KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)

Re-accredited by NAAC with 'A+' Grade (4th Cycle)

College of Excellence (UGC)

Coimbatore – 641 029

DEPARTMENT OF MATHEMATICS

COURSE OUTCOMES (CO)

B.SC. MATHEMATICS

**For the students admitted
in the
Academic Year 2020-2021**

Programme Code: 02		B.Sc Mathematics		
Course Code: 20UMA101		Core Paper 1 - Classical Algebra		
Batch 2020-2023	**Semester** I	**Hours / Week** 4	**Total Hours** 60	**Credits** 4

Course Objectives

1. To get the knowledge of convergence and divergence of a series.
2. To find the summation of series.
3. To understand the nature of the roots of an algebraic equation.

Course Outcomes (CO)

K1 to K4	CO1	Finding the roots of a polynomial function.
	CO2	Classifying convergence and divergence of a series.
	CO3	Applying the Binomial theorem, Exponential theorem, logarithmic theorem to find summation of series.
	CO4	Analyzing the nature of the roots of the equation.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA102		Core Paper 2 –CALCULUS		
Batch 2020-2023	**Semester** I	**Hours / Week** 5	**Total Hours** 75	**Credits** 4

Course Objectives

1. To give basic knowledge about Mathematical concepts in calculus.
2. To evaluate double and triple integrals.
3. To learn different methods of integration, Beta and Gamma integrals which form the basis for higher studies.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the formulas in differentiation and integration.
	CO2	Interpret the definite integral geometrically as the area under a curve.
	CO3	Apply the concept of definite integral to solve various kinds of problems.
	CO4	Analyze the values of the derivative at a point algebraically.

Programme Code : 02		B.Sc Mathematics	
Course Code : 20UMA1I1		Allied Paper 1-STATISTICS – I	
Batch 2020-2023	**Semester** I	**Hours / Week** 7	**Total Hours** 105	**Credits** 5

Course Objectives
1. To enable the students to acquire the knowledge of statistics.
2. To remember the properties of various statistical functions.
3. To understand the concepts of some statistical distributions.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concepts of probability and random variables
	CO2	Understanding the properties of some distributions.
	CO3	Solving mean, median, mode, moments and moment generating functions of Binomial, Poission and Normal distributions.
	CO4	Analyzing how correlation is used to identify the relationships between variables and how regression analysis is used to predict outcomes.

Programme Code : 02		B.Sc Mathematics	
Course Code: 20UMA203		Core Paper 3 - Differential Equations And Laplace Transforms	
Batch 2020-2023	**Semester** II	**Hours / Week** 4	**Total Hours** 60	**Credits** 4

Course Objectives
1. To solve second-order linear differential equations with constant and variable coefficient.
2. To get the ability of solving first and second order ordinary differential equations and first order partial differential equations.
3. To get the knowledge about Laplace and inverse Laplace transforms.

Course Outcomes (CO)

K1 to K4	CO1	Recalling the concept of first order linear differential equations.
	CO2	Understanding the concept of first order higher degree ordinary differential equations
	CO3	Solving Linear partial differential equations by using the Lagrange's method.
	CO4	Analyzing the concepts of Laplace transforms and inverse Laplace transforms to solve ODE with constant coefficients.

Programme Code : 02	B.Sc Mathematics			
Course Code: 20UMA204	Core Paper 4 - Trigonometry, Vector Calculus And Fourier Series			
Batch 2020-2023	Semester II	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To enable the students to get basic knowledge of trigonometry
2. To bring in the knowledge of vector calculus and its applications in theorems
3. To understand the expansions of Fourier series.

Course Outcomes (CO)

K1 to K4	CO1	Defining the hyperbolic and inverse hyperbolic functions.
	CO2	Illustrating the Fourier co-efficient for Periodic functions.
	CO3	Applying the differential operator to find Gradient, Divergence and Curl
	CO4	Examining the multiple integrals by applying Gauss divergence theorem, Stoke's theorem and Green's theorem.

