

Course specification

(3202 Computer Graphics)

Faculty: HICIT- **Higher Institute for Computers & Information Technology**

Programme(s) on which the course is given: Under graduate program in Computer Science

Major or minor element of programme: Compulsory

Department offering the programme: Department of Computer Science

Department offering the course: Department of Computer Science

Year / Class: 3rd Year – 2nd semester

Date of specification approval: 22/2/2016

A- Basic Information

Title: Computer Graphics

Code: 3202

Weekly Hours:

Lecture : 3 **Exercise:** -

Practical: 3

Total: 6

B- Professional Information

1- Course Objectives:

The objective of CS3202 is to teach concepts and the fundamentals of Computer Graphics with hands to build up simple applications using OpenGL. The course starts with Understanding of computer generated pictures, the objective of the graphics and the relation to modern systems. The core of the study subjects are: elements of computer generated picture, graphic devices, real to device mapping, rasterization to polyline, general function rasterization, filling regions, 2D and 3D rasterizations, projection, lightening and clipping and containment.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes

Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
a12, a21	b2, b3, b4	c1, c7, c10	d5

3 - Intended learning outcomes of course (ILOs)

After Completing this course the student must demonstrate the Knowledge and ability to:-

a: Knowledge and Understanding

On successful completion of the course, the student should demonstrate knowledge and understanding of:

a1- explain projection of 3-D views on 2-D plane using parallel projection.

a2- explain projection of 3-D views on 2-D plane based on perspective projection.

a3- explain lighting to a seen based on local reflection model.

a4- Understand 2-D and 3-D transformations to objects

b: Intellectual skills

On successful completion of the course, the student should be able to.

- b1– Apply Transformations to shapes .
- b2 – analyze the problem and decompose it to a set of tasks.
- b3 – analyze complex computation problems with less computational approaches.
- b4- Differentiate between the computer generated pictures and raster images

c: Professional and practical skills

On successful completion of the course, the student should be able to:

- c1- design and implement graphics based applications in 2D.
- c2- use OPENGL for developing graphics based applications.
- c3- design and implement a graphics based applications that has 3D views.
- C4- Apply transformations and its inverse to the 2D, and 3D pictures.
- c5- Perform systems analysis and design.

d: General and transferable skills

- d1- Communicate with others; work in a team and involvement in group discussion and seminars.
- d2. Write technical Report.

4- Contents

Topic	Hours	Lec.	Practical
Computer generated picture elements, attributes, uses	6	3	3
Mapping real window with coordinates to a device window	6	3	3
Rastering line segment, polyline, and polygon	6	3	3
General functions drawing and 2D transformations	12	6	6
Filling a region techniques	12	6	6
Parallel and perspective projections	6	3	3
3D transformations	6	3	3
Textures	6	3	3
Lightening	6	3	3
Clipping and containments	6	3	3
Course Project	6	3	3

5 -Teaching and learning methods

- 5.1 Lectures
- 5.2 Tutorial Exercises
- 5.3 Practical Lab
- 5.4 Discussions.

6 -Student assessment methods

- 6.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks.
- 6.2 Final Exam: To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.

6.3 Course Project: To allow students work in team, and to evaluate knowledge, understanding, intellectual, and transferable skills.

6.4 Course Work & Quizzes: To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.

Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Project	3-14
Course Work & Quizzes	2-14

Assessment Weight

Assessment	Weigh %
Mid Term Exam	5%
Final Exam	80%
Course Project	10%
Course Work & Quizzes	5%
Total	100

Course Work & Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

7 -List of references

7.1 Text Books

-Computer Graphics using OPENGL, F. S. Hilll, JR and Stephen M. Kelley, PEARSON Prentice Hall 2011

8- Required Facilities

None

9-Course Matrices

9.1-Course Content/ILO Matrix

Course Contents	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2	
Computer generated picture elements, attributes, uses								x								
Mapping real window with coordinates to a device window	X											x				
Rastering line segment, polyline, and polygon								x								
General functions drawing and 2D transformations		x			x	x	x									
Filling a region techniques	X	x							x	x		x				
Parallel and perspective projections																
3D transformations										x						
Textures			x													
Lightening .													x			
Clipping and containments				x												
Course Project														x	x	x

9.2-Learning Method /ILO Matrix

Learning Methods	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2
Lectures	x	x	x	x	x	x	x	x	x	x	x	x	x		
Tutorial Exercises					x	x	x	x	x	x	x	x	x		
Practical Lab					x	x	x	x	x	x	x	x	x		
Discussions.					x	x	x	x	x	x	x	x	x	x	x

9.3-Assessment Methods /ILO Matrix

Assessment Methods	a1	a2	a3	a4	b1	b2	b3	b4	c1	c2	c3	c4	c5	d1	d2
Mid Term Exam	x	x	x	x	x	x	x	x	x	x	x	x	x		
Final Exam	x	x	x	x	x	x	x	x	x	x	x	x	x		
Course Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Course Work &Quizzes	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Course Coordinator: Dr. Abdelatif Hussien ()

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