

EN1740 - Spring 2012

Computer Aided Visualization and Design

Tu-Th 6:30-7:50pm B&H 191

website: <http://www.brown.edu/Departments/Engineering/Courses/En174/>

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Objective

An overview of software tools available for the formulation, visualization, simulation and communication of engineering designs. Students will study the use of computer applications to develop an engineered product from initial concept through to completed production design. Includes hands-on experience in the use of CAD/CAE software packages. Emphasis is placed on applications to solids and structural problems. Design projects will be carried out to supplement the material presented in course lectures.

Grading

Homework - 40%

Approximately bi-weekly assignments

Individual Project (*due on or around 3/22*) - 30%

Create component and assembly 3D models as well as corresponding engineering drawings.

Group Project (*due on or around 5/8*) - 30%

Use selected individual projects as a starting point to enhance design by using tools presented in class.

Recommended Textbook

GD&T Application and Interpretation by Bruce A. Wilson, Goodheart-Willcox
(ISBN 978-1-60525-249-0)

Available from a large number of on-line retailers

Notes

- Assignments will be distributed in class
- Electronic files will be submitted to en1740.brown@gmail.com
- Supporting materials will be available on the class website
- Assignments will be due one week after distribution
- Assignments may be submitted late only if an extension is granted before the due date
- The tenets of Brown's Academic Code will be followed

Proposed Course Outline

- Formulation
 - Top-Down vs. Bottom-up design
 - Solid Modeling
 - ★ Parametric feature creation
 - ★ Layout, datums and coordinate systems
 - ★ Data sharing and published geometry
 - ★ Advanced geometry creation
 - Assemblies
 - ★ Skeletons
 - ★ Parent-child
 - ★ Tolerance analysis
 - ★ Best practices
- Visualization
 - Rendering
 - Animation
- Simulation
 - Motion Analysis
 - Structural FEA
 - Optimization
- Communication
 - Multi-view engineering drawings
 - Orthographic projection
 - Geometric Dimensioning and Tolerancing
 - ASME Y14.5 2009