

RATHINAM COLLEGE OF ARTS AND SCIENCE
DEPARTMENT OF MATHEMATICS

B.SC MATHS - COURSE OUTCOME

Semester-I	
Classical Algebra	Recall the fundamental concept of expansion and summation.
	Examine the concept of roots of equations.
	Compare the concept of increase or decrease of the roots of the equation.
	Understand the fundamental concept of Matrices with respect to real life applications.
	Examine the applications of Binomial and Newton theorems.
	Discuss the need of being with ethics of science while experimenting Algebraic concepts in society.
Practical Algebra	Apply the fundamental concept of expansion and summation.
	Examine the concept of roots of equations.
	Compare the concept of increase or decrease the roots of the equation
	Analyze the concept of Matrices with respect to real life applications
	Examine the applications of Binomial and Newton theorems
Trigonometry, Vector Calculus and Fourier series	Understand the concept of trigonometric equations, triangles, and applications.
	Demonstrate the concept of several trigonometric identities and use them to verify other identities.
	Evaluate trigonometric and inverse trigonometric functions.
	Determine gradient vector fields and find potential functions
	Apply Fourier analysis to half range series.
	Develop conceptual understanding and fluency with trigonometric functions, techniques, vector calculus and manipulations.
Trig World	Examine the concept of trigonometric equations, triangles, and applications.
	Demonstrate the concept of several trigonometric identities and use them to verify other identities.
	Evaluate trigonometric and inverse trigonometric functions.
	Determine gradient vector fields and find potential functions
	Apply Fourier analysis to half range series.

Statics	Recall the concept of forces and its related applications.
	Demonstrate the method to resolve forces and to find the resultant of forces.
	Experiment the fundamental concepts of statics with respect to real life mechanism.
	Deduce the resultant of coplanar forces in different planes.
	Examine the concept of couples and parallel forces in different systems.
	Develop the understanding of the concepts in Statics for further learning of Mechanics.
Experimental Statics	Apply the concept of forces and its related applications.
	Demonstrate the method to resolve forces and to find the resultant of forces.
	Experiment the fundamental concepts of statics with respect to real life mechanism.
	Analyze the concept of resultant of coplanar forces in different planes.
	Examine the concept of couples and parallel forces in different systems.
Modern Algebra	Recall the concept of sets, groups and its properties.
	Understand the basic concepts of Normal and Quotient groups.
	Examine the types of Automorphisms by their properties.
	Apply the concept of Rings.
	Evaluate the concept of More Ideals and Quotient Rings.
	Discuss the concept of Sets and Rings.
Actual Algebra	Compare the concept of sets, groups and its properties.
	Analyze the basic concepts of Groups.
	Examine the types of Rings by their properties.
	Determine the concept of Matrices and its types.
	Apply the concept of vector space in Transformation.
Real Analysis – I	Recall the basic concepts of Real and Complex number Systems.
	Understand the concept of Set theory, Relations and Functions.
	Apply the concept of intersection theorem and covering theorems.
	Compare the concept of continuity, convergent sequences and metric space.
	Evaluate the concept of Limits and Continuity to solve the problems.
	Discuss the fundamental properties of the real numbers that lead to the formal development of real analysis.

Real Applications	Analyze the basic concepts of Real and Complex number Systems.
	Examine the concept of Set theory, Relations and Functions.
	Apply the concept of intersection theorem and covering theorems.
	Compare the concept of continuity, convergent sequences and metric space.
	Evaluate the concept of Limits and Continuity to solve the problems
Real Analysis – II	Recall the Properties of Derivatives and Continuity.
	Understand the concept of bounded variations and its properties.
	Examine the concept of functions and continuous functions.
	Apply the concept of Riemann- Stieltjes integral and derive conclusions.
	Prove the theorems by using the properties of Riemann integral.
	Discuss the fundamental properties of the real numbers that lead to the formal development of real analysis.
Exploring Complexity	Compare the Properties of Derivatives and Continuity.
	Analyze the concept of bounded variations and its properties.
	Examine the concept of functions and continuous functions.
	Apply the concept of Riemann- Stieltjes integral and derive conclusions.
	Determine the theorems by using the properties of Riemann integral.
Calculus	Define fundamental concepts and principles of calculus.
	Apply the concept of PDE to solve first order equation.
	Compare the concepts of differential and integral calculus to solve multiple integrals.
	Classify beta and gamma functions with respect to change in double integrals.
	Examine the properties of Laplace transformation with application.
	Discuss the Mathematical Idea to communicate effectively to the needy with the help of Scientific method of analysis.
Thinking Calculus	Analyze the fundamental concepts and principles of calculus
	Apply the concept of PDE to solve first order equation
	Compare the concepts of differential and integral calculus to solve multiple integrals
	Create beta and gamma functions with respect to change in double integrals
	Examine the properties of Laplace transformation with application