Programme Code : 02	B.Sc Mathematics			
Course Code : 20UMA2I2	Allied Paper 2-STATISTICS – II			
Batch 2020-2023	Semester II	Hours / Week 7	Total Hours 105	Credits 5

Course Objectives

1. To enable the students to give inference on statistical population based on

   sample statistics.
2. To Understand the concepts of various estimators.
3. To study the concepts of analysis of variance.

Course Outcomes (CO)

K1 to K4	CO1	Finding the derivations of t, χ^2 and F distributions.
	CO2	Explaining the procedure for Testing of hypothesis and sampling of attributes.
	CO3	Applying the concepts of various distributions in real time situations.
	CO4	Analyzing one - way and two – way Classifications and design of experiments.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA305		Core Paper 5 **-** Analytical Geometry		
Batch 2020-2023	Semester III	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives
1. To gain knowledge about coordinate geometry and also about geometrical aspects.
2. To know the concepts of cone and cylinder.
3. To determine coordinate axes and coordinate planes in the dimensional space.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the equation of a line that passes through a given point which is parallel or perpendicular to a given line.
	CO2	Understanding the results based on the properties of a sphere.
	CO3	Identifying conic sections.
	CO4	Analyzing the concepts of geometry.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA306		Core Paper 6 –Statics		
Batch 2020-2023	Semester III	Hours / Week 3	Total Hours 45	Credits 4

Course Objectives
1. To enablethe knowledge of Forces and Moments.
2. To understand the notionsof Friction.
3. To solve problems under friction and equilibrium of strings**.**

Course Outcomes (CO)

K1 to K4	CO1	Remembering the notions of friction and equilibrium of strings and deploy them in solving the problems.
	CO2	Understanding the concepts of forces and moments.
	CO3	Applying the concepts of forces in finding the resultant of any number of forces and the resultant of force and moments.
	CO4	Analyzing the basics of coplanar forces and equilibrium of forces acting on a rigid body and solving the problems.

PART-IV SBS I – GENERAL AWARENESS

Course Objectives

1. To acquire knowledge in relation to various competitive examinations.
2. To encourage the students to newspaper reading and journals.
3. To familiarise the students with online examinations which are being adopted in competitive examinations.

Course Outcomes (CO)

K1 to K4	CO1	Knowledge about literature, Reasoning, Science and Technology and Youth Red Cross.
	CO2	Remembering important data on general knowledge.
	CO3	Make use of the data for competitive examinations
	CO4	Analyse social phenomena

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA407		Core Paper 7 - Number Theory		
Batch 2020-2023	**Semester** IV	**Hours / Week** 3	**Total Hours** 45	**Credits** 3

Course Objectives

1. To expose the basics of number theory to the students.
2. To enable the students to learn the usage of prime numbers and factors.
3. To solve linear congruences.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concepts of divisibility, congruence, GCD and prime numbers.
	CO2	Explaining various divisibility tests.
	CO3	Identifying G.C.D and L.C.M using prime factors.
	CO4	Analyzing the nature of numbers.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA408		Core Paper 8 –Dynamics		
Batch 2020-2023	Semester IV	Hours / Week 4	Total Hours 60	Credits 4

Course Objectives

1. To enable the students to know the laws, principles and understand the concepts of motion of a particle and projectiles.
2. To provide the knowledge about the field of kinematics and impact between spheres.
3. To gain knowledge about simple harmonic motion and central orbits.

Course Outcomes (CO)

	CO1	Remembering the concepts of motion of a particle and projectile in different angles.
	CO2	Understanding the notions of impact between two smooth spheres in different ways.
K1 to K4	CO3	Applying the concept of simple harmonic motions in composition of two bodies in different directions.
	CO4	Distinguishing between the pedal equations of well known curves and solving two fold problems in central orbits.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA4S2		Skill Based Subject 2–Vedic Mathematics		
Batch 2020-2023	Semester IV	Hours / Week 2	Total Hours 30	Credits 3

Course Objectives

1. To make the students to calculate faster.
2. To equip the students with skills to meet competitive examinations.
3. To train the students to solve complex problems efficiently.

