University of East Anglia

ACADEMIC PARTNERSHIPS

Module Outline **Part 1- as validated**

1.	**Title**	**Engineering Automation and Manufacture**
2.	**Level ***	**6**
3.	**Credits**	**20**
4.	**Indicative Student Study Hours**	**24 hours lectures** **176 hours self-directed learning**
5.	**Core (must take and pass), Compulsory (must take) or Optional**	**Compulsory**

5. Brief Description of Module (purpose, principal aims and objectives)

This module is intended to cover the fundamentals of automation and control, where an understanding of how processes are controlled and automated will be achieved through the study of control theory, motion control and process control.

Students will understand modelling and control of modern automated equipment, through the study of industrial robots and programmable logic controllers. Approaches to equipment control PLC, automated assembly, design and operation of automated manufacturing systems, selection, specification and justification of an automated system including a plc system, will be covered as part of manufacturing systems – which will focus on the justification, design and operation of manufacturing systems that comprise of automated equipment.

Major topics covered are:

Robotics: robot types, mobile robots, end effectors/manipulators.

PLC's: system operational characteristics, programming languages, programming methods, communication standards, sensors, actuators, interfacing, fault finding, de-bugging methods.

Health and safety, safe working practices, risk assessments, cell safety features, programming languages, programming methods.

The module will provide students with the essential skills needed to develop automated manufacturing systems for practical applications.

Produce all elements of a PLC program for a given industrial task and analyse its performance; apply fault finding techniques and de-bugging methods.

Module 05H: Engineering Automation and Manufacture **Learning Outcomes - On successful completion of this module a student will be able to:**	
	Subject Specific Learning Outcomes
1	Critically evaluate the practical application of automated systems in manufacturing.
2	Analyse and implement major control systems on a practical automated system, based on critical evaluation.
3	Apply independent research and analysis, thinking creatively to solve engineering challenges.
	Generic Learning Outcomes
4	Critically evaluate own learning and development, take responsibility for it, and apply reflection for improvement.
5	Analyse and evaluate ideas and concepts by considering information from a range of perspectives, including ethical considerations.

7. Assessment

Pass on aggregate or Pass all components *(modules can only be pass all components if this is a PSRB requirement)*	Pass on aggregate

Summary of Assessment Plan

	Type	% Weighting	Anonymous Yes / No	Word Count/ Exam Length	Learning Outcomes Coverage	Comments
Note: Formative assessments are available during booked tutorial sessions.						
1.	Investigative report	50%	Yes	2000 words	LO 3, 4, 5	
2.	Practical experiment evaluation	50%	Yes	2000 words and supporting video (up to 5 minutes)	LO 1, 2	

Further Details of Assessment Proposals

Give brief explanation of each assessment activity listed

Formative Assessment:

Formative assessments provide you with preliminary guidance, feedback, and feedforward on your proposed submissions. You should aim to book tutorial sessions and send your lecturers any work or areas of concern ahead of the session. This ensures you receive the best guidance possible during your session. Please note, the quality of work sent across will directly influence the quality of feedback received, so ensure the work is detailed and in context.

In addition to tutorial sessions, you will also participate in in-class exercises which constitute part of the formative assessments. These exercises are designed to reinforce the module content and provide immediate feedback on your understanding.

Investigative report:

The student will research and report on the applications of robotic systems in the UK manufacturing industry with particular emphasis on cost effectiveness, sustainability and future applications of those systems.

Practical experiment evaluation:

The student will design and produce all elements of a PLC program for a given industrial task and analyse its performance. The practical element will involve the student applying safe working practices, fault-finding, and de-bugging methods.

In addition, students are required to provide up to five minutes of supporting video evidence of their experiment.

8. Summary of Pre and / or Co Requisite Requirements
Not applicable

9. For use on following programmes
BEng Engineering