

Final Exam Review for CS480/580

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1. **Chapter 6:**
2. Chapter 11: Representing curves and surfaces, polygonal meshes (11.1), representing polygonal meshes (11.1.1, explicit polygons, pointers into a vertex list, explicit edges), consult lecture notes for doubly connected edge list, consistency checks (11.1.2), plane equations (11.1.3) (consult lecture notes for finding equation of the plane given three points on the plane, two vectors and a point on the plane, or a point and a normal vector to the plane. Intersection of parametric line and any plane.) Parametric cubic curves, continuity considerations (geometric and parametric continuity) (11.2). Consult lecture notes for spline curves, desirable properties of curves and surfaces, and why cubic splines. Hermite curves (11.2.1), Bezier curves (11.2.2), B-splines definition (11.2.3, lecture notes) (briefly) Uniform non-rational B-splines (11.2.4, lecture notes), (briefly) Non-uniform rational B-splines (11.2.5, lecture notes), how to represent surfaces (very briefly from lecture notes).
3. Chapter 14: Why realism (14.1), orthographic views (14.3.1), perspective projection (14.3.3), depth cueing (14.3.4), depth clipping (14.3.5), texture (14.3.6), color (14.3.7), visible line surface algorithms (14.3.8), stereopsis (14.7), interacting with other senses (14.9).
4. Chapter 15: Visible surface determination. Extents and Bounding Volumes (15.2.3), back-face culling (15.2.4), Perspective projection (15.2.2), back-face culling (15.2.4), z-buffer algorithm (15.4), list priority algorithm (the depth sort or painter's algorithm) (15.5), scan -line algorithm (15.6), area subdivision algorithms (Warnock's algorithm) (15.7).

Brief introduction to ray tracing (15.10, see lecture notes), radiosity, grid, quad tree (used in Warnock's algorithm), oct tree space subdivision (see lecture notes), intersection of a ray and a triangle, intersection point inside or outside a triangle (see lecture notes).

5. Chapter 16: Illumination and Shading: ambient light (16.1.1), diffuse reflection (16.1.2), specular reflection (Phong reflection model (16.1.4), multiple light sources (16.1.6). Shading models (16.2), constant shading (16.2.1), polygon mesh shading, mach band effect (16.2.3), Gouraud shading (16.2.4), Phong shading (16.2.5), problems with interpolated shading (16.2.6). Texture mapping (16.3.2), Bump Mapping (16.3.3), shadows (briefly, see lecture notes), Transparency (16.5.1, see lecture notes) Recursive ray tracing (16.12, see lecture notes) Radiosity (Section 16.13.1).
6. Chapter 20: Fractal Models (20.3)(see lecture notes), Grammar-based models (20.4), L-systems (see lecture notes), Particle systems (20.5), Volume Rendering (20.6, see lecture notes), Waves (20.8.1, see lecture notes), Particle Systems (Section 20.5),
7. Other topics: Texture Mapping (see lecture notes), paste image on the object (see lecture notes), Environment mapping (see lecture notes), bump mapping (see lecture notes), deformation (see lecture notes).