

Syllabus for M. A. / M. Sc. Mathematics
Course Structure : W.E.F. 2008 and Onwards

SEMESTER –I

- MAT 101 Complex Analysis
- MAT 102 Differential Equations
- MAT 103 Advanced Discrete Mathematics
- MAT 104 Programming in C⁺⁺

SEMESTER –II

- MAT 201 Topology
- MAT 202 Abstract Algebra
- MAT 203 Numerical Analysis
- MAT 204 Mathematical Methods

SEMESTER –III

- MAT 301 Functional Analysis
- MAT 302 Measure Theory
- MAT 303 Probability Theory and Statistics

Any one of the following

- MAT 304 Graph Theory
- MAT 305 Spherical Astronomy
- MAT 306 Number Theory

SEMESTER –IV

MAT 401 Mathematical Modeling
MAT 402 Operational Research
MAT 403 Fuzzy Sets and their Applications

Any one of the following

MAT 404 Fourier Analysis and Wavelet Theory
MAT 405 Fluid Dynamics
MAT 406 Neural Network

Note: Each course is divided into five units .The question paper will consist of six questions. One question per unit will be asked, and sixth question will be based on all the units. Each of the first five questions will consist four parts, out of which the examinee will be asked to attempt only two parts .However the sixth question may contain sixth to eight parts and the candidate may be asked to attempt only three or four parts. The examinee will be required to attempt only five questions out of six questions.

SYLLABUS
M. A. / M. Sc. Mathematics
SEMESTER-I

MAT: 101 Complex Analysis**Max Marks: 100****UNIT-I**

Continuity and differentiability of complex functions, Analytic and regular functions, Cauchy-Reimann equations, Necessary and sufficient conditions for a function to be analytic, Some properties of conjugate functions, Construction of an analytic function, Milne Thomson's method, The zeros of an analytic function, Singularities.

UNIT-II

Complex integration, Cauchy Goursat theorem, Cauchy's theorem, Morera's theorem, Cauchy's integral formula, Cauchy inequalities, Liouville's theorem.

UNIT-III

Gauss mean value theorem, Maximum modulus theorem, The Argument Theorem, Rouché's Theorem, Poisson's integral formulae.

UNIT-IV

Power series, The circle of convergence of the power series, Taylor's series, Laurent's series, Different types of singularities, Introductory conformal mapping (Bilinear transformation).

UNIT-V

Residue at a single pole, Residue at a pole of a order greater than unity, Residue at infinity, Cauchy's residue theorem, Evaluation of real definite integral, Integral round the unit circle.

Books Prescribed:

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| 1. | B.Churchil | Fundamental of Complex Analysis |
| 2. | T.Pati | Fundamental of Complex Variable |

Books Recommended:

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| 1. | Schaum's outline | Complex Analysis |
| 2. | V.Ahlfors | Complex Analysis |

MAT: 102 Differential Equations**Max Marks:100****UNIT-I**

The Existence and Uniqueness of solutions : The method of successive approximation, Picard's Existence and Uniqueness theorem.

Solution of linear differential equations of second order with variable coefficients, Applications to the vibrational mechanical systems.

UNIT -II

Boundary value problems – Wave equation, Laplace equation and heat conduction equation, Their solutions by method of separation of variables and applications, Eigenvalues, Eigenfunctions.

UNIT-III

Ordinary and regular singular points, Power series solution, Series solution (Frobenius method) of first and second order linear equations., Legendre and Bessel Functions, Their recursion formulae, Integral representation and properties.

UNIT –IV

Partial Differential Equations of the First Order: Origin of First order Partial Differential Equations, Cauchy's problems for the first order equations, Linear & Non-linear partial differential equations of the first order, Charpit's method, Jacobi's method.

UNIT –V

Partial Differential Equations of Second Order: Linear Partial Differential Equations with constant and variable coefficients, Solution of linear hyperbolic equations.

