COMP 6909 —
FUNDAMENTALS OF COMPUTER GRAPHICS

Winter 2016

Department of Computer Science
Memorial University of Newfoundland

Instructor:
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Lectures:
Time slot: Monday, Wednesday, & Friday 10:00 ~ 10:50am
Room: EN-1004
Website: http://www.cs.mun.ca/~gong/Courses/comp6909/

Course Description:
The objective of this course is to introduce the students to the state-of-the-art concepts and trends in computer graphics. The underlying algorithms, as well as the basic techniques to develop them, are presented. Topics of the course include 2D raster graphics, basic image handling, geometrical transformations, 3D modeling and rendering, advanced photorealistic rendering.

Prerequisite: COMP 3719 and MATH 2050
Reference: Introduction to Computer Graphics
By: James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, & Richard L. Phillips

Evaluation:
Term test: 20%
Assignments: 40%
Course project: 40%

Course Topics:
Introduction:
Introduction
Intensity & Color
Image Capture
Human Perception
Display Hardware
Raster Graphics:
- Line Generation
- Line Clipping
- Circle Generation
- Polygon Filling

Image Handling:
- Alpha Compositing
- Warping & Sampling
- Digital Halftoning
- Feature Warping

Geometrical Transformation:
- Math Preliminary
- 3D Transformation
- 2D Transformation
- 3D Projection
- 3D Viewing

3D Modeling:
- Geometric Primitives
- Parametric Curve
- Parametric Surface
- Solid Modeling

3D Rendering:
- Visibility Determination
- Illumination Model
- Ray Casting
- Texture Mapping
- Polygon Shading
- Anti-Aliasing

Photorealistic Rendering:
- Global Illumination
- Ray Tracing
- Radiosity Rendering
- Photon Mapping

Teaching Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Introduction</td>
<td>Human Perception</td>
</tr>
<tr>
<td>2</td>
<td>Intensity &amp; Color</td>
<td>Line Generation</td>
<td>Polygon Filling (Assignment 1)</td>
</tr>
<tr>
<td>3</td>
<td>Circle Generation</td>
<td>Line Clipping</td>
<td>Alpha Composition</td>
</tr>
<tr>
<td>4</td>
<td>Warping &amp; Sampling</td>
<td>Feature Warping</td>
<td>Image Morphing (Assignment 2)</td>
</tr>
<tr>
<td>5</td>
<td>Digital Halftoning</td>
<td>Math Preliminary</td>
<td>2D Transformation</td>
</tr>
<tr>
<td>6</td>
<td>3D Transformation</td>
<td>3D Projection</td>
<td>3D Viewing</td>
</tr>
<tr>
<td>7</td>
<td>Geometric Primitives</td>
<td>Visibility Determination</td>
<td>Solid Modeling</td>
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<tr>
<td></td>
<td>(Assignment 3)</td>
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<tr>
<td>8</td>
<td>Winter Semester Break</td>
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<td>Parametric Curve</td>
<td>Parametric Surface</td>
<td>Illumination Model</td>
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<tr>
<td>9</td>
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<tr>
<td>10</td>
<td>Polygon Shading (Assignment 4)</td>
<td>Texture Mapping</td>
<td>Ray Casting</td>
</tr>
<tr>
<td>11</td>
<td>Anti-Aliasing</td>
<td>Global Illumination</td>
<td>Ray Tracing</td>
</tr>
<tr>
<td>12</td>
<td>Radiosity Rendering</td>
<td>Photon Mapping</td>
<td>Term Test</td>
</tr>
<tr>
<td>13</td>
<td>Display Hardware</td>
<td>Image Capture</td>
<td>Term Test Feedback</td>
</tr>
<tr>
<td>14</td>
<td>Project Presentations</td>
<td>Project Presentations</td>
<td></td>
</tr>
</tbody>
</table>

**Resources:**

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The Desire2Learn website ([https://online.mun.ca/](https://online.mun.ca/)) is used for posting all assignments and you are required to check regularly regarding to assignment announcements and due dates. All assignments are due prior to the midnight of the specified dates. Late submissions will not be accepted. Finished assignment must be submitted online via Desire2Learn. Physical submissions are not required.