Lesson Plan (2024-2025, Even Semester)

Name of Assistant Professor	**Dr. Deepak Sehrawat**
Class and Semester	**B.Sc. (Maths Hons) 6th Semester**
Subject	**Mathematics**
Paper	**Elementary Topology**
Week –1	Definition and examples of topological spaces; Neighbourhoods, Interior point and interior of a set;
Week –2	Closed set as a complement of an open set; Adherent point and limit point of a set
Week –3	Closure of a set, Derived set, Properties of Closure operator, Boundary of a set, Dense subsets, Interior, Exterior and boundary operators.
Week –4	Relative (Induced) topology, Alternative methods of defining a topology in terms of neighbourhood system and Kuratowski closure operator.
Week –5	Base and sub-base for a topology, Neighbourhood system of a point and its properties, Base for Neighbourhood system.
Week –6	Continuous functions, Open and closed functions, Homeomorphism.
Week– 7	Connectedness and its characterization, Connected subsets and their properties. Continuity and connectedness.
Week –8	Components and related results; Path connected and locally connected spaces.
Week –9	Compact spaces and subsets, Compactness in terms of finite intersection property.
Week –10	Continuity and compact sets, Basic properties of compactness.
Week –11	Closedness of compact subset and a continuous map from a compact

	space into a Hausdorff and its consequence.
Week –12	Sequentially and countably compact sets. Local compactness and one point compatification. First countable, second countable and separable spaces.
Week –13	Hereditary and topological property. Countability of a collection of disjoint open sets in separable and second countable spaces.
Week –14	Lindelof theorem, T0 and T1 spaces.
Week –15	T2 (Hausdorff) separation axioms, their characterization.
Week –16	Revision, Problem Discussion, Class Test
Week –17	Assignment and Test

Name of Assistant Professor	**Dr. Deepak Sehrawat**
Class and Semester	**B.Sc. (NM) 6th Semester (Sec-A & B)**
Subject	**Mathematics**
Paper	**Linear Algebra**
Week –1	Vector Spaces, subspaces, sum and direct sum of subspaces.
Week –2	Linear span, Linearly dependent and independent subset of a vector space, Finitely generated vector spaces.
Week –3	Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces.
Week –4	Invariance of the number of elements of basis sets and Dimensions Quotient space and its dimension. Class test.
Week –5	Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces.

Week –6	Vector space of all the linear transformations Dual Spaces, Bidual spaces. Annihilator of subspaces of finite dimensional vector spaces.
Week– 7	Null space, Range space of a linear transformation.
Week –8	Rank and Nullity theorem. Class test.
Week –9	Compact spaces and subsets, Compactness in terms of finite intersection property.
Week –10	Algebra of Linear Transformation, Minimal Polynomial of a Linear transformation.
Week –11	Singular and non-singular Linear transformation, Matrix of linear transformation.
Week –12	Change of basis, Eigen Values and Eigen vectors of Linear transformation.
Week –13	Inner Product spaces, Cauchy-Schwarz Inequality
Week –14	Orthogonal compliments, Orthogonal sets and basis, Bessel inequality for finite dimensional vector space.
Week –15	Gram-Schimidt, orthogonalization process, Adjoint of linear transformation.
Week –16	Properties of Linear transformation and Unitary linear transformation.
Week –17	Assignment, Revision, and Test

Lesson Plan (2024-2025, Even Semester)

Name of Assistant Professor	**Sunil Dua**
Class and Semester	**B.Sc. Maths Hons 4th Semester**
Subject	**Mathematics**
Paper	**Sequence and Series**

Week –1	Some def. Related to Sets, Boundedness of the set of real numbers, Some Theorems on Least Upper Boundof a set, Some Theorems on Greatest Lower Bound of a set, Completeness Axiom, Archimedean Property of Reals, Neighborhood of a point
Week –2	Deleted Nbd, Interior point of a set, Some Theorems on open Sets, Closed sets, their examples, SomeTheorems on closed Sets, Limit point of a set, some Important theorems and Revision
Week –3	Examples on limit point, Open sets, their examples, Related Theorems of open sets, Closed sets, Interior ofa set, Closure of a set in real numbers and their propertie
Week –4	IBolzano- Weierstrass Theorem, Open covers, Compact sets and Heine- Borel Theorem, Revision, ProblemDiscussion and test of Unit-1
Week –5	Real Sequence and Convergence, Some Theorems on Convergent Sequence, Examples on Convergent Sequence, Some basic Theorems on Limits, Squeeze principle, Cauchy's Theorem on Limits, Related Examples of Cauchy's Theorem, Bounded and Monotonic Sequences, Examples on Monotonic Sequences
Week –6	Limit Point, Cauchy's Sequence, Cauchy's General principle of convergence, Examples on Cauchy's Sequence,Subsequences, Subsequential limits, Infinite Series, Convergence and Divergence of an infinite series
Week– 7	Examples on convergence and divergence of the series, Comparison test of positive terms infinite series,Cauchy's general principle of convergence of series, Convergence and divergence of geometric series, Hyper harmonic series or p-series, Revision, Problem discussion and test
Week –8	Infinite Series: D' Alembert's Ratio Test, Examples on Alembert's Ratio Test, Cauchy's Root Test, Examples on Cauchy's Root Test, Rabbe's Test, Examples on Rabbe's Test
Week –9	Logarithmic Test, Examples on Logarithmic Test, De Morgan and Bertrand's Test, Examples on De Morgan and Bertrand's Test, Cauchy's nth root test, Examples on Cauchy's nth root test
Week –10	Gauss Test, Examples on Gauss Test, Cauchy's Integral Test, Examples on Cauchy's Integral Test, Cauchy's Condensation Test, Examples on Cauchy's Condensation Test, Revision and Problem Discussion and Test
Week –11	Leibnitz's Test for the convergence of alternating series, Examples on above topic, Abel's lemma, Abel's Test, Dirichlet's Test, their examples, Insertion and removal of parenthesis, Re-arrangement of terms in aseries, Dirichlet's Theorem

Week –12	Riemann's Re-arrangement Theorem, Pringsheim Theorem and their examples Revision and Multiplicationof series
Week –13	Product Theorem, Cauchy's Theorem, Mertin's Theorem their examples Cesaro's Theorem, Abel's Theorem their examples
Week –14	Infinite Product, Sequence of Partial Product and their examples General Principles of convergence of anInfinite Product
Week –15	Some Theorems for proving the convergence of Infinite Products, Test and submission of assignment
Week –16	Absolute convergence of an infinite product, Problem discussion and test
Week –17	Assignment, Revision, and Test

Lesson Plan (2024-2025, Even Semester)

Name of Assistant Professor	**Sunil Dua**
Class and Semester	**B.Sc. Maths Hons 6th Semester**
Subject	**Mathematics**
Paper	**Linear Algebra**
Week –1	Vector Spaces, subspaces, sum and direct sum of subspaces.
Week –2	Linear span, Linearly dependent and independent subset of a vector space, Finitely generated vector spaces.
Week –3	Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces.
Week –4	Invariance of the number of elements of basis sets and Dimensions Quotient space and its dimension. Class test.
Week –5	Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces.

