

# CMSC 740 – Tentative Course Plan

Spring 2007, Amitabh Varshney

<b>Jan 25</b>	Overview, Human Visual System <i>applications, pipeline, perception</i>	<b>Jan 30</b>	Graphics Hardware and APIs <i>GPUs, OpenGL, GLUT</i>
<b>Feb 1</b>	Transformations and Viewing <i>types, composition, parallel/perspective</i>	<b>Feb 6</b>	Lines, Polygons, Visibility in 3D <i>scan conversion, Z-buffer, BSP</i> <b>Assg 1 given</b>
<b>Feb 8</b>	Illumination, Shading, Textures <i>uses, types, mappings</i>	<b>Feb 13</b>	Global Illumination <i>ray-tracing, radiosity</i>
<b>Feb 15</b>	Rendering Equation <i>overview, motivation</i>	<b>Feb 20</b>	Volume Rendering <i>indirect and direct</i> <b>Assg 1 due, projects out</b>
<b>Feb 22</b>	<b>Guest Lecture:</b> Ben Shneiderman <i>InfoVis: Hierarchical and Tree-Structured Data</i>	<b>Feb 27</b>	Parallel Graphics <i>sorting classification</i>
<b>Mar 1</b>	GPU Programming <i>vertex, fragment shaders, Cg</i>	<b>Mar 6</b>	General-Purpose GPU Programming <i>linear algebra, sort, databases</i> <b>Project report 1 due</b>
<b>Mar 8</b>	Triangle Meshes <i>representation, LOD</i>	<b>Mar 13</b>	<b>Midterm Exam</b>
<b>Mar 15</b>	Delaunay Triangulations and Convex Hulls <i>duality, lifting</i>	<b>Mar 27</b>	Surface Reconstruction <i>alpha shapes and molecular surfaces</i>
<b>Mar 29</b>	Implicit Modeling <i>metaballs, blobby models</i>	<b>Apr 3</b>	Project Updates <b>Project report 2 due</b>
<b>Apr 5</b>	Discrete Differential Geometry <i>mesh processing</i>	<b>Apr 10</b>	Discrete Differential Geometry <i>mesh parameterizations</i>
<b>Apr 12</b>	General Illumination <i>BRDF, BSSRDF, factorization</i>	<b>Apr 17</b>	Rendering Basis Functions <i>spherical harmonic lighting</i>
<b>Apr 19</b>	Pre-Computed Radiance Transfer <i>diffuse and general</i>	<b>Apr 24</b>	High-Dynamic Range Graphics <i>images, lighting, tone-mapping</i>
<b>Apr 26</b>	Non-Photorealistic Rendering <i>NPR illustration, lighting</i>	<b>May 1</b>	Lighting Design and Saliency <i>principles and algorithms</i>
<b>May 3</b>	Wrap-up Review	<b>May 8</b>	Project Demos and Presentations <b>Final project submissions due</b>
<b>May 10</b>	Project Demos and Presentations	<b>May 12</b>	<b>Final Exam</b> <b>8:00am – 10:00am</b>