

Computer Graphics

Course Name	Course type (credit/hours)	Elective course(3/3)	Course code	F030
	Target students Division/major/grade	Software and Computer Engineering/Senior	Opening semester	2020 1ST SEMESTER
	Class time and classroom	Tue F(Pal111)Thu E(Pal111)	English Grade	A(100%English)
Reference to this course	Prerequisite courses	자료구조 (Data Structure)		
	Related basic courses	선형대수 (Linear Algebra)		
	Recommended concurrent courses			
	Related advanced courses			

Instructor	Name (title/division)		Hwanyong Lee(Associate Professor, Software and Computer Engineering)		
	Office Room Number		Office phone Number	3858	e-mail
	Office hours	2 hours after class		Homepage address	
Teaching Assistant	Name (title/division)				
	Office Room Number		Office phone Number		e-mail

1. Introduction

Computer Graphics is a engineering subject for generating pictorial information from numerical information. Mathematics, Physics, Cognitive science are base of computer graphics and it is applied to CAD, medical imaging, AR, VR, Game, Animation and etc.

Topics of this class are

- basic theories - multimedia, color theory, geometric modeling, motion, vector.
- modern computer graphics system - hardware and software including GPU, API's
- Graphics API - OpenGL ES

Objective of the subject is; "Student can generate image using graphics API"

2. Course Objectives

삼차원 컴퓨터 그래픽스의 기본 개념을 이해하고 이를 구현할 수 있는 능력을 기른다. 또한 그래픽스 라이브러리 중의 하나인 WebGL를 사용하여 삼차원 그래픽스를 기반으로 한 간단한 응용 프로그램을 구현할 수 있도록 한다.

Understanding basic theory of computer graphics, and practice to implement using graphics API.

Major API used in class is WebGL - Practice to render WebGL simple web application

3. Class types and activities

Theroy 50% / Lab 50%

4. Teaching Method

- | | |
|---|---|
| <input checked="" type="checkbox"/> lecture | <input type="checkbox"/> discussion and debate |
| <input checked="" type="checkbox"/> team project(presentation and case studies) | <input checked="" type="checkbox"/> experiments(role-playing,etc) |
| <input type="checkbox"/> designing and production | <input type="checkbox"/> on-site learning(on-site training) |
| <input type="checkbox"/> others | |

5. Support Systems in Use

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> AjouBb | <input type="checkbox"/> automatic recording system | <input type="checkbox"/> web-based assignment |
| <input type="checkbox"/> cyber lecture | <input checked="" type="checkbox"/> online content | |
| <input type="checkbox"/> class behavior analyzating system | <input checked="" type="checkbox"/> others | (git.ajou.ac.kr – all projects and homework should be |

6. Teaching Tools

- | | | |
|--|---|---|
| <input type="checkbox"/> PBL(Problem Based Learning) | <input type="checkbox"/> CBL(Case Based Learning) | <input type="checkbox"/> TBL(Team Based Learning) |
| <input type="checkbox"/> UR(Undergraduate Research) | <input type="checkbox"/> FL(Flipped Learning) | <input type="checkbox"/> DSAL(Data Science Active Learning) |
| <input type="checkbox"/> others | | |

7. Knowledge and ability required for taking this course

프로그래밍 능력, 자료구조에 대한 이해, 선형대수학, 웹 프로그래밍 수강은 도움이 됨

Requires – Programming Skill, Data Structure
Linear Algebra and Web Programming (Javascript) is helpful.

8. Method of Evaluation

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		20	Attendance + Class Activity
midterm exam		20	Mid-term exam
final exam		30	Final exam
quiz			
presentation			
discussion			
homework		30	Homework 5x4 / Final Project 1x20
etc			
study hours			

9. Textbook and supplementary material

Main/Sub	Title (Web-site)	Writer	Publisher	Publication year
Ref.	Interactive Computer Graphics A Top-Down Approach with WebGL : Global Edition	Edward Angel	Pearson	2015
Ref.	OpenGL ES Programming Guide	Ginsberg	Addison Wesley	2015
Main	Handout will be released before classes			

10. Class system and Class shedule

<ol style="list-style-type: none"> 1. Introduction to computer graphics 2. Basic theory of 2D, 3D Graphics 3. Advanced theory of 3D Graphics and Animation 4. WebGL lab

< Class Schedule >

* language : K-korean, E-English

Weeks	Topics	language	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
1	Introduction to computer graphics (+ mathematics for computer graphics)	K	Hwanyong Lee			
2	graphics programming	K	Hwanyong Lee		Homework 1	
3	graphics primitives	K	Hwanyong Lee			

< Class Schedule >

* language : K-korean, E-English

Week s	Topics	lang uage	Instructor	Teaching Method	Evaluation Method	Matter to be prepared
4	geometric transforms	K	Hwanyong Lee			
5	geometric transforms	K	Hwanyong Lee		Homework 2	
6	viewing (graphics pipeline)	K	Hwanyong Lee			
7	viewing (graphics pipeline)	K	Hwanyong Lee			
8	midterm exam	K	Hwanyong Lee		Exam	
9	Illumination and shading	K	Hwanyong Lee			
10	Illumination and shading	K	Hwanyong Lee		Homework 3	
11	texture mapping	K	Hwanyong Lee			
12	shadows	K	Hwanyong Lee			
13	global illumination	K	Hwanyong Lee		Homework 4	
14	antialiasing	K	Hwanyong Lee			
15	curves and surfaces	K	Hwanyong Lee		Final Project	
16	final exam	K	Hwanyong Lee		Exam	

11. Other items of notification