Computer-Aided Engineering

Lecture 1: Introduction

1. Review syllabus

Course Objective: To develop intelligent users of computational engineering analysis software.

   a) Attempt to evenly cover all major aspects of CAE, including:
      - geometrical modeling
      - mesh generation
      - selection of boundary & initial conditions
      - selection of appropriate solver
      - quantification of numerical uncertainty
      - presentation of results
      - trouble-shooting when things go wrong
         - numerical instabilities
         - mesh-related errors
         - ill-posed boundary or initial condition

   b) We will illustrate these CAE concepts for the major application areas of mechanical engineering:
      - solid mechanics
      - fluid mechanics
      - rigid-body dynamics
      - heat transfer
Related courses:
58:032 Design for Manufacturing (ProE)
58:111 Numerical Calculations (Numerical analysis)
58:115 Finite Element I (Ansys)
58:143 Computational Fluid and Thermal Engineering (Fluent)
58:154 Kinematics and Dynamics (DADS)

Software to be used in course: ProE, Ansys, Gambit, Fluent, Tecplot, DADS, Matlab

Introduce TAs / responsibilities

Dong Wei - Ansys, Matlab, Lead TA
Note Bradley - ProE, DADS
Xiongbin Liu - Fluent, Gambit, Tecplot

Grading

Homework - 30%
Midterms (2) - 20% each
Final project - 30%

- lectures will end about two weeks before end of course to give students time to work on final project

Review Course Contents (2)