Week –6	Vector space of all the linear transformations Dual Spaces, Bidual spaces. Annihilator of subspaces of finite dimensional vector spaces.
Week– 7	Null space, Range space of a linear transformation.
Week –8	Rank and Nullity theorem. Class test.
Week –9	Compact spaces and subsets, Compactness in terms of finite intersection property.
Week –10	Algebra of Linear Transformation, Minimal Polynomial of a Linear transformation.
Week –11	Singular and non-singular Linear transformation, Matrix of linear transformation.
Week –12	Change of basis, Eigen Values and Eigen vectors of Linear transformation.
Week –13	Inner Product spaces, Cauchy-Schwarz Inequality
Week –14	Orthogonal compliments, Orthogonal sets and basis, Bessel inequality for finite dimensional vector space.
Week –15	Gram-Schimidt, orthogonalization process, Adjoint of linear transformation.
Week –16	Properties of Linear transformation and Unitary linear transformation.
Week –17	Assignment, Revision, and Test

Name of the Assistant/Associate Professor: Dr Ritika
Class and Section: B.Sc. (Pass) 6th Semester and B.A. (Pass) 6th Semester
Subject: MATHEMATICS
Paper: Linear Algebra
Week 1 Vector Spaces, subspaces, sum and direct sum of subspaces
Week 2 Linear span, Linearly dependent and independent subset of a vector space, Finitely generated vector space
Week 3 Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces
Week 4 Invariance of the number of elements of basis sets and Dimensions
Week 5 Quotient space and its dimension
Week 6 Homomorphism and isomorphism of vector spaces, Linear transformations and linear forms on vector spaces
Week 7 Vector space of all the linear transformations Dual Spaces, Bidual spaces
Week 8 Annihilator of subspaces of finite dimensional vector spaces
Week 9 Null space, Range space of a linear transformation, Rank and Nullity theorem
Week 10 Algebra of Linear Transformation, Minimal Polynomial of a Linear transformation

Week 11 Singular and non-singular Linear transformation, Matrix of linear transformation
Week 12 Change of basis, Eigen Values and Eigen vectors of Linear transformation
Week 13 Inner Product spaces, Cauchy-Schwarz Inequality
Week 14 Orthogonal compliments, Orthogonal sets and basis, Bessel inequality for finite dimensional vector space
Week 15 Gram-Schimidt, orthogonalization process, Adjoint of linear transformation
Week 16 Properties of Linear transformation and Unitary linear transformation
Week 17 Revision and Class Test

Name of the Assistant/Associate Professor: Dr Ritika
Class and Section: B.A. (Pass) 4th Semester
Subject: MATHEMATICS
Paper: Programming in C and Numerical Methods
Week 1 Programmer's model of a computer, Algorithms, Flow charts.
Week 2 Input / outputs functions. Class Test.
Week 3 Data types, Operators and expressions.
Week 4 Decisions control structure: Decision statements, Logical and conditional statements. Class Test.
Week 5 Implementation of Loops.

Week 6 Switch Statement & Case control structures. Functions
Week 7 Preprocessors and Arrays. Class Test.
Week 8 Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters
Week 9 Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures.
Week 10 Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions.
Week 11 Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method.
Week 12 Newton's iterative method for finding pth root of a number, Order of convergence of above methods. Class Test.
Week 13 Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method.
Week 14 Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method.
Week 15 Iterative method, Jacobi's method, Gauss-Seidal'smethod, Relaxation method.
Week 16 Revision and Class Test.
Week 17 Revision and Class Test

Name of Assistant Professor	**Shilpa Aggarwal**
Class and Semester	**B. Sc.Hons(Semester – 4)**
Subject	**Mathematics**
Paper	**Elementary Inference**

Week - 1	Statements of parameter and statistic,distribution and sampling error.
Week – 2	Point and interwal estimation, Unbiased estimator and their examples.
Week - 3	Efficiency,Consistency
Week - 4	Sufficiency and their examples
Week - 5	Method of maximum likelihood estimator
Week - 6	Examples based on maximum likelihood estimator
Week - 7	Examples based on maximum likelihood estimator
Week - 8	simple and composite hypotheses
Week - 9	Critical region,level of significance
Week - 10	one tailed and two tailed test.
Week - 11	Types of error
Week – 12	Neymann Pearson lemma and their examples
Week – 13	Testing and interwal estimation of a single mean,single proportion and their examples.
Week – 14	Difference between two mean and two proportion.Fisher's Z transformation
Week - 15	Definition of Chi-square statistic, Chi-square tests for goodness of fit and independence of attributes.,

Week – 6	Definition of Student's 't' and Snedcor's F-statistics. Testing for the mean and variance of univariate normal distributions
Week – 17	Testing of equality of two means and two variances of two univariate normal distributions. Related confidence intervals. Analysis of variance(ANOVA) for one-way and two-way classified data.
Week - 18	Revision

Name of Assistant Professor	**Shilpa Aggarwal**
Class and Semester	**B. Sc. chem Hons(Semester – 4)**
Subject	**Mathematics**
Paper	**Mathematics optional**

Week - 1	Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method
Week – 2	Newton-Raphson's method
Week - 3	Numerical Integration: Trapezoidal rule, Simpson's one-third
Week - 4	Three-eighth rule and Gauss Quadrature formula
Week - 5	Concepts in Probability: Random experiment, trial, exhaustive, equally likely and independent events.
Week - 6	Definition of probability- classical , relative frequency
Week - 7	statistical and and axiomatic approach

Week - 8	Addition and multiplication laws of probability.
Week - 9	Baye'stheorem
Week - 10	Correlation for Bivariate Data: Concept and types of correlation, Scatter diagram
Week - 11	Karl Pearson Coefficients(r) of correlation and rank correlation coefficient
Week – 12	Linear Regression: Concept of regression, two lines of regression, properties of regression coefficients
Week – 13	Difference between correlation and regression.
Week – 14	Test of significance:t-test for single mean
Week - 15	Chi-square test
Week – 16	ANOVA for one way classified data
Week – 17	ANOVA for two way classified data

Name of Assistant Professor	**Shilpa Aggarwal**
Class and Semester	**B. Sc. chem Hons ,B.Sc. 1st(Semester – 2)**
Subject	**Mathematics**
Paper	**MDC maths**
Week - 1	Analogy, Classification
Week – 2	Series Completion , Coding -Decoding

Week - 3	Blood Relation
Week - 4	Puzzle set
Week - 5	Sequential output tracing
Week - 6	Logical Venn Diagram,Alphabet test
Week - 7	Number and ranking
Week - 8	Time sequence test
Week - 9	Mathematical operation
Week - 10	Logical sequence and word
Week - 11	Arithmetical reasoning
Week – 12	Tabulation and Bar Graphs
Week – 13	Line Graphs and Pie chart
Week – 14	Venn Diagrams
Week - 15	Analytical Reasoning
Week – 16	Mirror Images
Week – 17	Revision

Name of Assistant Professor	**Vikash Ghlawat**
Class and Semester	**B.sc.(Hons) Mathematics Semester-6**
Subject	**Mathematics**
Paper	**FLUID DYNAMICS**
January	
Week - 1	Kinematics - Eulerian and Lagrangian methods.
Week – 2	Stream lines, path lines and streak lines.
Week – 3	Velocity potential. Irrotational and rotational motions. Vortex lines.
Week – 4	Equation of continuity. Boundary surfaces.
February	
Week - 1	Acceleration at a point of a fluid. Components of acceleration in cylindrical and spherical polar co-ordinates.
Week – 2	Pressure at a point of a moving fluid. Euler's and Lagrange's equations of motion.
Week – 3	Bernoulli's equation. Impulsive motion.
Week – 4	Stream function.
March	
Week - 1	Acyclic and cyclic irrotational motions. Kinetic energy of irrotational flow. Kelvin's minimum energy theorem.
Week – 2	Axially symmetric flows. Liquid streaming past a fixed sphere.
Week – 3	Motion of a sphere through a liquid at rest at infinity. Equation of motion of a sphere.
Week – 4	Three-dimensional sources, sinks, doublets and their images. Stoke's stream function
April	
Week - 1	Irrotational motion in two-dimensions. Complex velocity potential.
Week – 2	Milne-Thomson circle theorem.