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Course Outcomes (CO)

	CO1	To understand various techniques in Vedic Mathematics
K1 to K4	CO2	To remember the steps involved in each technique
	CO3	To solve general equations
	CO4	To analyze the different methods available for effective calculation

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA509		Core paper 9 **-** Real Analysis-I		
Batch 2020-2023	**Semester** V	**Hours / Week** 5	**Total Hours** 75	**Credits** 3

Course Objectives

1. To know about the basic notions of the real numbers system, set theory, relations and functions .
2. To enable to have knowledge about the basic topological properties and theorems based on point set topology.
3. To Study about the covering theorems, compactness, metric spaces and continuity of a function.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the basic properties in the field of real numbers.
	CO2	Understanding the concepts of continuity, convergent sequences and metric spaces.
	CO3	Applying the concept of point set topology in related theorems
	CO4	Analyzing the compactness and to classify the continuity of a function with its limits.

Programme Code: 02		B.Sc Mathematics		
Course Code: 20UMA510		Core Paper 10 - Complex Analysis – I		
Batch 2020-2023	**Semester** V	**Hours / Week** 6	**Total Hours** 90	**Credits** 4

Course Objectives

1. To recognize complex analysis as an essential part of mathematical background for engineers, physists and other scientists.
2. To introduce the students about the complex number system.
3. To Justify the need for a complex number system and explain how it is related to other existing number systems.

Course Outcomes (CO)

K1 to K4	CO1	Defining continuity, differentiability and analyticity of a complex valued function which helps the students to acquire deeper knowledge.
	CO2	Showing the condition(s) for a complex valued function to be analytic and/or harmonic.
	CO3	Developing the concept of sequences and series with respect to the complex numbers system.
	CO4	Analyzing complex integration, Cauchy's integral formulae and Cauchy's fundamental theorem and evaluation of complex integration.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA511		Core Paper 11 - Modern Algebra I		
Batch 2020-2023	Semester V	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To know the concepts of group theory and ring theory
2. To understand the concepts of Ideals and Quotient Rings
3. To enable the concepts of Cauchy's theorem for Abelian groups , Sylow's theorem for Abelian groups , Automorphisms , Inner automorphism and Cayley's theorem.

Course Outcomes (CO)

K1 to K4	CO1	Finding whether a given abstract structure is a group or a ring.
	CO2	Understanding the elementary concepts of rings and fields and compare the similarities and differences between these concepts and those of group theory.
	CO3	Applying the concepts of homomorphism and isomorphism for comparing the algebraic features of mathematical systems in groups, rings and fields
	CO4	Examining the results from group theory to study the properties of rings and fields and to possess the ability to work within their algebraic structures.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA512		Core paper 12 - Programming in C Theory		
Batch 2020-2023	Semester V	Hours / Week 4	Total Hours 60	Credits 3

Course Objectives

1. To understand the C programming language.
2. To learn the concept of control statements, one dimensional, two dimensional and multi-dimensional arrays.
3. To solve the mathematical problems using C programs.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the importance and functioning of C programming.
	CO2	Understanding the use of decision making statement and loop structures.
	CO3	Applying the operators and functions to solve mathematical problems.
	CO4	Distinguish different types of arrays.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA5CL		Core Practical 1 - Programming in C Practical		
Batch 2020-2023	**Semester** V	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

1. To provide practical experience for the students to understand the structure of a C program.
2. To enrich the knowledge in solving mathematical problems using C programs.
3. To train the students to construct C programs on their own.

Course Outcomes (CO)

K3 to K5	CO1	Applying the concepts of loops and control statements in C programs.
	CO2	Classify the various operators used to develop a solution for a mathematical problem
	CO3	Evaluating the mathematical and statistical problems using C programs.

Extra Departmental Course (EDC)				
Course Code: 20UMA5X1		Fundamentals of Mathematics		
Batch 2020-2023	**Semester** V	**Hours/Week** 2	**Total Hours** 30	**Credits** 3

Course Objectives

1. To understand the basic concepts in Mathematics and Statistics.
2. To study the concepts related with banking using various Mathematical concepts.
3. To understand the application of these mathematical concepts in the real life problems.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concepts of matrices and set theory.
	CO2	Understand the appropriate Statistical techniques for summarizing and displaying business data.
	CO3	Applying basic mathematical concepts in business problems.
	CO4	Analyze the correlation and its types.

