F21GP Computer Games Programming

COURSE DETAILS
Course Code: F21GP
Full Course Title: Computer Games Programming
SCQF Level: 11
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: Yes  Postgraduate Research: Yes

Additional Information:

COURSE AIMS
To develop programming skills and techniques specific to the area of 2D and 3D computer games

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.

LEARNING OUTCOMES – PERSONAL ABILITIES

- Ability to think and plan in three dimensions
- Representation of, planning for, and solution of problems

Team working skills

Ability to plan, design, prototype critically evaluate and communicate a game

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.

NOTE: A pre-requisite of this course is that students must have C++ programming skills

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