Week – 3	Two-dimensional sources, sinks, doublets and their images. Blasius theorem.
Week – 4	Two- dimensional irrotational motion produced by motion of circular and co- axial cylinders in an infinite mass of liquid. **Revision and Class Test**.

Name of Assistant Professor	**Vikash**
Class and Semester	**B.sc.(Hons) Mathematics Semester-4**
Subject	**Mathematics**
Paper	**HYDROSTATICS**
January	
Week - 1	Pressure Equation, Condition of equilibrium.
Week – 2	Lines of force, Homogeneous and heterogeneous fluids.
Week – 3	Elastic fluids, Surface of equal pressure.
Week – 4	Fluid at rest under action of gravity, Rotating fluids. **Class Test.**
February	
Week - 1	Fluid pressure on plane surfaces, Centre of pressure.
Week – 2	Resultant pressure on curved surfaces.
Week – 3	Equilibrium of floating bodies, Curves of buoyancy.
Week – 4	Surface of buoyancy. **Class Test.**
March	
Week - 1	Stability of equilibrium of floating bodies.
Week – 2	Meta Centre.
Week – 3	Work done in producing a displacement.

Week – 4	Vessels containing liquid. **Class Test.**
April	
Week - 1	Gas laws, Mixture of gases, Internal energy.
Week – 2	Adiabatic expansion, Work done in compressing a gas.
Week – 3	Isothermal atmosphere, Connective equilibrium.
Week – 4	**Revision and Class Test**.

Name of Assistant Professor	**Vikash Ghlawat**
Class and Semester	**BCA 1st(Semester – 2)**
Subject	**Mathematics**
Paper	**MDC maths**
Week - 1	Analogy, Classification
Week – 2	Series Completion , Coding -Decoding
Week - 3	Blood Relation
Week - 4	Puzzle set
Week - 5	Sequential output tracing
Week - 6	Logical Venn Diagram,Alphabet test
Week - 7	Number and ranking
Week - 8	Time sequence test
Week - 9	Mathematical operation
Week - 10	Logical sequence and word
Week - 11	Arithmetical reasoning
Week – 12	Tabulation and Bar Graphs
Week – 13	Line Graphs and Pie chart
Week – 14	Venn Diagrams
Week - 15	Analytical Reasoning
Week – 16	Mirror Images
Week – 17	Revision

Name of Assistant Professor	**Dr. Jyotsana**
Class and Semester	**B. Sc. 1st (Semester – 2)**
Subject	**Mathematics**
Paper	**Calculus**

Week - 1	Limit and Continuity ($\varepsilon - \delta$ definition), Discontinuity & its types, Differentiability of the functions, Successive differentiation
Week – 2	Leibnitz rule and its applications, L' Hospital's rule: Indeterminate form
Week - 3	Taylor's Theorem with Lagrange's and Cauchy's forms of remainders
Week - 4	Maclaurin's and Taylor's series expansions.
Week - 5	Tangent and Normal, Asymptotes of Curves in Cartesian and polar co-ordinates, Curvature
Week - 6	Radius of Curvature for Cartesian curves, parametric, polar and pedal form of curves
Week - 7	parametric, polar and pedal form of curves, Circle of Curvature, Chord of curvature
Week - 8	Concavity, Convexity and Inflexion points.
Week - 9	Tracing of curves in Cartesian, parametric and polar co-ordinates of Standard curves (Cubic curves ,semicubical parabola)
Week - 10	Folium of Descartes, Cardioid, Lemniscate of Bernoulli
Week - 11	Astroid, Rose curve, Logarithmic Spiral ,Epispiral, Cycloid, Catenary).
Week – 12	Functions of Several Variables, Limits and Continuity

Week – 13	Limits and Continuity, Partial Differentiation
Week – 14	Partial Differentiation and Euler's theorem on homogeneous functions
Week - 15	Chain rule, Directional derivatives.
Week – 16	Gradient vector and Tangent Plane.
Week – 17	Revision

Name of Assistant Professor	**Dr. Asha Rani**
Class and Semester	**B. Sc. Major in Maths (Semester – 2)**
Subject	**Mathematics**
Paper	**Number Theory & TRIGONOMETRY**

Week - 1	Divisibility, G.C.D.(greatest common divisors), L.C.M.(least common multiple)
Week – 2	Primes, Fundamental Theorem of Arithemetic.
Week - 3	Linear Congruences and its Properties
Week - 4	Fermat's theorem and its Properties
Week - 5	Wilson's theorem and its converse
Week - 6	Linear Diophanatine equations in two variables
Week - 7	Complete residue system
Week - 8	reduced residue system modulo m.
Week - 9	Euler's ø function and its Properties
Week - 10	Chinese Remainder Theorem and its Application, Quadratic residues. Legendre symbols.
Week - 11	Lemma of Gauss; Gauss reciprocity law, Greatest integer function [x].
Week– 12	The number of divisors and the sum of divisors of a natural number n (The functions d(n) and □(n)).
Week –13	Moebius function and Moebius inversion formula, Test
Week –14	Assignments & De Moivre's Theorem and its Applications.
Week - 15	Expansion of trigonometrical functions. Direct circular and hyperbolic functions and their properties

Week– 16	Inverse circular and hyperbolic functions and their properties. Logarithm of a complex quantity.
Week –17	Gregory's series. Summation of Trigonometry series,Test.

Name of Teacher- ASHA

Class- MSC MATHS SEM 2 Subject- 24MAT202DS03.

Integral Equations and Calculation of Variations

WEEKS	SYLLABUS
Week 1	Linear Integral equations, Some basic identities, Initial value problems reduced to Volterra integral equations,
Week 2	Methods of successive substitution and successive approximation to solve Volterra integral equations of second kind
Week 3	Iterated kernels and Neumann series for Volterra equations. Resolvent kernel as a series. Laplace transfrom method for a difference kernel.
Week 4	Solution of a Volterra integral equation of the first kind.
Week 5	Boundary value problems reduced to Fredholm integral equations, Methods of successive approximation and successive substitution to solve Fredholm equations of second kind,
Week 6	Iterated kernels and Neumann series for Fredholm equations
Week 7	Resolvent kernel as a sum of series. Fredholm resolvent kernel as a ratio of two series.
Week 8	Fredholm equations with separable kernels. Approximation of a kernel by a separable kernel, Fredholm
Week 9	Alternative, Non homonogenous Fredholm equations with degenerate kernels.
Week 10	Green function, Use of method of variation of parameters to construct the Green function for a nonhomogeneous linear second order boundary value problem
Week 11	Basic four properties of the Green function, Alternate procedure for construction of the Green function by using its basic four properties.
Week 12	Reduction of a boundary value problem to a Fredholm integral equation with kernel as Green function, Hilbert-Schmidt theory for symmetric kernels.

Week 13	Motivating problems of calculus of variations, Shortest distance, Minimum surface of resolution
Week 14	Brachistochrone problem, Isoperimetric problem, Geodesic. Fundamental lemma of calculus of variations,
Week 15	Euler equation for one dependent function and its generalization to 'n' dependent functions and to higher order derivatives.
Week 16	Conditional extremum under geometric constraints and under integral constraints.