Programme Code : 02		B.Sc Mathematics		
Course Code: 20UMA613		Core Paper 13 - Real Analysis-II		
Batch 2020-2023	Semester VI	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To understand the concept of functions, Connectedness, uniform continuity, fixed point and related theorems.
2. To find the Derivatives and related theorems and Functions of bounded variations and related theorems.
3. To enable to know about the Reimann- Stieltjes integrals and its properties.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concept of derivatives, bounded variation.
	CO2	Understanding the concepts of connectedness
	CO3	Applying the differentiability of real functions in related theorems.
	CO4	Analyzing the Riemann Integrals.

Programme Code : 02		B.Sc Mathematics		
Course Code:20UMA614		Core paper 14 - Complex Analysis – II		
Batch 2020-2023	Semester VI	Hours / Week 6	Total Hours 90	Credits 4

Course Objectives

1. To learn about Taylor's Series and Laurent's series.
2. To understand the concept of singularities and residues.
3. To study the concept of definite integrals.

Course Outcomes (CO)

K1 to K4	CO1	Recalling the fundamental theorem of algebra in complex number system.
	CO2	Illustrating the Taylor's and Laurent's expansions of simple functions.
	CO3	Applying Laurent's series for isolated singularities and determine residues.
	CO4	Analyzing the concepts of residues and residue theorem to compute real definite integrals using contours.

Programme Code : 02	B.Sc Mathematics
Course Code: 20UMA615	Core Paper 15 - Modern Algebra II

Batch 2020-2023	**Semester** VI	**Hours / Week** 6	**Total Hours** 90	**Credits** 4

Course Objectives

1. To know the concepts of Hermitian and Skew-Hermitian Matrices , Orthogonal and Unitary Matrices ,Characteristic Roots and Characteristic Vectors of a Square Matrix.

2. To enable the concepts of linear independence, basis and dimension of a vector spaces.

3. To understand the concept of linear transformation and matrices which will enrich the

knowledge of logical thinking.

Course Outcomes (CO)

K1 to K4	CO1	Recalling the basic concepts of matrices, rank of a Matrix
	CO2	Understanding the basic ideas of vector spaces and the concepts of linear span, linear independence, basis, dimension and to apply these concepts to vector spaces, subspaces and inner product spaces.
	CO3	Applying the principles of matrix algebra to linear transformations and compute their rank.
	CO4	Examining whether the given set of vector is linearly independent or linearly dependent .

Programme Code : 02	B. Sc Mathematics
Course code: 20UMA6Z1	Project
Batch 2020-2023	Credits :5

Course Objectives

1. To study the basic concepts related to the Project work.
2. To identify the field of research.
3. To know the concept of writing a dissertation in an effective way.

Course Outcomes (CO)

K3 toK5	CO1	Applying the relative notions in the respective areas and finding the results.
	CO2	Analyzing results with the existing results.
	CO3	Interpreting the results with suitable examples.

Programme Code : 02		B.Sc Mathematics		
Course Code:20UMA6SL		Skill Based Subject 3Fundamentals of LaTeX-Practical		
Batch 2020-2023	Semester VI	Hours / Week 3	Total Hours 45	Credits 3

Course Objectives

1. LaTeX is a typewriting system that is extremely useful for typing and formatting scientific documents.
2. Typing Mathematical equations is very intuitive and easy in LaTeX.
3. This practical subject is Job and Skill oriented for the students.

Course Outcomes (CO)

	CO1	Constructing the letters, dissertation, curriculum vitae and other documents using LaTeX.
K3 to K5	CO2	Analyzing the LaTeX software for the preparation of question papers and tables.
	CO3	Choosing LaTeX for typing Mathematical equation, case statements and Matrices.

Programme Code : 02	B.Sc Mathematics		
Major Elective Paper - Operations Research			
Batch 2020-2023	Hours / Week 6	Total Hours 75	Credits 5

Course Objectives

1. To introduce certain OR techniques such as LPP, Transportation problems, Assignment problems and network techniques.
2. To help the students to develop logical reasoning.
3. To apply mathematical tools to managerial and real life problems.

Course Outcomes (CO)

	CO1	Analyzing the concept of linear programming problem using Simplex Method.
K1 to K4	CO2	Understanding the rules of artificial variables and summarizing the concept of replacement problems.
	CO3	Applying the notions of linear programming in solving transportation problems and Assignment Problem.
	CO4	Analyzing the concept of CPM & PERT

Programme Code: 02	B.Sc Mathematics		
Major Elective Paper- NUMERICAL METHODS			
Batch 2020-2023	**Hours / Week** 5	**Total Hours** 75	**Credits** 5

Course Objectives

1. To solve algebraic and transcendental equations for finding roots usingnumerical methods.
2. To solve simultaneous linear algebraic equations using various numerical methods
3. To know about finite differences and its uses to interpolate the values for equal and unequal intervals.

Course Outcomes (CO)

K1 to K4	CO1	Remembering various numerical methods for finding the solution of algebraic and transcendental equations.
	CO2	Demonstrating various numerical algorithms for solving simultaneous linear algebraic equations.
	CO3	Applying finite difference methods for interpolation.
	CO4	Analyzing the ordinary differential equations by using numerical methods.

Programme Code : 02	B.Sc Mathematics		
Major Elective Paper- LINEAR ALGEBRA			
Batch 2020-2023	**Hours / Week** 5	**Total Hours** 75	**Credits** 5

Course Objectives

1. Represent mathematical information and communicate mathematical reasoning symbolically and verbally.
2. Apply mathematical methods involving arithmetic, algebra, geometry, and graphs to solve problems.
3. Interpret and analyze numerical data, mathematical concepts, and identify patterns to formulate and validate reasoning

Course Outcomes(CO)

K1 to K4	CO1	Remember to write the system of linear equations in terms of matrix equations
	CO2	Understanding the systems of linear equations and matrix equations to determine linear dependency or independency.
	CO3	Solve problems that can be modeled by systems of linear equations.
	CO4	Examining the solution set of a system of linear equations

Programme Code : 02	B.Sc Mathematics		
Major Elective Paper **FUZZY MATHEMATICS**			
Batch 2020-2023	**Hours / Week** 5	**Total Hours** 75	**Credits** 5

Course Objectives

1. To know the basic definitions of fuzzy set theory.
2. To know the fundamentals of fuzzy Algebra.
3. To know the applications of fuzzy Technology.

Course Outcomes(CO)

K1 to K4	CO1	Remembering the basic concepts of Boolean algebra.
	CO2	Understanding the concepts of fuzzy sets.
	CO3	Identifying the concepts of Algebra of fuzzy relations and logic connectives.
	CO4	Analyzing fuzzy subgroup and Preimage of subgroupoid.

Programme Code : 02	B.Sc Mathematics		
Major Elective Paper **COMBINATORICS**			
Batch 2020-2023	**Hours / Week** 5	**Total Hours** 75	**Credits** 5

Course Objectives

1. To learn about recurrence relation.
2. To have knowledge about permutation.
3. To be familiar with assignment problems.

Course Outcomes(CO)

K1 to K4	CO1	Remembering the basic concepts of Fibonacci sequence.
	CO2	Understanding the concepts of Permutation and Fibonacci type relation.
	CO3	Identifying the concepts of counting simple electrical networks.
	CO4	Analyzing inclusion and Exclusion principle.

Programme Code: 03		B.Sc Physics		
Course Code:20UMA1A1		Allied A Paper 1 Mathematics		
Batch	Semester	Hrs/Week	Total Hours	Credits
2020-2023	I	7	105	5

Course Objectives
1.To provide the basic knowledge of Trigonometry and Matrices.
2.To get the ability of solving first and second order ordinary differential equations and first order partial differential equations
3.To give basic knowledge about Mathematical concepts in Calculus.

Course Outcomes (CO)

	CO1	Defining hyperbolic and inverse hyperbolic functions.
K1 to K4	CO2	Understanding the concept of Characteristic equations to find Eigen Values and Eigen Vector.
	CO3	Applying finite difference methods for interpolation.
	CO4	Analyzing the Laplace and inverse Laplace transforms and solve Ordinary differential equations.

