Course descriptor F21GP

Course code	**F21GP**
Course title	Computer Games Programming
Credits	15
School	Mathematics and Computer Sciences
SCQF Level	11
Semester	2
Aims	This course aims to develop programming skills and techniques specific to the area of 2D and 3D computer games.
Syllabus	• Computer Games Design Concepts (Genres, Narrative and Fun). • Elements of Game Design (Formal, Dramatic and System Dynamics). • Character and World Design. • Design Programming Patterns (Input, loops, structures, objects and optimisation). • Games Creation Concepts (Conceptualisation, Prototyping, Playtesting). • Game-state, simulator, renderer, (hierarchical) controllers. • Tools, environments and coding practices– e.g. graphics, C++ and engines. • 2D and 3D game programming techniques. • Physically-based modelling, particle systems, flocking. • Obstacle avoidance and path planning. • Group movement. • Learning and adaptation in games. • Action and behaviour selection. • Procedural Generation. • Course summary and review.

Learning Outcomes	
Subject Mastery	• Critical appreciation of game theory and computer games history, genres and impact • Ability to critically evaluate game design concepts, elements and characters. • Critical understanding of available tools and their application. • Knowledge of algorithms for path planning and navigation • Understanding and knowledge of physically-based modelling in games and selection of techniques.

	• Understanding and knowledge of AI techniques in games and selection of techniques. • Ability to design and implement a small-scale game using 2D and 3D tools. • Practical skills in graphics and AI programming in the computer games context.
Personal Abilities	• Representation of, planning for, and solution of problems. • Ability to plan, design, prototype, critically evaluate and communicate a game. • Ability to think and plan in three dimensions. • Team working skills.

Assessment method	50% written examination, 50% coursework (joint project)