Advanced Numerical Analysis
Department of Mechanical Eng., Shahrood Univ. of Technology

Lecturer   *Mohsen Nazari*, Email: nazari_me@yahoo.com, mnazari@shahroodut.ac.ir

Prerequisites   Mathematics, Programming.

Topics Covered

1.   Basic Concepts
2.   Approximations and Round-Off Errors
3.   Roots of Equations
4.   Linear Algebraic Equations
5.   Curve Fitting
6.   Numerical Differentiation
7.   Numerical Integration
8.   Numerical Methods for ODEs
9.   Numerical Methods for PDEs
10. Optimization

Textbooks

1- *Numerical Analysis,* R.L. Burden, J. D. Faires

2- *Numerical Methods for Engineers,* S.C. Chapra, R.P. Canale

Homework Problems

Homework problems are indicated in the course outline for each topic. It is necessary for all students to solve and turn in the homework problems.

Examinations

There will be 1- midterm exams during the term, announced well in advance. There will be a three-hour final exam. Quizzes and the exam will permit a limited number of pages of **open notes** (and a calculator and a book of mathematical formulas and tables). No other books will be allowed. The quizzes and the exam will not present you with routine problems, but will probe for mastery of the underlying material and for skill in modeling problems in the simplest possible realistic terms.

Grading

Activities	Percentages
Mid Term	20 %
Homework & Quiz	25 %
Final Exam	55 %
Seminar and Research	Extra Point (May be)