Books Prescribed :

1. G.F. Simmons Differential equation with Applications and Historical Notes

Books Recommended:

1. W.I. Martin and E. Reissner Elementary Differential Equations
2. I. G. Petrovaski Ordinary Differential Equations
3. I.N.Sneddon A text book of Partial Differential Equations
4. M.D.Raisinghanian Advanced Differential Equations

MAT: 103 Advanced Discrete Mathematics

Max Marks: 100

UNIT-I

Propositional Calculus: Proposition and logical operations, Proposition and truth tables, Tautologies & contradiction, Logical equivalence, Conditional & Bi-conditional statements, Logical implication , Propositional functions & quantifiers.

Semi groups & Monoids: Definitions and examples of semi groups and monoids, Isomorphism & homomorphism of semi groups and monoids.

UNIT-II

Partially ordered set, Hasse diagram, External element of poset, Lattices as algebraic system. Sub lattices, Isomorphic lattices, Bounded lattices, Complete, Compliment, Complemented lattices, Modular lattices, Pentagonal lattices, Pentagonal.

UNIT-III

Boolean algebra: Definition, Principle of duality, Basic Theorems, Sub algebra, Isomorphic, Boolean algebra as lattices, Boolean functions and minterms, Disjunctive normal form, Complete disjunctive normal form, Conjugate normal form.

UNIT-IV

Language & Grammar and their types: Regular expressions and Regular sets, Regular language, Finite state Automata, Finite state Machine, Semi-Machines and languages.

UNIT-V

Application of Logic Circuit: Sum-of products form for Boolean algebra, Minimal Boolean expressions, Prime implicants, Logic and Circuits, Boolean functions, Karnaugh map.

Books Prescribed:

1. B. Colman, R. C. Busby, S. Ross Discrete Mathematical Structures (PHI), [II & III]

2. Schaum's series Discrete Mathematics, Tata Mc-Graw- Hill Edition
[I, III, IV & V]

Books Recommended:

1. Susanna S. Epp. Discrete Mathematics with Applications (Thomson Learning TM)

MAT: 104

Programming in C ++

Max Marks: 70

UNIT-I

Introduction to OOP and C++: Procedure Oriented Programming (POP) and Object Oriented Programming (OOP), Need of Object Oriented Programming, Characteristics of Object Oriented languages, C++ an OOP Language.

C++ Programming Basics : Basic Program Construction, Character Set, Tokens, Keywords and Identifiers, Constants and Variables, Data Types, Declaration and Initialization of Variables, Qualifiers, Coercion, I/O Operators, Cascading of I/O Operators, Manipulators, Comments, Arithmetic Operators, Expressions, Precedence of Operators, Evaluation of Expressions, Library Functions, Preprocessor Directives.

UNIT-II

Loops and Decisions: Relational operators, Loops, Logical Operators, Decisions, Precedence and Associativity of Operators, Control Statements.

Structures and Functions: Structures, Nested Structures, Enumerated Data Types, Simple Functions, Passing Arguments to and Returning Values from Functions, Reference Arguments, Overloaded Functions, Inline Functions, Default Arguments, Variables and Storage Classes, Returning by Reference.

UNIT-III

Objects and Classes : Specification of class, Access Specifiers, Using Class and Objects, Constructors , Objects as Function Arguments, Returning Objects from Functions, Structures and Classes, Static Class Data.

Arrays: Arrays Fundamentals, Arrays as Class member data, Arrays of objects, Strings.

UNIT-IV

Operator Overloading: Overloading of Unary and Binary Operators, Data Conversion.

Inheritance: Derived class and Base class, Derived Class Constructors, Overriding Member Functions, Class Hierarchies, Public and Private Inheritance, Levels of Inheritance, Multiple Inheritance.

UNIT- V

Pointers: Pointers with Arrays, Functions, Strings and Objects, Memory Management, Linked List.

