

## Module 9: 3-D Modelling and Animation

<b>Stage</b>		1					
<b>Semester</b>		2					
<b>Module Title</b>		3-D Modelling and Animation					
<b>Module Number</b>		9					
<b>Module Status</b>		Elective					
<b>Module ECTS Credits</b>		5					
<b>Module NFQ level</b>		9					
<b>Pre-Requisite Module Titles</b>		None					
<b>Co-Requisite Module Titles</b>		None					
<b>Capstone Module?</b>		No					
<b>List of Module Teaching Personnel</b>		Dr Waseem Akhtar					
<b>Contact Hours</b>				<b>Non-contact Hours</b>			<b>Total Effort (hours)</b>
36				64			100
<b>Lecture</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Seminar</b>	<b>Assignment</b>	<b>Placement</b>	<b>Independent Work</b>	
18	18			24		40	
<b>Allocation of Marks (Within the Module)</b>							
	<b>Continuous Assessment</b>	<b>Project</b>	<b>Practical</b>	<b>Final Examination</b>	<b>Total</b>		
<b>Percentage Contribution</b>	100				100%		

### Intended Module Learning Outcomes

On successful completion of this module learners will be able to:

1. Implement interactive works comprised of computer graphic 3-D environments and objects;
2. Demonstrate an understanding of the fundamental concepts, principles and techniques of 3D animation
3. Demonstrate an in-depth knowledge of an industry standard 3D modelling and animation package.
4. Plan and create a 3D project from initial conception to final piece.

### Module Objectives

This module deepens the learners' understanding of 3D animation principles. The module fosters awareness of applications of 3D and critical evaluation of

existing 3D products. It encourages the exploration of creative possibilities for integration of 3D to multimedia products.

## Module Curriculum

### Introduction to 3D Workspace

Moving from 2D to 3D—new ways of thinking, new approaches to design, points, vertices, Scene Coordinate System in 3D.

### 3D-Modelling

Object Coordinate System, Spline modelling, Using reference images, Polygonal Modelling, Constructive Solid Geometry, Extrusion, Meshes, Patches, NURBS, Surfaces, subdivision surfaces

### Modelling Irregular and compound Objects

Landforms, Plants, Lofts, lathes, booleans

### Detailing and Lighting

Fundamental Lighting, Colour and Shading Models, Global Illumination, radiosity, Transparency, Texture Mapping, Rendering

### Animation

Motion Generation, Key Framing and Tweening, Morphing, View and Camera Control, Principles of traditional animation as applied to digital animation.

## Reading Lists and other learning materials

### Recommended Reading

<i>3DS Max Modelling for Games: Insider's Guide to Game Character, Vehicle and Environment Modelling: Volume 1 (2<sup>nd</sup> Edition)</i>	Gahan, A.,	Focal	2011
<i>3DS Max Modelling for Games: Insider's Guide to Stylized Modeling: Volume 2</i>	Gahan, A.,	Focal	2011
<i>The Art of 3D Animation and Effects (4<sup>th</sup> Edition),</i>	Kerlow	John Wiley & Sons,	2009

### **Secondary Reading**

3D computer graphics	Watt	Addison-Wesley	1999
Character animation in 3D	Roberts	Focal	2004

Additional reading as recommended by lecturer, appropriate to topic.

### **Module Learning Environment**

Lectures are carried out in class rooms / lecture halls in the College. Lab tutorials are carried out in computer labs throughout the Campus. All have the software required to deliver the programme.

### **Library**

All learners have access to an extensive range of physical and electronic (remotely accessible) library resources. The library monitors and updates its resources on an on-going basis, in line with the College's Library Acquisition Policy. Lecturers update reading lists for this course on an annual basis as is the norm with all courses run by Griffith College.

### **Module Teaching and Learning Strategy**

Learners are taught using a combination of lectures and Practical tutorials. Tutorials are Lab-based and are used to develop the learner's expression in a creative and innovative fashion. The lecturer further explores animation styles and aesthetics and examines the ways in which 3D animation can be integrated into multimedia products. This is further developed in the practical class where the learners are required to demonstrate the ability to think and design in a 3 dimensional fashion.

### **Module Assessment Strategy**

Assessment is 100% continuous. Continuous assessment enables the learner to apply visual design strategies and develop a portfolio of design solutions. In-class critiques and textual analysis add to their understanding of the effective application of the principles of desktop publishing.

Learners are assessed on the following, completed during the course of the module:

Element No.	Weighting	Type	Description	Learning Outcomes Assessed
1	30%	Assignment	The first assignment will cover the concepts of 3D space world coordinate system, Object coordinate system, concepts of vertices, edges, faces, meshes and polygons. This assignment will represent 30% of the overall mark for the module. This assessment focuses on learning outcomes (a) and (b)	1,2
2	70%	Project	Learners will be assigned a project that involves creating and placing 3D models in a 3D space. They will be required to take a basic idea to the finished presentation going through the different steps of 3D modeling, scene creation and animation. Learners will use an industry standard tool to create the models and animations. The focus will be on the steps that learners follow to create a 3D virtual world rather than the finished product. Also, learners will be required to present their progress every week. This progress will be used in the final evaluation of the project. This assignment will represent 70% of the overall mark for the module. This assignment focuses on learning outcomes (a), (c), (d), (e) and (f).	1,3,4,5,6