

Course Plan

1. Course Data

Course Title	Mathematics IV	Code: Math 201	
Department	2 nd year - Mechanical Engineering		
Academic Year / Semester	2019 / 2020	First Semester	
No. of Hours per week	Lecture: 2	Tutorial: 1	Total: 3
Course Instructor	Dr. Mohamed Hussein Eid		

2. Course Objectives

- 2.1 Provide the students the properties of advanced matrices and quadratic forms.
- 2.2 Provide the students the fundamentals of Laplace transformations and its applications.
- 2.3 Provide the students the basic concepts of partial differential equations.
- 2.4 Teach students methods of solution of partial differential equations.

3. Course Contents and Lectures

Week	Topic	Hours	Exercises	Hours	Total
1	Introduction, Symmetric matrices	2	Solving exercises	1	3
2	Unitary and orthogonal matrices	2	Solving exercises	1	3
3	Positive definite and negative definite matrices	2	Solving exercises	1	3
4	Quadratic forms	2	Solving exercises	1	3
5	Laplace transformations	2	Solving exercises	1	3
6	Properties of Laplace transformations	2	Solving exercises	1	3
7	Laplace transformations of special functions	2	Solving exercises	1	3
8	Mid-Term Exam			1	
9	Inverse Laplace transformations	2	Solving exercises	1	3
10	Solving ordinary differential equations by Laplace transformations	2	Solving exercises	1	3
11	First order partial differential equations	2	Solving exercises	1	3
12	Second order partial differential equations	2	Solving exercises	1	3
13	Second order partial differential equations	2	Solving exercises	1	3
14	Wave equation, Heat equation	2	Solving exercises	1	3
15	Final Exam			2	

4. Assessment Details

Methods of Assessment	Marks	Weighting %	Outline Details
Quizzes	5	8 %	Before mid-term
Assignments	5	8 %	Weeks: 3, 10
Mid-Term Exam	10	17 %	Week 8: 1 hour
Final Exam	40	67 %	Week 15: 2 hours

5. References

Course Notes : Lectures PDF, Dr. Mohamed Husien Eid

Books : 1- Advanced Engineering Mathematics, C.R.Wylie and L.C.Barrett, McGraw- Hill International Book Co., London 1982.

2- Advanced Engineering Mathematics, E.Kreyszig, John Wiley & Sons Inc, New York , 1999.