Subtleties and Files I/O : Virtual Functions, Friend Functions, Static Functions ,The this Pointer, String I/O, Character I/O, Object I/O, I/O with Multiple Objects, File Pointers,Disk I/O with Member Function.

Books Prescribed :

1. Robert Lafore Object Oriented Programming in TURBO C++
[Galgotia Pub.Pvt.Ltd.],(unit III, IV and V)
2. E. Balagurusamy Programming in ANSI C
[Tata Mc-Graw Hill Pub.Comp.Ltd.], (unit –I and II)

Books Recommended

1. Yashwant Kanitkar Let us C [B.P.B.Publications]
2. E. Balagurusamy Object Oriented Programming in C++
[Tata Mc-Graw Hill Pub.Comp.Ltd.]

SEMETER-II

MAT: 201

Topology

Max Marks: 100

UNIT-I

Metric space, Open sets, Closed sets, Convergence, Completeness, Continuity in metric space, Cantor intersection theorem.

UNIT-II

Topological space, Elementary concept, Open and Closed sets, Neighbourhood of a point, Closure, Interior, Basis and Sub-basis, Weak topology, Product topology, Continuous maps ,Open and Closed maps , Homeomorphism.

UNIT-III

Connectedness, Continuity and Connectedness, Components, Totally disconnected space, Locally connected space, Compact space; Sequentially compact space, Local compactness, Continuity and Compactness, Tychonoff theorem, Tietz-extension theorem.

UNIT-IV

First and second countable space , T_1 spaces ,Hausdorff spaces , Regular spaces ,Normal spaces ,Completely normal space ,Completely regular space, Uryshon Lemma,Uryshon metrization theorem.

UNIT-V

Fundamental group function, Homotopy of maps between topological spaces, Homotopy equivalence, Contractible and simple connected spaces, Fundamental groups of S^1 , and $S^1 \times S^1$ etc., Calculation of fundamental groups of S^n , $n > 1$ using Van Kampen's theorem , Fundamental groups of a topological group. Brouwer's fixed point theorem, Fundamental theorem of algebra, Vector field on planer sets, Frobenius theorem for 3×3 matrices.

Books Prescribed:

1. G.F.Simmons Introduction to topology (for Unit-I)
2. J..Munkers Topology (for Unit-II,III,and IV)
- 3.Marwin J.Greenberg and J.R. Harper Algebraic Topology (for Unit-V)

Books Recommended:

1. Schaum's outline series General Topology

MAT :202**Abstract Algebra****Max Marks:100****Unit-I**

Symmetric groups, Alternating groups, Normal subgroups, Conjugacy, Normalization, Centre of a group, Class-equation of a group and its consequences, Theorems for finite groups, Cauchy's theorem, Sylow's theorem.

Unit-II

Homomorphisms, Endomorphisms, Automorphisms, Inner automorphisms, Group of automorphisms and Inner automorphisms, Simple groups, Maximal subgroups, Composition series, Jordan-Holder theorem, Normal series , Solvable groups, Direct-Products.

Unit-III

Rings, Sub-rings, Integral domain, Euclidean Rings, Ideal, Principal Ideal, Maximal and Prime ideals, Module, Sub-module, Module homomorphism, Linear sum and direct sum of sub-module, Cyclic module, Finitely generated module and related theorems.

Unit –IV

Extension fields, Transitivity of finite extensions, Algebraic element, Algebraic field extensions, Minimal polynomials, Roots of polynomials, Multiple roots, Splitting field, Uniqueness of SF of a polynomial.

Unit- V

Automorphism of a field, Fixed field, Group of Automorphism of a field K relative by a subfield F of K, Galois group of a Polynomial over a field, Construction with straight edge and Compass, Solvability by radicals.

