Form 2B

City University of Hong Kong

Information on a Course
offered by Department of Computer Science
with effect from Semester A in 2012 / 2013

Part I

Course Title: Computer Graphics

Course Code: CS5182

Course Duration: One Semester

Credit Units: 3

Level: P5

Medium of Instruction: English

Prerequisites: Nil

Precursors: Nil

Equivalent Courses: Nil

Exclusive Courses: Nil

Part II

Course Aims

This course covers the core concepts and algorithms of 2D/3D computer graphics and the applications of computer graphics technologies. The main objective is to familiarize students with current computer graphics techniques and their applications in different domains.

Course Intended Learning Outcomes (CILOs)
Upon successful completion of this course, students should be able to:

No.	CILOs	Weighting (if applicable)
1.	identify the motivation and the main characteristics of different computer graphics techniques;	

2.	design and develop selected computer graphics algorithms;	
3.	evaluate and critique different types of graphics systems;	
4.	apply computer graphics techniques to real-world applications.	

Teaching and Learning Activities (TLAs)

(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

Teaching pattern:
Suggested lecture/tutorial/laboratory mix: 2 hrs. lecture; 1 hr. tutorial.

CILO No.	TLAs	Hours/week (if applicable)
CILO 1,2,3	**Lecture:** The lectures will focus on the introduction of 2D/3D computer graphics techniques, and their applications in different domains.	
CILO 2,3	**Tutorial:** In the tutorials, students are provided with exercise questions and asked to complete them during the class. The answers to the exercise questions are then provided and discussed in order for the students to get familiar with the course materials.	
CILO 3,4	**Project:** Students are required to apply suitable computer graphics techniques to solve a real world problem. The project may involve OpenGL programming or VRML.	

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

CILO No.	Type of Assessment Tasks/Activities	Weighting (if applicable)	Remarks
CILO 1	**Coursework:** Students are required to work on different tutorial problem sets each week, and present their solutions in class. The quality of their works will be used to assess this ILO. **Examination:** Final examination will include questions to assess the capability of students to identify the important features of different computer graphics techniques.		
CILO 2	**Coursework:** In some of the tutorial exercises, students are required to design		

	and develop selected computer graphics algorithms, and observe the results of these different approaches. The quality of their works will be used to assess this ILO.		
CILO 3	**Coursework:** Students are required to evaluate and compare the performance of different graphics systems in their tutorial exercises and project. The quality of their evaluation will be used to assess this ILO. **Examination:** Final examination will include questions to assess the capability of students to evaluate and compare the results of different graphics systems.		
CILO 4	**Project assignment:** Students are required to work on a project by applying different graphics techniques to design and implement an application. The quality of the implemented application will be used to assess this ILO. **Examination:** Final examination will include questions to assess the capability of students to apply suitable computer graphics techniques to design a graphics system for a real-world application based on a requirement specification.		

Grading of Student Achievement: Refer to Grading of Courses in the Academic Regulations for Taught Postgraduate Degrees**.**

Examination duration: 2 hours

Percentage of coursework, examination, etc.: 40% CW; 60% Exam

Grading pattern: Standard (A+AA-…F)

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

Part III

Keyword Syllabus

2D graphics; 2D transformations and projection; 3D graphics: 3D transformations and projection; clipping; object modelling; rendering pipeline; common ray-tracing techniques; radiosity; aliasing; spatial vs temporal aliasing; anti-aliasing; image processing; window systems.

Syllabus

2D/3D computer graphics techniques

Graphical input/output devices, 2D primitive drawing, 2D transformation, 3D transformation and projection, clipping, object modeling.

Image Generation Techniques

Some of the important image generation techniques including scan-conversion, ray-tracing and radiosity. Related issues such as shading, anti-aliasing and texture mapping will also be discussed.

Applications of Computer Graphics

Introduction to window system, virtual reality, image processing and multimedia.

Recommended Reading

Text(s)

J. Foley, A. van Dam, S. Feiner, and J. Hughes, "Computer Graphics: Principles and Practice in C", Second Edition, Addison Wesley, 1995.

J. Foley, A. van Dam, S. Feiner, J. Hughes, and R. Phillips, "Introduction to Computer Graphics," Addison Wesley, 1994.

D. Hearn and M. Baker, "Computer Graphics with OpenGL", Fourth Edition, Prentice-Hall, 2010.

Online Resources