PRIFYSGOL glyndŵr UNIVERSITY

MODULE SPECIFICATION FORM

Module Title:	**Programmable Logic Controllers (PLCs)**	Level:	**5**	Cedit Value:	**10**

Module code: (if known)	**ENG50H**	Cost Centre:	**GAEE**	JACS2 code:	**H131**

Semester(s) in which to be offered:	**1**	With effect from:	**July 2015**

Office use only: To be completed by AQSU:	Date approved: July 2015 Date revised: Version No: 1

Existing/New: **new**	Title of module being replaced (if any): N/A

Originating Academic area: **Engineering and Applied Physics**	Module Leader: **R Holme**

Module duration (total hours)	100	**Status:** core/option/elective (identify programme where appropriate):	**Free-standing 10-credit component comprising first half of ENG535 (Programmable Automation Controllers).**
Scheduled learning and teaching hours	36		
Independent study hours	64		
Placement hours	0		

Percentage taught by Subjects other than originating Subject (please name other Subjects):	**0%**

Programme(s) in which to be offered: **Enginering European Programme** (Non Award Bearing)	Pre-requisites per programme (between levels):	**None**

Module Aims:

The module aims to introduce an understanding of PLCs and the principles of interfacing and programming PLCs in discrete control systems.

Expected Learning Outcomes

Knowledge and Understanding:
At the completion of this module, the student should be able to:

1. Apply the knowledge of logic programming methods and functionality of basic and intermediate instruction set; *(KS 4)*
2. Establish PLC interfacing and communications, upload/download programmes, monitor on line operation, edit existing, and develop new PLC programmes whilst considering system performance; *(KS 3)*

Key skills for employability

1. Written, oral and media communication skills,
2. Leadership, team working and networking skills
3. Opportunity, creativity and problem solving skills
4. Information technology skills and digital literacy
5. Information management skills
6. Research skills
7. Intercultural and sustainability skills
8. Career management skills
9. Learning to learn (managing personal and professional development, self management)
10. Numeracy

Assessment: *Please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%).*

Assessment is by means of a portfolio (practical work) several exercises developing knowledge of PLC functionality and programming methods.. It covers both outcomes.
(This corresponds to Assessment 1 of ENG535.)

Assessment number (use as appropriate)	Learning Outcomes met	Type of assessment	Weighting	Duration (if exam)	Word count (if coursework)
Assessment One:	1, 2, 3	Portfolio	100%		2000

Learning and Teaching Strategies:

Lab work – The student will have practical 'hands on' experience using Industrial standard PAC equipment and software. This is intended to develop, in stages, their learning and understanding. A series of lab exercise sheets will be used in order to affirm competency of specified outcomes.

Syllabus outline:

- Principles of PLC control;
- Interfacing with field devices;
- Familiarisation with industry standard PLC equipment;
- Software familiarisation – Programme configuration for hardware, communications configuration, menus, sub-menus, file structure and trees, memory allocation, data monitoring, editing, upload/download, communication protocols;
- Principles of logic programming – discrete devices, analogue devices, mathematical functions, functions used in data manipulation and control;

Bibliography:

Essential reading:
Tubbs, S.P. (2007) *Programmable Logic Controller Tutorial, Siemens Simatic S7-200*, Siemens.
Bolton, W. (2009) *Programmable Logic Controllers*, 5th Edn., Newnes.

Recommended reading:
Petruzella, F.D. (2010) *Programmable Logic Controllers*, 4th Edn., McGraw-Hill Higher Education.