F20GA 3D Graphics and Animation

COURSE DETAILS
Course Code: F20GA
Full Course Title: 3D Graphics and Animation
SCQF Level: 10
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

Additional Information:

COURSE AIMS
Investigate Computer Graphics theory and develop programming skills in 2D/3D Graphics and Animation.

LEARNING OUTCOMES – SUBJECT MASTERY
- Understanding and categorising Computer Graphics concepts.
- Ability to identify core 3D elements and structures.
- Investigation of scene graphs, hierarchical models, and spaces.
- Ability to contrasts different material, lighting and shadowing models.
- Develop and implement animation concepts and systems.
- Ability to design, understand and implement a small-scale rendering and animation system.
- Understanding and research into transformations, modelling, and projection concepts

LEARNING OUTCOMES – PERSONAL ABILITIES
- Ability to think, plan, and construct in three dimensions.
- Ability to plan, design and implement a rendering and animation system.
- Skills integrating graphics and animation in various industries.
- Representation of, planning for, and solution of problems

SYLLABUS
- Vertices, triangles, meshes, display lists and models.
- Hierarchical modelling and scene graphs understanding and representation.
- 2D and 3D transformations, homogeneous co-ordinates, matrices multiplication.
- Model, world, camera, scene and projection spaces.
- Instancing and tessellation.
- Materials, texture mapping and shading.
F20GA 3D Graphics and Animation

- Lighting and global illumination models.
- Shadows, occlusions and reflections.
- Real-time and offline rendering pipelines.
- Basics of procedural and physical animations.
- Animation systems and concepts.
- Animation skeletons, poses, clips, skinning and blending.
- Tools, environments, coding practices and industrial applications.
- Course summary and review.

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Part of the coursework-based assessment of the course is a class-test on the fundamental concepts of 3D Graphics and Animation, this class-test contributes 40% to the overall mark.