2309 CS440/SE440/CS104 Course Outline

Subject Code	:	CS440/SE440/CS104
Subject Title	:	COMPUTER GRAPHICS
Course Type	:	Elective
Level	:	3
Credits	:	3
Teaching Activity	:	Lecture 45 hours
Prior Knowledge*	:	Linear Algebra, Computer Programming, Object Oriented Programming
Class Schedule	:	

Class	Week	Time	Classroom	Date
D1	TUE	19:00-21:50	C309	2023-09-04 ~ 2023-12-17

Instructor	:	(Milton) Chi-Chong Wong
E-mail Address	:	ccwong@must.edu.mo
Office	:	A306b
Office Hour	:	Monday: 17:30 - 19:30 Tuesday: 17:00 - 19:00 Wednesday: 13:30 - 17:30 Friday: 12:00 - 14:00

COURSE DESCRIPTION

This course is designed to provide an introduction to interactive computer graphics for advanced undergraduates. The course will cover principles of computer graphics, elementary operations in two- and three-dimensional space, transformational geometry, lighting, texturing, and graphics processing units. It also aims to acquaint the student with the basic principles of computer graphics, and the cross-cutting relationship to multiple problem domains in graphics (rendering, animation, geometry, imaging).

REFERENCE BOOKS (Not required, lecture materials are self-contained)

Shirley, Peter, Michael Ashikhmin, and Steve Marschner. "Fundamentals of Computer Graphics", (4th/5th Edition), AK Peters/CRC Press, 2016/2021.

INTENDED LEARNING OUTCOMES

Upon successful completion of this subject, students will be able to:

1. Understand the basic principles of computer graphics;
2. Understand the two- and three-dimensional transformations;
3. Understand the concepts of modelling, rendering, and animation;
4. To be able to use graphics libraries to implement 2D/3D computer graphics;
5. To be able to develop interactive computer graphics programs.

Weekly Schedule

Index	Topic	Hours	Teaching Method
1	Introduction to Computer Graphics	3	Lecture
2	Linear Algebra and Vector Calculus review	3	Lecture

3	Rasterization and Sampling	3	Lecture
4	Spatial Transformations	3	Lecture
5	3D Graphics I: Perspective Projection	3	Lecture
6	3D Graphics II: Texture Mapping	3	Lecture
7	3D Graphics III: Meshes and Manifolds	3	Lecture/Practicals
8	Midterm	3	----
9	Digital Geometry Processing	3	Lecture/Practicals
10	Lighting, Color	3	Lecture
11	Radiometry, Shadow	3	Lecture
12	Rendering I	3	Lecture
13	Rendering II	3	Lecture/Practicals
14	Animation	3	Lecture
15	Final Project presentations	3	Lecture

ASSESSMENT APPROACH

Assessment method	% weight
1. Attendance	10%
2. In-Class Exercises/Written Exercises	10%
3. Practicals	10%
4. Midterm	30%
5. Project	40%
Total	100 %

Guideline for Letter Grade:

Marks	Grade
93-100	A+
88-92	A
83-87	A-
78-82	B+
72-77	B

68-71	B-
63-67	C+
58-62	C
53-57	C-
50-52	D
0-49	F

Notes:
Students will be assessed on the basis of continuous assessment (i.e. attendance, exercises, practicals, midterm, and project). The attendance evaluates the students' participation in the class activities. The exercises and practicals evaluate the students' ability to problem solving in computer graphics. The coursework assessment item (i.e. project) is used to evaluate students' ability to apply concepts, to construct knowledge and skills in solving problems in computer graphics. Midterm will primarily evaluate students' knowledge of the theoretical aspects of the course contents.