Module Title **Interactive 3D Graphics** **Keywords** 3D Modelling, 3D Rendering, Ray Tracing, 3D Modelling Tools	Reference CM4044 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved April 2005 Amended August 2007 Version No. 5

This Version is No Longer Current

Prerequisites for Module

None, in addition to course entry requirements.

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to evaluate the use of 3D graphics primitives, and the principles of modelling and rendering used in 3D graphics.
To provide the student with the ability to build

Global illumination: ray tracing, acceleration techniques, data structures, radiosity, hybrid methods.

3D modelling tools: use of an interactive 3D modelling system.

Indicative Student Workload

Contact Hours	Full Time
Lectures/Tutorials	24
Laboratories	24
Coursework preparation	17
Assessment	10
Directed Study	
Information gathering	24
Private Study	
Private Study	51

the ability to build interactive 3D graphics applications.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1. Evaluate and assess algorithms for the rasterisation of 2D graphics primitives.
2. Describe and evaluate techniques for modelling and transforming objects in 3D space.
3. Describe and evaluate techniques for shading and texturing object surfaces.
4. Evaluate and illustrate techniques for global illumination modelling.
5. Design and implement 3D models and scenes using suitable modelling tools.

Indicative Module Content

Display systems: raster refresh graphics displays, frame buffers, RGB colour systems.

Rasterisation: lines, polygons, 2D clipping, antialiasing.

Mode of Delivery

Key concepts are introduced and illustrated through lectures. The understanding of students is tested and further enhanced through interactive tutorials. In the laboratories the students will progress through a sequence of exercises to develop sufficient knowledge of 3D modelling tools and environments to enable them to complete the practical design and implementation of 3D models.

Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2,3,4
Component 2	5

Component 2 - Coursework

Component 1 - This is a closed book examination.

Indicative Bibliography

1. VAN DER STEEN,J,and BOARDMAN,T.,2009. Rendering With Mental Ray and 3ds Max. 2nd ed. Focal Press.
2. GERHARD,M.,HARPER,J,and MCFARLAND,J.,2009. Mastering Autodesk 3ds Max Design 2010. John Wiley and Sons.

3D modelling: solid modelling, surface modelling, wireframes, meshes, affine transformations, perspective and projection, clipping, viewing systems.

Shading: reflection models, light sources, flat shading, interpolated shading, Gouraud shading, Phong shading, use of depth buffers.

3. BROOKER,D., 2008. Essential CG Lighting Techniques with 3ds Max. 3rd Ed. Focal Press.
4. TOOD, D.,2008. Poly-Modeling with 3ds Max. Focal Press.
5. DRAPER P., 2008. Deconstructing the Elements with 3ds Max. 3rd Ed. Focal Press.