MODULE SPECIFICATION

Part 1: Information			
Module Title	Intelligent and Adaptive Systems		
Module Code	UFMF99-15-3	Level	Level 6
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	Robotics [Jan][PT][Frenchay][2yrs] MRes 2018-19 Robotics [Sep][FT][Frenchay][1yr] MRes 2018-19 Robotics [Sep][PT][Frenchay][2yrs] MRes 2018-19 Robotics [Jan][FT][Frenchay][1yr] MRes 2018-19		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Educational Aims: See Learning Outcomes. **Outline Syllabus:** Introduction: Review of the links with other disciplines, e.g. classical AI, psychology, robotics, ethology, neuroscience and classical control. Scope and limitations of this module, especially with respect to classical control and AI. Learning and adaptive systems: Working definitions of intelligence, adaptive systems and

learning. Adaptation through learning versus design.

Basic Architectures: Neural networks. Fuzzy systems. Evolutionary computation. Supervised, unsupervised and reinforcement learning.

Example applications: Review of work carried out in this Faculty, and at other establishments, in order to demonstrate the major strengths and weaknesses of the techniques. For example; intelligent multiple agents for fault diagnosis in electrical power distribution systems, fuzzy control of an automated underground transportation system, co-operative behaviour in multi-agent mobile robotics, neurocontrol of an industrial robot manipulator, fuzzy classifier systems for telecommunications network routing, evolutionary computation as an aid to engineering design, human face and handwriting recognition using neural networks.

Teaching and Learning Methods: Lectures will introduce the fundamental concepts. Tutorial case study sessions will be used for two purposes. They will be used to expose students to demonstrations of the basic architectures in action. They will also be used to discuss real implementations of these new techniques, each designed to illustrate the essential details of a particular concept or technique, and especially its strengths and weaknesses in both technical and business contexts. At all times specific examples will be used to "ground" the theory and students will use the case study material to contribute towards the coursework assignment.

Scheduled learning includes lectures, tutorials, practical classes and workshops; work based learning; supervised time in studio/workshop.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

Contact: 36 hours
Assimilation and skill development: 66 hours
Undertaking Coursework: 24 hours
Exam preparation: 24 hours
Total: 150 hours

Part 3: Assessment

End of module examination to assess individual abilities on problem analysis and subject knowledge.

One coursework assignment that assesses practical design and implementation abilities and understanding of a chosen topic from the syllabus.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Written Assignment - Component B		50 %	Assignment (2500 words)
Examination - Component A	✓	50 %	Examination (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Written Assignment - Component B		50 %	Assignment (2500 words)
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	Show a knowledge and understanding of the critical features of intelligent and adaptive systems
MO2	Show a knowledge and understanding of appropriate terminology and working definitions in the subject
MO3	Compare the characteristics of the advanced new techniques covered in this module with traditional approaches to selected problems in signal processing, classification and control
MO4	Demonstrate communication skills
MO5	Demonstrate IT skills in context
MO6	Demonstrate ability to formulate problems, critically analyse them and evaluate appropriate techniques for their solution

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/modules/ufmf99-15-3.html