

Geometric modeling and computer graphics -- course outline

Last updated: Yeh-Liang Hsu (2010-09-12).

Note: This article is the course outline for "ME550, Geometric modeling and computer graphics", autumn 2010, Mechanical Engineering Department, Yuan Ze University.

1. Instructor

Professor Yeh-Liang Hsu, Rm. 3417, Ext.2459, email: mehsu@saturn.yzu.edu.tw.

2. TA

Po-Er Hsu(許博爾), Rm. 3423, (03) 4638800 Ext.2464-3423, or (03) 4357020, email: <u>s968705@mail.yzu.edu.tw</u>.

3. Course materials

Course materials adapted from *CAD/CAM Theory and Practice*, by Ibrahim Zeid, McGraw-Hill, 1991, Principles of CAD/CAM/CAE Systems, by Kunwoo Lee, Addison-Wesley, 1999, and *Graphics Concepts for Computer-Aided Design*, by Richard M. Lueptow, Pearson Prentice Hall, 2008, is available on the Portal or webpage of the course one week before class: http://designer.mech.yzu.edu.tw/. **This material is be used strictly for teaching and learning of this course**.

4. Course objective and format

In this course, students are expected to understand the fundamental theories and mathematics behind geometric modeling systems, to get familiar with a commercial software, and to explore the state of the art of current commercial software. **This course will be conducted strictly in English.** Students are expected to do the readings and finish the assignments **before** class, and teams will be selected to present their homework each week. **All homework assignments and student presentations will be in English.**

5. Assignments and grading

- (a) There will be 12 homework assignments and a final project. Students form teams of two for the assignments and the final project. Each team should pick a commercial CAD software (e.g., Pro/E, SolidWorks, AutoCad, etc.) as the subject of the assignments and final project. There are 6 problems in each assignment, including writing computer programs in Matlab and demonstrations of features of the CAD software for the theories discussed in the course.
- (b) The final project is an in-depth application of the CAD software or a demonstration of features of the CAD software that are not covered in the course. There will be an oral presentation for the final project, preferably in multi media.
- (c) A **PowerPoint** file should be uploaded into the portal of the course before class time. **No late homework is accepted.**
- (d) Homework assignments 72%, homework presentation 16%, final presentation 16%. Each problem in the homework assignment will be graded in 100%, 90%, 80%, 70%, 60%, 50% by the professor. There will be 4 homework presentations for each team, to be graded by your fellow student judges in 4%, 3%, and 2%. The final presentation will also be graded in part by your fellow student judges.

6. Master Schedule

Date	Topic	Note
2010/09/13	Course introduction	
2010/09/20	(1) CAD systems – basic concepts	
2010/09/27	(2) Projection of geometric models	
2010/1 <mark>0/04</mark>	Matlab programming tutorial	By TA
2010/10/11	(3) Curve representation	
2010/10/18	(4) Bezier curves	
2010/10/25	(5) B-Spline curves	
2010/11/01	(6) Analytic surfaces	
2010/11/08	Midterm week	No class
2010/11/15	(7) Geometric properties of surfaces	
2010/11/22	(8) Synthetic surfaces	
2010/11/29	(9) Boundary representation	
2010/12/06	(10) Constructive solid geometry	
2010/12/13	(11) Hidden line and surface	
2010/12/20	(12) Visual realism	
2010/12/27	Final presentation (I)	
2011/01/03	Final presentation (II)	
2011/01/10	Final week	No Class