

Liverpool John Moores University

Title: AI & Machine Learning
Status: Definitive
Code: **5174CSD** (125572)
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering
Teaching School/Faculty: Engineering

Team	Leader
Karl Jones	Y

Academic Level: FHEQ5
Credit Value: 20
Total Delivered Hours: 55
Total Learning Hours: 200
Private Study: 145

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	22
Practical	22
Tutorial	11

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	ASS 1	2,000 word report	50	
Report	ASS 2	2,000 word report	50	

Aims

Artificial intelligence as a concept has been around for many years but more recently has become a very prominent and socially acceptable technology. From self-driving vehicles, healthcare and medical diagnosis, through to robot manufacture, intelligent machines and Amazon Echo, Apple Homepod or Google Home. AI and machine learning is the technology of the moment and this module will explore the underlying technology and how it is changing our lives.

Learning Outcomes

After completing the module the student should be able to:

- 1 Apply AI and knowledge based systems to design technology applications.
- 2 Apply simulation tools to develop a realistic small fuzzy logic system.
- 3 Apply the fundamental principles of evolutionary computation to develop machine learning and AI systems.

Learning Outcomes of Assessments

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

Report	1	2
Report	1	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.

Evolutionary Computing (introduction), principles, data coding, fundamental operations, Basic GA, Bee Algorithm, etc.

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

Learning Activities

A series of structured lectures, tutorials and practical tasks will provide a varied range of learning activities.

Notes

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