هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Computer Graphics
Course Code:	**CS 233**
Program:	**BS CS**
Department:	Computer Science
College:	**College of Computer and Information Sciences**
Institution:	**Majmaah University**

Table of Contents

A. Course Identification

1. Credit hours:	3 Credits (3 Lecture,0 Lab,1 Tutorial))
2. Course type	
a.	University ☐ College ☐ Department ☑ Others ☐
b.	Required ☐ Elective ☐
3. Level/year at which this course is offered:	**Level 6**
4. Pre-requisites for this course (if any)**:**	**CS 120**
5. Co-requisites for this course (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	%100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This Course is designed to develop knowledge and understanding of the 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, 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.

2. Course Main Objective

The aim of this course is to allow students to acquire knowledge of understanding Computer Graphics Systems, specifically;

- The fundamental display algorithms for raster graphics systems
- The mathematical nature of 2- and 3-D environments
- The properties of surfaces and their simulation

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

- Update the content periodically.
- Using Latest references.
- Using web references.
- Using new visual tools in teaching.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO1 Understand and practice the concept of cryptographic algorithms	K1
1.2	CLO2: Learn the current state of the art techniques that are employed for defeating secure systems	K1
1.3	CLO4: Understand Digital signatures in practice with legal/regulatory aspects	K1
1.4	CLO5: Understand attacks in payment systems, bitcoin and crypto currencies	K1
2	**Skills :**	
2.1	CLO3: Analyze hashing functions, message authentication codes and key establishment	C2
3	**Values:**	
3.1		
3.2		

C. Course Content

No	List of Topics	Contact Hours
1	Graphics Models	3
2	Graphics Programming	5
3	Input and Interaction	4
4	Geometric Objects	3
5	Geometric Transformations	6
6	Viewing	4
7	Shading	3
8	From Vertices to Fragments	4
9	Discrete Techniques	2
10	Programmable Shaders	2

11	Modeling	2
12	Curves & Surfaces	2
13	Advanced Rendering	2
14	Revision	2
Total		44

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Understand the foundations of computer graphics: hardware systems, math basis, light and colour.	Lecture	Direct-Quiz, Mid Term Exam, Final Exam,
1.2	Understand Graphics Models & Geometric Objects	Lecture	Direct-Quiz, Mid Term
1.3	Understand Geometric Transformations	Lecture	Exam, Final Exam
1.4	Understand the concept of Viewing, Shading	Lecture	Direct-Quiz, Mid Term, Project
1.5	Understand & describe Curves & Surfaces and Advanced Rendering Acquainted with some advanced topics in computer graphics; these might include texturing, animation, physically-based modeling, procedural modeling, curves and surfaces, global illumination, interaction, visualization, and virtual reality.	Lecture	Direct-Quiz, Mid Term, Project
2.0	**Skills**		
2.1	Implement Line drawing, Circle drawing, Clipping algorithms, Geometric Transformations, key components of the rendering, especially visibility, characterization, viewing, and shading. Understand the issues involved in implementing other components.	Lecture	Assignments, CLO Survey
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Test 1	Week 4,	10%
2	Mid Term	Week 8	20%
3	Test 2	Week 9,	10%
4	Final Exam	Week 11	40%
5	Attendance	Week 11	5%
6	Project	Week 11	15%

***Assessment task** (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Every faculty will be assigned 10 students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Computer Graphics with OpenGL, D. Hearn and M. Baker, 3rd ed., Prentice Hall, 2003.
Essential References Materials	• 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	• http://ocw.mit.edu/courses/electrical-engineering-and-computer-science / • http://courses.cs.vt.edu/csonline/CG • http://www.cs.iit.edu/~cs561/cs351/CG
Other Learning Materials	Nil

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	LCD Projector,
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test-1, Test-2Final Examination, Mid term exam, and Practical exam	Faculty	Direct
Survey	Students	Indirect

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	
Reference No.	
Date	