

Tentative Weekly Lectures Schedule:

 Numerical Analysis , Burden and Faires , 9th Ed

Week	Contents / Topics	Exercise	Questions	Exam
1	Error analysis: Introduction of Numerical Computing ,ChoppingRoundoff and truncation error ,Abslute ,relative and percentage error ,Taylor polynomial,.Significant figures, Nested arithmetic, loss of significance.	1.1 1.2	1,2,11,13 1,4,5-8,13	A1/M1 /Q1/F CLO1
2	Solution(Root) of equations in one variable: The Bisection or Binary-search method. Fixed Point iteration. (x=g(x))	2.1 2.2	1-6,12,13 1-6,9- 11,14	
3	Newton’s Raphson and Secant Method.	2.3	1-10	
4	Method of False position (Regula falsi).			
5	Interpolation and Polynomial approximation: Lagrange interpolation polynomial of degree one,two and three with error term	3.1	1,2,5,6	CLO2
6	Mid 1 Exam			
7	Divided difference table and interpolating polynomial. Newton Forward and Backward difference formula	3.3	1-6,9	Q2/A2 /M2/F CLO2
8	Newton centered difference (stirling) formula.			
9	Numerical differentiation : Differentiation using Forward and Backward differences 3-point Endpoint and Midpoint formula & error bound 5-point Endpoint and Midpoint formula & error bound	4.1	1,2,5,6,18, 25,26	
10	Numerical Integration: Trapezoidal and Simpson’s rule with error term. Closed & open Newton-Cotes formulas with error term Composite Numerical Integration: Trapezoidal , Simpson’s and Midpoint formula with bound error	4.3 4.4	1,2,5- 10,22 1-4,7,8,11	
11	Mid 2 Exam			
12	Differential Equations: Euler’s method with bound error, 2-RK method , Mid Point formula Modify Euler and Huen’s method , 4-RK method	5.2 5.4	1,2,5 1-4 5-8 , 9-12 13-16	Q3/A3 /F CLO2
13	Direct Method for solving linear system: LU decomposition (Dolittle and Crout) and positive definite matrices LDL ^t Factorization , cholsky method	6.5 6.6	1,2,3-6 1- 3,5,11,12	
14	Iterative Techniques: Iterative methods for solving linear system Gauss-Siedel and Jacobi’s methods.	7.3	1,2,3,4	
15	Approximating Eigenvalues : The Power method	9.3	1,2,3	
16	One-Dimensional Optimization: Golden-Section Search and Parabolic Interpolation	7 (Steven Chapra)	1-10	

Course Teacher : Jamilusmani

Outline for Final exam CS-325

- 1. Solution(Root) of equations in one variable:**
- 2. Interpolation and Polynomial approximation:**
- 3. Numerical differentiation and Integration:**
- 4. Differential Equations:**
- 5. Direct Method for solving linear system:**
- 6. Iterative Techniques for solving $Ax=b$:**
- 7. Approximating Eigenvalues :**
- 8. One-Dimensional Optimization:**

FormulaSheet will be provided