



# Course Specifications

Institution:	Majmaah University.
Academic Department :	College of Science at AzZulfi.
Programme:	Computer Science and Information
Course :	Computer Graphics (CSI-425)
Course Coordinator :	Mr. ISSA ALSMADI
Programme Coordinator :	DR.YOSRY AZAAM
Course Specification Approved Date :	23/ 12 / 1435 H



## A. Course Identification and General Information

1 - Course title :	Computer Graphics	Course Code:	(CSI-425)
2. Credit hours :	3 (2 lecture + 2 Laboratory)		
3 - Program(s) in which the course is offered:	Computer Science and Information Program		
4 – Course Language :	ENGLISH		
5 - Name of faculty member responsible for the course:	ISSA ALSMADI		
6 - Level/year at which this course is offered :	8 <sup>th</sup> level		
7 - Pre-requisites for this course (if any) :	<ul style="list-style-type: none"> <li>Linear Algebra &amp; Differential Equations (MATH 310)</li> </ul>		
8 - Co-requisites for this course (if any) :	N/A		
9 - Location if not on main campus:	College of Science at AzZulf		
10 - Mode of Instruction (mark all that apply)			
A - Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	80 %
B - Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	5%
D - e-learning	<input type="checkbox"/>	What percentage?	5 %
E - Correspondence	<input type="checkbox"/>	What percentage?	..... %
F - Other	<input checked="" type="checkbox"/>	What percentage?	10 %
Comments :	One-tenth of the course is presented mainly inside video lectures of other instructors worldwide. They illustrate the same topics that I introduced in my lectures with a different presentation.		

## B Objectives

**What is the main purpose for this course?**

The main objective of this module is to introduce students to the main concepts of computer graphics. It starts with an overview of interactive computer graphics, two dimensional system and mapping, then it presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics.

The purpose of this course is to:

1. Introduce the students with the concepts and principles of computer graphics.
2. Give a thorough description of computer graphics hardware and software systems.





3. Understand the theory and application of Transformation and Viewing.
4. Understand the graphics pipeline: Modeling, Viewing and Rendering.
5. Design and implement a simple project using OpenGL.

Briefly describe any plans for developing and improving the course that are being implemented :

1. Using group discussion.
2. Updating the materials of the course to cover the new topics of the field.

## C. Course Description

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
<b>1. A Survey of Computer Graphics Applications:</b> CAD/CAM, Art, Entertainment, Education, Training, Visualization, GUI, Image Processing.	<b>1</b>	<b>4</b>
<b>2. Overview of Computer Graphics &amp; Systems Graphics:</b> Primitives and Packages, The Graphical Pipeline, CRT, Raster-Scan and Random-Scan displays, Color CRT Monitors, Flat-Panel Displays, Video Controller, Display Processor, CLUT ... etc.	<b>2</b>	<b>8</b>
<b>3. Colors and Grayscale:</b> Beam-Penetration method Shadow-mask method.	<b>2</b>	<b>8</b>
<b>4. Output Primitives and Attributes:</b> Points, Lines, Circles, Ellipses. Examples - Open GL.	<b>2</b>	<b>8</b>
<b>5. 2D and 3D Modeling</b> Types of Modeling, Types of Geometric Models	<b>1</b>	<b>4</b>
<b>6. 2D Transformations and Viewing:</b> Translation, Scaling, Rotation, Shearing, reflection, Examples - Open GL.	<b>2</b>	<b>8</b>
<b>7. 3D Transformation and Viewing:</b> 3D Representation, Translation, Scaling, Rotation, Examples - Open GL	<b>1</b>	<b>4</b>
<b>8. 2D Viewing and 3D Viewing:</b> Windows and Viewports, Window-To-Viewport Coordinate Transformation, Point clipping, line clipping, Cohen-Sutherland Line Clipping, 3d Rendering Pipeline, Examples - Open GL.	<b>2</b>	<b>8</b>
<b>9. projection :</b> Parallel and Perspective Projection, Orthographic Parallel Projection, Oblique Parallel Projection, Oblique Projection, Cavalier Projections, Cabinet Projections, Examples - Open GL.	<b>2</b>	<b>8</b>





## 2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
<b>Contact Hours</b>	30	30	-	-	-	60
<b>Credit</b>	30	15	-	-	-	45

## 3. Additional private study/learning hours expected for students per week.

5 Hours

The total workload of the student in this course is then:  $60 + 5 \times 15 = 135$  work hours.

