CSE 530: GEOMETRIC FOUNDATIONS FOR GRAPHICS AND VISUALIZATION  
(Course Syllabus, Spring Semester, 2006)

- **INSTRUCTOR:** PROFESSOR HONG QIN (qin@cs.sunysb.edu, Rm.2426, 631-632-8450)
- **LECTURES:** MW 2:20pm - 3:40pm, Computer Science Building, Rm. 1223.
- **OFFICE HOURS:** Monday 9:00 — 12:30, Wednesday 9:00 — 11:00, 1:00 — 2:20 or by appointment!
- **CREDITS:** 3

**SYNOPSIS:**

This entry-level graduate course will focus on mathematical tools, geometric (and graphical and visual) modeling techniques, and fundamental algorithms, that are relevant to graphics, visualization, and other visual computing areas. The goal is to provide graduate students a comprehensive knowledge on geometric concepts and demonstrate the significance of these mathematical tools and geometric algorithms in graphics and relevant areas. Course topics include geometric algorithms for both polygonal and curved objects, theory of parametric and implicit representations, modeling methods of curves, surfaces, and solids, in-depth spline theory, rudiments of wavelet theory and multi-resolution shape representations, and differential geometry fundamentals. If time permits, we will also cover general data and material modeling techniques, novel spline/subdivision schemes and their effective computation, reverse engineering, and shape deformation, as well as other sophisticated topics and latest advances in the field. Throughout the course, we will emphasize the application relevance in graphics, visualization, animation, digital geometric processing, medical imaging analysis, and human-computer interface.

**PREREQUISITES:**

1. Mathematical skills in calculus and linear algebra
2. Undergraduate graphics or visualization course
REFERENCES:

THERE IS NO SINGLE TEXTBOOK FOR THIS COURSE! MATERIALS FROM THE FOLLOWING RELEVANT REFERENCE BOOKS WILL BE PRESENTED!


OTHER BOOKS:


**THE FOLLOWINGS ARE RELEVANT JOURNALS:**


2. *IEEE Computer Graphics and Applications*

3. *ACM Transactions on Graphics*

4. *IEEE Transactions on Visualization and Computer Graphics*

5. *Computer-Aided Design*

6. *Computer Aided Geometric Design*


8. *The Visual Computer*

9. *Graphical Models*

**GRADING SCHEME:**

NO MIDTERM TESTS! NO FINAL EXAMS! 100% ON ASSIGNMENTS/PROJECTS! The work submitted should be your own! Late assignments will be penalized 25% per day. Furthermore, because a primary goal of the course is to teach professionalism, any academic dishonesty (e.g. plagiarism) will be viewed as a serious academic offense, thus as an evidence that the above goal has not been achieved and will be grounds for receiving a grade of F (Please refer to CEAS Procedures and Guidelines Governing Academic Dishonesty (1/81) for details).

Machine failure should not be a reason to delay assignment due dates unless there is a massive catastrophe, which will be announced by the instructor. Consider the possibility that machine failure may happen and then contention for machines will occur, my advice to all of you is that please start the projects as early as possible!

All graduate students should have access to the Grad PC Lab (located in Rm. 1239). The version of OpenGL in the Grad PC lab is V1.1, the same as the TransLab. If you don’t have access to the lab, please talk to the instructor and email to root requesting the (grad) course accounts.
DISTRIBUTION of INFORMATION

The syllabus and other detailed information are also available on-line at the CSE530 course website. The instructor is working hard to put all of the course material on the course website!

SPECIAL NOTES:

If you have a physical, psychological, medical or learning disability that may impact on your ability to carry out assigned course work, I would urge that you contact the staff in the Disabled Student Services office (DSS), Room 133, Humanities, 632-6748v/TDD. DSS will review your concerns and determine with you what accommodations are necessary and appropriate. All information and documentation of disability are confidential.