

# CMSC 740 – Tentative Course Plan

Spring 2006, Amitabh Varshney

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|---------------|---|---------------|---|
| <b>Jan 26</b> | Motivation, Overview, Pixel Ops<br><i>applications, pipeline, raster/vector</i>                   | <b>Jan 31</b> | Graphics Hardware and APIs<br><i>GPUs, OpenGL, GLUT</i>   |
| <b>Feb 2</b>  | 2D and 3D Transformations<br><i>types, composition, coordinate systems</i><br><b>Assg 1 given</b> | <b>Feb 7</b>  | Viewing in 3D<br><i>parallel, perspective</i><br><i>hierarchical coordinate systems</i>                           |
| <b>Feb 9</b>  | Illumination & Shading<br><i>Ambient, Lambertian, Phong</i><br><i>Flat, Gouraud, Phong</i>        | <b>Feb 14</b> | Textures<br><i>use types mapping</i><br><b>Assg 1 due, Assg 2 given</b>   |
| <b>Feb 16</b> | Line and Polygon Scan-Conversion<br><i>various algorithms</i>                                     | <b>Feb 21</b> | Hidden Surface Removal<br><i>depth cues, Z-buffer, BSP</i>  |
| <b>Feb 23</b> | Ray Tracing<br><i>overview, acceleration</i>  | <b>Feb 28</b> | Volume Rendering<br><i>direct and indirect schemes</i><br><b>Assg 2 due</b>                                       |
| <b>Mar 2</b>  | GPU Programming<br><i>vertex, fragment shaders, Cg</i>  | <b>Mar 7</b>  | Parallel Graphics<br><i>classification based on sorting</i><br><i>Chromium, MPI</i>                               |
| <b>Mar 9</b>  | Aliasing and Filtering<br><i>sampling, reconstruction, filtering</i>                              | <b>Mar 14</b> | <b>Midterm Exam</b>   |
| <b>Mar 16</b> | Rendering Equation<br><i>overview, motivation</i><br><b>Suggested projects list given</b>         | <b>Mar 28</b> | Illumination Basis Functions<br><i>spherical harmonics, BRDF, BSSRDF</i><br><i>pre-computed radiance transfer</i> |
| <b>Mar 30</b> | Radiosity<br><i>overview, applications</i>  | <b>Apr 4</b>  | Modeling Overview<br><i>Meshes, Implicit, Parametric, CSG</i><br><b>First project report due</b>                  |
| <b>Apr 6</b>  | Triangle Meshes<br><i>Multiresolution Hierarchies</i>   | <b>Apr 11</b> | Triangle Meshes<br><i>Static and Dynamic visibility</i>   |
| <b>Apr 13</b> | Implicit Modeling<br><i>meta balls, blobby models</i><br><i>interpolatory implicits</i>           | <b>Apr 18</b> | Parametric Modeling<br><i>Bézier and B-Spline</i><br><b>Project prototype due</b>                                 |
| <b>Apr 20</b> | Point-based Rendering<br><i>motivation, overview</i>  | <b>Apr 25</b> | Image-based Rendering<br><i>overview, approaches</i>  |
| <b>Apr 27</b> | Computer Animation<br><i>keyframing, interpolation</i>  | <b>May 2</b>  | Graphics Display Technology<br><i>LCD, DMD, HMD, Autostereoscopes</i>   |
| <b>May 4</b>  | Wrap-up Review  | <b>May 9</b>  | Projects Demo Day 1<br><b>Final project submissions due</b>   |
| <b>May 11</b> | Projects Demo Day 2   | <b>May 17</b> | <b>Final Exam</b><br><b>10:30am – 12:30pm</b>   |