

DEPARTMENT OF MATHEMATICS
CENTRAL UNIVERSITY OF JAMMU

TEACHING PLAN	
Course Title: Numerical Analysis	Duration of Examination: 3 hours
Course Code: MAMT- 104	Maximum Marks: 100
Course Instructor: Dr. Deep Singh	
Lecture 1	Errors and Numerical solutions of algebraic equations
Lecture 2	Concept of approximate numbers
Tutorial	Assignment/discussion/exercises
Lecture 3	Significant digits, Scientific notation
Lecture 4	Absolute and relative error
Tutorial	Assignment/discussion/exercises
Lecture 5	Normalized floating point numbers
Lecture 6	Solution of algebraic equations using the method of iteration
Tutorial	Assignment/discussion/exercises
Lecture 7	Newton Raphson method and examples
Lecture 8	Rate of convergence of iterative methods
Tutorial	Assignment/discussion/exercises
Lecture 9	System of linear algebraic equations and Gauss elimination method
Lecture 10	Gauss-Seidel methods and examples
Tutorial	Assignment/discussion/exercises
Lecture 11	Matrix Inversion method and examples
Lecture 12	Jordan's Method and examples
Tutorial	Assignment/discussion/exercises
Lecture 13	Norms of matrices and their examples
Lecture 14	Condition number of matrices, ill conditioned systems and examples
Tutorial	Assignment/discussion/exercises
Lecture 15	Results/analysis of convergence of iterative methods
Lecture 16	Constructing an algorithm based on Gauss elimination method
Tutorial	Assignment/discussion/exercises
Lecture 17	Finite differences: Forward, backward and divided difference operators
Lecture 18	Results on Forward, backward and divided difference operators
Tutorial	Assignment/discussion/exercises
Lecture 19	Newton's interpolations and examples
Lecture 20	Lagrange's interpolations and examples
Tutorial	Assignment/discussion/exercises
Lecture 21	Spline's interpolations and examples
Lecture 22	Different types of approximations: Least square polynomial approximation
Tutorial	Assignment/discussion/exercises
Lecture 23	Polynomial approximation by use of orthogonal polynomial
Lecture 24	Approximation with Chebyshev polynomial
Tutorial	Assignment/discussion/exercises

Lecture 25	Numerical integration and examples
Lecture 26	topic continued
Tutorial	Assignment/discussion/exercises
Lecture 27	Newton's cotes of integration trapezoidal
Lecture 28	Exercices on Newton's cotes of integration trapezoidal
Tutorial	Assignment/discussion/exercises
Lecture 29	Simpson's 1/3 rd and 3/8 rules
Lecture 30	Exercises on Simpson's 1/3 rd and 3/8 rules
Tutorial	Assignment/discussion/exercises
Lecture 31	Gaussian quadrature formula
Lecture 32	Exercises on Gaussian quadrature formula
Tutorial	Assignment/discussion/exercises
Lecture 33	Numerical solutions of ODE using Picard method
Lecture 34	topic continued
Tutorial	Assignment/discussion/exercises
Lecture 35	Numerical solutions of ODE using Euler's method
Lecture 36	topic continued.
Tutorial	Assignment/discussion/exercises
Lecture 37	Numerical solutions of ODE using Modified Euler's method
Lecture 38	Numerical solutions of ODE using Runge-Kutte method
Tutorial	Assignment/discussion/exercises
Lecture 39	Second and fourth order multistep method-Milne method
Lecture 40	topic continued
Tutorial	Assignment/discussion/exercises