Books recommended:

1. I.N. Herstein Topics in Algebra
2. J. Fraleigh Abstract Algebra

MAT: 203**Numerical Analysis****Max Marks: 70****Unit – I**

Errors in numerical calculations: Absolute, Relative and Percentage errors, A general error formula, Error in a series approximation; Solutions of Algebraic & Transcendental equations: The Bisection method, The Iteration method: Acceleration of convergence, Aitken's process, Regula-Falsi method, Secant method, Newton- Raphson method, Solution of system of non-linear equations: The method of iteration, Newton-Raphson method.

Unit – II

Interpolation: Errors in Polynomial interpolation, Finite differences: Forward, Backward and Central differences, Symbolic relations, Difference of polynomial, Newton's formulae of interpolation, Central difference interpolation formulae: Gauss's , Bessel's & Stirling's formulae; Interpolation with unevenly spaced points: Lagrange's interpolation formula, Interpolation with cubic splines; Divided differences and their properties, Newton's general interpolation formula, Inverse interpolation, Method of successive approximations.

Unit-III

Numerical differentiation and integration: Forward, Backward and Central difference formulae for first and second order derivatives, Errors in numerical differentiation, Numerical integration, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Boole's and Weddle's rules, Newton's-Cotes integration formulae.

Unit – IV

Numerical solution of ordinary differential equations : Taylor's series , Picard's successive approximations, Euler's, Modified Euler's , Runge-Kutta & Milne's Predictor-Corrector methods, Simultaneous and higher order equations: Taylor's series method and Runge-Kutta method; Boundary value problems: Finite differences method.

Unit –V

Numerical solution of partial differential equations: Finite difference approximations to derivatives, Laplace's equation: Jacobi's method, Gauss Seidel method, The ADI method; Parabolic equations: Explicit scheme, C-N scheme, Hyperbolic equations: Explicit scheme, Implicit scheme.

Books Prescribed :

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| 1. S.S. Sastry | Introductory Methods of Numerical Analysis
[Prentice Hall of India Pvt. Ltd.] |
| 2. M.K. Jain, S.R.K Iyengar
and R.K.Jain | Numerical methods of Scientific and Engineering
Computation |

MAT: 204**Mathematical Methods****Max Marks: 100**

UNIT-I

Origin and classification of Integral equations, Conversion of differential equations into integral equations, Linear integral equations of the first and second kind of Fredholm and Voltra types, Solution by successive substitutions and successive approximations.

UNIT-II

Solution of equations with separable kernels. The Fredholm alternative, Holbert-Schmidt theory for symmetric kernels.

UNIT-III

Functional: Some simple variational problems, The variation of a functional, Euler's equation, Special cases of Euler's equation, Case of several variables, Simple variable end point problem, Variational derivative, Invariance of Euler's equation, Fixed end point problem for n unknown functions, Variational problems in parametric form, Functional depending on higher order derivatives, Variational problems with subsidiary conditions.

UNIT-IV

Laplace transform, Transform of elementary functions, Transform of Derivatives, Inverse transforms, Convolution theorem.

UNIT-V

Application of Laplace transform in solving ordinary and partial differential equations.

Books Prescribed:

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| 1. F.B. Hildebrand | Methods of Applied Mathematics, Prentice Hall. |
| 2. L.B. Chambers | Integral Equations, International Text Book Co. |
| 3. I.M Gelfand, & S.V. Fomin | Calculus of Variations, Prentice Hall (Unit-III) |
| 4. Schaum's Outline Series | Integral Transforms |

Books Recommended:

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| 1. M.D.Raisinghania | Integral Equations |
| 2. B.S. Grewal | Engineering Mathematics |

SEMESTER-III

MAT:301

Functional Analysis

Max Marks:100

UNIT-I

Normed spaces, Hahn –Banach theorem, Banach space, Subspace of Banach space, Finite dimensional Normed space and subspaces, Compactness and Finite dimension, Linear operators, Bounded and Continuous linear operators. Linear functionals, Linear operators and Functional on finite dimensional spaces, Normed spaces of operators, Dual spaces.

