

Module title Artificial Intelligence for Video Game Development				
Module code Tba	Level Bachelor (B.Sc.)	Hours per week 4	ECTS credits 5	Duration ~2 weeks block course + virtual lectures
Module instructor Aaron Hunter, British Columbia Institute of Technology		Lecture type Lectures + Guided Lab Sessions	Prerequisite(s) Intermediate Programming Ability	Grading Midterm, Final, lab exercises, 5 assignments
<p>Objectives In the broadest sense most games incorporate some form of artificial intelligence (AI). This course provides students with an opportunity to explore theoretical and practical aspects of Artificial Intelligence for computer games. Topics include chasing and evading, pattern movement, flocking, path finding, A* path finding, finite state machines, fuzzy logic, rule-based AI, neural networks and genetic algorithms.</p> <p>On successful completion of this module, students will be able to demonstrate knowledge and understanding of:</p> <ul style="list-style-type: none"> • The distinction between video game AI and academic AI. • Basic algorithms and approaches to creating character AI in a game setting. <p>Learning Outcomes</p> <ol style="list-style-type: none"> 1. Describe the various AI algorithms and methods that are currently used in games development. 2. Describe AI algorithms for movement and pathfinding in video games. 3. Describe AI algorithms for decision making in video games. 4. Differentiate between deterministic and non-deterministic AI. 5. Implement AI programs to create believable simulations of an opponent. 6. Apply machine learning algorithms to basic problems, such as classification. 7. Implement adversarial search algorithms for games. 				
<p>Content</p> <ul style="list-style-type: none"> • Academic AI versus Game AI • Movement algorithms and steering behavior • Pathfinding algorithms • Decision Making: Decision Trees, Finite State Machines, Behaviour Trees, Fuzzy Logic, Goal-Oriented behavior, Rule-based Systems • Learning: Naïve Bayes Classifiers, Decision Tree Learning, Reinforcement Learning, Neural Networks • Board game AI: Minimax • Strategic AI 				
<p>Textbook/teaching material</p> <ul style="list-style-type: none"> • Artificial Intelligence for Games, 2nd Edition, Ian Millington and John Funge, 2009, Morgan Kaufmann. 				

Note: this is not the official course descriptor according to the "Studien- und Prüfungsordnung" (SPO)