MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering

Numerical Analysis

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404403	Numerical Analysis	3	48

INSTRUCTOR/COORDINATOR

Name	Dr. Mohammad A. Aliedeh
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TEXTBOOK

Text:
- Steven Chapra and Raymond Canale, Numerical Methods for Engineers, , WCB/McGraw-Hill, 7th Edition, 2015.

References:
- Michael B. Cutlip and Mordechai Shacham, Problem Solving in Chemical Engineering with Numerical Methods. Prentice Hall, 1998.
- James B. Riggs. An Introduction to Numerical Methods for Chemical Engineers, 2nd Edition, Texas Tech University Press.

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

Numerical solution of linear and non-linear equations. Numerical integration. Numerical differentiation. Finite difference methods. Interpolation and curve fitting. Solutions of ordinary differential equations. Finite difference methods for solution of partial differential equations. Computer applications for numerical computations.

B. Pre-requisites (P) or Co-requisites (C)

(P): 0404303

C. Course Type (Required or Elective)

Required (Compulsory Department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

By the end of this course, the student should be able to:
1. understand **Modeling and Numerical Computation Techniques**. **(SLO 1)**
2. numerically solve **Nonlinear Algebraic equations**. **(SLO 1, 7)**
3. numerically solve **linear Systems of Algebraic Equations**. **(SLO 1, 7)**
4. perform **curve fitting of data**. **(SLO 1, 7)**
5. perform **Interpolation of data**. **(SLO 1, 7)**
6. perform **Numerical Integration**. **(SLO 1, 7)**
7. perform **Numerical Differentiation**. **(SLO 1, 7)**
8. numerically solve **Ordinary Differential Equations**. **(SLO 1, 7)**
9. numerical solve of **Partial differential equations**. **(SLO 1, 7)**

B. Student Learning Outcomes (SLOs) Addressed by the Course

1	2	3	4	5	6	7				
✓						✓				

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
• **Introduction to Modeling and Numerical Computation Techniques**	1	3
• **Numerical Solution Nonlinear Algebraic Equations**	1	3
• **Numerical Solution Systems of Linear Algebraic Equations**	2	6
• **Curve Fitting of Data**	2	6
• **Interpolation of Data**	1	3
Mid Term Exam	1	3
• **Numerical Integration**	1	3
• **Numerical Differentiation**	1	3
• **Numerical Solution of Ordinary Differential Equations**	3	9
• **Numerical Solution of Partial Differential Equations**	2	6
Final Exam	1	3
Total	**16**	**48**

METHODS OF ASSESSMENT			
No.	Method of assessment	Week and Date	%
1	1st Examination	5th week	20
2	2nd Examination	10th week	20
3	Homeworks, projects and Activities	All over the Semester	10
3	Final examination	End of Semester	50
Total			100