UNIT-II

Principle of uniform boundedness, Boundedness and Continuity of linear transformations, Hahn-Banach theorem, Open mapping theorem, Closed graph theorem .

UNIT-III

Inner product space ,Orthogonal compliments and Direct sums, Hilbert spaces, Projections, Orthonormal basis, Riesz-representation theorem, Conjugate Hilbert spaces, Hilbert-Adjoint operator.

UNIT-IV

Bessels inequality, Parsaval's identity, Self adjoint operators, Normal operators, Unitary operators, Spectral theory in finite dimensional Normed spaces, Spectral properties of bounded linear operators.

UNIT-V

Banach fixed point theorems and their iteration methods, Application to collinear and integral equations, Application to ordinary differential theorems.

Books Prescribed:

1. E Krayszing. Introductory Functional analysis with applications.
2. W. Rudin. Functional analysis

Books Recommended:

1. T.Nair Functional analysis

MAT: 302

Measure Theory

Max Marks: 100

UNIT-I

Cardinality of sets, Cardinal numbers, Order relation, Addition, Multiplication, Exponentials, Cantor like sets, Measurable sets, Borel sets, Outer measure, Lebesgue measure in \mathbb{R} .

UNIT-II

Measurable functions, Lebesgue integral of simple functions, Lebesgue non-negative measurable function. Jordan-Hahn Decomposition theorem.

UNIT-III

General Lebesgue Integral, Comparison of Riemann and Lebesgue Integrals, Convergence in measure, Monotone convergence theorem, Fatou's lemma, Dominated convergence theorem.

UNIT-IV

Differentiation of monotone functions and bounded variation, Absolute continuity, Differentiation of an integral. Fubini's theorem.

UNIT-V

L^p spaces : Definition of L^p space, Definite conjugate number, Definite Norm of an element of L^p space, Holder's inequalities, Schwartz inequality, Minkowski inequality.

Books recommended:

1. P.K. Jain and V.P. Gupta Lebesgue Measure and Integration (Relevant parts of Chapter II and Chapter II to VI only)
2. P.P. Gupta (chapter VIII only)
3. H.L.Roydon Real Analysis

Books Prescribed:

Rana Introduction to Measure and integration

MAT: 303

Probability Theory and Statistics

Max Marks: 100

UNIT-I

Probability: Sample space and Events, Axioms of Probability, Conditional Probability, Baye's theorem, Expectations, Moments, Chebyshev's inequality, Weak law of large numbers, Strong law of large numbers.

UNIT-II

Probability Distributions: Random Variables, Distribution functions, Probability density function, Discrete Random Variable, Bernoulli's Distribution, Binomial Distribution, Poisson distribution, Hyper geometric distribution (their density functions, means, variance, moments up to fourth order)

UNIT-III

Continuous Distributions: Continuous random variable, Normal Distribution, Uniform & Exponential distribution, Null hypothesis, Test of hypothesis, Testing the significance of sample mean and difference between means of two samples.

UNIT-IV

Pt. Estimation, Interval Estimation, Methods of Estimation, Max Likelihood method, Method of moments, Least square method, Unbiasedness, Efficiency, Consistency, Sufficient Statistics.

UNIT-V

Curve Fitting, Regression & Correlation.

Books Prescribed:

1. Miller & Johan Freund. Probability and Statistics

2. Gupta & Kapoor

Probability and Statistics

Books Recommended:

1 M.R.Spiegel

Theory & problems of Probability
(Schaum's Outline Series)

MAT: 304

Graph Theory

Max Marks:100

UNIT – I

Introduction, Finite and infinite graphs, Weighted graph, Sub-graph, Walks, Paths, Circuits, Connected and Disconnected graphs, Components, Euler graph, Unicursal graph, Operations on graphs, Hamiltonian paths and circuits, Directed graphs, Types of digraphs, Digraphs and binary relations, Directed paths and Connectedness, Euler Digraphs, Trees with directed edges.

