CMSC 740 – Tentative Course Plan  
Fall 2008, Amitabh Varshney

Sep 2  Overview, Human Visual System  
applications, pipeline, perception  

Sep 4  Graphics Hardware and APIs  
GPUs, OpenGL, GLUT

Sep 9  Transformations and Viewing  
types, composition, parallel/perspective  

Sep 11  Lines, Polygons, Visibility in 3D  
scan conversion, Z-buffer, BSP  
Assg 1 given

Sep 16  Illumination, Shading, Shadows  
uses, types  

Sep 18  Textures and Triangle Meshes  
mapping, representation, transparency

Sep 23  Computer Animation  
overview, approaches

Sep 25  Sampling and Filtering  
aliasing: causes and fixes  
Assg 1 due, Assg 2 given

Sep 30  Global Illumination  
ray tracing, radiosity  

Oct 2  Volume Rendering  
ray casting, isosurfaces  
transfer functions

Oct 7  Parallel Graphics  
sorting classification

Oct 9  Programmable Shading  
shaders, Cg  
Assg 2 due, Assg 3 given

Oct 14  General-Purpose GPU Programming  
linear algebra, CUDA

Oct 16  Surface Reconstruction  
acquisition, alpha shapes

Oct 21 Midterm Exam

Oct 23  Geometric Modeling  
discrete operators, Laplacian, smoothing

Oct 28  Discrete Differential Geometry  
mesh processing and editing

Oct 30  Level of Detail for 3D Meshes  
operators, algorithms, error  
Assg 3 due, Assg 4 given

Nov 4  Implicit Modeling  
metaballs, blobby models

Nov 6  Implicit Modeling  
radial-basis functions

Nov 11  Parametric and Procedural Modeling  
Bezier, splines, L-systems

Nov 13  Rendering Basis Functions  
spherical harmonic lighting

Nov 18  Pre-Computed Radiance Transfer  
mid-range, subsurface, triple product

Nov 20  High-Dynamic Range Graphics  
images, lighting, tone-mapping  
Assg 4 due

Nov 25  Non-Photorealistic Rendering  
NPR illustration, lighting  

Dec 2  Point-based Rendering  
Surfels, Qsplat, Statistical techniques

Dec 4  Lighting Design  
cinematic effects and light placement

Dec 9  Salient Visualization  
saliency, enhancement, uses

Dec 11 Wrap-up Review

Dec 16 Final Exam  
8:00am – 10:00am