2023
TP-153

Course Specification

(Bachelor)

Course Title:	Computer Graphics
Course Code:	CS233
Program:	Computer Science
Department:	Computer Science
College:	Computer and Information Sciences
Institution:	Majmaah University
Version:	1
Last Revision Date:	*Pick Revision Date.*

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3(3,0,1)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☐Required		☐Elective		
3. Level/year at which this course is offered: (7)					
4. Course general Description: This Course is designed to develop knowledge and understanding of Computer Graphics. There is virtually no area in which graphical displays cannot be used to some advantage, and so it is not surprising to find the use of computer graphics so widespread. Although early applications in engineering and science had to rely on expensive and cumbersome equipment; the advances in computer technology have made interactive computer graphics a practical tool. Today, we find computer graphics used routinely in such diverse areas as science, engineering, medicine, business, industry, government, art, entertainment, advertising, education, and training.					
5. Pre-requirements for this course (if any)**: CS211 Programming 2**					
6. Pre-requirements for this course (if any)**: CS211 Programming 2**					
7. Course Main Objective(s):					
(a) Understand the foundations of computer graphics: software systems, math basis, light and colour. (b) Understand the issues involved in implementing other components. (c) Appreciate the complexities of modelling realistic objects through modelling complex scenes using a high- level scene description language.					

(d) Become acquainted with some advanced topics in computer graphics; these might include texturing, animation, physically-based modelling, procedural modelling, curves and surfaces, global illumination, interaction, visualization, and virtual reality.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	56	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1				
1.2				
…				
2.0	**Skills**			
2.1	**Students understand the basic foundations of**	**SO1**	**Classroom Teaching**	**Class Test, Mid Exam, Final Exam**

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	computer graphics: software systems, math basis, light and color.			
2.2	Students understand and analyze the functioning and performance of viewing, and shading techniques.	SO1	Classroom Teaching	Class Test, Mid Exam, Final Exam
...	Students understand the design and the complexities of modelling realistic objects through modelling complex scenes using a high-level scene description language.	SO2	Classroom Teaching	Class Test, Mid Exam, Lab based Assignments, Final Exam, Mini Project
	Students apply the advanced topics in computer graphics such as texturing, animation, physically-based modeling, procedural modeling, curves and surfaces, global illumination, interaction, visualization, and virtual reality using algorithms and mathematical equations	SO6	Classroom Teaching	Class Test, Mid Exam, Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Computer Graphics Software	5
2.	Graphics Output Primitives I and II	5
3	Implementation Algorithms for Graphics Primitives I and II	8
4	Two-Dimensional Geometric Transformations	8
5	Two-Dimensional Viewing	8
6	Three-Dimensional Geometric Transformations	4
7	Three-Dimensional Viewing	5
8	Three-Dimensional Object Representations (Modeling, Curves, Surfaces & Advanced Rendering)	8
9	Color Models and Color Applications	5
10	Programmable Shaders	4
Total		56

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Exercises**	**(as per schedule)**	**5%**
2.	**Quiz 1**	**Week 4**	**10%**
3.	**Mid Term Exam**	**Week 7**	**20%**
4.	**Quiz 2**	**Week 10**	**10%**
5.	**Assignment/Homework**	**(as per schedule)**	**15%**
6.	**Final Exam**	**(as per schedule)**	**40%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**D. Hearn and M. Baker, Computer Graphics with OpenGL, fourth Edition, Prentice Hall, 2014.**

Supportive References	• **Real-Time Rendering, Akenine-Moller, Haines, 2nd edition, AK Peters Ltd, 2002.** • **Fundamentals of Computer Graphics, Shirley, Ashikhmin, Gleicher, Marschner, Reinhard, Sung, Thompson, and Willemsen, A K Peters, 2005.** • **Computer Graphics: Princiles and Practice, Foley, Addison-Wesley, 2000.** • **Computer Graphics: Using OpenGL, Hill, 2nd edition, Prentice Hall, 2001.**
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom, Network Lab
Technology equipment (projector, smart board, software)	PC or Laptop with Windows/Linux, Smart Board, Projector
Other equipment (depending on the nature of the specialty)	Internet Connection

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Survey
Effectiveness of Students assessment	Instructor	Exams Answer Scripts evaluation
Quality of learning resources	Students	Survey
The extent to which CLOs have been achieved	Instructor	Direct and Indirect Assesment
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	

DATE	