



University: *Fayoum University*  
 Faculty: *Computers and Information*  
 Department: *Information Systems*



### Course Specification

1- Basic Information			
<b>Code:</b> CSC 333	<b>Course Title:</b> Computer Graphics	<b>Year/Level:</b> Third year – Second term	
<b>Programme:</b> B.Sc degree in Information Systems	<b>Number of units:</b>	<b>Lecture:</b>	3 hrs/ week
		<b>Tutorial:</b>	0 hrs/ week
		<b>Practical:</b>	2 hrs/ week
		<b>Total:</b>	5 hrs/ week

<b>2- Aims of Course:</b>	By the end of the course, a successful student should be able to:
	<ol style="list-style-type: none"> <li>1. Understand what are the computational geometry and its use in our life.</li> <li>2. Programming assignments are used to help clarify basic concepts (using OpenGL Programming language, android).</li> <li>3. Recognizing raster and vector graphics and rasterization of graphics primitives</li> <li>4. Understand &amp; apply computer graphics algorithms.</li> <li>5. How to perform transformations on computer graphics.</li> <li>6. Understand the triangulation problem.</li> <li>7. Understand the computer graphics problems their applications.</li> <li>8. Differentiate between graphics systems.</li> <li>9. Closest point matching and closest pair problems.</li> </ol>

3- Intended Learning Outcomes	
<b>A- Knowledge and Understanding:</b>	<p><b>On completing this course, students should have knowledge and understanding of :</b></p> <p>A3. Demonstrate the essential mathematics and physics relevant to computer science.</p> <p>A5. Explain essential concepts, principles, and theories related to computer science such as computer graphics and GIS.</p> <p>A6. Explain essential concepts, principles, and theories related to computer-application development such as: databases, information systems development.</p> <p>A12. Selects advanced topics to provide a deeper understanding of some aspects of the subject such as Unified Process, object-oriented analysis and design, e-commerce technologies, and Decision support systems.</p>

	<p>A13. Define the mapping of real-world problems to algorithmic solutions.</p> <p><b>Through the following:</b></p> <ul style="list-style-type: none"> <li>a1) A good understanding of the graphics algorithms concepts and their complexities.</li> <li>a2) A good understanding of the computational geometry fundamental problems.</li> <li>a3) A good understanding of converting one problem to its related ones.</li> </ul>
<b>B- Intellectual Skills:</b>	<p><b>On completion of this course the successful student will be able to:</b></p> <p>B2. Determine different computer- system application attributes, components, relationships, patterns, architecture, and source of errors.</p> <p>B3. Generate a range of innovative design patterns and solutions to solve a computer science problem containing a range of commercial and industrial constraints.</p> <p>B5. Discuss factors other than computational efficiency that influence the choice of algorithms, such as programming time, maintainability, and the use of application-specific patterns in the input data.</p> <p><b>Through the following:</b></p> <ul style="list-style-type: none"> <li>b1) Try to introduce new graphical algorithms to basic problems.</li> <li>b2) Draw the output of these algorithms using the skill learned in the computer graphics system course.</li> <li>b3) Analyze the advantage and the limits of these algorithms and the basic heuristics to improve their performance.</li> </ul>
<b>C- Professional and Practical Skills:</b>	<p><b>At the end of the course, the student will be able to:</b></p> <p>C1. Analyze and improve organizational processes from an ICT perspective.</p> <p>C2. Negotiate effectively with clients, other stakeholders and peers.</p> <p>C6. Employ the statistical, probabilistic and mathematical techniques in analyzing data and interpreting experimental results.</p> <p><b>Through the following:</b></p> <ul style="list-style-type: none"> <li>c1) Work with famous graphics systems like OpenGL.</li> <li>c2) Use famous computational geometry packages like CGAL.</li> </ul>
<b>D- General and transferable Skills</b>	<p><b>At the end of the course, the student will have:</b></p> <p>D2. Use effective information-retrieval skills (including the use of browsers, search engines and catalogues) and general IT facilities.</p> <p>D3. Work as a member of a development team, recognizing the different roles within a team and different ways of organizing teams.</p>

