

## Subject Description Form

<b>Subject Code</b>	COMP 5514
<b>Subject Title</b>	Computer Image Generation and Applications
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/Exclusion</b>	Nil
<b>Objectives</b>	<p>The objectives of this subject are to:</p> <ol style="list-style-type: none"> <li>1. To learn the fundamental concepts, models and techniques in Computer Graphics;</li> <li>2. To learn the basic theory and algorithms in Image Processing; and</li> <li>3. To understand some of the important applications of Computer Graphics and Image Processing.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a) Design interesting and interactive graphics and their applications;</li> <li>b) Be competent using OpenGL or other graphics related programming languages for software development;</li> <li>c) Design and develop computer software for image processing; and</li> <li>d) Apply visual information technology to various applications.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<ul style="list-style-type: none"> <li>• <b>Basic Computer Graphics Techniques:</b> Pixels, frame buffers, input/output devices, 2D primitive drawing, 2D transformation, 3D transformation, 3D projection, Clipping, Object modeling.</li> <li>• <b>Image Generation Techniques:</b> The three image generation techniques: polygon scan-conversion, ray-tracing and radiosity. Realistic image generation techniques including shading, anti-aliasing, depth cueing and texture mapping. Computer animation.</li> <li>• <b>Basic Concepts in Image Processing:</b> Digital image acquisition and representation, basic techniques and algorithms for image enhancement, image feature extraction, representation and classification.</li> <li>• <b>Computer Graphics and Image Processing Applications:</b> Window systems and a brief introduction to X11. Image Processing including image editing and morphing. Virtual Reality including techniques and applications. Multimedia.</li> </ul>
<b>Teaching/Learning Methodology</b>	<p>39 hours of class activities including - lecture, tutorial, lab, workshop seminar where applicable. Lectures supplemented with tutorials and small projects</p>

<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	Specific Assessment Methods/Tasks	% weighting	Intended subject learning outcomes to be assessed			
			a	b	c	d
	Assignments, Tests & Projects	55	✓	✓	✓	✓
	Final Examination	45	✓	✓	✓	✓
	Total	100				
<b>Student study effort expected</b>	<b>Class Contact:</b>					
	Class activities (lecture, tutorial, lab)				39 hours	
	<b>Other student study effort:</b>					
	Assignments, Quizzes, Projects, Exams				65 hours	
	<b>Total student study effort</b>				<b>104 hours</b>	
<b>Reading list and references</b>	(1). Angel, 2004, Interactive Computer Graphics: A Top-Down Approach Using OpenGL, 4th Ed., Addison Wesley (2). Hearn and Baker, 2003, Computer Graphics with OpenGL, 3rd Ed., Prentice Hall. (3). Watt Policarpo, 2005, The Computer Image, Addison Wesley. (4). Fisher, Y., Ed., 1995, Fraetal Image Compression, Springer-Verlag. (5). Watkins, C. and Marenka, S., 1994, Virtual Reality Excursions, AP Professional.					