

Syllabus

MAE 384 Numerical Methods for Engineers

Tu/Thu 12:00-1:15 PM SCOB 152

Instructor: Huei-Ping Huang
Office hours: Tuesday & Thursday 3:30-5:00PM
ISTB2 Room 219A

Textbook: *Numerical Methods for Engineers and Scientists: An Introduction with Applications Using MATLAB*, Gilat and Subramaniam, Wiley 2007

- Please review: (1) Calculus and ordinary differential equation
(2) Linear algebra
(Self study: Ch.2 of Gilat & Subramaniam)
- Please refresh your skill in **Matlab** programming. It will help homework assignments. (Most homeworks can be done by pen and paper and a calculator, but it will take longer.)
 - Excellent online tutorials at <http://www.mathworks.com>
Click on Matlab and Simulink Tutorials
 - Beginner's guide (it's free):
http://www.mathworks.com/access/helpdesk/help/pdf_doc/matlab/getstart.pdf
 - Instructor will provide limited tutorials

Part I Basic Numerical Methods (Gilat & Subramaniam)

- Overview (Lecture note and Ch.1 of G&S)
- Nonlinear equations (Ch.3)
- System of linear equations (matrix equation and eigenvalue problem) (Ch. 4)
- Curve fitting and interpolation (Ch. 5)
- Numerical differentiation (Ch. 6)
- Numerical integration (Ch. 7)
- Ordinary differential equation
 - Initial value problem (Ch. 8)
 - Boundary value problem (Ch. 9)

Part II Introduction to Partial Differential Equation (PDE) (Lecture note)

- Overview and analytic solutions of PDE
- Numerical solutions of PDE

Grade: 50% Homework & projects
20% Mid-term
30% Final