Lesson Plan
MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans-Odd Semester (Semester-III)
Session – 2023-24

Department: Mathematics

Class: MSc-II Mathematics

Subject: MATH 617S; Field Theory

Name of the Teacher:Dr Swati Sidana

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
July	24.07.2023	31.07.2023	Fields, examples, characteristic of a field, subfield and prime field of a field, field extension, the degree of a field extension.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.08.2023				
August	01.08.2023	31.08.2023	Algebraic extentions and transcendental extension, Adjunction of roots, splitting fields, finite fields, existence of algebraic closure, algebraically closed fields. Separable, normal and purely inseparable extensions.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	Perfect fields, primitive elements. Langrange's theorem on primitive elements. Galois extensions, the fundamental theorem of Galois theory, Cyclotomic extensions, and Cyclic extensions,	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	Applications of cyclotomic extensions and Galois theory to the constructability of regular polygons.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	18.11.2023	Solvability of polynomials by radicals.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Subject: MATH 618S; Topology

Name of the Teacher: DrSonica

Month	**Date**		**Topics to be covered**	**Academic Activity to be Undertaken**
	From	**To**		
July	24.07.2023	31.07.2023	**Topological Spaces:**Definition and Examples, some special topologies, Comparison of topologies, Bases for a topology, the subspace topology, closed sets and limit points.	Syllabus, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.08.2023				
August	01.08.2023	31.08.2023	**Continuity:**Continuous functions, the order topology, the product topology, the metric topology, the quotient topology. **Connectedness:**Connected spaces, connected subspaces of the real line, components and local connectedness.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	**Compactness:**Compact spaces, compact space of a real line, limit point compactness, local compactness, sequentially compact spaces.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	**Countability Axioms and Seperation Axioms:**First countability, second countability, Lindelof space, seperable space,T_0, T_1, T_2, T_3, T_4 spaces, regular spaces, normal spaces, the Uryson Lemma, the UrysohnMetrization Theorem.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	18.11.2023	**Seperation Axioms and Nets:**The Tietz extension Theorem, The TychonoffThorem and the nets.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Subject: MATH 661S; Probability and Mathematical Statistics-I

Name of the Teacher:MsChitra

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
July	24.07.2023	31.07.2023	Probability: Bayes' theorem and its applications. Discrete and Continuous random variables. Probability mass and density function, Expectation of single and two dimensional random variables.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.08.2023				
August	01.08.2023	31.08.2023	Distributions Binomial. Poisson distribution, Negative Binomial and Hypergeometric..	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	Uniform, Normal distribution. Beta, Gamma, Chi-square and Bivariate normal distributions.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	Chebyshev's inequality, weak law of large numbers, Central limit theorems Measurement scales, Attribute and variable,Collection, Compilation and Tabulation of data, Measures of central tendency their properties. Standard deviation and Kurtosis, Box and Whisker plot Correlation & Regression Analysis Karl Pearson's and Spearman's rank correlation coefficient.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	18.11.2023	Linear Regression and its properties. Theory of attributes, independence and association. Moment generating function and probability generating functions	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Subject: MATH-672S: Computational Techniques-I

Name of the Teacher: DrNavjot Kaur

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
July	24.07.2023	31.07.2023	Solution of non-linear equations: Functional iteration, Bisection, Secant, Regula-Falsi, Newton-Raphson and Bairstow's methods,	Syllabus, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.08.2023				
August	01.08.2023	31.08.2023	Rate of convergence of numerical methods, Solution of linear system of equations: Gauss elimination, Gauss Seidal and Triangularization methods, Condition of convergence of these methods. Interpolation: Finite difference operators, Newton interpolation, Gauss Forward and backward interpolation formulae, Newton's divided difference formula, Lagrange's Formula, Inverse interpolation, Hermite interpolation.	Syllabus, Examination pattern discussed, Doubt Session
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	Programmer's model of a computer, Types of computers, General awareness of Computer Hardware – CPU, Input, Output and peripherals, Software and Programming languages. Programming in FORTRAN 77: Character set, constants, variables, Arithmetic expressions, Format specification.	Doubt session, Assignments (MS-WORD), revision of a few topics. . Practical classes to illustrate various features of MS-WORD
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	READ, WRITE statements, unformatted I/O Statements, Unconditional GO TO, Computed GO TO, Arithmatic and Logical IF statements, IF-THEN-ELSE, Nested IF-THEN-ELSE, ELSE-IF-THEN, DO loops, Nested DO loops, CONTINUE Statement, Data statement, Double Precision. Logical Data, Complex Data, WHILE Structure, Arrays-One and multidimensional,	Doubt session along with practical implication in the lab. Assignments, Power Point Presentations.

Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	18.11.2023	Subscripted Variables, Implied DO loops, Sorting Problem, Function Subprograms and Subroutine subprograms, COMMON, EQUIVALENCE, Simple programs.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Subject: MATH 676S; Fluid Mechanics-I

Name of the Teacher: DrNisha Sharma

Month	**Date**		**Topics to be covered**	**Academic Activity to be Undertaken**
	From	**To**		
August	16.08.2023	31.08.2023	Real, Ideal fluids, Velocity of fluid particle, Streamline, Pathline, Velocity Potential, Vorticity vector, Local-Particle Rate of change, Equation of continuity, Irrotational and rotational motion, rigid boundary conditions,	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	Application of Euler and Bernoulli theorem, Potential theorems, Axis symmetric flow, Impulsive motion, Kelvin theorem, Stoke stream function	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	vorticity equation, 3 D flow, Images in plane and solid sphere, 2D flow, Complex potential. Milne Thompson theorem,	Doubt session, Assignments, Presentations, Viva
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	30.11.2023	Blasius theorem with applications, Karman Vortex Street	Doubt session, Assignments, Presentations, Question papers discussed. Revision
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Subject: MATH 678S; Linear Programming Problems
Name of the Teacher:DrLeetika

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
July	24.07.2023	31.07.2023	Linear Programming and examples, Convex Sets, Hyperplane, Open and Closed half-spaces, Feasible, Basic Feasible and Optimal Solutions, Extreme Point & graphical methods	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.08.2023				
August	01.08.2023	31.08.2023	Simplex method, Charnes-M method, Two phase method, Determination of Optimal solutions, unrestricted variables, Duality theory, Dual linear Programming Problems, fundamental properties of dual Problems, Complementary slackness, Unbounded solution in Primal. Dual Simplex Algorithm,	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.09.2023				
September	01.09.2023	30.09.2023	Sensitivity analysis,Parametric Programming, Revised Simplex method, Transportation Problems, Balanced and unbalanced Transportation problems, U-V method, Paradox in Transportation problem	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 03.10.2023				
October	03.10.2023	31.10.2023	Assignment problems, Integer Programming problems: Pure and Mixed Integer Programming problems, 0-1 programming problem, Gomary's algorithm, Branch & Bound Technique. Travelling salesman problem	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.11.2023				
November	01.11.2023	18.11.2023	, Gomary's algorithm, Branch & Bound Technique. Travelling salesman problem	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 19.11.2023				
End semester Examination 27.11.2023 to 30.12.2023				

Even Semester (Semester-IV)

Subject: MATH 637S; Linear Algebra

Name of the Teacher: Dr Swati Sidana

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
January	09.01.2024	31.01.2024	Definition and examples of vector spaces (over arbitrary fields), subspaces, direct sum of subspaces, linear dependence and independence, basis and dimensions.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	linear transformations, quotient spaces, algebra of linear transformations, linear functions, dual spaces, matrix representation of a linear transformation, rank and nullity of a linear transformation, invariant subspaces.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	Characteristic polynomial and minimal polynomial of a linear transformation, eigenvalues and eigenvectors of a linear transformation, diagonalization and triangularization of a matrix, Jordan and Rational canonical forms.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				
April	01.04.2024	22.04.2024	Bilinear forms, symmetric bilinear forms, Sylvester's theorem, quadratic forms, Hermitian forms, Inner product spaces, Gram-schmidtorthonormalization process.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 02.05.2024 to 05.06.2024				

Subject: MATH 638S; Functional Analysis

Name of the Teacher: Dr Sonica

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	**To**		
January	09.01.2024	31.01.2024	**Normed Linear spaces:** Normed linear spaces , its examples, Banach Spaces with examples of l^pspaces, L^p([a,b]) spaces and C ([a,b]), Hahn Banach theorems, open mapping theorem, closed graph theorem, Baire Category theorem.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	**Principle of Uniform Boundedness:**BanachSteinhauns theorem (uniform boundedness principle), Boundedness and continuity of linear transformation, Dual Spaces, embedding in second dual.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	**Hilbert Spaces:** Hilbert spaces, orthonormal basis, Bessel's inequality, Riesz Fischer theorem, Parseval's identity, bounded Linear functional, projections, Riesz Representation theorem.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				
April	01.04.2024	22.04.2024	**Operators:** Adjoint operators, self adjoint, normal, unitary and isometric operators.	Doubt session, Assignments, Power Point Presentations, Discussion of previous year question papers, Revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 02.05.2024 to 05.06.2024				

Subject: MATH 681S; Probability and Mathematical Statistics-II

Name of the Teacher: MsChitra

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
January	09.01.2024	31.01.2024	Point estimation, unbiasedness, consistency, efficiency and Sufficiency. Factorization theorem, completeness, Rao-Blackwell theorem, Cramer-Rao inequality. Maximum likelihood method of estimation and method of moments. Interval estimation, confidence intervals for means, difference of means and variances.	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	The basic idea of significance test. Null and alternative hypothesis, Type-I and TypeII errors. Uniformly most powerful tests, Likelihood Ratio tests.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	t , Chi-square and F-distributions. Tests of significance based on t, Chi-square and F Distribution	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				
April	01.04.2024	22.04.2024	One way and two way Analysis of Variance (ANOVA). Non-Parametric Tests: Sign test, Wilcoxon signed rank test, Mann-whitney test.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 02.05.2024 to 05.06.2024				

