CS606: Computer Graphics
Evaluation Booklet

Jaya Sreevalsan-Nair *
International Institute of Information Technology, Bangalore

Jan-02-2014

Syllabus

1. Topics from textbook, "Interactive Computer Graphics: A Top-down Approach with Shader-based OpenGL, 6E," Edward Angel and Dave Shreiner, Addison Wesley, 2012:
   (a) Graphics Systems and Models.
   (b) Graphics Programming.
   (c) Geometric Objects and Transformations.
   (d) Viewing - Orthographic, Perspective, Hidden Surface Removal.
   (e) Lighting and Shading.
   (f) Algorithms for Processes from Vertices to Fragments.
   (g) Discrete Techniques - Texture Mapping.
2. Programmable Pipeline and Shader Programming.
3. Surfaces
   (a) Parametric Surfaces - Parametrization, Continuity, Bézier and B-spline Curves and Surfaces, NURBS, Interactive Editing of Control Points, Parametric Versions of Implicit Surfaces.
   (b) Mesh Surfaces - Representation Schemes, Edge and Mesh Data Structures, Approximating Splines by Meshes, Adaptive Subdivision and Subdivision Surfaces, Interactive Editing.
   (c) Trimmed Surfaces - Topology and Basic Data Structure, Trimmed Surfaces in OpenGL, Tessellation.
4. Models
   (a) Solid Models - Overview of Schemes such as Voxels, CSG, etc., B-rep and Sample Data Structures.
   (b) Hierarchical Models - Scene graph, Hierarchy of Transforms, Rendering - Integrating with OpenGL, Picking.
5. Animation and Kinematics - Keyframe Animation, Forward and Inverse Kinematics, e.g. Articulated Figures and Simulation, Collision Detection.

*(jnair@iiitb.ac.in); shared with a co-instructor, whose details will be provided in Feb-2014