

Module Code	ACCA6011
Title	Artificial Intelligence and Machine Learning
Date	06/01/2020
Level	6
Credits	20
Pre-Requisites	None

AIM(S)

- To develop students' systematic understanding of AI and machine learning principles and techniques used in Software Engineering, Games, Visualisation and Interactive Applications.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Critically analyse, evaluate and apply A.I. and machine learning methods to solve given problems.
- Analyse practical problems and synthesise appropriate software solutions using selected AI/machine learning methods.

INDICATIVE CONTENT

- Definition and review of Artificial Intelligence, General History, Contextualised AI eg Games AI.
- Review of probability and statistics
- Trigger systems, terrain analysis, obstacle evasion, movement, influence maps
- Decision-making and the development of methods for controlling and implementing behaviour of agents, for example, fuzzy logic, knowledge representation, state machines. rule-based systems, decision trees, etc.
- Search, Local search methods
- Evolutionary computing.
- Machine Learning: unsupervised/ supervised learning, Classifying, Naïve Bayes, Clustering, K-means, Function approximation/ neural nets, Bayesian networks

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	48	24%
Independent learning	152	76%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Exam	2 hours	50%

Assessment Component 2

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Implementation	2500-word equivalent	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	0%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACCA6011	
Module Title	Artificial Intelligence and Machine Learning	
Classification	Reading List entry	Electronic*
Essential	Russell, S. and Norvig, P. (2016) Artificial Intelligence: A Modern Approach (3rd edition) Prentice Hall	☒
Essential	Millington, I. (2019) Artificial Intelligence for Games, 3 rd edition, CRC Press	☒
Essential	Geron, A. (2019) Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems. O'Reilly	☒
Further	Bishop, C.M. (20016) Pattern Recognition and Machine Learning, Springer	☐
Further	Mark, D. (2009) Behavioral Mathematics for Game AI, Delmar	☐
Further	Schwab, B. , AI Game Engine Programming (2nd Edition), Charles River Media (2009)	☐
Further	Barber, M. (2012) <i>Bayesian Reasoning and Machine Learning</i> , Cambridge University Press	☐