

## Liverpool John Moores University

Title: 3D MODELLING, ANIMATION AND VISUAL EFFECTS  
Status: Definitive  
Code: **5521YCOM** (118258)  
Version Start Date: 01-08-2011

Owning School/Faculty: Computing and Mathematical Sciences  
Teaching School/Faculty: Kolej Teknologi YPC-ITWEB

Team	Leader
Stephen Tang	Y

**Academic Level:** FHEQ5  
**Credit Value:** 24.00  
**Total Delivered Hours:** 72.00  
**Total Learning Hours:** 240  
**Private Study:** 168

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24.000
Workshop	48.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Artefacts	AS1	Individual project involving low polygon 3D modelling, visual effects production and key frame animation.	40.0	
Artefacts	AS2	Group project involving high polygon 3D character modelling with complex animation and effects.	60.0	

### Aims

*To develop a theoretical knowledge of the concepts and techniques required for 3D modelling and animation.*

*To provide an opportunity to practice the principles of 3D modelling and animation*

*using appropriate tools, techniques and methods.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Explain various animation and modelling techniques to generate motion and visual effects 3D animated sequences.
- 2 Produce a storyboard, compose, and render animation sequences.
- 3 Create low polygon but complex 3D objects and apply key frame animation using 3D modelling software.
- 4 Create high-quality 3D model and apply complex animation using appropriate techniques using 3D modelling software.
- 5 Use 3D Modelling and Animation software tools (for example 3DS Max, Maya or Blender) to produce motion and visual effects for an animated sequence.
- 6 Produce appropriate documentation of the stages and techniques applied for a given computer animation product.

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

Individual project	1	2	3
Group coursework	4	5	6

## **Outline Syllabus**

*Computer Animation: background and history, principles of 3D animation, computer animation software, animation techniques (flip-book, cell, object-orientated, path-based and tweened animations).*

*3D Production: Storyboarding, scene composition and rendering, colour sciences, colour model and image quality.*

*3D Modelling: 3-D coordinate systems, 3D graphics model, 3D modelling techniques constructive (solid geometry and spline), converting 2D shapes to 3D models, operations on 3D model, character and organic modelling.*

*3D Animation: Key-Framing /Track-based Animation, Inverse Kinematics, Forward Kinematic and Pose to pose animation.*

*3D effects: shading, lighting, texturing, particle systems.*

## **Learning Activities**

Formal lectures will deliver theoretical concepts while practical-based workshop sessions, which take place in the computer laboratories, will be used to introduce specific techniques and methods used in the production of 3D models and animation sequences.

## References

<b>Course Material</b>	Book
<b>Author</b>	Murdock, K.L.
<b>Publishing Year</b>	2009
<b>Title</b>	3ds max 2010 Bible
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	John Wiley & Sons
<b>ISBN</b>	0470471913

<b>Course Material</b>	Book
<b>Author</b>	Gahan, A.
<b>Publishing Year</b>	2008
<b>Title</b>	3ds Max Modeling for Games
<b>Subtitle</b>	Insider's Guide to Game Character, Vehicle, and Environment Modeling
<b>Edition</b>	
<b>Publisher</b>	Focal Press
<b>ISBN</b>	0240810619

<b>Course Material</b>	Book
<b>Author</b>	Daniele, T.
<b>Publishing Year</b>	2008
<b>Title</b>	Poly-Modeling with 3ds Max
<b>Subtitle</b>	Thinking Outside of the Box
<b>Edition</b>	
<b>Publisher</b>	Focal Press
<b>ISBN</b>	0240810929

<b>Course Material</b>	Book
<b>Author</b>	Griffin, H.
<b>Publishing Year</b>	2001
<b>Title</b>	The Animator's Guide to 2D Computer Animation
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Focal Press
<b>ISBN</b>	024051579X

<b>Course Material</b>	Book
<b>Author</b>	Bousquet, M.
<b>Publishing Year</b>	2005
<b>Title</b>	Model, Rig, Animate with 3DS Max 7
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	New Riders

<b>ISBN</b>	0321321782
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<b>Course Material</b>	Book
<b>Author</b>	Shirley, P., Marschner, S., Ashikhmin, M., and Gleicher, M.
<b>Publishing Year</b>	2009
<b>Title</b>	Fundamentals of Computer Graphics
<b>Subtitle</b>	
<b>Edition</b>	3rd Edition
<b>Publisher</b>	A K Peters
<b>ISBN</b>	1568814690

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### Notes

This course introduces techniques for computer modelling and animation using a 3D Modelling and Animation software.