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 contrast 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.

**COURSE RELATIONSHIPS**

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<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Title</th>
<th>School</th>
<th>Type</th>
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<tbody>
<tr>
<td>F27SG</td>
<td>7</td>
<td>Software Development 3</td>
<td>School of Math and Comp Sci.</td>
<td>Pre-Requisite</td>
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**LOCATION AND ASSESSMENT METHODS**

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<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
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<th>Malay</th>
<th>IDL</th>
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<tbody>
<tr>
<td>Y</td>
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<td>Assessment</td>
<td>Semester 2</td>
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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.