Analytical Geometry	Understand the basic concept of Geometry in a practical way.
	Understand the differences of 2D and 3D geometrical shapes.
	Examine the relationship between Cone and Cylinder.
	Construct the models based on Sphere, Cone and Cylinder
	Apply the concepts of Sphere, Cone and Cylinder in real world.
	Develop problem solving techniques using analytical geometry to diverse situations in mathematical contexts.
Geometry with 2D and 3D	Analyze the basic concept of Geometry in a practical way.
	Compare the differences of 2D and 3D geometrical shapes.
	Examine the relationship between Cone and Cylinder.
	Construct the models based on Sphere, Cone and Cylinder
	Apply the concepts of Sphere, Cone and Cylinder in real world.
Differential Equations	Recall the Algebraic equations and its types.
	Construct the Differential equations by using the rules with arbitrary constants.
	Develop first order higher degree equations.
	Compare the effectiveness of Ordinary differential equations and Partial differential equations.
	Choose suitable method to examine the values of x , y , p with respect to the solvable Differential Equations.
	Develop problem solving techniques using differential equations.
Applicable Derivatives	Analyze the fundamental concepts of differential equation.
	Design first and second order higher degree equations.
	Compare the concepts of ODE, PDE and Homogeneous linear equation.
	Examine the real life applications of ODE & PDE.
	Apply the fundamental concepts of Homogeneous linear equation.
Dynamics	Remember the basic concepts of Kinematics.
	Understand the concept of Acceleration.
	Examine the relationship between mass and weight and solve problems.
	Discuss the concept of projectile and its characteristics.
	Apply the concept of impulsive forces to derive conclusions.

	Develop problem solving techniques using analytical geometry to diverse situations in mathematical contexts.
Experimental Dynamics	Analyze the basic concept of Kinematics.
	Determine the concept of Acceleration.
	Examine the relationship between mass and weight and solve problems.
	Demonstrate the concept of projectile and its characteristics.
	Apply the concept of impulsive forces to derive conclusions.
Complex Analysis	Remember the fundamental concept of complex number system and basic operations.
	Understand the concept of geometric representation in complex numbers.
	Examine the concept of analytic and rational functions in suitable case.
	Construct the theorems using power series and convergence.
	Apply the concepts of exponential and trigonometric functions.
	Develop problem solving techniques using complex analysis to diverse situations in mathematical contexts.
Complex Analysis- Practical	Analyze the fundamental concepts of complex number system and basic operations.
	Demonstrate the concept of geometric representation in complex numbers
	Examine the concepts of analytic and rational functions in suitable case
	Construct the theorems using power series and convergence
	Apply the concepts of exponential and trigonometric functions.
Fuzzy Mathematics	Understand the basic concepts of fuzzy set and its properties.
	Compare the differences and similarities between fuzzy sets and classical sets theories.
	Examine the concept of relations and logic connectives.
	Understand the concept of fuzzy subgroup.
	Understand the concept of fuzzy invariant subspaces.
	Discuss and develop new technologies so as to improve computing facility to maintain environment sustainability.
Frizzy Logic	Analyze the role of fuzzy set and its properties in real life phenomena.
	Experiment with algebraic concept and Cartesian product of fuzzy subsets.
	Examine the concept of relations and logic connectives.
	Construct a mathematical model with the concept fuzzy subgroup.
	Apply the concept of fuzzy invariant subspaces in real life phenomena.
Abstract Algebra	Recall fundamental concept of sets and groups

