

# CMSC 427 – Tentative Course Plan

Spring 2009, Amitabh Varshney

<b>Jan 27</b>	Motivation, Overview <i>applications, graphics pipeline</i>	<b>Jan 29</b>	Graphics APIs and Pixel Operations <i>event-driven computing, OpenGL, GLUT</i>
<b>Feb 3</b>	Graphics Meshes <i>overview, representations</i>	<b>Feb 5</b>	Illumination & Shading <i>ambient, diffuse, specular flat, Gouraud, Phong</i>
<b>Feb 10</b>	Textures <i>use, types, mapping</i> <b>Assg 1 given</b>	<b>Feb 12</b>	2D and 3D Transforms <i>homogeneous coords, composition hierarchical transforms, rotations</i>
<b>Feb 17</b>	3D Viewing and Screen Picking <i>parallel, perspective canonical views, selection</i>	<b>Feb 19</b>	Visibility Determination <i>object-order, image-order Z-buffer, cells/portals, BSP trees</i>
<b>Feb 24</b>	Color, Transparency, & Shadows <i>blending, dithering, shadow algorithms</i> <b>Assg 1 due, Assg 2 given</b>	<b>Feb 26</b>	Modeling Curves and Surfaces <i>modeling overview Bézier curves and surfaces</i>
<b>March 3</b>	Culling and Collisions <i>VFC, back-face, visibility depth cues, collision detection</i>	<b>March 5</b>	Physically-based Modeling <i>particles, mass-spring models</i>
<b>March 10</b>	Graphics Processing Units <i>architecture, applications</i> <b>Assg 2 due, Assg 3 given</b>	<b>March 12</b>	Shader Programming <i>vertex and fragment programs</i>
<b>March 24</b>	General-Purpose GPU Programming <i>linear algebra, CUDA</i>	<b>March 26</b>	Procedural Graphics <i>textures and geometry synthesis</i>
<b>March 31</b>	Implicit Modeling <i>metaballs, blobby models</i>	<b>Apr 2</b>	<b>Mid-Term Exam</b>
<b>April 7</b>	Ray Tracing <i>overview, acceleration</i> <b>Assg 3 due, Assg 4 given</b>	<b>April 9</b>	Radiosity <i>overview</i>
<b>April 14</b>	Graphics Display Technology <i>vector/raster, CRT, LCD, DMD</i>	<b>April 16</b>	Line and Polygon Drawing <i>incremental algorithms</i>
<b>April 21</b>	Sampling and Filtering <i>anti-aliasing</i> <b>Assg 4 due</b>	<b>April 23</b>	Volume Rendering <i>overview, applications</i>
<b>April 28</b>	Point-based Rendering <i>overview, approaches</i>	<b>April 30</b>	Computer Animation <i>overview</i>
<b>May 5</b>	Level of Detail for 3D Meshes <i>operators, algorithms, error</i>	<b>May 7</b>	Salient Visualization <i>saliency, enhancement, uses</i>
<b>May 12</b>	Wrap-up Review	<b>May 14</b>	<b>Final Exam 8:00am – 10:00am</b>