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College of Engineering & Computer Science

Spring 2006

CEG 777-01: Computer Aided Geometric Design

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CEG-777 Course Syllabus

Computer Aided Geometric Design

Spring 2006

Class Hours: 4:00 - 5:25 PM, Mon, Wed.,

Classroom: 154 Russ Center

A. Goshtasby, Office: 341 Russ Center, E-mail: agoshtas@wright.edu, Phone: X5170

Office Hours: 2:00 - 3:00 Mon; 3:00 - 4:00 Wed, or by appointment.

Units: 4

Prerequisite: MTH230, MTH253, CS600 or equivalent

Textbooks:

Computer Graphics and Geometric Modeling

David Salomon

Springer-Verlag, 1999

Purpose of Course:

To cover the fundamentals of geometric modeling, including design of curves and surfaces, composite curves and surfaces, and subdivision techniques for creation of free-form shapes.

Contents:

1. Mathematical preliminaries
2. Lines and planes
3. Hermite cubic curves
4. Bézier curves
5. Composite curves
6. B-spline curves
7. NURBS curves
8. Rational Gaussian curves
9. Properties of curves
10. Polygons and Delaunay triangulation
11. Coons surfaces
12. Catmull-Rom surfaces
13. Bézier patches
14. B-spline surfaces
15. NURBS surfaces
16. Rational Gaussian surfaces
17. Surface of revolution
18. Subdivision surfaces
19. Implicit surfaces

Learning Goals:

Students will learn the basic mathematical tools to design geometric models and implement some of the

tools.

Projects:

There will be two programming assignments, a midterm exam, and a final project. Each of the assignments will require about 15 hours of work, while the final project will require about 30 hours of work.

Grading Policy:

Programming assignments will worth 30%, final project will worth 30%, and midterm exam will worth 35%. 5% of the grade is devoted to class participation.

Calendar:

Assignments, exam, project	Assigned or given	Due
Assignment 1	4/5/06	4/19/06, 4:00 PM
Assignment 2	4/19/06	5/3/06, 4:00 PM
Midterm exam	5/12/06, 4:10 PM	5/12/06, 5:25 PM
Final Project	5/19/06	6/3/06, 4:00 PM