**COURSE DETAILS**

**Course Code:** F20GP  
**Full Course Title:** Computer Games Programming  
**SCQF Level:** 10  
**SCAF Credits:** 15  
**Available as Elective:** No

**DELIVERY LEVEL**

<table>
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<tr>
<th>Undergraduate:</th>
<th>Yes</th>
<th>Postgraduate Taught:</th>
<th>No</th>
<th>Postgraduate Research:</th>
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**Additional Information:**

**COURSE AIMS**

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

**LEARNING OUTCOMES – SUBJECT MASTERY**

- Understanding of game theory and computer game history, genres and impact  
- Understanding of game design concepts, elements and characters.  
- Understanding of available tools and their application  
- Knowledge of algorithms for path planning and navigation  
- Knowledge of physically-based modelling in games and selection of techniques  
- Knowledge of AI techniques in games and selection of techniques  
- Ability to understand, 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 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.
F20GP Computer Games Programming

- 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.

Prerequisites: C++ programming skills

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<th>COURSE RELATIONSHIPS</th>
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<th>LOCATION AND ASSESSMENT METHODS</th>
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