

Liverpool John Moores University

Title: ARTIFICIAL INTELLIGENCE SYSTEMS
Status: Definitive
Code: **6027ENG** (106367)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Karl Jones	Y

Academic Level: FHEQ6
Credit Value: 12
Total Delivered Hours: 48
Total Learning Hours: 120
Private Study: 72

Delivery Options

Course typically offered: Summer

Component	Contact Hours
Lecture	24
Practical	12
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	Class Test	50	
Report	AS2	Case study	50	

Aims

To provide an introduction to a range of artificial intelligence (AI) techniques and how they can be applied to engineering and technological problems.

Learning Outcomes

After completing the module the student should be able to:

- 1 Design and apply AI and knowledge based systems to engineering applications.
- 2 Develop and evaluate a neural network application.
- 3 Appreciate optimization problems and their solution with genetic algorithms.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Class test	1	
Case study	2	3

Outline Syllabus

Introduction to AI including definitions.

Knowledge based systems: knowledge acquisition and representation, construction, operation, forward and backward chaining.

Neural nets: overview of network architectures and learning schemes, perceptron learning, multi-layer perceptron and backpropagation, implementation.

Genetic algorithms: optimisation and conventional techniques, data coding, reproduction, cross-over, mutation and evolution techniques.

Case studies will illustrate the application and performance of AI methods in engineering, e.g. modelling of systems and signals; pattern recognition; image processing.

Learning Activities

A series of lectures, tutorials, and laboratory assignments. Some additional demonstrations of AI methods and applications may also be given.

Notes

A range of artificial intelligence (AI) techniques will be studied. Case studies will illustrate the application of AI to engineering problems. Students will gain hands on use of implementing AI methods using computer software packages.