Name of the Assistant/Associate Professor: Dr. Sheetal Chawla

Class and Section: B.Sc. Pass Course (VI semester)

Subject: MATHEMATICS

Paper: Dynamics

Week 1

Velocity and acceleration along radial and transverse velocity

Week 2

Examples and Exercise related to Velocity and acceleration along radial and transverse velocity

Week 3

Acceleration along tangent and normal directions

Week 4

Test of Chapter 1, Relative velocity and acceleration

Week 5

Simple Harmonic motion, Examples and Exercise related to S.H.M.

Week 6

Test of Chapter 2, Elastic Strings and Examples and Exercise related to Elastic Strings

Week 7

Mass, Momentum and Force and Examples and Exercise related to Mass, Momentum and Force

Week 8

Test of Chapter SHM, Newton laws of motion Examples and Exercise

Week 9

Work, Power and Energy Examples and Exercise

Week 10

Definition of Conservative forces Examples and Exercise

Week 11

Impulsive forces, Examples and Exercise, Discussion of Work, Power and Energy Chapter.

Week 12

Motion on smooth and rough plane curves, Examples and Exercise

Week 13

Projectile motion of a particle in a plane

Examples and Exercise

Week 14

Vector angular velocity, General motion of a rigid body

Examples and Exercise

Week 15

Central Orbits, Kepler's laws of motion

Examples and Exercise

Week 16

Motion of a particle in Three Dimension, Acceleration in terms of different coordinate

Systems, Examples and Exercise

Week 17

Problem discussion and

Week 18

Revision and class test

Name of Assistant Professor	**Sanjay**
Class and Semester	**B.Sc II Pass course**
Subject	**Mathematics**
Paper	**Sequence and Series**
January	
Week - 1	Boundedness of the set of real numbers.
Week – 2	Neigbhourhoods, interior, isolated and limit points, open and closed set.
Week – 3	closure of a set, Compact sets, Bolzano-weierstrass and Heine-Borel theorem.
Week – 4	Sequences and their convergence, Theorems on limits of sequence
Week - 5	Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence.
February	
Week - 1	Subsequences and subsequential limits.
Week – 2	Convergence and divergence of infinite series,
Week – 3	Comparison tests, Cauchy's general principle, geometric series
Week – 4	Hyper Harmonic series or p-series
March	
Week - 1	Infinite series, D'Alembert's ratio test, Raabe's test, Logarithnic test.
Week – 2	de Morgan and Bertrand's test, Cauchy's nth root test, Guess Test, Cauchy's integral and condensation test.
Week – 3	Leibnitz's test for Alternating series, absolute and conditional convergence, Abel's test, Dirichlet's test, Dirichlet's theorem.

Week – 4	Riemann's Re-arrrangement theorem, Pringsheim's theorem.
April	
Week - 1	Multiplication of series, Cauchy product of series.
Week – 2	Convergence and absolute convergence of infinite series.
Week – 3	Revision and class test of first and second unit.
Week – 4	Revision and Class test of third and fourth unit.

Name of the Assistant/Associate Professor: Dr Sanjay
Class and Section: B.Sc.(Pass, Maths Hons) 4th Semester
Subject: MATHEMATICS
Paper: Programming in C and Numerical Methods
Week 1 Programmer's model of a computer, Algorithms, Flow charts.
Week 2 Input / outputs functions. Class Test.
Week 3 Data types, Operators and expressions.
Week 4 Decisions control structure: Decision statements, Logical and conditional statements. Class Test.
Week 5 Implementation of Loops.
Week 6 Switch Statement & Case control structures. Functions
Week 7 Preprocessors and Arrays. Class Test.
Week 8 Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters
Week 9 Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures.
Week 10 Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions.

Week 11 Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method.
Week 12 Newton's iterative method for finding pth root of a number, Order of convergence of above methods. Class Test.
Week 13 Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method.
Week 14 Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method.
Week 15 Iterative method, Jacobi's method, Gauss-Seidal'smethod, Relaxation method.
Week 16 Revision and Class Test.
Week 17 Revision and Class Test

Name of Assistant Professor	**Amit Sehgal**
Class and Semester	**M. Sc. Math (Semester – 2)**
Subject	**Mathematics**
Paper	**Theory of Field Extensions**
Week 1	Extension of fields: Elementary properties, Simple Extensions
Week 2	Algebraic and transcendental Extensions.
Week 3	Factorization of polynomials
Week 4	Splitting fields
Week 5	Algebraically closed fields, Separable extensions
Week 6	Perfect fields, Galios field
Week 7	Revsion of Two units and test
Week 8	Galios theory: Automorphism of fields, Monomorphisms and their linear independence
Week 9	Galios theory: Automorphism of fields, Monomorphisms and their linear independence
Week 10	Galios theory: Automorphism of fields, Monomorphisms and their linear independence
Week 11	Fixed fields
Week 12	Normal extensions, Normal closure of an extension
Week 13	Normal extensions, Normal closure of an extension
Week 14	The fundamental theorem of Galois theory
Week 15	The fundamental theorem of Galois theory
Week 16	Problems unit III
Week 17	Problems unit IV + Test
Week 18	Presentation

Name of Assistant Professor	**Dr. Amit Sehgal**
Class and Semester	**M. Sc. 1st (Semester – 2)**
Subject	**Mathematics**
Paper	**Algebraic Number Theory**

Week - 1	Algebraic Number and Integers : Gaussian integers and its properties, Primes and fundamental theorem in the ring of Gaussian integers
Week – 2	Integers and fundamental theorem in Q(ω) where $\omega^3 = 1$, Algebraic fields, Primitive polynomials
Week - 3	The general quadratic field $Q(\sqrt{m})$, Sections of $Q(\sqrt{2})$,, Fields in which fundamental theorem is false
Week - 4	Real and complex Euclidean fields, Fermat theorem in the ring of Gaussian integers, Primes of $Q(\sqrt{2})$ and $Q(\sqrt{5})$.
Week - 5	Countability of set of algebraic numbers, Liouville theorem and generalizations
Week - 6	Transcendental numbers, Algebraic number fields
Week - 7	Liouville theorem of primitive elements, Ring of algebraic integers
Week - 8	Theorem of primitive elements.
Week - 9	Norm and trace of an algebraic number, Non degeneracy of bilinear pairing, Existence of an integral basis
Week - 10	Discriminant of an algebraic number field, Ideals in the ring of algebraic integers,
Week - 11	Explicit construction of integral basis, Sign of the discriminant, Cyclotomic fields

Week – 12	Calculation for quadratic and cubic cases.
Week – 13	Integral closure, Noetherian ring, Characterizing Dedekind domains, Fractional ideals and unique factorization
Week – 14	G.C.D. and L.C.M. of ideals
Week - 15	Chinese remainder theorem, Dedekind theorem, Ramified and unramified extensions
Week – 16	Different of an algebraic number field
Week – 17	Factorization in the ring of algebraic integers.

