

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Computer Graphics	
2.	Course Code	TCS2221	
3.	Status of Course [Applies to (cohort)]	Specialisation Core for B.IT (Hons) Artificial Intelligence	
4.	MQF Level/Stage Note : <i>Certificate – MQF Level 3</i> <i>Diploma – MQF Level 4</i> <i>Bachelor – MQF Level 6</i> <i>Masters – MQF Level 7</i> <i>Doctoral – MQF Level 8</i>	Bachelor – MQF Level 6	
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version :	May 2015
		Date of current version :	June 2016
6.	Pre-Requisite	TCP1121 Computer Programming	
7.	Name(s) of academic/teaching staff	Lim Kian Ming Leow Meng Chew	
8.	Semester and Year offered	Trimester 2, Year 2	
9.	Objective of the course in the programme : This subject aims to equip students with fundamentals of the modern Computer Graphics pipeline and the skill to manipulate graphics effects and application of mathematics in Computer Graphics. By using OpenGL, students can implement the techniques of computer graphics and thus, gain hands on experience through the development of interactive and real-time rendering applications.		
10.	Justification for including the course in the programme : Computer graphics are graphics created using computers and the representation of image data by a computer specifically with help from specialized graphic hardware and software. The interaction and understanding of computers and interpretation of data has been made easier because of computer graphics. This course will provide students with introductory concepts in computer graphics as well as apply effective techniques in designing and developing computer graphic application.		
11.	Course Learning Outcomes :		Domain
	LO1 Explain the basic concept, theory and algorithm of computer graphics.		Cognitive
	LO2 Compute and solve the problems of computer graphics.		Cognitive
	LO3 Apply the various techniques of computer graphics.		Cognitive
	LO4 Develop real-world computer graphics applications.		Cognitive
		Level	
			Level 2
			Level 3
			Level 3
			Level 5

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12.	Mapping of Learning Outcomes to Programme Outcomes :										
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	
	LO1							X			
	LO2							X			
	LO3	X						X	X		
	LO4	X						X	X		
13.	Assessment Methods and Types :										
	Method and Type	Description/Details							Percentage		
	Quiz	Written quiz							10%		
	Mid Test	Written test							20%		
	Assignment	Report							30%		
	Final Exam	Written examination							40%		
14.	Mapping of assessment components to learning outcomes (LOs)										
	Assessment Components	LO1	LO2	LO3	LO4						
	Quiz	14	10								
	Mid Test	29	20								
	Assignment		30	100	100						
	Final Exam	57	40								
15.	Details of Course										
	Topics							Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic			
								Lecture	Lab		
	1. A Survey Of Computer Graphics Computer-Aided Design; Graphs, Charts, and Models; Computer Art; Computer Animation; Graphical User Interface; Image Processing.							2	2		
	2. Overview of Graphics Systems Display Devices; Hardcopy Devices; Interactive Input Devices, Display Processors; Graphics Software.							2	2		
3. Output Primitives Points and Lines; Line-Drawing Algorithms; Anti-aliasing Lines; Line Command; Fill Areas; Circle-Generating Algorithms; Other Curves; Character Generation; Instruction Sets for Display Processors; Attributes of Output Primitives: Lines Styles; Color Intensity; Area Filling; Character Attributes; Inquiry Functions; Bundled Attributes.							4	4			

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4. 2-D Transformations Basic Transformations: Translation; Scaling; Rotation. Matrix Representations and Homogeneous Coordinates; Composite Transformations.		2	2
5. Windowing AND Clipping Windowing Concepts; Clipping Algorithms; Window-to-Viewport Transformation		2	2
6. Segments Segments Concepts; Segments Files; Segments Attributes. Multiple Workstation		2	2
7. Interactive input methods Physical Input Devices; Logical Classification of Input Devices; Locator Devices; Stroke Devices; String Devices; Valuator Devices; Choice Devices; Pick Devices; Interactive Picture-Construction Techniques; Input Functions		2	2
8. 3-D Modelling Concepts: Coordinates Systems; Display Techniques; Graphics Packages. Representations: Polygon Surfaces; Curved Surfaces; Fractal-Geometry Methods; Sweep Representations; Solid-Geometry. Transformations: Translation; Scaling; Rotation; Rotation about an arbitrary Axis; Other Transformation; Commands. Viewing: Projections; Transformation. Hidden-Surface and Hidden-Line Removal		4	4
9. Rendering Illumination Model: Modeling and Displaying Light Intensities; Surface-Shading Methods; Color Models; Ray Tracing. Transparency; Shadow.		4	4
Total		24	24
Total Student Learning Time (SLT)	Face to Face	Total Guided and Independent Learning	
Lecture	24	24	
Tutorials	-	-	
Laboratory/Practical	24	12	
Quizzes (x 5 times)	-	5	
Assignment	-	10	
Mid Term Test	1	3	
Final Exam	2	15	
Sub Total	51	69	
Total SLT	120		
16. Credit Value	3		
17.	Reading Materials :		
	Textbooks		
	1. Hughes, J. F., & Foley, J. D. (2014). Computer Graphics: Principles and Practice. Addison-Wesley Professional.		

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Reference Material
1. Hearn, D. D., Baker, M. P., & Carithers, W. (2010). Computer Graphics With Open GL. Prentice Hall Press.
2. Sellers, G., Wright, R. S., & Haemel, N. (2013). OpenGL SuperBible: Comprehensive Tutorial and Reference. Addison-Wesley.
3. Angle, E., & Shreiner, D. (2011). Interactive Computer Graphics: A Topdown Approach With Shader-based OpenGL. Pearson.

Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement