GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2025-26) EVENSEMESTER

Name of Teacher: Dr. Kiran Bala

Designation: Assistant Professor

Class: M.Sc I (2nd Sem)

Subject/ Paper: Computer Programming With MATLAB

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**January/February**	Basics of Programming, Anatomy of a program; Constants, Variables; Data types; Assigments; Operators; functions Working with Vectors, Matrices M-files, The find function, format function; SuPPressing outPut	**Group-Learning and Teaching** **Learning through Problem Solving**	Get familiar with the importance and rvorking of MATLAB as computation platform through the knowledge of characters, variables, operators, functions and expressions as used for elementary operations in matrix algebra along with the editing, load/save data and compilation/execution/quitting of source programs	
2.	**March**	Flow Control Data Structures Scripts and Functions Linear differential equation of order n with constant coefficients Characteristic roots, Fundamental set	**Group-Learning and Teaching** **Learning through Problem Solving**	Leam the process of writing a source progr,rm in MATLAB as a programming language making use of the statements for input/output, conditional/non-sequential processing involving functions, arrays and structures.	
3.	**April**	Graphics, Basic , Plotting Functions, Mesh and Surface Plots, Printing and Handle Graphics: Using the handle; Graphics object; Setting object Properties; Specifying the axes or figure,	**Group-Learning and Teaching** **Learning through Problem Solving**	Leam the plotting ofthe curves and surfaces, which can be edited, modified. accumulated, handled, printed, exported	

		Finding the handles of existing objects. Animations: Erase mode method. Creating movies			
4.	**May**	Symbolic Math: Symbolic objects; Creating symbolic variables and expressions; The findsym Command; The default symbolic variable constructing real and complex variables; Creating abstract function reating symbolic math functions; Creating an M-file Calculus: Limits; Differentiation; lntegration; Symbolic summation Taylor series; Examples; Simplifications and substitutions, Variabel precision arithmetic examples. Linear Algebra, Jordan canonical form; Solving Equations: System of algebraic equations	**Group-Learning and Teaching** **Learning through Problem Solving**	Write source programs with objects, variables, expressions, [bstract functions, math functions in symbolic form and their bubsequent use for the operations/ concepts/ problems in calculus, inear algebra and differential equations.	

- **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

Signature of Teacher **Principal**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2025-26) EVEN SEMESTER

Name of Teacher: **Pooja Girotra**

Designation: **Extension Lecturer**

Class: **M.Sc. Mathematics (IInd Sem)**

Subject/ Paper: **FIELD THEORY (M24-MAT-201)**

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	January	Irreducible polynomial, Eisenstein criterion, field extension, algebraic and transcendental extension, algebraically closed fi eld.	1. Learning through Problem Solving 2. Group-Learning & Teaching	Understand concepts of irreducible polynomial, Eisenstein criterion, field extension, algebraic and transcendental extension, algebraically closed fi eld.	
2.	February	Splitting fields, degree of extension of splitting field, normal extension, multiple roots, prime field, finite field and separable extension.	1. Learning through Problem Solving 2. Group-Learning & Teaching	Have deep understanding of Splitting fields, normal extension, multiple roots, prime field, finite field and separable extension.	
3.	March	Automorphism groups, fixed field, Dedekind lemma, fundamental theorem of Galois theory, Galois extension, fundamental theorem on Galois theory, fundamental theorem of algebra, roots of unity, Cyclotomic polynomial	1. Learning through Problem Solving 2. Group-Learning & Teaching	Learn about automorphism groups, fixed field, Dedekind lemma, fundamental theorem of Galois theory, roots of unity, Cyclotomic polynomial and cyclic extension.	

		and cyclic extension. Frobenius automorphism of a finite field.			
4.	**April & May**	Polynomials solvable by radicals over Q. symmetric functions and elementary symmetric functions, ruler and compass construction	**1. Learning through Problem Solving** **2. Group-Learning & Teaching**	Have deep understanding of polynomials solvable by Theory radicals. symmetric functions, ruler and compass construction.	

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Signature of Teacher **Principal**

GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA

LESSON-PLAN (Session 2025-26) EVEN SEMESTER

Name of Teacher: **Pooja Girotra**

Designation: **Extension Lecturer**

Class: **M.Sc. Mathematics (IVth Sem)**

Subject/ Paper: **BIO-MATHEMATICS (M24-MAT-411)**

S. No.	Month	Topics to be covered	Teaching Learning Strategy	Learning Outcomes of Students	Remarks
1.	**January**	Population Dynamics: The Malthusian growth ; The Logistic equation; A model of species competition; The Lotka-Volterra predator-prey model; Age-structured Populations : Fibonacci"s rabbits; The golden ratio Φ; The Fibonacci numbers in a sunflower; Rabbits are an age-structured population; Discrete age-structured populations; Continuous age structured populations; The brood size of a hermaphroditic worm.	**1. Learning through Problem Solving** **2. Group-Learning & Teaching**	Derive population growth laws/models regulated through logistic equation, involving species competition, Lotka-Volterra predator-prey equations to develop the theory of age-structured populations using both discrete- and continuous-time models for their applications in life cycle of a hermaphroditic worm.	
2.	**February**	Stochastic Population Growth : A stochastic model of population growth; Asymptotics of large initial populations; Derivation of the deterministic model; Derivation of the normal probability distribution; Simulation of population growth. Infectious Disease Modeling: The SI model; The SIS model; The SIR epidemic disease model; Vaccination ; The SIR endemic disease model ; Evolution of virulence.	**1. Learning through Problem Solving** **2. Group-Learning & Teaching**	Model smaller populations those exhibit stochastic effects so as to analyze births rates in finite populations for their role in mathematical models of infectious disease epidemics and endemics so as to predict the future spread of a disease and to develop strategies for containment and eradication.	

3.	**March**	Population Genetics: Haploid genetics; Spread of a favored allele; Mutation-selection balance ; Diploid genetics; Sexual reproduction; 15 Spread of a favored allele; Mutation-selection balance; Heterosis; Frequency-dependent selection; Linkage equilibrium; Random genetic drift.	**1. Learning through Problem Solving** **2. Group-Learning & Teaching**	Learn the mathematical modeling of the evolution/maintenance of polymorphism to understand population genetics, influence of natural selection, genetic drift, mutation, and migration (i.e., evolutionary forces) in changing the Allele frequencies.	
4.	**April & May**	Biochemical Reactions: The law of mass action; Enzyme kinetics; Competitive inhibition; Allosteric inhibition; Cooperativity. Sequence Alignment: DNA ; Brute force alignment; Dynamic programming; Gaps; Local alignments; Software.	**1. Learning through Problem Solving** **2. Group-Learning & Teaching**	Derive mathematical models for biochemical reactions, including catalyzed by enzymes, based on the law of mass action, enzyme kinetics, fundamental enzymatic properties (i.e., competitive inhibition, allosteric inhibition, cooperativity) so as to know about DNA chemistry and the genetic code for alignment of DNA/RNA sequences by brute force, dynamic programming or gaps.	

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