## 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
<b>1.1</b>	Acquire knowledge of the history and evolution of computer graphics, both hardware and software.	Lectures. Lab demonstrations. Case studies. Individual presentations.	Written Exam Homework assignments Lab assignments Class Activities Quizzes
<b>1.2</b>	Understand the 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations. They will be able to implement these concepts.		
<b>1.3</b>	Understand the concepts and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping.		
<b>2.0</b>	<b>Cognitive Skills</b>		
<b>2.1</b>	Use matrix algebra in computer graphics application and draw the basic primitives (e.g., point, line, polygons) using OpenGL.	Lectures. Lab demonstrations. Case studies. Individual presentations.	Written Exam Homework assignments Lab assignments Class Activities Quizzes
<b>2.2</b>	Apply the 2D transformations and 3D transformations, and Explain how simple line and polygon clipping algorithms work.		





	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
2.3	Implement simple animations using OpenGL.	Brainstorming.	
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Learn how to search for information through library and internet, and Present a short report in a written form and orally using appropriate scientific language.	Small group discussions. Whole group discussions. Brainstorming. Presentations.	Written Exam Homework assignments Lab assignments Class Activities Quizzes
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	Function effectively on teams to accomplish a common goal, and communicate with teacher, ask questions, solve problems, and use computers.	Small group discussions. Whole group discussions. Brainstorming. Presentations.	Written Exam Homework assignments Lab assignments Class Activities Quizzes
<b>5.0</b>	<b>Psychomotor</b>		
5.1	N/A		

### 5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	First written mid-term exam	6	15%
2	Second written mid-term exam	12	15%
3	Presentation, class activities, and group discussion	Every week	5%
4	Homework assignments	After Every chapter	5%
5	Practical exam	15	20%
6	Final written exam	16	40%
7	Total		100%





## **D. Student Academic Counseling and Support**

**Office hours: Sun: 8-10, Mon. 8-10, Tus. 1-3.**

**Office call: Mon. 12-1 and Tus 12-1**

**Email: i.alsmadi@mu.edu.sa**

## **E. Learning Resources**

### **1. List Required Textbooks :**

Computer Graphics with Open GL (4th Edition) Hardcover – November 19, 2010  
by Donald D. Hearn , M. Pauline Baker , Warren Carithers .ISBN-13: 978-0136053583

### **2. List Essential References Materials :**

OpenGL Programming Guide: The Official Guide to Learning OpenGL, Versions 3.0 and 3.1 (7th Edition)2013

### **3. List Recommended Textbooks and Reference Material :**

N/A

### **4. List Electronic Materials :**

Determines as the course is going on.

### **5. Other learning material :**

Videos and presentations are available with the instructor.

## **F. Facilities Required**

### **1. Accommodation**

Classrooms and Labs available at College of science in Zulfi.

### **2. Computing resources**

Smart Board.

### **3. Other resources**

N/A





## **G. Course Evaluation and Improvement Processes**

### **1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:**

- Analysis of students' results.
- Observation during work.
- Students' evaluations.
- Colleagues' evaluations.
- Evaluation questionnaire filled by the students.
- Interview a sample of students enrolled in the course to take their opinions.

### **2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor :**

- Self-assessment.
- External evaluation.
- Periodic review of course (the Commission of study plans).

### **3 Processes for Improvement of Teaching :**

- Taking into account the recommendations yielded from the internal review of the course.
- Guidelines about course teaching provided by the by study plans commission.
- Department Guidelines about faculty member performance on the basis of direct observation.
- Training and development.
- Workshops to improve the educational process.

### **4. Processes for Verifying Standards of Student Achievement**

- Reviewing the final exam questions and a sample of the answers of the students by others.
- Visiting the other institutions that introduce the same course one time per semester.
- Watching the videos of other courses by international institutions.

### **5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement :**

- Comparison of the course to its counterparts offered in similar departments.
- Periodic revision of course description by faculty member.
- Periodic revision of course description by the study plans and schedules Commission.
- Update learning resources related to the course to ensure that the course is kept up with developments in the field.
- Make use of statistical results of course evaluation made by students to improve and develop the course.
- Giving the opportunity for students to express their opinions about what is taught and receive suggestions and study their effectiveness.





**Course Specification Approved**  
**Department Official Meeting No( 6 )Date23/ 12 / 1435H**

**Course's Coordinator**

**Name :** ISSA ALSMADI  
**Signature :** .....  
**Date :** 23/ 12 / 1435H

**Department Head**

**Name :** Dr. YossryAzzam  
**Signature :** .....  
**Date :** .../ ... / ..... H