	Examine the concept of cyclic groups and Lagrange's theorem
	Estimate the properties of isomorphism and homomorphism
	Estimate the concept of rings and properties of rings by some definition and examples
	Describe facts of Maximal and Prime Ideals
	Discuss the use of Mathematical concepts and to develop further the ability to understand and produce proofs in an algebraic context.
Abstract Algebra Practical	Apply the fundamental concept of sets and groups
	Examine the concept of cyclic groups and Lagrange's theorem
	Analyze the properties of isomorphism and homomorphism
	Estimate the concept of rings and properties of rings by some definition and examples
	Discover the facts of Maximal and Prime Ideals
Number Theory	Recall the concepts of divisibility and linear Diophantine equations.
	Apply the concept of permutations and combinations in deriving theorems.
	Make use of properties of congruence in theorems.
	Examine the concept of multiplicative functions.
	Develop new methods to solve unsolved problems about primes.
	Explain the need of number theoretic concepts underlie almost all of the encryption methods used for a large variety of important security measures.
Number Theory Practical	Apply the concepts of divisibility and linear Diophantine equations.
	Evaluate the concept of permutations and combinations in defined theorems.
	Examine the properties of congruence in theorems.
	Apply the concept of multiplicative functions.
	Determine new methods to solve unsolved problems about primes.
Linear Algebra	Explain the basic concepts of Vector spaces.
	Examine the concept of linear transformations and its characteristics.
	Understand the concept of Inner product space.
	Demonstrate the concept of determinants.
	Make use of the concept of determinants and developing knowledge about diagonalization.
	Develop the concept of linear algebra to develop ethical and legal environment.
Linear Algebra- Practical	Apply basic properties of Vector spaces.
	Examine the characteristics of linear transformation in real life phenomena
	Compare the applications of matrix and determinants.

	Determine the properties of inner product space.
	Analyze the properties of diagonalisation to construct a mathematical model.
Group theory	Recall the basic concepts of Set theory.
	Understand the concepts of groups and its types.
	Examine the concepts of permutation and its properties.
	Apply the concept of normal subgroups and factor groups.
	Compare the theorems on Homomorphism.
	Develop the knowledge about group theory and its problem solving technique.
Group theory - Practical	Analyze the basic concepts of Set theory.
	Determine the concepts of groups and its types.
	Examine the concepts of permutation and its properties.
	Apply the concept of normal subgroups and factor groups.
	Compare the theorems on Homomorphism.
Statistics for Mathematics– I	Recall the Basic Fundamental concepts about various types of data, to construct suitable diagrams.
	Apply suitable methods under Measure of Central Tendency to solve the real time applications.
	Compare the difference between Correlation and Regression.
	Recall the fundamental concepts of Probability.
	Apply the Suitable Probability law to solve the Probability Distribution related problems.
	Explain the need of Being with ethics of Science while Communicating and producing the results using statistical tools.
Statistics For Mathematics– II	Remember the concept of parameters and properties.
	Understand the concept of hypothesis testing.
	Analyze the variance with one or two way classification.
	Apply the testing of significance using various distributions.
	Measure the concept of census and sample survey.
	Develop the problem solving techniques using statistics.
Physics	Recall the basic concept of Mechanics.
	Understand the properties of elasticity.
	Analyze the condition for interference.
	Apply the concept of thermal physics.

	Explain the Law's of electricity .
	Discuss the concepts of physics and its applications.
Principles of Accountancy	Recall the fundamental concept of accounting.
	Understand the concept of accounting information to solve Errors and rectification.
	Apply the Bills of exchange and Account current in data.
	Analyze the Accounting for consignments and Joint ventures.
	Apply the Bank Reconciliation statement and Accounts of professionals.
	Develop knowledge on application of accountancy in real life business.
Financial Mathematics	Recall the concept of profit and loss, basis of interest.
	Explain the suitability of interest and valuations of securities in business situation.
	Understand the fundamental concepts of insurance mathematics.
	Apply Premium Calculations and Law of Averages and Large numbers.
	Examine the concept of various distributions.
	Develop the knowledge in students to follow ethics in financial transaction.
Office Automation	Recall the basics of computer language.
	Develop skills in windows using , word pad, notepad etc.
	Examine the concept of Microsoft office 2000 and access the knowledge about working in word pad.
	Analyze the available tools to work with excel.
	Describe the usage of computers and the essential components in business and society.
	Develop the knowledge to work with Microsoft office.
Introduction to MATLAB	Understand the basics of Matlab and Matlab operations.
	Construct data files and formulate the data for plotting the graphs.
	Construct the matrices and vectors with the aid of mathematical operators.
	Apply the concept of scripts and functions.
	Estimate the three dimensional graphs for data values.
	Develop the Programming knowledge about MATLAB.

