

# CMSC 740 – Tentative Course Plan

Spring 2004, Amitabh Varshney

<b>Jan 27</b>	Motivation, Overview <i>applications, graphics pipeline</i>	<b>Jan 29</b>	Pixel Ops & Line Scan Conversion <i>bitmaps, pixmaps, raster/vector line scan-conversion</i>
<b>Feb 3</b>	Graphics APIs and 2D Transforms <i>OpenGL, GLUT, graphics transforms</i> <b>Assignment 1 given</b>	<b>Feb 5</b>	3D Transformations and Quaternions <i>representation, composition local vs global coords</i>
<b>Feb 10</b>	Viewing in 3D <i>parallel, perspective hierarchical coordinate systems</i>	<b>Feb 12</b>	Color and Transparency <i>models and theory dithering, halftoning, gamma</i>
<b>Feb 17</b>	Polygon Scan-Conversion <i>overview, algorithms</i> <b>Assg 1 due, Assg 2 given</b>	<b>Feb 19</b>	Illumination & Shading <i>local illumination interpolative shading</i>
<b>Feb 24</b>	Textures <i>use, types, mapping</i>	<b>Feb 26</b>	Aliasing and Filtering <i>sampling, reconstruction, antialiasing</i>
<b>Mar 2</b>	Hidden Surface Removal <i>depth cues, Z-buffer, BSP, Scan-line</i> <b>Assg 2 due, Assg 3 given</b>	<b>Mar 4</b>	Rendering Equation <i>overview, motivation multi-pass rendering, shadows</i>
<b>Mar 9</b>	General Illumination <i>BRDF, BSSRDF, Spherical Harmonics</i>	<b>Mar 11</b>	Ray Tracing <i>overview, acceleration</i>
<b>Mar 16</b>	Photon Mapping <i>Monte Carlo methods</i> <b>Assignment 3 due</b>	<b>Mar 18</b>	Radiosity <i>overview, applications</i>
<b>Mar 30</b>	Modeling Overview <i>Meshes, Implicit, Parametric, CSG</i> <b>Assignment 4 given</b>	<b>Apr 1</b>	<b>Midterm Exam</b>
<b>Apr 6</b>	Curves and Surfaces <i>Bézier and B-Spline</i>	<b>Apr 8</b>	Implicit Modeling <i>Interpolating Implicits Metaballs/Bloppy Models</i>
<b>Apr 13</b>	Triangle Meshes <i>Multiresolution Hierarchies</i>	<b>Apr 15</b>	Triangle Meshes <i>Static and Dynamic visibility</i>
<b>Apr 20</b>	Point-based Rendering <i>overview, approaches</i>	<b>Apr 22</b>	Volume Rendering <i>indirect techniques</i>
<b>Apr 27</b>	Volume Rendering <i>direct techniques</i>	<b>Apr 29</b>	Computer Animation <i>keyframing, interpolation</i>
<b>May 4</b>	Graphics Display Technology <i>LCD, DMD, HMD, Autostereoscopies</i> <b>Assignment 4 due</b>	<b>May 6</b>	Virtual Environments <i>technology, applications</i>
<b>May 11</b>	Wrap-up Review	<b>May 19</b>	<b>Final Exam</b> <b>10:30am – 12:30pm</b>