UNIT-II

Trees, Properties of Trees, Distance and Centres in a tree, On counting trees: Counting labeled and unlabeled trees, Fundamental circuits, Spanning trees of a graph and weighted graph.

UNIT-III

Cuts-sets and Cut-vertices, Fundamental circuits and cut-sets, Connectivity and Separability, Isomorphism, 1- Isomorphism, 2- Isomorphism, Combinatorial vs. Geometric graphs, Planer graphs, Kuratowski's two graphs, Detection of planarity, Homeomorphic graphs, Geometric Dual, Combinatorial Dual.

UNIT-IV

Modular arithmetic and Galois Fields, Vector space associated with a graph, Incidence matrix, Submatrix of $A(G)$, Circuit matrix, Fundamental circuit matrix and rank of B , Cut-sets matrix, Path matrix and Adjacency matrix.

UNIT-V

Chromatic number, Chromatic partitioning, Chromatic polynomial, Matchings, Coverings, Four-color problem, Five-color theorem.

Books Prescribed:

1. Nar Singh Deo Graph theory

Books Recommended:

SEMESTER-IV**MAT:401 Mathematical Modelling****Max Marks:100****UNIT-I**

Introduction of Mathematical Modelling, Types of modelling, Some characteristics of mathematical models, Linear growth and decay models, non-linear growth and decay model, Simple compartment models.

UNIT-II

Equation of continuity in fluid flow (Euler's and Lagrange's), Equation of continuity in Cartesian, Cylindrical and spherical polar coordinates, Equivalence between Eulerian and Lagrangian forms of equations of continuity, Euler and Navier-Stokes equations of motion.

UNIT-III

Model for microbial growth in a chemostat, Stability of steady states for chemostat, Single species population model : Fundamental concept, exponential growth model (formulation solution, interpretations and limitations), logistic growth model (formulation, solution, interpretations and limitations), extension of the logistic model.

UNIT-IV

Two species population models: Introduction, Types of interaction between two species, Prey –Predator model. Models for competing species. Epidemics: Basic concept, Simple Epidemic model (formulation, solution, interpretation), General epidemic model (formulation, solution, interpretation), SIS model, SIS model with specific rate of infection as a function of t ., general deterministic model with removal and immigration (SIS model), model for control of an epidemic, Simple models in genetics and Pharmacokinetics.

UNIT-V

Structure and flow properties of blood, Blood flow in circulatory system. Effects of mild stenosis, Pulsatile flow.

Books Prescribed:

1. J.N.Kapur

Mathematical Modeling, New Age Int.

2. J.N.Kapur

Mathematical models in Biology and Medicine
(East-west press Pvt. Ltd.)

3.E.Shorlton

A text Book of Fluid Dynamics

3.M.D.Raisinghania

Fluid Dynamics

Books Recommended:

1. N.T.J.Bailey

The mathematical theory of epidemics

MAT: 402 Operation Research**Max Marks: 100****UNIT-I**

Introduction : Definition and scope of O.R., Different O.R. models, General methods for solving O.R. models, Main characterization and phases of O.R., Linear

programming and Simplex method with simple problems, Two-phase and Big-M methods.

UNIT-II

Inventory Management: Inventory control, Types of inventories, Cost associated with inventories, Factors affecting inventory control, Single item deterministic problems with and without shortages, Inventory control with price breaks, Inventory control for one period without setup cost with uncertain demands.

UNIT-III

Sequencing Theory: Introduction, Processing with n-jobs and two machines, n-jobs and three machines, n-jobs and m- machines, Concept of jobs blocks.
Non-linear Programming: Convex sets and convex functions, Quadratic programming, Wolfe's and Beale's methods.

UNIT-IV

Queuing Theory: Introduction, Characteristics of queuing systems, Poisson process and Exponential distribution, Classification of queues, Transient and steady states, Poisson queues (M/M/1, M/M/C).

