UNIVERSITI TEKNOLOGI MARA
CSC732: COMPUTER GRAPHICS, VISUALISATION AND ANIMATION

Course Name (English)	COMPUTER GRAPHICS, VISUALISATION AND ANIMATION `APPROVED`
Course Code	CSC732

MQF Credit	3

Course Description	The course introduces the students to two-dimensional and three-dimensional aspects of computer graphics. It covers major topics in computer graphics modelling and rendering such as primitives drawing, viewing, object representation, rendering and illumination. Animation concepts are also introduced in this course.

Transferable Skills	Describe the basic elements Three Dimensional Object Representation and Visible Surface Detection technique Apply 3D Object Representation, Visible Surface Detection, Illumination Model and Surface Rendering Methods Use the basic logic constructs that will serve as models for any program development Apply basic concept of animation techniques and productions

Teaching Methodologies	Lectures, Blended Learning, Case Study, Presentation, Journal/Article Critique

CLO	CLO1 Describe the basic elements Three Dimensional Object Representation and Visible Surface Detection technique CLO2 Apply 3D Object Representation, Visible Surface Detection, Illumination Model and Surface Rendering Methods CLO3 Use the basic logic constructs that will serve as models for any program development CLO4 Apply basic concept of animation techniques and productions

Pre-Requisite Courses	No course recommendations

Topics
1. Introduction to Graphics Concepts 1.1) • Introduction to graphics, visualization and animation 1.2) • Introduction to graphics hardware system 1.3) • Computer graphics primitives 1.4) • Color model 1.5) • 2D Geometric, transformation, windows and view ports. 1.6) • 2D : Rotation, translation and scaling
2. Three Dimensional Object Representation 2.1) • 3D Transformation : Rotation, translation and scaling 2.2) • Shearing and reflection 2.3) • 3D Viewing 2.4) • Object representation
3. Visible Surface Détection 3.1) • Algorithms Classification 3.2) • Back-face detection 3.3) • Z_buffer algorithm 3.4) • Buffer algorithm 3.5) • Scan-line method 3.6) • Painters's algorithm

4. Illumination Model and Surface Rendering Methods
4.1) • Illumination models
4.2) • Rendering methods
4.3) • Mapping methods

5. Animation: Introduction, Concept and Implementation
5.1) • Heritage of Animation
5.2) • Background and history
5.3) • Animation hardware requirement
5.4) • Recording techniques and tools
5.5) • Real time vs Single frame

6. Animation : Techniques and Productions
6.1) • Frame-based animation
6.2) • Sprite-based - key framing, parameter-based, sample- based
6.3) • Animation Composition and editing
6.4) • Animation Post-production review
6.5) • Film vs Video
6.6) • Frame-based vs sprite-based

Assessment Breakdown	%
Continuous Assessment	100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Weekly observation	20%	CLO1 , CLO2 , CLO3 , CLO4
	Group Project	Group assessment	10%	CLO1 , CLO2 , CLO3 , CLO4
	Journal/Article Critique	Article Critique	5%	CLO1 , CLO2
	Presentation	Presentation	20%	CLO1 , CLO2 , CLO3 , CLO4
	Quiz	Quiz	5%	CLO1 , CLO2 , CLO3 , CLO4
	Test	Test 1	20%	CLO1 , CLO2 , CLO3 , CLO4
	Test	Test 2	20%	CLO1 , CLO2 , CLO3 , CLO4

Reading List	Recommended Text	• **Hearn & Baker 2010**, *Computer Graphics with OpenGL*, 4 Ed., **Prentice Hall** • **Sumanta Guha 2014**, *Computer Graphics Through OpenGL: From Theory to Experiments*, 2 Ed., **A K Peters/CRC Press Florida**
	Reference Book Resources	• **John F. Hughes, Andries van Dam, Morgan McGuire, David F. Sklar, James D. Foley, Steven K. Feiner, Kurt Akeley 2013**, *Computer Graphics: Principles and Practice (3rd Edition)*, 3 Ed., **Pearson Education USA** • **Eric Lengyel 2011**, *Mathematics for 3D Game Programming and Computer Graphics*, 3 Ed., **Cengage Learning PTR USA** • **Fletcher Dunn, Ian Parberry 2011**, *3D Math Primer for Graphics and Game Development, 2nd Edition*, 2 Ed., **A K Peters/CRC Press Florida**
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	