



## LONDON CAPITAL COMPUTER COLLEGE

### Diploma in Graphic Design (991) – Introduction to Computer Graphics

<p><b>Prerequisites:</b> Keystroking ability. Knowledge of Windows terminology and mouse techniques.</p>	<p><b>Corequisites:</b> A pass or better in Diploma in eCommerce &amp; Web Design, Information Technology or equivalence.</p>
<p><b>Aim:</b> The good news is that Computer Graphics is fun: fun to look at, fun to use, and when done properly even fun to program and debug. There are also many fun applications of Computer Graphics, ranging from video games, to animated cartoons, to full length feature movies. Art and architecture, biomedical imaging, computational photography: whatever people can see, or whatever people imagine can see, designers can design with Geometric Modeling and displayed with Computer Graphics. Broadly, the major themes of Computer Graphics can be divided into three categories: <b>graphics</b>, <b>modeling</b>, and <b>mathematical foundations</b>. Graphics consists of lighting and shading - reflection and refraction, recursive ray tracing, radiosity, illumination models, polygon shading, and hidden surface procedures. Modeling is the theory of curves, surfaces, and solids - planes and polygons, spheres and quadrics, algebraics and parametrics, constructive solid geometry, boundary files, and octrees, interpolation and approximation, Bezier and B-spline methods, fractal algorithms and subdivision techniques. The mathematical foundations are mostly linear algebra, but from a somewhat idiosyncratic perspective not typically encountered in standard linear algebra classes - vector geometry and vector algebra, affine spaces, affine maps and projective transformations, matrices and quaternions. This course introduces techniques for 2D and 3D primitives, including modeling and representation, illumination and shading algorithms, rendering, texturing, projections, matrix composition and advanced software tools. Candidates will learn fundamental algorithms and techniques and gain the knowledge necessary to understand and augment the latest innovations in computer graphics. The course introduces techniques of modeling, transformation, and rendering for computer generated imagery. It also prepares candidates majoring in Computer Graphics with the necessary visual and design capabilities to develop a portfolio emphasising on creative and applied business needs.</p>	
<p><b>Required Materials:</b> Recommended Learning Resources.</p>	<p><b>Supplementary Materials:</b> Lecture notes and tutor extra reading recommendations.</p>
<p><b>Special Requirements:</b> Candidates are recommended to read and practice the mathematical concepts behind computer graphics outside class time.</p>	
<p><b>Intended Learning Outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Outline the basics of graphic design and its different applications and describe important and fundamental design components.</li> <li>2. Explore the differences between 2D and 3D computer graphics, demonstrate how the 2D and 3D graphics features are mapped from polygons.</li> <li>3. Outline how mathematics is the basis for graphical perspective and how computer games (especially games using 3-D polygons) use linear.</li> </ol>	<p><b>Assessment Criteria:</b></p> <ol style="list-style-type: none"> <li>1.1 Explore graphics disciplines</li> <li>1.2 Compare image processing vs image analysis</li> <li>1.3 Analyse the importance of graphics</li> <li>1.4 Analyse the history of computer graphics</li> <li>1.5 Outline computer graphics application divisional areas</li> <li>2.1 Define 2D</li> <li>2.2 Define 3D</li> <li>2.3 Describe graphics terminology</li> <li>2.4 Analyse projections</li> <li>2.5 Define clipping</li> <li>3.1 Analyse the elements of geometry</li> <li>3.2 Devine vector spaces</li> <li>3.3 Describe linear transformations</li> </ol>




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4. Explore the different types of computer graphics devices and the input devices for computer graphics.	4.1 Analyse output technology 4.2 Outline processor technology 4.3 Explore input devices 4.4 Discuss memory technology 4.5 Define frame buffer
5. Explain what graphics software is and isn't, explore the examples of computer graphics software	5.1 Describe different graphics software programs 5.2 Outline graphics system components 5.3 Compare polling vs sampling 5.4 Define event-loop processing
6. Describe the algorithms developed for drawing lines and circles.	6.1 Analyse line and circle equations 6.2 Explore line and circle drawing algorithms 6.3 Discuss aliasing problems and solutions

**Recommended Learning Resources:  
Introduction to Computer Graphics**

<b>Text Books</b>	<ul style="list-style-type: none"> <li>• Good: An Introduction to Ethics in Graphic Design by Lucienne Roberts ISBN-10: 2940373140</li> <li>• An Introduction to Graphic Design by Peter Bridgewater ISBN-10: 1555211453</li> <li>• Graphic Design: From Concept to Form by Scott Santoro and Emily Santoro ISBN-10: 0132300702</li> </ul>
<b>Study Manuals</b> 	BCE produced study packs
<b>CD ROM</b> 	Power-point slides
<b>Software</b> 	None