UNIT-V

Non-Poisson Queuing systems: $(M/E_k/1)$ queuing systems.
Replacement Problems: Replacement of items that deteriorate gradually and value of money does not change with time, Replacement of items that fail suddenly, Individual and group replacement policies.

Books Prescribed:

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| 1. H.A. Taha | Operation Research: An introduction, 6 th edition |
| 2. P.K.Gupta, Kanti Swarup & Man Mohan | Operation Research |
| 3. R.L.Ackoff and N.W. Sasieni | Fundamental of Operations Research |

Books Recommended:

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| 1. S.D.Sharma | Operation Research |
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MAT: 403 Fuzzy Sets and Their Applications Max Marks: 100

UNIT-I

Crisp sets, Fuzzy sets (basic types), Fuzzy sets (basic concepts), Representation of fuzzy sets, Decompositions theorems, Extension principle for fuzzy sets.

UNIT-II

Operations on fuzzy sets (Fuzzy compliment, intersection, and union), Combinations of operations.

UNIT-III

Fuzzy numbers, Linguistic variables, Arithmetic operations on fuzzy numbers, Lattice of fuzzy numbers, Fuzzy equations.

UNIT-IV

Crisp and fuzzy relations, Projections, Binary fuzzy relations, Binary relations on a single set, Fuzzy equivalence relations, Fuzzy compatibility relations, Fuzzy ordering relations, Fuzzy morphemes, Sup- α compositions of binary fuzzy relations, Inf- w_i compositions of fuzzy relations.

UNIT-V

Fuzzy relation equations, Fuzzy logic, Fuzzy decision making, Fuzzy linear programming, Linear Regression with fuzzy parameters, Fuzzy regression with fuzzy data.

Books Prescribed:

1. H.J. Zimmerman. Fuzzy set theory and its applications
2. George J.Klier and Bo Yuan Fuzzy sets and fuzzy logic

Books Recommended:

1. Kaufmann, A. and Gupta, M.M. Fuzzy mathematical models in engineering and management science

MAT: 404 Fourier Analysis and Wavelet Theory Max Marks: 100

UNIT – I

Trigonometric Fourier Series: Periodic functions, Harmonics, Trigonometric Polynomial and series, The orthogonality of Sines and Cosines, Fourier series for function of period 2π , Fourier series for function defined on an interval of length $2L$, Jump discontinuities, Smooth and Piecewise smooth functions, A criterion for the convergence of Fourier series, Even and odd functions, The complex form of Fourier series, Function of period $2L$.

UNIT- II

Orthogonal Systems : Definitions, Fourier series with respect to an orthogonal system, Some simple orthogonal systems, Square integrable functions, A consequence of Bessel's inequality, Unit as $n \rightarrow \infty$ of trigonometrical integral, Formula for sum of Cosines-Auxiliary integrals, Integral formula for partial summation Fourier series, Sufficient condition for a convergence of a point of discontinuity, Integration of Fourier series, Differentiation of Fourier series.

UNIT – III

Double Fourier series: Orthogonal system in two variables, Basis trigonometric systems in two variables, Double trigonometric Fourier series, The integral formula for the partial sum of a double trigonometric Fourier series, The Fourier integral as a limiting

B.A. /B.Sc. Mathematics Part-I (w.e.f. 2007)
(Duration: One Year)

BMG 101	Abstract Algebra
BMG 102	Calculus
BMG 103	3-D Coordinate Geometry and Trigonometry

B.A. /B.Sc. Mathematics Part-II (w.e.f. 2008)
(Duration: One Year)

BMG 201	Elementary Analysis, Differential Equations and Vector Calculus
BMG 202	Linear Algebra
BMG 203	Mechanics

B.A. /B.Sc. Mathematics Part-III (w.e.f. 2009)
(Duration: One Year)

BMG 301	Real Analysis and Statistics
BMG 302	Differential Geometry
BMG 303	Linear Programming and Probability

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