Name of Assistant Professor	**Dr. Amit Sehgal**
Class and Semester	**M. Sc. 2nd Year (Semester – 4)**
Subject	**Mathematics**
Paper	**Algebraic Number Theory**

Week- 1	Algebraic Number and Integers : Gaussian integers and its properties, Primes and fundamental theorem in the ring of Gaussian integers
Week– 2	Integers and fundamental theorem in Q(ω) where $\omega^3 = 1$, Algebraic fields, Primitive polynomials
Week- 3	The general quadratic field $Q(\sqrt{m})$, Sections of $Q(\sqrt{2})$,, Fields in which fundamental theorem is false
Week- 4	Real and complex Euclidean fields, Fermat theorem in the ring of Gaussian integers, Primes of $Q(\sqrt{2})$ and $Q(\sqrt{5})$.
Week- 5	Countability of set of algebraic numbers, Liouville theorem and generalizations
Week- 6	Transcendental numbers, Algebraic number fields

Week- 7	Liouville theorem of primitive elements, Ring of algebraic integers
Week- 8	Theorem of primitive elements.
Week- 9	Norm and trace of an algebraic number, Non degeneracy of bilinear pairing, Existence of an integral basis
Week- 10	Discriminant of an algebraic number field, Ideals in the ring of algebraic integers,
Week - 11	Explicit construction of integral basis, Sign of the discriminant, Cyclotomic fields
Week– 12	Calculation for quadratic and cubic cases.
Week –13	Integral closure, Noetherian ring, Characterizing Dedekind domains, Fractional ideals and unique factorization
Week –14	G.C.D. and L.C.M. of ideals
Week - 15	Chinese remainder theorem, Dedekind theorem, Ramified and unramified extensions
Week– 16	Different of an algebraic number field
Week - 17	Factorization in the ring of algebraic integers.

Name of the Assistant Professor	**Dr Roji**
Class and Semester	**B.Sc. 4th Semester (B&C) , BA 4th sem**
Subject	**Mathematics**
Paper	**Special Functions and Integral Transforms**
January	
Week-1	Define Power series method and use it in finding solution of differential equation
Week-2	Introduce Beta and Gamma Functions and their properties
Week-3	Define Bessel equation and finding its solution
Week-4	Define Bessel Function and its properties-Convergence, Recurrence
Week-5	Define Orthogonality of Bessel functions and solving the problems of the students and discuss about whole Section-1
February	
Week-1	Legendre and Hermite differentials equations and their solutions
Week-2	Legendre and Hermite functions and their properties-Recurrence Relations and generating functions
Week-3	Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials,
Week-4	Laplace Integral Representation of Legendre polynomial and solving the problems of the students and discuss about whole Section-2
March	
Week-1	Class test of 1st and 2nd sections, Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems
Week-2	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms
Week-3	Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals
Week-4	solution of ordinary differential equations using Laplace transform and solving the problems of the students and discuss about whole Section-3
April	
Week-1	Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem
Week-2	Fourier Transform of Derivatives, Relations between Fourier transform and Laplace

	transform
Week-3	Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.
Week-4	solving the problems of the students and discuss about whole Section-4, solving the problems of the students and discuss about whole Section-4, Class test of 3rd and 4th sections

Name of the Assistant/Associate Professor: Dr Parvesh, Dr Shipra
Class and Section: BSc (Pass) 4th Semester
Subject: MATHEMATICS
Paper: Programming in C and Numerical Methods
Week 1 Programmer's model of a computer, Algorithms, Flow charts.
Week 2 Input / outputs functions. Class Test.
Week 3 Data types, Operators and expressions.
Week 4 Decisions control structure: Decision statements, Logical and conditional statements. Class Test.
Week 5 Implementation of Loops.
Week 6 Switch Statement & Case control structures. Functions
Week 7 Preprocessors and Arrays. Class Test.
Week 8 Strings: Character Data Type, Standard String handling Functions, Arithmetic Operations on Characters
Week 9 Structures: Definition, using Structures, use of Structures in Arrays and Arrays in Structures.
Week 10 Pointers: Pointers Data type, Pointers and Arrays, Pointers and Functions.
Week 11 Solution of Algebraic and Transcendental equations: Bisection method, Regula-Falsi method, Secant method, Newton-Raphson's method.
Week 12 Newton's iterative method for finding pth root of a number, Order of convergence of above methods. Class Test.
Week 13 Simultaneous linear algebraic equations: Gauss-elimination method, Gauss-Jordan method.
Week 14 Triangularization method (LU decomposition method). Crout's method, Cholesky Decomposition method.

Week 15 Iterative method, Jacobi's method, Gauss-Seidal'smethod, Relaxation method.
Week 16 Revision and Class Test.
Week 17 Revision and Class Test

Name of Assistant Professor	**Dr. Pravesh Kumar**
Class and Semester	**M. Sc. 1st (Semester – 2)**
Subject	**Mathematics**
Paper	**Python Programming**
Week - 1	Structure of a Python Program, Understanding
Week – 2	Python Interpreter/Python Shell
Week - 3	Indentation, Keywords, Identifier, Data Types
Week - 4	Operators, Type Conversions
Week - 5	Expressions, I/O Statements
Week - 6	Flow Control Statements: Branching
Week - 7	Looping, Conditional Statement
Week - 8	Break Statement, Continue Statement, Pass Statement, Exit function

Week - 9	Built-in Data Structures: Strings, lists, Sets
Week - 10	Tuples and Dictionary and Associated Operations
Week - 11	Functions: Defining and Calling Functions
Week – 12	Passing Arguments, Returning values, Recursive functions
Week – 13	File Operations: Read Functions - read(), readline(), readlines()
Week – 14	Write Functions - write(), writelines()
Week - 15	Opening and Closing Files, Reading and Writing Files
Week – 16	Visualization using graphical objects like point, line, histogram, sine and cosine curve
Week – 17	Visualizing 3D objects, Revision

Name of Assistant Professor	**Ravinder Kumar**
Class and Semester	**B.Sc II, section A&B, BA II**
Subject	**Mathematics**
Paper	**Sequence and Series**
January	
Week - 1	Boundedness of the set of real numbers.
Week – 2	Neigbhourhoods, interior, isolated and limit points, open and closed set.
Week – 3	closure of a set, Compact sets, Bolzano-weierstrass and Heine-Borel theorem.
Week – 4	Sequences and their convergence, Theorems on limits of sequence
Week - 5	Bounded and monotonic sequences, Cauchy's sequence, Cauchy general principle of convergence.
February	
Week - 1	Subsequences and subsequential limits.
Week – 2	Convergence and divergence of infinite series,
Week – 3	Comparison tests, Cauchy's general principle, geometric series
Week – 4	Hyper Harmonic series or p-series
March	
Week - 1	Infinite series, D'Alembert's ratio test, Raabe's test, Logarithnic test.
Week – 2	de Morgan and Bertrand's test, Cauchy's nth root test, Guess Test, Cauchy's integral and condensation test.

Week – 3	Leibnitz's test for Alternating series, absolute and conditional convergence, Abel's test, Dirichlet's test, Dirichlet's theorem.
Week – 4	Riemann's Re-arrrangement theorem, Pringsheim's theorem.
April	
Week - 1	Multiplication of series, Cauchy product of series.
Week – 2	Convergence and absolute convergence of infinite series.
Week – 3	Revision and class test of first and second unit.
Week – 4	Revision and Class test of third and fourth unit.

