Computer Graphics

Course Code:

CSE 483

Course Period:

Spring

Course Type:

Area Elective

Credits:

3

Theoric:

3

Practice:

0

Laboratory Hour:

0

ECTS:

5

Course Language:

English

Course Coordinator:

Esin Onbaşıoğlu [1]
Courses given by:

Esin Onbaşıoğlu [1]
Course Objectives:

The aim of this course is to introduce the theory and practice of computer graphics. The emphasis is on basic concepts, mathematical principles, algorithms and data structures used in computer graphics. Hands-on exercises help students to understand practical

aspects of the subjects.

Course Content:

Computer graphics application areas, line and curve drawing, polygon drawing, polygon filling, transformations (translation, rotation, scaling, reflection, shear), 2-D viewing, line clipping, polygon clipping, 3-D viewing, parallel and perspective projections, 3D clipping, visible surface detection, illumination, polygon rendering, ray tracing, OpenGL

Course Methodology:

1: Lecture, 2: Question-Answer, 3: Lab, 4: Case-study

Course Evaluation Methods:

A: Testing, B: Experiment, C: Homework, D: Project

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Knowledge in computer graphics (drawing, transformations, viewing, illumination, rendering, ray tracing).	1	1	A
2) Ability to use theoretical and applied information in these areas to design computer graphics software with realistic constraints.	1, 4	1, 4	A, C
4) Ability to devise, select, and use modern techniques and tools needed for the design and implementation of computer graphics environments.	1, 4	1, 4	A, C
5) Ability to work efficiently in intra-disciplinary teams and to work individually.	6	4	A, C

COURSE CONTENT

Week	Topics	Study Materials
1	Introduction (computer graphics hardware, application areas)	Textbook
2	Line and Curve Drawing	Textbook
3	Polygon drawing, polygon filling	Textbook
4	2-D Transformations (translation, rotation, scaling, reflection, shear)	Textbook

5	3-D Transformations	Textbook
6	2-D Viewing (viewing pipeline, line clipping, polygon clipping)	Textbook
7	MIDTERM EXAM	Textbook
8	3-D Viewing (orthogonal, oblique projections)	Textbook
9	3-D Viewing (perspective projection)	Textbook
10	3D clipping, visible surface detection	Textbook
11	Illumination (light sources, reflection, refraction, transparent surfaces)	Textbook
12	Polygon rendering	Textbook
13	Polygon rendering	Textbook
14	Ray tracing	Textbook

RECOMMENDED SOURCES

Textbook	D. Hearn, M.P. Baker, “Computer Graphics with OpenGL”, Pearson
Additional Resources	F.S. Hill, “Computer Graphics using OpenGL”, Prentice-Hall J.D. Foley, A. van Dam, S.K.Feiner, J.F.Hughes, R.L. Phillips, “Introduction to Computer Graphic”, Addison-Wesley

MATERIAL SHARING

Documents	http://coadsys.yeditepe.edu.tr/ [2]
Assignments	http://coadsys.yeditepe.edu.tr/ [2]
Exams	

ASSESSMENT

IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Mid-terms	1	46
Assignment	6	54
Lab Work		
Term Project		
Total		**100**

CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE	35
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE	65
Total	**100**

COURSE'S CONTRIBUTION TO PROGRAM

No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					**X**
2	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.	x				
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.		x			
4	Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively.					**X**
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.		x			
6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.					**X**
7	Ability to communicate effectively both orally and in writing; knowledge of a minimum of one foreign language.		x			
8	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.		x			
9	Awareness of professional and ethical responsibility.			x		
10	Information about business life practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.	x				

11	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety; awareness of the legal consequences of engineering solutions.	x

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks: 12x Total course hours)	13	3	39
Hours for off-the-classroom study (Pre-study, practice)	13	3	39
Midterm examination	1	2	2
Homework	6	7	42
Project			
Final examination	1	3	3
Total Work Load			125
Total Work Load / 25 (h)			5.0
ECTS Credit of the Course			5