Instructor: Dr. Xin (Shane) Li (URL: www.ece.lsu.edu/xinli Email: xinli@lsu.edu)

Course Description:
- To provide a knowledge on 3D computer graphics algorithms, techniques, and applications for modeling, simulation, animation, rendering and other key elements of visual computing.
- An advanced graduate course, but basic/necessary computer graphics knowledge will be briefly covered at the beginning.
- Good math background and programming skills could easily follow it.

Prerequisites:
- Calculus and linear algebra (vectors, matrices, …)
- Programming experience: homework and projects require substantial programming effort
  (You are expected to know C/C++ programming and standard data structures)

Tentative Contents:
1. Basic computer graphics pipeline, basic OpenGL programming;
2. Basic 3D Representation and Modeling: how to store, represent, and render 3D geometric objects using triangle meshes;
3. Basic Geometry and Topology;
4. Graphics modeling system, Graphics User Interface design, build your own GUI,
5. Efficient Modeling: Multi-resolutinal Representation (Progressive Meshes), Hierarchical Spatial Representation
6. Enhance your visual effects: Texture mapping, environmental mapping and rendering
7. Deformation and Animation: Free-form Deformation, Skeleton-driven Animation, Morphing, Collision Detection
8. Broader applications in visual computing: meshing; segmentation; shape analysis, comparison, recognition, and retrieval; …

Homework and exams:
1. One warm-up assignment, four regular homework assignments (8+10+10+10+11);
2. One course project (with a midterm and final presentation), you will pick the topic and team up for it (8+8+15);
3. A Final Exam (20).

Textbook: (not required, slides will be provided)