**De Montfort University**

**Module template proforma**

**Basic module information**

Module Title: Artificial Intelligence for Simulation

|  |  |  |
| --- | --- | --- |
| Module Code: IMAT2904 | Credit value: 15 | Credit level: 5 |

Owning Board: GMIS

Faculty: Technology

Term/semester: Term 2

Module Leader: Liang Hu

Module pre-requisites (module code/s only):

Maximum student numbers on module (if applicable):

**Module description** (including outline content)

Many applications of modern computing involve processes of assessment and decision making which used to be solely within the domain of human beings. Uses of Artificial Intelligence are widespread globally - from search engine algorithms on the internet to making decisions on credit worthiness to route finding in virtual worlds. This module covers in outline the major techniques of Artificial Intelligence and focuses on applications in computer games programming and simulation which use these techniques. The general methods of AI include knowledge based reasoning, graph-based search algorithms, probabilistic reasoning, finite state machines, flocking and behavioural trees. Students will be required to explore the implications of their knowledge and use of these intelligent technologies with reference to ethical codes of relevant professional bodies and legal responsibilities.

Outline content: graphs and search: BFS, DFS, A\*, JPS.Forward and backwards chaining rule systems, finite state machines, behavioural trees, flocking behaviours and probabilistic reasoning.

**Learning outcomes**

|  |  |
| --- | --- |
| 1  2 | Know the principal areas of Artificial Intelligence which relate to the global games programming industry.  Be able to implement a simple AI software system and demonstrate it successfully. |

**Assessment**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Type of assessment** | **Duration/**  **volume** | **Assessment weighting %** | **Final assessment Y/N** | **Minimum threshold mark %** (if not 40% for UG, 50% for PGT) | **Essential component Y/N** | **Learning outcome(s)**  **assessed** | **Anonymously marked**  **Y/N** |
| **Groupwork** | **Report to be about 10-20 pages. Presentation 5-10 minutes** | **100** | **Y** |  |  | **LO 1**  **LO 2** | **N** |
|  |  |  |  |  |  |  |  |

**Assessment Notes**

A group coursework will test the students’ knowledge through the practical application of AI to a simple problem realised in software. The assessment comprises of software development, a report on their findings and a short presentation.

**Reassessment**

By failed component.

**Expected methods of delivery**

Please include learning and teaching activity hours for the module in this section, for example:

Lecture 15 hours  
Seminar 30 hours  
Practical 40 hours  
Self-directed study 45 hours  
Assessment 20 hours  
A list of the activities which can be included is available in the guidance on the Department of Academic Quality web pages: <http://www.dmu.ac.uk/documents/about-dmu-documents/quality-management-and-policy/academic-quality/programme-approval-management/module-template-guidance-notes.pdf>

**Module delivery variations** (if applicable)