligent systems in Flexible Manufacturing cell. You will also explore their adaptability to change of settings, looking at the capabilities, limitations and future trends in robot systems in order to specify and plan robot installations with major phase in design and operation of automated industrial applications for manufacturing functions.

### 6b. Outline Content

- Introduction to automation and control fundamentals; robotics and intelligent machines/ systems
- Automation through theory of systems
- Principles and methods of optimized automatic assembly for serial production line.
- Planning and implementation of automation
- Automatic process control logic and sequence
- Automated materials handling and storage
- Hardware & Software Integration
- Robot technology and applications
- Robot Programming

### 6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

### 6d. Specialist Learning Resources

Module Study Guide

### 7. Learning Outcomes (threshold standards)

| No. | Type | On successful completion of this module the student will be expected to be able to: |
|---|---|---|
| 1 | Knowledge and Understanding | Systematically identify the technical, social, and economic factors for the applications of automation and robotics in manufacturing systems and the latest technology available to automate major manufacturing functions. |
| 2 | Knowledge and Understanding | Comprehensively understand the architecture of automation and robotics along with the techniques involved in communication and integration in manufacturing systems. |
| 3 | Intellectual, practical, affective and transferrable skills | Analyse the operational capabilities, limitations, and future trends in robot systems to specify, operate and plan robot installations with a focus on mathematical modelling and engineering principles. |
| 4 | Intellectual, practical, affective and transferrable skills | Select and critically evaluate technical literature and other sources of information to solve complex problems related to the design and operation of automated industrial applications. |

| 8a. Module Occurrence to which this MDF Refers | | | | |
|---|---|---|---|---|
| **Year** | **Occurrence** | **Period** | **Location** | **Mode of Delivery** |
| 2025/6 | ZZF | Template For Face To Face Learning Delivery | | Face to Face |

| 8b. Learning Activities for the above Module Occurrence | | | |
|---|---|---|---|
| **Learning Activities** | **Hours** | **Learning Outcomes** | **Details of Duration, frequency and other comments** |
| Lectures | 18 | 1-3 | 1.5 hours lectures per week. |
| Other teacher managed learning | 18 | 2-3 | 1.5 hours tutorials and laboratory work. |
| Student managed learning | 114 | 1-4 | Private study and student-managed group. |
| TOTAL: | 150 | | |

| 9. Assessment for the above Module Occurrence | | | | | |
|---|---|---|---|---|---|
| **Assessment No.** | **Assessment Method** | **Learning Outcomes** | **Weighting (%)** | **Fine Grade or Pass/Fail** | **Qualifying Mark (%)** |
| 010 | Coursework | 1 2 4 | 60 (%) | Fine Grade | 40 (%) |
| **Assignment 1500 words** | | | | | |
| **Assessment No.** | **Assessment Method** | **Learning Outcomes** | **Weighting (%)** | **Fine Grade or Pass/Fail** | **Qualifying Mark (%)** |
| 011 | Examination | 1 3 | 40 (%) | Fine Grade | 40 (%) |
| **Exam 1.5 hours** | | | | | |

**In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).**

**In addition, students are required to:**
**(a) achieve the qualifying mark for each element of fine graded assessment as specified above**
**(b) pass any pass/fail elements**

**[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]**