Name of Assistant Professor	**Dr Sunil Kumar**
Class and Semester	**BCom and BBA (Semester – 2)**
Subject	**Mathematics**
Paper	**MDC maths**
Week - 1	Analogy, Classification
Week – 2	Series Completion , Coding -Decoding
Week - 3	Blood Relation
Week - 4	Puzzle set
Week - 5	Sequential output tracing
Week - 6	Logical Venn Diagram,Alphabet test
Week - 7	Number and ranking
Week - 8	Time sequence test
Week - 9	Mathematical operation
Week - 10	Logical sequence and word
Week - 11	Arithmetical reasoning
Week– 12	Tabulation and Bar Graphs
Week –13	Line Graphs and Pie chart
Week –14	Venn Diagrams
Week - 15	Analytical Reasoning
Week– 16	Mirror Images
Week –17	Revision

Name of Assistant Professor	**Dr. Sunil Kumar**
Class and Semester	**BCom sem 2**
Subject	**Mathematics**
Paper	**Minor**

Week	Syallbus
Week 1	Linear Programming: Formulation and Graphical Methods.
Week 2	Problems with two variables,

Week 3	mixed constraints.
Week 4	Cases: No solution, multiple solutions, unbounded/redundant constraints.
Week 5	Simplex Method
Week 6	Solving problems up to three variables., Test of Section I
Week 7	Mixed constraints
Week 8	Duality, Transportation Problems.
Week 9	Compound Interest:, Revision
Week 10	Different interest rates.
Week 11	Concepts of present value and sum amounts.
Week 12	Test of Section II
Week 13	Annuities, Types of annuities.
Week 14	Present value, amount of annuity (including continuous compounding).
Week 15	Loan/debenture valuation.
Week 16	Sinking funds.
Week 17	Revision and Test
Week 18	Presentation

Name of Assistant Professor	**Dr. Upma**
Class and Semester	**B.Sc., Math Hon and BSc Pass (Sem – 2)**
Subject	**Mathematics**
Paper	**Numerical Analysis(SEC)**

Week	Syllabus
Week 1	Finite Difference Operators. Forward difference operator, Backward difference operator, Central difference operator and their properties. Fundamental theorem of difference calculus
Week 2	The operator E and their properties.Numerical problems related to different difference operators.Effect of an error in a tabular value(Missing terms).Numerical problems related to effect of an error in a tabular value.Relation between different Finite difference operators. Give brief overview of Chapter 1 and take problems.
Week 3	Defining the term interpolation and extrapolation, Difference between Interpolation with equal intervals and Interpolation with unequal intervals.Newton-Gregory formula for forward interpolation and their problems.Newton-Gregory formula for backward interpolation and their problems.More problems related to Newton's interpolation formulas interpolation.
Week 4	Subdivision of intervals and related examples. Chapter 2: Interpolation with equal intervals. Chapter 3: Interpolation with unequal intervals. Discussion on Chapter 2 and Take problems of Chapter 2.Define the term divided difference and related theorems.Newton's divided difference interpolation formula for unequal intervals and related examples.Relation between divided differences and ordinary differences and related examples.
Week 5	More examples related to Divided Differences. Lagrange's interpolation formula and related examples. Lagrange's interpolation formula and related examples. Hermite's interpolation formula and related examples. Brief overview of Interpolation with unequal intervals. *Assignments:* *State when Lagrange and Hermite interpolation is applied and Test of Chapter 3.*

Week 6	Problems of Chapter 3 Chapter 4: Central Difference Interpolation formula and related examples. Define central difference, Gauss forward interpolation formula and related examples. Gauss backward interpolation formula and related examples
Week 7	Sterling formula and related examples. Bessle's formula and related examples. Brief overview of Central Difference interpolation formulas. Problems of Chapter 4. Chapter 5 : Probability Distributions
Week 8	Examples of probability distribution of a random variable, Mean and variance of a random variable. Problems based on mean and variance of a random variable. Binomial distribution and related examples. Mean and variance of binomial distribution, recurrence formula Problems based on properties of binomial distribution
Week 9	Problems based on fitting a binomial distribution. Poisson distribution, Mean, variance and recurrence formula of poisson distribution. Problems related to poisson distribution and their properties. Fitting a poisson distribution and related properties. Normal distribution and its properties. Problems related to Normal distribution and its properties
Week 10	Method of area to find the expected frequencies for normal curve. Problems to find the expected frequencies for normal curve under the method of area. More problems related to Probability distribution. Chapter6: Derivatives Using Newton's Forward and Backward Interpolation formula Derivatives Using Sterling and Bessel's Central Difference Formula and Newton's Divided Difference formula. Problems to find the different derivative when some tabulated table is given
Week 11	Chapter 7: Define Eigen values and Eigen vectors and some properties of eigen values, Problems to find the eigen values and their corresponding eigen vectors of the matrix Power method and problems to find the largest eigen value of the matrix Jacobi's method for symmetric matrix, method to find all the eigen values and eigen vectors of the matrix Given's Method, Problems on how to transform a matrix into tridiagonal form by Given's method and to find the eigen vector corresponding to the largest eigen value from the eigen vectors of the tridiagonal matrix. House-Holder's method and problems based on House-Holder's method

	More Problems based on House-Holder's method QR method and related problems Lanczo's method and related problems. More problems on power, jacobi's, Given's, House Holder's method, QR and Lanczo's method. Problem discussion on Eigen value Problems
Week 12	Presentation on Eigen value Problems Newton Cotes Quadrature formula and related problems Numerical Integration by trapezoidal rule and related problems Test of Chapter-6 Numerical Integration by Simpson's 1/3 rule and related problems More problems on Numerical Integration
Week 13	Numerical Integration by Chebyshev's Quadrature formula and related problems Problems discussion. Introducing the concept: Initial and Boundary conditions, Single step and Multi step method, Euler's method and related examples. Modified Euler's Method and related examples
Week 14	More problems on Euler's method and Modified Euler's method. Taylor's series method and problems related to Taylor's series method. Runge-Kutta method of First and Second order and its examples
Week 15	Runge-Kutta method of Third and Fourth order and its examples. Picard's Method and problems related with Picard's method, Predictor-Corrector Methods, Milne-Simpson's method and its examples Adams-Bashforth Predictor Formula and Adams-Moulton Corrector Formula and its examples More examples related to Numerical Solution of Ordinary Differential Equations More examples related to Numerical Solution of Ordinary Differential Equations Take Problems of Chapter 9
Week 16	Doubts, Revision and Test

Name of Assistant Professor	**Dr. Upma**
Class and Semester	**B.Sc. 1st (Semester – 2) Section-A**
Subject	**Mathematics**
Paper	**MDC Mathematics**
Week - 1	Analogy, Classification
Week – 2	Series Completion, Coding -Decoding

Week - 3	Blood Relation
Week - 4	Puzzle set
Week - 5	Sequential output tracing
Week - 6	Logical Venn Diagram, Alphabet test
Week - 7	Number and ranking
Week - 8	Time sequence test
Week - 9	Mathematical operation
Week - 10	Logical sequence and word
Week - 11	Arithmetical reasoning
Week – 12	Tabulation and Bar Graphs
Week – 13	Line Graphs and Pie chart
Week – 14	Venn Diagrams
Week - 15	Analytical Reasoning
Week – 16	Mirror Images
Week – 17	Revision
Week -18	Presentation

Name of Assistant Professor	**Dr. Upma**
Class and Semester	**Physics Hons Sem 2**
Subject	**Mathematics**
Paper	**Minor**

Week	Syllabus
Week 1	Linear Programming: Formulation and Graphical Methods.
Week 2	Problems with two variables,