Programming in C	Understand the concept of functional hierarchical code organization.
	Define and manage data structures based on problem subject domain.
	Understand the concept of decision making and branching statements.
	Apply defensive programming and concept of object thinking within the framework of functional model.
	Develop knowledge about textual information, characters and strings.
	Discuss about arrays of complex objects and to handle possible errors during program execution.
Mathematica	Remember the basic concept of Mathematica.
	Understand the concept of functions and programs.
	Apply advanced mathematics in Mathematica.
	Classify the concepts of series, limits and residues.
	Explain the numerical operations on data & functions.
	Discuss the problem solving techniques using mathematics.
Programming in C++	Understand dynamic memory management techniques using pointers, constructors and destructors.
	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
	Apply inheritance, usage of exception handling, generic programming.
	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
	Demonstrate the use of various OOPs concepts with the help of programs.
	Learn and Discuss about C++ Streams.
Introduction to Entrepreneurship	Able to become an ethical entrepreneur and to provide job for others.
	Analyze the business environment in order to identify business opportunities.
	Forecast the market opportunity through surveys.
	Interpret their own business plan and support the entrepreneurs by preparing project plan.
	Raise capital by submitting project plan to various financial institutes.
	Develop the knowledge about Professional ethics and management

	techniques
Quantitative Aptitude	Recall the fundamental concepts of mathematics.
	Understand the need of critical thinking to improve chance of employ ability.
	Apply the concept of measurement and simple interest.
	Examine the ability of knowledge in mathematics.
	Examine the knowledge in logical reasoning.
	Develop problem solving skills and reasoning ability for cracking competitive exams.
Actuarial Mathematics	Remember the basics of probability and theory of interest.
	Acquire knowledge about computational illustration in splus.
	Analyze the comparison of forces of morality.
	Examine the knowledge of binomial variables.
	Classify some special integrals and rules for manipulating expectations.
	Develop the practical knowledge on Real life problems.
Numerical Methods	Explain the concept of Bisection and Iteration method.
	Understand the concept of polynomial interpolation.
	Analyze the concept of Newton Forward and Backward interpolation method.
	Derive numerical methods for approximating the solution of the problems of algebraic and transcendental equations, ordinary and partial differential equations.
	Solve the ordinary differential equations by using the methods like Euler's, RungeKutta, Modified Euler and Improved Euler.
	Develop the practical knowledge on problem solving techniques.
Graph Theory	Recall the fundamental concepts of graph and its types.
	Understand the characteristics of operation on graphs, trees and Fundamental circuits.
	Apply the Concepts of Spanning Trees in graphs.
	Analyze the concept of characterization in graphs.
	Build the Matrix Representation of Graphs and Fundamental Circuit.

	Discuss about the application of Graph theory in computer science and other fields.
Astronomy	Recall the concept of solar system and planets.
	Understand the concepts of universe and Zodiac.
	Apply the mathematical concepts to explore objects in universe.
	Analyze the concept of milky way galaxy and constellations.
	Develop knowledge about various constellations.
	Discuss the astronomical facts and its related properties.
Operations Research –I	Understand the fundamental concepts of Linear Programming Problem.
	Apply the concepts of Big M Method and Duality.
	Examine the concepts of Transportation problem in a suitable case.
	Construct the problems based on Assignment.
	Evaluate the problems on Network scheduling.
	Develop problem solving techniques using operations research to diverse situations in mathematical contexts.
Operations Research –II	Understand the fundamental concepts of Game Theory.
	Apply the concepts of Queuing Theory with different models.
	Examine the concepts of Inventory control in a suitable case.
	Construct the problems based on Simulation.
	Evaluate the problems on Decision Analysis.
	Develop problem solving techniques using operations research to diverse situations in mathematical contexts.
Discrete Mathematics	Recall the basic concept of recurrence relation.
	Understand the concept of logic and its characteristics.
	Build knowledge about lattices and Boolean algebra.
	Demonstrate the concept of graphs and its terminologies.
	Make use of the concept of graphs and develop knowledge about types of graphs.
	Understand the concept of language, grammar and automata.
Mathematical	Recall the concepts of mathematical modeling in terms of differential

modeling	equations.
	Understand the idea about model design for given problems.
	Analyze the procedure for physical phenomena.
	Apply the design of models in terms of PDE.
	Examine the various methods for obtain the models.
	Discuss about physical problem into mathematical problem in terms of differential equations.
Number Theory	Recall the concepts of divisibility and linear Diophantine equations.
	Apply the concept of permutations and combinations in deriving theorems.
	Make use of properties of congruence in theorems.
	Examine the concept of multiplicative functions.
	Develop new methods to solve unsolved problems about primes.
	Explain the need of number theoretic concepts underlie almost all of the encryption methods used for a large variety of important security measures.
Combinatorics	Recall the basic concepts of permutations and the binomial theorem.
	Analyze the pairing problem and assignment problem.
	Make use the concept of concurrence and generating functions.
	Understand the difference between the exclusion and inclusion principle and related problems.
	Discuss the block designs and its applications to error Correcting codes.
	Develop the optimal assignment problem and Gale's optimal assignment problem.