



MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering



Applied Mathematics for Chemical Engineering

COURSE SYLLABUS

Course Code	Course Name	Credits	Contact Hours
0404303	Applied Mathematics for Chemical Engineering	3	48

INSTRUCTOR/COORDINATOR

Name	Dr. Salah ALJBOUR
Email	saljbour@mutah.edu.jo
Website	

TEXTBOOK

Text:

- **Advanced Engineering Mathematics, Kreyszig, E., John Wiley & Sons, 2009, 10th Edition**

References:

1. Brannan, J.R. and Boyce, W.E., "Differential Equations: An Introduction to Modern Methods and Applications", John Wiley, 2007.
2. Hunt, B.R., Lipsman, R.L., Osborn, J.E., and Rosenberg, J.M., "Differential Equations With Matlab", 2nd edition, John Wiley, 2005.
3. Greenberg, M.D., "Advanced Engineering Mathematics", 2nd edition, Prentice Hall, Upper Saddle River, 1998.
4. Farlow, S.G., "An Introduction to Differential Equations and Their Applications", McGrawHill, 1994.
5. Derrick, W.R. and Grossman, S.I., "Elementary Differential Equations with Applications", Wesley

SPECIFIC COURSE INFORMATION

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

This course introduces students to the formulation, methodology, and techniques for mathematical solution of chemical engineering interest. These methods can be used to solve problems in Fluid Flow, Heat and mass Transfer, Reaction Engineering and Thermodynamics. This course involves various engineering mathematical concepts with the focus on chemical engineering applications. The material covered in the course includes first, second and higher order ordinary

differential equations, system of first order ordinary differential equations in addition to series solutions, Laplace transforms and Fourier analysis. By the end of the course solution of simple partial differential equations will be covered as well.

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

(P): 0301203 ordinary Differential Equations

(P): 0404205 Multivariate Mathematics

C. Course Type (Required or Elective)

Required (Compulsory Department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

Students who successfully complete the course will be able to:

1. Demonstrate knowledge and understanding of the concepts, principles, solution approaches and operational techniques for the various topics covered in the course. [01]
2. Learn how to translate a variety of problems in traditional and emerging chemical engineering fields into mathematical problems and how to solve them analytically. [01]

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
• Concepts of Differential Equations	1	3
• First Order Differential Equations Applications to Chemical Engineering Problems	2-4	3
• Second Order Differential Equations Applications to Chemical Engineering Problems	5-7	6
• Third Order Differential Equations	8-9	6
Mid Term Exam	1	3
• System of Differential Equations Applications to Chemical Engineering Problems	10	3
• Series Solution of Differential Equations	11-12	3
• Laplace Transform	13-14	3
• Fourier Analysis	14	9
• 15 Introduction Partial Differential Equations	15	6
Final Exam	16	3

Total 16 48

METHODS OF ASSESSMENT			
No.	Method of assessment	Week and Date	%
1	Midterm Examination	9th week	30
2	Homeworks and Activities	All over the Semester	20
3	Final examination	End of Semester	50
Total			100