Week 3	mixed constraints.
Week 4	Cases: No solution, multiple solutions, unbounded/redundant constraints.
Week 5	Simplex Method
Week 6	Solving problems up to three variables., Test of Section I
Week 7	Mixed constraints
Week 8	Duality, Transportation Problems.
Week 9	Compound Interest:, Revision
Week 10	Different interest rates.
Week 11	Concepts of present value and sum amounts.
Week 12	Test of Section II
Week 13	Annuities, Types of annuities.
Week 14	Present value, amount of annuity (including continuous compounding).
Week 15	Loan/debenture valuation.
Week 16	Sinking funds.
Week 17	Revision and Test
Week 18	Presentation

Name of Assistant Professor	**Dr. Upma**
Class and Semester	**Phys. Hons_Sem 4,**
Subject	**Mathematics**
Paper	**Mathematics**

Week	Syallbus
Week 1	Discrete and continuous distribution: basic definitions and examples Binomial distribution and its properties and its numerical Problems
Week 2	Poisson distribution and its properties and its numerical Problems Geometric distribution and its properties
Week 3	Numerical Problems related to Geometric distribution Normal distribution and its properties and its numerical Problems
Week 4	Exponential distribution and its properties and its numerical Problems
Week 5	Bivariate distribution and its properties and its numerical Problems
Week 6	Numerical Problems related to Conditional distribution Marginal distribution and its properties and its numerical Problems
Week 7	Correlation for two variables only Regression for two variables only Numerical Problems related to Correlation and regression for two variables only
Week 8	Weak law of large numbers Central limit theorem for independent and identically distributed random variables and its numerical Problems
Week 9	Revision of Section I Test of Section I
Week 10	Definitions of random sample, parameter and statistic with examples Sampling distribution: Definition and its properties and its numerical Problems
Week 11	Standard error sampling distribution of mean variance of random sample from a normal population Numerical Problems based on standard error sampling distribution of mean variance of random sample from a normal population
Week 12	Tests of significance based on t.f. distribution Tests of significance based on chi-square distribution Examples based on t.f. and chi-square distribution
Week 13	Numerical Problems based on t.f. distribution and chi-square distribution
Week 14	Revision of Binomial distribution, Poisson distribution Revision of geometric distribution, normal distribution Test of Section II
Week 15	Revision of exponential distribution, Bivariate distribution Revision of conditional distribution, marginal distribution Revision of Correlation for two variables only
Week 16	Revision of regression for two variables only Revision of Weak law of large number Revision of Central limit theorem for independent and identically distributed random variables

Week 17	Revision of random sample, parameter and statistic and sampling distribution
Week 18	Presentation and Assignment Submission

Name of the Assistant Professor	**Mrs Amita**
Class and Semester	**B.Sc. 4th Semester (Maths Hons.) , B.Sc. 4th semester (sec A)**
Subject	**Mathematics**
Paper	**Special Functions and Integral Transforms**
January	
Week-1	Define Power series method and use it in finding solution of differential equation
Week-2	Introduce Beta and Gamma Functions and their properties
Week-3	Define Bessel equation and finding its solution
Week-4	Define Bessel Function and its properties-Convergence, Recurrence
Week-5	Define Orthogonality of Bessel functions and solving the problems of the students and discuss about whole Section-1
February	
Week-1	Legendre and Hermite differentials equations and their solutions
Week-2	Legendre and Hermite functions and their properties-Recurrence Relations and generating functions
Week-3	Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials,
Week-4	Laplace Integral Representation of Legendre polynomial and solving the problems of the students and discuss about whole Section-2
March	
Week-1	Class test of 1st and 2nd sections, Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems
Week-2	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms
Week-3	Convolution theorem, Inverse Laplace transforms, convolution theorem, Inverse Laplace transforms of derivatives and integrals
Week-4	solution of ordinary differential equations using Laplace transform and solving the problems of the students and discuss about whole Section-3

April	
Week-1	Fourier transforms: Linearity property, Shifting, Modulation, Convolution Theorem
Week-2	Fourier Transform of Derivatives, Relations between Fourier transform and Laplace transform
Week-3	Parseval's identity for Fourier transforms, solution of differential Equations using Fourier Transforms.
Week-4	solving the problems of the students and discuss about whole Section-4, solving the problems of the students and discuss about whole Section-4, Class test of 3rd and 4th sections

Name of the Assistant/Associate Professor: Mrs Amita
Class and Section: M.Sc. Mathematics 2nd Year (Fourth Semester)
Subject: Mathematics
Paper: Inner Product Spaces and Measure Theory
Week 1 Hilbert Spaces: Inner product spaces, Hilbert spaces, Schwarz inequality, Hilbert space as normed linear space.
Assignments: Quiz/Presentation related to "Inner Product Spaces"
Week 2 Convex sets in Hilbert spaces, Projection theorem.
Assignments: Presentation of "Results related to Pre-Hilbert Spaces"
Week 3 Orthonormal sets, Separability, Total Orthonormal sets, Bessel inequality.
Assignments: Presentation of "Results related to Hilbert Spaces"
Week 4 Parseval identity, Conjugate of a Hilbert space, Riesz representation theorem in Hilbert spaces.
Assignments: Test of Section I.
Week 5 Adjoint of an operator on a Hilbert space, Reflexivity of Hilbert space.
Assignments: Presentation of "Conjugate of a Hilbert Space"
Week 6 Self-adjoint operators, Positive operators, Product of Positive Operators.
Assignments: Presentation of "Riesz Representation Theorem in Hilbert Spaces".
Week 7 Projection operators, Product of Projections, Sum and Difference of Projections.
Assignments: Test of Section II.
Week 8 Normal and unitary operators, Projections on Hilbert space, Spectral theorem on finite

dimensional space. Convex functions, Jensen inequalities,
Week 9 Measure space, Generalized Fatou lemma, Measure and outer measure, Extension of a measure.
Assignments: Presentation of "Projection Operators"
Week 10 Caratheodory extension theorem, Signed measure.
Assignments: Test of "Projection Operators"
Week 11 Hahn decomposition theorem, Jordan decomposition theorem, Mutually signed measure, Radon – Nikodyn theorem.
Assignments: Presentation of "Normal Operators and Unitary Operators"
Week 12 Lebesgue decomposition, Lebesgue - Stieltjes integral.
***Assignments: Presentation of* "Spectral theorem on finite dimensional space"**
Week 13 Product measures, Fubini theorem, Baire sets, Baire measure.
Week 14 Continuous functions with compact support.
Assignments: Test of Section III
Week 15 Revision and Test
Assignments: Test of Section IV
Week 16 Revision and Test
Assignments: Tests of Sections I & II
Week 17 Revision and Test
Assignments: Tests of Sections III & IV

Name of the Assistant/Associate Professor: D r R a j e e v K u m a r
Class and Section: MSc 2nd sem
Subject: MATHEMATICS
Paper: Operation Research
Week 1 Operations Research: Origin, Definition and scope.
Week 2 Linear Programming: Formulation and solution of linear programming problems by graphical and simplex methods.
Week 3 Big - M and two-phase methods, Degeneracy.
Week 4 Duality in linear programming.
Week 5 Transportation Problems: Basic feasible solutions, Optimum solution by stepping stone and modified distribution methods.
Week 6 Unbalanced and degenerate problems.

