MATH 204 Differential Equations (Semester II-1437/38)

References:
1. Differential equations with boundary value problems: by Dennis G. Zill and Michael R Cullen (Seventh or sixth edition)
2. Differential Equations by Prof. Dr. Said Mesloub, Prof. Dr. Damlakhi Mostafa, and Dr. Khawaja Zafar Elahi.

Weekly Course Details

1. Definition of a Differential equation, Classification of Differential equations, type of solutions.

2. Initial value problems. Existence and uniqueness theorem, Separable equations (Separable variables).

3. Equations with homogeneous coefficients, Exact Equations

4. Integrating factors, general form of a linear equation and Equations with linear coefficients

5. Bernoulli equation.

6. Applications, Linear Models: Orthogonal trajectories, Growth and decay, Newton's Law of Cooling.

7. Higher order Differential equations. Linear Differential equations: Existence-Uniqueness Theorem, Linearly (independent solutions, dependent solutions), Wronskian, Method of Reduction of order.

8. Homogeneous linear Differential equations with constant coefficients. Undetermined coefficient method.

9. Cauchy-Euler Equation, Variation of parameters.

10. Series solutions of Linear Equations.

11. Solving systems of Linear Equations by Elimination Method.

12. Orthogonal Functions and Fourier series.

13. Fourier cosine and sine series, Complex Fourier series.

14. Fourier Integral.

15. Revision

Final Examination: Thursday 13/09/1438 at 13.00-16.00
Mid Exam1: Monday 13/07/38 at: 07.00 - 8.30
Mid Exam 2: Monday 19/08/38 at: 07.00 - 8.30