Intro of Computer Graphics

Course Code: CSC 3224 Course Title: Computer Graphics

Dept. of Computer Science
Faculty of Science and Technology

Lecturer No:	**2**	**Week No:**	**01**	**Semester:**	**Summer, 20-21**
Lecturer:	*Dr. Md. Abdullah - Al - Jubair*				

Outline

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2. - Introduction to Computer Graphics
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Introduction of Computer Graphics

Course Prerequisite

- ✓ MAT2202
- ✓ CSC 2211: Algorithms
- ✓ Programming Language 1 & 2

Introduction of Computer Graphics

Definition

- Computer graphics studies the manipulation of visual and geometric information using computational techniques.
- It focuses on the mathematical and computational foundations of image generation and processing

Introduction of Computer Graphics

Subfields

- Geometry: studies ways to represent and process surfaces
- Animation: studies ways to represent and manipulate motion
- Rendering: studies algorithms to reproduce light transport
- Imaging: studies image acquisition or image editing
- Topology: studies the behaviour of spaces and surfaces.

Introduction of Computer Graphics

Connected Studies

- ✓ Applied mathematics
- ✓ Computational geometry
- ✓ Computational topology
- ✓ Computer vision
- ✓ Image processing
- ✓ Information visualization
- ✓ Scientific visualization

Introduction of Computer Graphics

Objective

This course provides a broad overview of the basic concepts of computer graphics. 2D raster graphics will be covered. Topics from raster graphics include transformations, color theory and scan conversion of lines and polygons. In addition, with this a practical glimpse of computer graphics will be given using OpenGL.

Introduction of Computer Graphics

Importance of the course

- Learn the basic principles and concepts of Computer Graphics.
- Learn to use mathematical transformations and vector techniques in the production of computer graphics as well as how to use these things in real world using OpenGL.
- Gain familiarity with the OpenGL library as a tool for writing C/C++ programs to create real graphics application.

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Practical use /Benefit of the course

- ✓ Augmented Reality
- ✓ Virtual Reality
- ✓ 3D/2D Structured Content
- ✓ Game, Animation
- ✓ 3D Animated Movie
- ✓ Higher Study Opportunity
- ✓ 2D/3D Game Development
- ✓ Higher Studies opportunities

Etc…

Introduction of Computer Graphics

About this course

- Each Lecture is of Two (2) hours.
  - ✓10 Min break after one hour or as suitable.
- Each Lab Class is of Three (3) hours.
  - ✓15 Min break after one and half hour or as suitable.

Introduction of Computer Graphics

Course Contents

- Introduction to Computer Graphics
- Image Representation
- Scan Conversion for Line
- Scan Conversion for Circle & Ellipse
- 2D Transformations,
- Homogeneous Co-ordinate System
- 3D Transformations
- Projection/Viewing
- Clipping
- Lighting and Shading
- Hidden Surface
- Removal and Animation
- Fractal, Bezier Curves

Introduction of Computer Graphics

Project Evaluation Policy

- Group: 3-4 person
- Make sure all group member present in time and wear formal dress
- Simple PowerPoint slide and Report needed

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Marking Criteria (Mid Term)

Midterm (Carry Marks) (It might be change later)

- Attendance @ 5%
- Theory Class Assessment @ 20% (Every Class)
- Lab Performance @ 15% (Every Lab)
- Lab Assignment @ 10%

Mid Assessment @ 50%

a. MCQ (Theory)- 10%

b. Discussion (Theory) - 15%

c. MCQ (Lab) – 10%

d. Lab Assessment & Discussion – 15%

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Marking Criteria (Final Term)

Final Term (Carry Marks) @ 50% (It might be change later)

Attendance @ 5%
Class Assessment @ 20%
Lab Performances @ 15%
Lab Assignments @ 10%

Final Assessment @ 50% (After Assessment weeks)

a. Project Assessment with Discussion @ 40%
b. Report Writing @ 7%
c. Project Proposal @ 3%

Introduction of Computer Graphics

Marking Criteria (Final Grade)

Final Grade: Mid (40%) + Final (60%)

***Bonus: In Final Grade only and Limited to those who are capable to get**

Introduction of Computer Graphics

Text Books/Reference Materials

- Foley, van Dam, Feiner, Hughes, Computer Graphics: principles and practice, Addison Wesley, Second Edition.
- Peter Shirley Steve Marschner , “Fundamental of computer graphics”, Third Edition.
- Schreiner et. al., OpenGL Programming Guide, Fourth Edition, also known as "The Red Book"
- Schaum's Outline of Theory & Problems of Computer Graphics.
- Helpful link for Problem Solving : http://nehe.gamedev.net/
- Lecture notes will be provided online at the course website weekly.