Programme Code:03		B.Sc Physics		
Course Code:20UMA2A1		Allied A Paper 2 Mathematics II		
Batch	Semester	Hrs/Week	Total Hours	Credits
2020-2023	II	7	105	5

Course Objectives
1. To provide the basic knowledge of Probability.
2. To get the ability to solve Partial differential equations.
3. To Understand basic knowledge in Vector Calculus.

Course Outcomes (CO)

	CO1	Defining the multiple integrals using Green's Theorem.
K1 to K4	CO2	Illustrating the Fourier Coefficient for periodic Functions.
	CO3	Solving Partial Differential Equation by using the Lagrange's Method.
	CO4	Examining theGeneral solution of Bessel's equations.

Programme Code:04	B.Sc Chemistry			
Course Code:20UMA1A2	Allied A Paper 1 Mathematics I			
Batch 2020-2023	Semester I	Hrs/Week 7	Total Hours 105	Credits 5

Course Objectives

1.To provide the basic knowledge of Trigonometry.
2.To get the ability of solving first and second order ordinary differential equations and first order partial differential equations
3.To know about finite differences and its uses to interpolate the values for equal and unequal intervals.

Course Outcomes (CO)

K1 to K4	CO1	Defining hyperbolic and inverse hyperbolic functions.
	CO2	Understanding the concept of first order higher degree ordinary differential equations.
	CO3	Applying finite difference methods for interpolation.
	CO4	Analyzing the Laplace and inverse Laplace transforms to solve the Ordinary differential equations.

Programme Code: 04	B.Sc Chemistry			
Course Code:20UMA2A2	Allied A Paper 2 Mathematics II			
Batch 2020-2023	Semester II	Hrs/Week 7	Total Hours 105	Credits 5

Course Objectives

1. To give basic knowledge about Mathematical concepts in Calculus.
2. To understand the concepts of Evaluating Double and Triple integrals.
3. To get the ability of solving Partial differential equations .

Course Outcomes (CO)

K1 to K4	CO1	Remembering the formulas in Differentiation and Integration.
	CO2	Illustrating the Fourier Coefficient for periodic Functions.
	CO3	Solving Partial Differential Equation by using the Lagrange's Method.
	CO4	Analyzing the differential operator to find Gradient, Divergence and Curl

Programme Code : 09		B.Sc Computer Science		
Course Code: 20UCS1A1		Allied 1 - DISCRETE MATHEMATICS AND STATISTICS		
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To understand the concepts of discrete structures, formal languages.
2. To use finite state machines to model computer operations.
3. To solve real time problems using various statistical techniques.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the fundamental ideas and notation of discrete mathematics with examples.
	CO2	Understanding the concept of measures of central tendency, measures of dispersion, Correlation, regression, probability distributions, hypothesis testing.
	CO3	Applying problem solving techniques to solve real world problems.
	CO4	Analyzing the experimental and observational data and draw appropriate conclusions.

Programme Code: 11		B.Sc Computer Technology		
Course Code: 20UCT1A1		Allied 1-Discrete Mathematics and Statistics		
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To understand the concepts and principles of mathematical logic, formal languages
2. To classify Measures of central tendency and dispersion
3. To know the purpose of correlation and regression

Course Outcomes (CO)

K1 toK4	CO1	Remembering about the fundamental ideas and notation of discrete mathematics with examples
	CO2	Understanding the concepts of measures of central tendency and dispersion
	CO3	Applying Logic and Boolean algebra concepts in circuit construction
	CO4	Analyzing grammar in shortest path construction

Programme Code: 10		BCA		
Course Code: 20UCA3A3		**OPERATIONS RESEARCH**		
Batch 2020-2023	**Semester** III	**Hours / Week** 6	**Total Hours** 90	**Credits** 5

Course Objectives

1. Toidentify and develop operational research models from the verbal description of the real system.

2. To understand the mathematical tools that are needed to solve optimization problems.

3. To develop a report that describes the model and the solving technique.

Course Outcomes (CO)

K1 to K4	CO1	Showing that the real time problems can be solved by using operations research techniques.
	CO2	Demonstrating the idea of finding the shortest path using transportation problem.
	CO3	Appling the concept of inventory control and replacement techniques in business.
	CO4	Examining the concept of traffic intensity in real life problems.

