COMP H4202: AI for Games

Module Title:	Artificial Intelligence for Games
Language of Instruction:	English

Credits:	10

NFQ Level:	8

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	As well as traditional lectures students will undertake various laboratory exercises implementing various algorithms. They will be expected to participate in class on the materials covered. A term paper will involve a more in-depth study of the issues raised.

Module Aim:	To introduce the formal theory behind, the current techniques in, and the application of Artificial Intelligence in Games.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Demonstrate a familiarity with the logical foundations of symbolic AI
LO2	Demonstrate a familiarity with non symbolic approaches to AI
LO3	Compare and contrast a number of adversarial search techniques
LO4	Illustrate different techniques for modelling/implementing the Game space
LO5	Apply appropriate AI techniques to solve various Gaming problems

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is recommended before enrolment in this module.*
No recommendations listed
Incompatible Modules *These are modules which have learning outcomes that are too similar to the learning outcomes of this module.*
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements *This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.*
No requirements listed

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Module Content & Assessment

Indicative Content
What is Intelligence? Turing Test. Chinese Room. Philosophical Implications, AI in Games Context.
Basic Behaviours Flocking, Swarming, Chasing, Evading.
Group Behaviours Flocking, Swarming, Coordinated movements, Squads
Search Search space, Basic search algorithms, Heurisitc Search, A* Search, Advanced A* variants
Game Search Mini-max search, alpha-beta search, search space pruning
Basic Decision Making Finite State Machines, Decision Trees
Fuzzy Logic Fuzzification, Fuzzy Rule Application, Defuzzification, Combs Method
Probability Basic Probability, Bayes rule, Bayesian Reasoning (Networks)
Artificial Neural Networks Perceptron, Multilayer Networks, Backpropagation, Hopfield Networks, Simmulated Annealing
Genetic Algorithms Genetic encoding, Genetic Operators, Selection
Agent based AI. BDI Architecture. Subsumption Architecture

Assessment Breakdown	%
Continuous Assessment	40.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Case Studies	n/a	1,2,3,4,5	25.00	n/a
Practical/Skills Evaluation	n/a	1,2,3,4,5	15.00	n/a

No Project

No Practical

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	n/a	1,2,3,4,5	60.00	End-of-Semester

ITCarlow reserves the right to alter the nature and timings of assessment

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Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	30 Weeks per Stage	2.00
Laboratory	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	3.20
	Total Hours	216.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_KCCGD_B	Bachelor of Science (Honours) in Computer Games Development	4	Mandatory