

Department of Mechanical and Aerospace Engineering
ME xxxx – Geometric Computing for Engineers
Spring 2016

Course Description:

The course is designed for those who wish to pursue careers in digital design and manufacturing

Course Instructor: Prof. Jami Shah
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Textbook Class Notes

Credits 3

Time and Classroom TBD.

Recommended references:

1. Sedgewick: Algorithms in C++
2. Corney & Lim: 3D modeling with ACIS
3. Shah & Mantyla: Parametric & Feature based CAD/CAM

Pre-requisite:

Graduate standing in MAE, ISE, CS
Ability to program in C++
Linear Algebra.

Course Content/Objectives:

C++ data structures and algorithms to support geometric computing

Graph and geometric algorithms

Theory of solid modeling: adjacency topology; point set topology; BRep & CSG

Theory & implementation of Boolean ops

Computational geometry: bi-cubics, Bezier, B-splines, NURBS

Geometric reasoning & parametric feature recognition applications in design & manufacturing

Digital data exchange

Software:

- C++, MS/Visual Studio
- ACIS 3D Toolkit

Graded Work:

- Will be based on 6 programming projects and occasional quiz
- Quizzes: 20%
- Projects: 80%