

CE343 NUMERICAL ANALYSIS

COURSE CONTENT

1 Week	Mathematical Modelling and Engineering Problem-Solving
2. Week	Algorithm Design and Pseudocode, Approximations and Errors
3. Week	Roots of equations, Simple One-Point iteration, Newton-Raphson Method, The Secant Method, Systems of Nonlinear equations
4. Week	Systems of Linear Algebraic Equations I: Gauss Elimination, Gauss-Seidel Method, Gauss-Jordan Method
5. Week	Systems of Linear Algebraic Equations II:LU Decomposition, Matrix Inverse
6. Week	I. Midterm
7. Week	Curve Fitting 1: Least-Squares regression, Linear regression, Polynomial regression, Multiple linear regression, Nonlinear regression
8. Week	Curve Fitting 2: Interpolation, Newton's Divided Difference Interpolating Polynomials, Lagrange Interpolating Polynomials
9. Week	Numerical Differentiation and Integration I: Newton-Cotes Integration formulas, Trapezoidal rule, Simpson's Rule
10. Week	Numerical Differentiation and Integration II: Integration with unequal segments,integration of equations, high accuracy numerical differentiation formulas
11. Week	Ordinary Differential Equations I: Euler Method, Modified Euler Method, Runge-Kutta Methods
12. Week	II.Midterm
13. Week	Ordinary Differential Equations II: Boundary value and eigenvalue problems
14. Week	Partial Differential Equations I: Finite difference elliptic equations
15. Week	Partial Differential Equations II: Finite difference parabolic equations
16. Week	Final Exam

Reference Book: Steven C. Chapra and Faymond P.Canale, 2015. Numerical Methods for Engineers, McGraw Hill Education.

Evaluation:	HOMEWORKS	%15
	MT1	%20
	MT2	%25
	FINAL	%40