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.

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>
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<td>Assessment</td>
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<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.