

Class- M.Sc. (Mathematics) 4th Sem. Session - 2023-24.

Paper - MM-411 - Differential Equations - II Teacher - Geeta Arora
Lesson - Plan.

Week	Date	Topics.
1.	(1-6) Jan.	Linear Second Order Equations - Preliminaries, self-adjoint eqn. of second order.
2.	(8-13) Jan.	Basic Facts, superposition principle, Ricatti's equation, Puffer Transformation.
3.	(15-20) Jan.	Zero of a solution, Oscillatory and non-oscillatory equations.
4.	(22-27) Jan.	Abel's Formula, Common zeroes of solutions and their linear dependence.
5.	(29 Jan. - 3 Feb.)	Sturm Theory:- Sturm Separation theorem, Sturm Fundamental Comparison theorem and its corollaries.
6.	(5-10) Febr.	Elementary linear oscillations, Autonomous system, the phase plane, paths and critical points
7.	(12-17) Febr.	Types of critical points - Node, Center, Saddle point, Spiral point, Stability of critical points: theorems and applications.
8.	(19-24) Febr.	Critical points and paths of non-linear systems:- Basic theorems and their applications.
9.	26 Febr. - 2 March	Lipunov Function. Lipunov's direct method for stability of critical points of non-linear systems.

10. 4 March - 9 March Limit Cycles and periodic solutions:- Limit Cycle, existence and non-existence of limit cycles.
11. 11 March - 16 March Bendixon's non-existence Criterion, Half-paths of semi-orbit, Limit Set, Poincare Bendixon's theorem. Index of a critical point.
12. 18 - 22 March. Second order boundary Value problem (BVP): Linear problems, periodic boundary conditions, regular linear BVP, singular linear BVP.
13. 1 - 06 April HOLI VACATIONS Non-linear BVP, Sturm - Liouville BVP, definitions, eigen values and eigen functions. Orthogonality of functions, Orthogonality of functions corresponding to distinct eigen values. Green's function.
14. 8 - 13 April. Application of boundary value problem. Use of implicit function theorem and fixed points theorems for periodic solutions. of linear and non-linear equations.
15. 15 - 24 April Revision of all topics and Problem Solving.

Lesson - Plan.

Wk	Date	Topics.
1.	(1-8) Jan.	Basic Statistics - Measure of Central Tendency,
2.	(8-13) Jan.	Measure of Dispersion, Central Tendency
3.	(15-20) Jan.	Measure of Dispersion - Range, Variance and Standard Deviations.
4.	(22-27) Jan.	Frequency Distributions and Cumulative Frequency Distributions.
5.	(29 Jan.-3 Feb)	Moments and Moment Generating Functions.
6.	(5-10) Feb.	Distribution Patterns - Types of Theoretical Probability
7.	(12-17) Feb.	Normal, Binomial Probability Distribution
8.	(19-24) Feb.	Poisson Probability Distribution
9.	26 Feb-2 March	Co-relation and Regression - Types of Correlation.
10.	4 March-9 March	Properties of Coefficient of Correlation.
11.	11 March-16 March	Methods of Studying Correlation, Aim of Regression Analysis.
12.	18-23 March	Kinds of Regression Analysis. HOLI - VACATIONS.
13.	1-06 April	Test of Significance - Z-test, Student Test, Chi-Square Test

14. 8-13 April Student Curve fitting, Analysis of Variance.
-Meaning, Assumptions.
15. 15-20 April. Cochran's Theorem. One Way classification
Baye's theorem in decision-making
Forecast techniques.
16. 22-24 April. Revision and Problems Solving.
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Class - B.C.A. - 2nd Sem. Session - 2023-24

Paper - Elements of Mathematical Foundation
For Computer Science. B23-CAP-204

Teacher's Name -
Greta Anora.

Lesson-Plan.

1.	February	Integration of simple algebraic, trigonometric and exponential functions. Presentation of data: Frequency distribution and cumulative frequency distribution, Diagrammatic and graphical presentation of data, Construction of data , Pie diagrams, Histograms, Frequency polygon, Frequency curve and Ogives.
2.	March	Measures of central tendency: Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean of Grouped and Ungrouped Data. Measures of dispersion: Concept of dispersion, Mean deviation and its Coefficients, Range, Variance and its Coefficient, Standard deviation.
3.	April	Correlation: Concept and types of correlation, Methods of finding correlation, Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation.
1.	May	Linear Regression. Principle of least square, Fitting of Straight line, Two lines of regression, Regression Coefficients.