Programme Code : 08		B.Sc Biotechnology		
Course Code: 20UBT3A3		BASIC MATHEMATICS AND STATISTICS		
Batch 2020-2023	**Semester** III	**Hours / Week** 5	**Total Hours** 75	**Credits** 4

Course Objectives

1. To understand the basic concepts in mathematics and statistics.
2. To analysis wide variety of data.
3. To make deductions from assumption.

Course Outcomes (CO)

K1 to K4	CO1	Remember the basic concepts in mathematics and statistics.
	CO2	Understand the scope of data collections using statistical methods.
	CO3	Apply the concepts of Differentiation and Integration in the field of Bio-technology.
	CO4	Analyze the correlation among the variables.

Programme Code : 12	B.Sc Information Technology			
Course Code: 20UIT1A1	MATHEMATICALFOUNDATION OF COMPUTER SCIENCE			
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To understand Matrices, Set theory, Mathematical logic, Relations and Graph theory.
2. To solve the problems of Eigen values and Eigen vector.
3. To solve the problems of statement calculus and predicate calculus

Course Outcomes (CO)

K1 to K4	CO1	Remembering the concepts of matrices, set theory, mathematical logic, relations and graph theory
	CO2	Understanding the basic terminology of discrete mathematics
	CO3	Applying theory inference for statement calculus and predicate calculus
	CO4	Analyzing the results through the program outputs

Programme Code :16	BBA			
Course Code : 20UBB1A1	MATHEMATICS FOR MANAGEMENT – I			
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To Understand the concepts of Matrices, concepts related with banking and concepts of various statistical tools.
2. To study the concepts of statistics, Measures of dispersion and Analysis of time series. Also understand the applications of these concepts in real world problems.
3. To use mathematical knowledge to analyze and solve problems.

Course Outcomes (CO)

K1 to K4	CO1	Remembering the basic concepts of mathematics in business analysis
	CO2	Understanding the problem-solving methods
	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing mathematical techniques and applications

Programme Code : 17		BBA CA		
Course Code : 20UBA1A1		MATHEMATICS FOR MANAGEMENT – I		
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To Understand the concepts of Matrices, concepts related with banking and concepts of various statistical tools.
2. To study the concepts of statistics, Measures of dispersion and Analysis of time series. Also understand the applications of these concepts in real world problems.
3. To use mathematical knowledge to analyze and solve problems.

Course Outcomes (CO)

	CO1	Remembering the basic concepts of mathematics in business analysis
	CO2	Understanding the problem-solving methods
K1 to K4	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing mathematical techniques and applications

Programme Code : 13		B.Com		
Course Code: 20UCM3A3		BUSINESS MATHEMATICS		
Batch 2020-2023	Semester III	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To give basic knowledge about Mathematical concepts
2. To solve the modern business problems using various mathematical techniques.
3. To solve the various real life business problems.

Course Outcomes (CO)

	CO1	Remembering the application of mathematics in business analysis
K1 to K4	CO2	Understanding the concepts of mathematics in finance
	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing the business conditions using Effective rate of Interest.

Programme Code : 15		B.Com PA		
Course Code: 20UPA1A1		MATHEMATICS FOR BUSINESS		
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. On successful completion of this course, the student should have understood the basic concepts.
2. To use Mathematical Techniques to solve the modern business problems.
3. To enable the students to apply basic mathematical knowledge to solve the real life business problems.

Course Outcomes (CO)

	CO1	Remembering the basic concepts of mathematics in business analysis
K1 to K4	CO2	Understanding the concepts of mathematics in finance
	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing the business conditions using Differentiation and Integration

Programme Code :14		B.Com CA		
Course Code: 20UCC1A1		BUSINESS MATHEMATICS		
Batch 2020-2023	Semester I	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To give basic knowledge about Mathematical concepts
2. To solve the modern business problems using various mathematical techniques
3. To enable the students to apply basic mathematical knowledge to solve the real life business problems.

