MODULE SPECIFICATION

Part 1: Information			
Module Title	Programmable Logic Controller Design		
Module Code	UFMFHM-15-2	Level	Level 5
For implementation from	2018-19		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards			
Module type:	Standard		
Pre-requisites	Digital Principles for Robotics 2018-19, Electrical and Electronic Principles B 2018-19, Practical Electronics 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Overview: This module is designed to introduce students to the basic working principles of Programmable Logic Controller (PLC), construction, functions of input and output with the aim of creating a sound fundamental knowledge of designing and operating engineering systems. **Educational Aims:** In addition to the learning outcomes. the educational experience may develop through practice but not formally discretely assess self-management skills and working with others. **Outline Syllabus:** The students will learn to model and analyse the performance of real-world engineering systems using a series of lectures, tutorials and simulation based laboratory work. The module also involves studying relevant literature on environmental and sustainability limits, ethical, health, safety, security and risk issues, and code of practice and standards issues. The syllabus outline includes design, structure and operation of PLC: working principles, characteristics, function of each section of PLC, operational procedure of PLC. Ladder Programming: covers all functions and operational procedures and examples covering variety of applications such as start/stop motor control, motor speed control, moving a pneumatic piston,

counting and balancing, pick and place unit and control of robots and work cells. PLC interfacing digital and analogue devices and communication aspects of PLC.

Teaching and Learning Methods: Concepts and the scope of the syllabus topics will be introduced in lectures, supported by directed reading and lab experiments/simulation based work. The labs sessions will enhance the understanding of students of real-world applications of the material delivered in the module. The students will learn through applying a variety of analysis methods, ladder programming and simulation tools to design PLC systems.

Relevant ethical issues will be highlighted and students will be encouraged to consider these further through directed reading.

In addition to 36 hours of scheduled contact, students will be expected to spend (typically) 92 hours in independent study, preparation for classes, assimilation of knowledge and skills development. The assessment strategy involving submitting a research based assignment and end of module examination will require (typically) 22 hours.

Scheduled learning includes lecture and tutorials/practical classes.

Independent learning includes hours engaged with essential reading, assignment preparation and completion etc. These sessions constitute an average time per level.

Part 3: Assessment

The assessment consists of an end of module examination and an individual assignment.

The strategy has been chosen to ensure that the engineering principles are assessed under controlled conditions, while a more open ended research based assignment is used to encourage wider engagement and reflection on this topic.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Report: maximum page limit 15 (excluding appendices and any additional material)
Examination - Component A	✓	50 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Report: maximum page limit 15 (excluding appendices and any additional material)
Examination - Component A	✓	50 %	Examination (2 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Apply concepts and working principles of programmable logic controller (PLC) used in advance engineering processes
MO2	Apply engineering and scientific principles of other disciplines to support real-world implementation of PLC

	MO3	Identify, classify and describe the performance of systems containing PLCs through the use of ladder programming techniques
	MO4	Investigate and design engineering application with PLC by identifying constraints including environmental and sustainability limits, ethical, health, safety, security and risk issues, and code of practice and standards
	MO5	Identify the commercial and economic and social context of engineering applications that integrate PLC systems
	MO6	Apply quality standards to the design of systems containing PLCs

Contact Hours		
	Contact Hours	
	Independent Study Hours:	
	Independent study/self-guided study	114
	Total Independent Study Hours:	114
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	36
	Total Scheduled Learning and Teaching Hours:	36
	Hours to be allocated	150
	Allocated Hours	150

Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/index.html