Military Institute of Science & Technology (MIST)
Mirpur Cantonment, Dhaka-1216

Department of Computer Science & Engineering (CSE)

Session : 2019 Commencement Date : 07 July 2019

Subject

Title: Numerical Methods

Code: CSE-311
Credit Hour: 3.00
Contact Hour: 3.00
Level-3, **Term-II**

Instructor

Name:
Air Cdre Md. Afzal Hossain (AH)
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Advising Hour: Sunday : 11:30 to 13:30 Hrs (AH)

1.0 Course Objectives:

1.1 To Calculate the Solutions of nonlinear equations in one variable.

1.2 To analyse the interpolation and approximation.

1.3 To analyse numerical differentiation and integration

1.4 To understand direct methods for solving linear systems, numerical solution of ordinary differential equations.

2.0 Text Books: (preferably all of latest edition)

2.1 Numerical Methods - S Balachandra Rao (University Press)

2.1 Numerical Methods for Engineers - Steven C Chapra & Raymond P Canale (McGraw Hill Companies).

3.0 Reference Books:

3.1 Numerical Analysis – G. Shanker Rao (New Age International Publishers)

4.0 Distribution of Marks:

Description	Percentage (%)
Class Participation/Observation	05
Mid Term	15
Class Test / Assignment	20
Final Examination (Section A & Section B)	60
Total	**100**

4.0 Distribution (Planning) of the Course Contents:

Week	Lecture	Topics	Faculty
1	Lec 1 Lec 2 Lec 3	Introduction to Numerical Methods and Mathematical Modeling	AH
2	Lec 4 Lec 5 Lec 6	Estimation of Errors : Round-Off Errors and Truncation Errors	AH
3	Lec 7 Lec 8 Lec 9	Solution of algebraic equations : the iterative process	NH
Class Test –1			
4	Lec 10 Lec 11 Lec 12	Solution of nonlinear equations : Bracketing methods	NH
5	Lec 13 Lec 14 Lec 15	Solution of nonlinear equations : Fixed Point Methods	NH
6	Lec 16 Lec 17 Lec 18	Roots of polynomial equations : Descartes' rule of sign etc.	NH
Class Test – 2			
7	Lec 19 Lec 20 Lec 21	Finite differences and interpolation (Divide differences etc.)	NH
8	Lec 22 Lec 23 Lec 24	Differences of a polynomial (Numerical Differentiation) : Newton's formula for forward and backward interpolation	NH
9	Lec 25 Lec 26 Lec 27	Solution of simultaneous linear equations : Determinants and Cramer's rule, Elimination of unknowns	AH
Mid Term			
10	Lec 28 Lec 29 Lec 30	Solution of simultaneous linear equations : Gauss-Jordan Methods	AH
11	Lec 31 Lec 32 Lec 33	Numerical Integration : (Trapezoidal rule, Simpson's Rule, Weddles's rule etc.)	NH
12	Lec 34 Lec 35 Lec 36	Linear Regression	AH
Class Test - 3			
13	Lec 37 Lec 38 Lec 39	Solution of First Order Differential Equation (ODE) : Euler's method, Pichard's method,	AH
14	Lec 40 Lec 41 Lec 42	Solution of First Order Differential Equations (ODE) Tailor's series method, Runge – Kutta method and Recapitulation.	AH

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Signature of the Instructor