Course No: MTCA 183
Course Title: Calculus II
Instructor: Engr. Sadaf Sufwan
Email: Sadaf.malik88@gmail.com
Term (Semester): 2nd Semester

Objectives:

The point of this course is to take your existing knowledge of calculus and apply it towards the construction and solution of mathematical models in the form of Calculus II. The goal is to understand the order and linearity of ODEs, computational solution methods for ODEs and the real-world applications of ODEs.

Course Contents:

1. Introduction
2. First and Second Order Differential Equations
3. Separable Equations
4. Equations Reducible to Separable form
5. Exact Differential Equations
6. Linear First Order Differential Equations
7. Bernoulli's Differential Equation
8. Homogeneous Differential Equations
9. D-operator and Particular Integrals
10. Cauchy Equation
11. Applications of Higher Order Linear Differential Equations
12. Introduction to Laplace Transformation

Reference Books:

1. Advanced Engineering Mathematics 5th Edition By C.R. Wylie McGraw-Hill Education.
2. Advanced Engineering Mathematics, 8th Edition By Erwin Kreyszig John Wiley & Sons.

Week #	Topic
Week # 1 (12th Feb 19)	**Introduction** **Basic Concepts of Differential Equation** **Geometrical Interpretation of First and Second ODE**
Week # 2 (19th Feb 19)	**Separable Equations** **Equations Reducible to Separable Form**
Week # 3 (26th Feb 19)	**Exact Differential Equations** **Integrated Factors**
Week # 4 (05th Mar 19)	**Linear First ODE** **Bernoulli's Differential Equation-I**
Week # 5 (12th Mar 19)	**Bernoulli's Differential Equation-II**
Week # 6 (19th Mar 19)	**Homogeneous Linear Differential Equations**
Week # 7 (26th Mar 19)	**Homogeneous Equations with Constant Coefficients**
Week # 8 (02nd Apr 19)	**Revision**
Week # 9 (09th Apr 19)	**MID Term Examination**
Week # 10 (16th Apr 19)	**General Solutions, Initial Solutions** **Boundary Value Problems**
Week # 11 (23rd Apr 19)	**D-Operator** **Particular Integrals**
Week # 12 (30th Apr 19)	**Real, Complex and Repeated roots**
Week # 13 (06th May 19)	**Cauchy Equation** **Non-Homogeneous Linear Equations**
Week # 14 (13th May 19)	**Introduction to Laplace Transformation-I**

Week # 15 (20th May 19)	**Introduction to Laplace Transformation-II**
Week # 16 (27th May 19)	**Revision & Discussion**
Week # 17 (03rd Jun 19)	**Final Examination**

Evaluation Criteria:

1.	Midterm	30 %
2.	Quiz	10%
3.	Assignments	10%
4.	Final Examination	50%
	Total	**100%**