Subject: MATH-692S : Computational Techniques-II

Name of the Teacher: Dr NAVJOT KAUR

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
January	09.01.2024	31.01.2024	MS Excel: Introduction, Functions and Formulae, Graphics and Data base. Numerical Differentiation, Numerical Integration: General formulae, Trapeziodal rule, Simpson's 1/3 and 3/8 rule, Romberg integration, Newton-Cotes formulae, Gaussian integration.	Syllabus, Examination pattern discussed, Doubt Session along with practical implication in the lab.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	Programming in C: Historical development of C, Character set, Constants, Variables, Keywords, Operators, Hierarchy of arithmetic operations, if and if-else statements, Logical and Conditional Operators, Switch structure, while structure, do-while and for-Loops, Nested loops, Break and Continue statements. Solution of Ordinary Differential Equations: Taylor's series, Picard method of Successive approximations, Euler's method, Modified Euler's method, RungeKutta Method-2nd and 4th order.	Doubt session, Assignments, revision of a few topics. Practical implementation of the content covered (Program writing and compile).
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	Solution of ordinary differential equations, Predictor-Corrector methods, Milne-Simpson's method, Adam's – Bashforth method, Finite difference method for boundary value problems. Arrays, Functions, Print Function, Function Declaration and Function Prototype, Return Statement, Local and Global Variables, Passing Arrays as parameter, Recursion and Library Functions, Files in C.	Doubt session, Power Point Presentations. Practical implementation.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				

April	01.04.2024	22.04.2024	Introduction to pointers, Simple programs to illustrate the usage. Approximation of functions: Chebyshev Polynomials, Orthogonality of Chebyshev polynomials, Lanczos Economization of Power series.	Doubt session, Practical implementation of the topic. Discussion of previous year question papers followed by revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 02.05.2024 to 05.06.2024				

Subject: MATH 696S; Fluid Mechanics-II

Name of the Teacher: DrNisha Sharma

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
January	09.01.2024	31.01.2024	Viscous Flows: Stress components, Stress and strain tensor, coefficient of viscosity and Laminar flow, plane Poiseuille flows and Couette flow	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	. Flow through tubes of uniform cross section in the form of circle, Ellipse, equilateral triangle, annulus, under constant pressure gradient , Diffusion of vorticity. Energy dissipation due to viscosity,	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	steady flow past a fixed sphere, dimensional analysis, Reynold numbers, Prandtl's boundary layer, Boundary layer equation in two dimensions, Karman integral equation, Elements of wave motion, waves in fluids, surface gravity waves,	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				
April	01.04.2024	22.04.2024	standing waves, dispersion relation, path of particles, waves at the interface of two liquids, equipartition of energy, group velocity, energy of propagation of waves.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 04.05.2024 to 01.06.2024				

Subject: MATH-698S; Non-Linear Programming Problems

Name of the Teacher: DrLeetika

Month	Date		Topics to be covered	Academic Activity to be Undertaken
	From	To		
January	09.01.2024	31.01.2024	Nonlinear Programming: Convex functions, Concave functions, Definitions and basic properties, subgradients of convex functions, Differentiable convex functions, Minima and Maxima of convex function and concave functions. Generalizations of convex functions and their basic properties. Unconstrained problems,	Syllabus, Examination pattern discussed, Doubt Session.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.02.2024				
February	01.02.2024	29.02.2024	Necessary and sufficient optimality criteria of first and second order. First order necessary and sufficient Fritz John conditions and Kuhn-Tucker conditions for Constrained programming problems with inequality constraints, with inequality and equality constraints. Kuhn Tucker conditions and linear programming problems.	Doubt session, Assignments, revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.03.2024				
March	01.03.2024	30.03.2024	Duality in Nonlinear Programming, Weak Duality Theorem, Wolfe's Duality Theorem, Hanson-Huard strict converse duality theorem, Dorn's duality theorem, strict converse duality theorem, Dorn's Converse duality theorem, Unbounded dual theorem, theorem on no primal minimum. Duality in Quadratic Programming. Quadratic Programming:Wolfe's method, Beale's method for Quadratic programming.	Doubt session, Assignments, Power Point Presentations.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 01.04.2024				
April	01.04.2024	22.04.2024	Linear fractional programming, method due to Charnes and Cooper. Nonlinear fractional programming, Dinkelbach's approach. Game theory - Two-person, Zero-sum Games with mixed strategies, graphical solution, solution by Linear Programming.	Doubt session, Assignments, Power Point Presentations, Question papers discussed. Revision of a few topics.
Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans on 23.04.2024				
End semester Examination 02.05.2024 to 05.06.2024				