	<p>D6. Demonstrate skills in team work, team management, time management and organizational skills.</p> <p><b>Through the following:</b></p> <p>d1) Ability to work in teams.</p> <p>d2) Solving practical graphics problems.</p> <p>d3) Work with Open Source Software</p>
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<b>4-Course Content:</b>	<ol style="list-style-type: none"> <li>1. Introduction to computer graphics: History, applications, and graphics system software.</li> <li>2. Output primitives: Points, lines,</li> <li>3. Circles, ellipses, character generation.</li> <li>4. Attributes of output primitives: Color and intensity,</li> <li>5. Area filling, character attributes.</li> <li>6. Two-dimensional transformations: Basic transformations; translation, scaling and rotation. Matrix representations and homogeneous coordinates,</li> <li>7. Composite transformations.</li> <li>8. Windowing and clipping. Segments. Interactive input devices.</li> </ol>
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<b>5- Teaching and Learning Methods:</b>	<ol style="list-style-type: none"> <li>1. Lectures</li> <li>2. Computer-lab Sessions</li> <li>3. Practical lab work</li> <li>4. Class discussions</li> <li>5. Internet searches</li> <li>6. Independent Work</li> <li>7. Group projects</li> <li>8. Problem-based Learning</li> </ol>
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<b>6- Teaching and Learning Methods for handicapped students :</b>	-
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<b>7- Student Assessment</b>	
<b>A- Assessment Methods:</b>	<ol style="list-style-type: none"> <li>1. Assignments and Quizzes</li> <li>2. Midterm written exam</li> <li>3. Oral exam</li> <li>4. Practical exam</li> <li>5. Final written exam</li> </ol>
<b>B- Assessment schedule:</b>	<p>Midterm Examination: Week 7 or 8</p> <p>Practical examination: Week 13</p> <p>Oral Examination: Week 14</p> <p><b>Final Examination: Week 15</b></p>
<b>C- Weighting of assessments:</b>	<p>Assignments and Quizzes: 0%</p> <p>Mid-Term Examination: 10%</p> <p>Oral Examination: 10%</p> <p>Practical Examination: 15%</p> <p>Final-term Examination: 65%</p>

<b>8- Books and References</b>	
<b>A- Notes:</b>	-
<b>B- Essential Books (Text Books):</b>	<ul style="list-style-type: none"> <li>• Fundamentals of Computer Grahics, Peter Shirly, 3rd edition, 2009.</li> <li>• B. Jahne "Computer Vision and applications " Elsevier Ed, 2000.</li> <li>• " Computer Graphics Principles and Practice ", Foley. Van Dam. Feiner. Hughes. (2014)</li> </ul>
<b>C- Recommended Books:</b>	<ul style="list-style-type: none"> <li>▪ Donald Hearn, M. Pauline Baker, "Computer Graphics with Open GL", Prentice Hall. (2014)</li> <li>▪ "Computer Graphics", Hearn Baker. (2004)</li> </ul>
<b>D- Periodicals, Web sites, ... etc</b>	-

- **Course Coordinator:** Dr. Shereen Aly Taie

- Head of Department: Dr. Amira Edress

Signature:.....

Date:

**Course Content Intended Learning Outcomes Matrix****Course Title:** Computer Graphics**Course Code:** CSC 333

Course Content	Week	Knowledge & Understanding			Intellectual Skills			Professional & Practical Skills		General & Transferable Skills		
		a1	a2	a3	b1	b2	b3	c1	c2	d1	d2	d3
1. Introduction to computer graphics: History, applications, and graphics system software.	1			x	x		x	x	x	x		x
2. Output primitives: Points, lines,	2	x	x	x	x	x	x			x	x	x
3. Circles, ellipses, character generation.	3:4	x	x	x	x	x	x			x	x	x
4. Attributes of output primitives: Color and intensity,	5	x		x	x	x	x			x	x	x
5. Area filling, character attributes.	6:7	x		x	x	x	x			x	x	x
6. Two-dimensional transformations: Basic transformations; translation, scaling and rotation. Matrix representations and homogeneous coordinates,	8:9	x	x	x	x	x	x			x	x	x
7. Composite transformations.	10	x		x	x	x	x			x	x	x
8. Windowing and clipping. Segments. Interactive input devices.	11:12	x	x	x	x	x	x			x	x	x

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