Week 7 Assignment problems: Hungarian method, Unbalanced problem, Case of maximization.
Week 8 Transhipment problem. Travelling salesman and crew assignment problems.
Week 9 Concepts of stochastic processes.
Week 10 Poisson process, Birth-death process.
Week 11 Queuing models: Basic components of a queuing system.
Week 12 Steady-state solution of Markovian queuing models with single and multiple servers (M/M/1. M/M/C, M/M/1/k, M/MC/k).
Week 13 Inventory control models: Economic order quantity(EOQ) model with uniform demand.
Week 14 EOQ when shortages are allowed, EOQ with uniform replenishment, Inventory control with price breaks.
Week 15 Game Theory: Two person zero sum game, Game with saddle points, The rule of dominance; Algebric, Graphical and linear programming methods for solving mixed strategy games.
Week 16 Revision and Class Test.
Week 17 Revision and Class Test

Name of the Assistant/Associate Professor: D r R a j e e v K u m a r
Class and Section: MSc 2nd sem
Subject: MATHEMATICS
Paper: Measure and Integration Theory
Week 1 Set functions, Intuitive idea of measure, Elementary properties of measure.
Week 1 Measurable sets and their fundamental properties.
Week 1 Lebesgue measure of a set of real numbers, Algebra of measurable sets, Borel set.
Week 4 Equivalent formulation of measurable sets in terms of open, Closed, $F\sigma$ and $G\delta$ sets, Non measurable sets
Week 5 Measurable functions and their equivalent formulations. Properties of measurable functions.
Week 6 Approximation of a measurable function by a sequence of simple functions.
Week 7 Measurable functions as nearly continuous functions, Egoroff theorem, Lusin theorem.
Week 8 Convergence in measure and F. Riesz theorem. Almost uniform convergence.
Week 9 Shortcomings of Riemann Integral, Lebesgue Integral of a bounded function over a set of finite measure and its properties.
Week 10 Lebesgue integral as a generalization of Riemann integral, Bounded convergence theorem, Lebesgue theorem regarding points of discontinuities of Riemann integrable functions.

Week 11 Integral of non-negative functions, Fatou Lemma, Monotone convergence theorem.
Week 12 General Lebesgue Integral, Lebesgue convergence theorem.
Week 13 Vitali covering lemma, Differentiation of monotonic functions.
Week 14 Function of bounded variation and its representation as difference of monotonic functions, Differentiation of indefinite integral.
Week 15 Fundamental theorem of calculus, Absolutely continuous functions and their properties**.**
Week 16 Revision and Class Test.
Week 17 Revision and Class Test

Name of Assistant Professor	**Dr. Rajeev Kumar**
Class and Semester	**M. Sc. 2nd Year (Semester – 4)**
Subject	**Mathematics**
Paper	Classical Mechanics
Week - 1	Moments and products of inertia, Angular momentum of a rigid body, Principal axes and principal moment of inertia of a rigid body
Week – 2	Kinetic energy of a rigid body rotating about a fixed point, Momental ellipsoid and equimomental systems
Week - 3	Kinetic energy of a rigid body rotating about a fixed point, Momental ellipsoid and equimomental systems
Week - 4	Free & constrained systems, Constraints and their classification, Holonomic and nonholonomic systems, Degree of freedom and generalised coordinates
Week - 5	Virtual displacement and virtual work, Statement of principle of virtual work (PVW), Possible velocity and possible acceleration
Week -	Ideal constraints, General equation of dynamics for ideal constraints,

6	Lagrange equations of the first kind. D' Alembert principle, Independent coordinates and generalized forces
Week - 7	Lagrange equations of the second kind, Generalized velocities and accelerations. Uniqueness of solution, Variation of total energy for conservative fields.
Week - 8	Lagrange variable and Lagrangian function L(t, Qi, i q), Lagrange equations for potential forces, Generalized momenta pi.Test (I and II unit)
Week - 9	Hamiltonian variable and Hamiltonian function, Donkin theorem, Ignorable coordinates, Hamilton canonical equations
Week - 10	Routh variables and Routh function R, Routh equations, Poisson Brackets and their simple properties, Poisson identity, Jacobi – Poisson theorem.
Week - 11	Hamilton action and Hamilton principle, Poincare – Carton integral invariant
Week – 12	Whittaker equations, Jacobi equations, Lagrangian action and the principle of least action.
Week – 13	Canonical transformation, Necessary and sufficient condition for a canonical transformation, Univalent Canonical transformation, Free canonical transformation, Hamilton-Jacobi equation
Week – 14	Jacobi theorem, Method of separation of variables in HJ equation, Lagrange brackets, Necessary and sufficient conditions of canonical character of a transformation in terms of Lagrange brackets
Week - 15	Jacobian matrix of a canonical transformation, Conditions of canonicity of a transformation in terms of Poison brackets
Week – 16	Invariance of Poisson Brackets under canonical transformation Test unit III and IV
Week – 17	Assignment, Revision, and Test

Name of the Assistant/Associate Professor: A n i l K u m a r
Class and Section: MSc 4th sem
Subject: MATHEMATICS
Paper: Object Oriented Programming with C++
Week 1 Basic concepts of Object-Oriented Programming (OOP). Advantages and applications of OOP. Object-oriented languages. Introduction to C++.
Week 2 Structure of a C++ program. Creating the source files. Compiling and linking.
Week 3 C++ programming basics: Input/Output, Data types, Operators, Expressions.
Week 4 Control structures, Library functions.
Week 5 Functions in C++ : Passing arguments to and returning values from functions.
Week 6 Inline functions, Default arguments, Function overloading.
Week 7 Classes and objects : Specifying and using class and object, Arrays within a class, Arrays of Objects.
Week 8 Object as a function arguments, Friendly functions, Pointers to members.
Week 9 Constructors and destructors. Operator overloading and type conversions.
Week 10 Inheritance : Derived class and their constructs, Overriding member functions, Class hierarchies, Public and private inheritance levels.

Week 11 Polymorphism, Pointers to objects, This pointer, Pointers to derived classes.
Week 12 Virtual functions.
Week 13 Streams, Stream classes, Unformatted Input/Output operations.
Week 14 Formatted console Input/Output operations, Managing output with manipulators.
Week 15 Classes for file stream operations, Opening and Closing a file. File pointers and their manipulations, Random access.
Week 16 Error handling during file operations, Command-line arguments. Exceptional handling.
Week 17 Revision and Class Test

Name of the Assistant/Associate Professor: Anil Kumar
Class and Section: B.Sc. Math (Hons.) 6th Semester
Subject: MATHEMATICS
Paper: Operations Research -II
Week 1 Inventory Control: introduction of inventory, factors affecting inventory.
Week 2 Inventory models, Deterministic models.
Week 3

Economic order quantity model when shortages are allowed/not allowed
Week 4 price discounts model, multi-item inventory models.
Week 5 Queuing Theory : Basic characteristics of queuing system.
Week 6 Birth-death equations.
Week 7 Steady state solution of Markovian queuing models with single and multiple servers (M/M/1 and M/M/c), with limited capacity (M/M/1/K and M/M/c/K).
Week 8 Steady state solution of Markovian queuing models with single and multiple servers (M/M/1 and M/M/c), with limited capacity (M/M/1/K and M/M/c/K).
Week 9 Sequencing problems: Processing of n jobs through 2 machines, n jobs through 3 machines.
Week 10 Sequencing problems: Processing 2 jobs through m machines, n jobs through m machines.
Week 11 Replacement problems: Replacement of items whose running cost increases with time.
Week 12 Replacement policies for the items that fail completely - Individual and the group replacement policies.
Week 13 PERT and CPM: Introduction of PERT and CPM.
Week 14 Earliest and latest times, Determination of critical path and various types of floats.
Week 15 Probablistic and cost considerations in project scheduling.

Week 16 Revision and Class Test.
Week 17 Revision and Class Test