## Computer Aided Engineering Course Schedule (2009)

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Class

- Hours: Thursday 9:10am-12:00pm
- Office: 5729
- cchang@mail.bme.ncku.edu.tw
  (Not for Home Work)

  - Office: x 63427

  - Lab.: x 63431 x 31

Course Grading

- Home Works: 40%
  - caeclass@mail.bme.ncku.edu.tw
    subject: HW#.## (student ID#, Name)
  - NO late turn in

- Midterm Test: 30%

- Final Project: 30%
Course Outline

- Optimization (w/o Linear Programming)
  - MATLAB
  - formulation; algorithm; theory
- Computer Graphics
  - SolidWorks
  - Matrix transformation
  - Parametric geometric
  - Solid modeling (w/ shading)
- Artificial Intelligence
  - MATLAB
  - Problem solving
  - Neural Network
  - Fuzzy Logical
- Finite Element Analysis
  - ANSYS; COSMOS
  - General concepts & Theory

*References will be given at the start of each topic.

Course Requirements

- BCC

- Computer Programming Concepts
  (BASIC, FORTRAN, C, MATLAB)

- Numerical Analysis
Terms

- **Algorithm**
  - A step by step procedure that produces a solution for a particular problem

- **Numerical Methods**
  - An algorithm for solving a problem whose solution consists of one or more numerical values. Most numerical methods give answers that are only approximate to the desired true solution
Terms

- **Numerical Solution**
  - numerical form; can obtain solution values at only pre-selected positions of the problem domain

- **Analytical Solution**
  - close (symbolic) form; can obtain solution values at any position of the problem domain

What is CAE?

- **Using computer to do the:**
  - Simulation
  - Analysis
  - Modeling
  - Graphic
  - ....
  - Computation
1946  ENIAC  5k operations/sec
1976  Cray-I  160 Mflops 8M RAM
1990s  Cray C90  1 Gflops 256M RAM

“Supercomputing made simple: New software helps tap unlimited power of idle PCs” (180 Tflops )
- 6.6.2003 CNN

“2009 Top 500: 1.1 Pflops (Los Alamos National Lab., USA)”

In 63 yrs: $10^3 \rightarrow 10^{15}$

“Never in the history of mankind has it been possible to produce so many wrong answers so quickly”

- Carl-Erik Fröberg
- (1918~2007, Sweden)