##### Daffodil International University



**102, Shukrabad, Mirpur Road, Dhanmondi, Dhaka- 1207**

**CSE-421: Computer Graphics (Day+Evening)**

**Course Teacher: Nazmun Nessa Moon**

**Objectives:**

An introduction to computer graphics hardware, algorithms and software. Line generators, transformations, line and polygon clipping, splines, interactive techniques, perspective projection, hidden surface algorithms, lighting models, shading, and animation.

**Detail Course Outline (Theory)**

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| **Week 1:**  **Chapter-1**  1.1 Introduction: A Survey of Computer Graphics  1.2 Definition  1.3 Application of Computer Graphics  **Chapter-2**  2.1 Overview of Graphics System  2.2 Video Display Devices: Refresh Cathode Ray Tubes  2.3 Raster Scan Displays  2.4 Random-Scan Displays  2.5 Color CRT Monitors  2.4.1 Beam-Penetration Method  2.4.2 Shadow-Mask Method  2.6 Direct-View Storage Tubes  2.7 Flat-Panel Displays  2.7.1 Plasma Panel Displays  2.7.2 Thin-Film Electroluminescent Display  2.7.3 LED Display  2.7.4 LCD Display  **Week 2:**  **Chapter-3**  3.1 Points and Lines  3.2 Line Drawing Algorithm  3.3 DDA Algorithm    **Chapter-3**  3.4 Bresenham’s Line Algorithm   * Parameter Description * Algorithm * Example     **Week 3:**  **Chapter-3**  3.5 Circle Generating Algorithm  3.6 Properties of Circle  3.7 Midpoint Circle Algorithm   * Parameter Description * Algorithm * Example   **Week 4:**  **Chapter-5**  5.1 Two-Dimensional Geometric Transformation  5.2 Basic Transformation   * Translations * Rotation * Scaling * Reflection * Shear   **Week 5:**  **Chapter-6**  6.1 Two-Dimensional Viewing  6.2 Window-to-Viewport Coordinate Transformation  6.3 Two-Dimensional Clipping  6.4 Clipping Operations   * Point Clipping * Line Clipping * Polygon Clipping * Curve Clipping * Text Clipping   6.5 Cohen-Sutherland Line Clipping Algorithm  6.6 Polygon Clipping  6.7 Sutherland- Hodgeman Polygon Clipping Algorithm  6.8 Weiler-Atherton Polygon Clipping Algorithm  **Week 6:**  **Chapter-9**  9.1 Three Dimensional Concepts  9.2 Three Dimensional Display Methods   * Parallel Projection * Perspective projection * Depth Cueing * Visible Line and Surface Identification * Surface Rendering   **Week 7:**  **Chapter 10**  10.1 Bezier Curves  10.2 Spline Curves   * B splines curves * Beta splines curves   **Week 8:**  **Chapter 13:**  13.1Hidden surface algorithm  13.2 Classification of visible surface detection algorithm  13.3 Depth- Buffer algorithm  **Week 9:**  **Chapter 14**  14.1 Lighting Model  14.2 Light Sources  14.3 Basic Illumination Models   * Ambient Light * Diffuse Reflection   14.4 Intensity Attenuation  **Week 10:**  **Chapter 14**  14.5 Halftone Pattern and Dithering Techniques  14.6 Halftone Approximation  14.7 Dithering Techniques  **Week 11:**  **Chapter 15**  15.1 Color Models and Color Applications  15.2 Properties of Light  15.3 Standard Primaries and the Chromaticity Diagram  15.4 Intuitive Color Concepts  15.5 RGB Color Model  15.6 CMY Color Model    **Week 12:**  **Chapter 16**  16.1 Computer Animation: Design of Animation Sequences  16.2 General Computer Animation Functions  16.3 Raster Animations  16.4 Motion Specification | **Class Test-1**  **Class Test-2**  **Mid Term Exam**  **Class Test-3**  **Presentation** |

**Book List**

**Text Books:**

1. Computer Graphics, by Donald Hearn, M. Pauline Baker

**Reference Books:**

1. Schaum's Outline of Computer Graphics

By [Ray Plastock](http://www.fishpond.com.au/c/Books/a/Ray+Plastock), [Gordon Kalley](http://www.fishpond.com.au/c/Books/a/Gordon+Kalley), [Zhiang Xiang](http://www.fishpond.com.au/c/Books/a/Zhiang+Xiang), [Zhingang Xiang](http://www.fishpond.com.au/c/Books/a/Zhingang+Xiang)

1. C Programming Using Turbo C++

By Robert Lafore

**Evaluation**

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| **Criteria** | **Marks Distribution**  **(Theory)** |
| Class Attendance | 7% |
| Assignment | 5% |
| Presentation | 8% |
| Class Test | 15% |
| Mid-Term | 25% |
| Semester Final | 40% |
| **TOTAL** | **100%** |

**Important notes:**

1. The class tests will be held on due class and extra exam will not be taken.

2. Every students should collect their Assignment from course teacher in due date.

3. Three class tests will be taken. And the average of all three tests will be considered.

4. The syllabus of the final examination should include the topics covered after the mid term examination and will also include at least 30% of the mid term syllabus.

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