Course Outcomes (CO)

	CO1	Remembering the basic concepts of mathematics in business analysis
K1 to K4	CO2	Understanding the concepts of mathematics in finance
	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing the business conditions using Differentiation and Integration

Programme Code : 19		B.Com (Banking & Insurance)		
Course Code: 20UCB1A1		BUSINESS MATHEMATICS		
Batch 2020-2023	**Semester** I	**Hours / Week** 6	**Total Hours** 90	**Credits** 5

Course Objectives

1. On successful completion of this course, the student should have understood the basic concepts.
2. To use Mathematical Techniques to solve the modern business problems.
3. To enable the students to apply basic mathematical knowledge to solve the real life business problems.

Course Outcomes (CO)

K1 - K4	CO1	Remembering the basic concepts of mathematics in business analysis
	CO2	Understanding the concepts of mathematics in finance
	CO3	Applying basic mathematical calculations in business problems
	CO4	Analyzing the business conditions using Linear Programming problems.

Programme Code : 11		B.Sc Computer Science		
Course Code: 20UCS2A2		ALLIED 2 - OPERATIONS RESEARCH		
Batch 2020-2023	**Semester** II	**Hours / Week** 6	**Total Hours** 90	**Credits** 5

Course Objectives

1. To understand the various mathematical applications in industries and decision making for real time environment.
2. To gain the knowledge about the principles and applications of operations research.
3. To develop skills necessary to effectively analyze and synthesize the inter-relationships inherent in complex socio-economic productive systems.

Course Outcomes (CO)

K1 to K4	CO1	Remembering mathematical formulation of the problem.
	CO2	Understanding the notions of linear programming in solving transportation problems and Assignment Problems.
	CO3	Applying the fundamental concept of inventory control and Queuing theory.
	CO4	Analyzing CPM and PERT techniques, to plan, schedule, and control project activities.

Programme Code :12		B.ScInformation Technology		
Course Code: 20UIT2A2		COMPUTER ORIENTED NUMERICAL& STATISTICAL METHODS		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To have indepth knowledge of various advanced methods in numerical analysis and statistics.
2. To get numerical solutions of equations like transcendental and non linear differential equations when ordinary analytical methods fail.
3. To learn fundamentals and concepts of statistical methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, Correlation and Regression.

Course Outcomes (CO)

	CO1	Remembering the concept of numerical and statistical methods
	CO2	Understanding the concepts of numerical differentiation and integration
K1 to K4	CO3	Applying an appropriate numerical method for solving algebraic or transcendental equation
	CO4	Analyzing the concept of Measure of central tendency, Measures of dispersion , Correlation and Regression

Programme Code :08		B.ScBiotechnology		
Course Code: 20UBT4A4		C PROGRAMMING AND NUMERICAL METHODS		
Batch 2020-2023	Semester IV	Hours / Week 5	Total Hours 75	Credits 4

Course Objectives

1. To understand the C Programming language.
2. To solve the mathematical problems using C Programs.
3. To learn the problem solving techniques in Numerical methods.

Course Outcomes (CO)

	CO1	Remember the functioning of C Programming
K1 to K4	CO2	Understand the various features of a C Program
	CO3	Apply the operators and functions to solve the Mathematical problems
	CO4	Analyze the accuracy of the results obtained

Programme Code : 08		B.ScBiotechnology		
Course Code: 20UBT4AL		CPROGRAMMING – Lab		
Batch 2020-2023	**Semester** IV	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

1. To provide practical experience for the students to understand the structure of a C Program.
2. To enable the students to enrich their knowledge in the compilation of C Programs.
3. To solve mathematical problems using C Programs.

Course Outcomes (CO)

K3 to K5	CO1	Apply the various operators and functions of C language in Programs
	CO2	Analyze the various data types and formatting features available in C language
	CO3	Determine the solution of mathematical problems using C Programs

Programme Code : 13		B.Com		
Course Code: 20UCM4A4		BUSINESS STATISTICS		
Batch 2020-2023	**Semester** IV	**Hours / Week** 6	**Total Hours** 90	**Credits** 5

Course Objectives

1. To demonstrate understanding of basic concepts of probability and statistics embedded in their courses
2. Statistics in the social sciences involves the collection, analysis, interpretation, and Presentation of data to answer questions about the social world.
3. To Perform Correlation & Compute the equation of simple regression line from a sample data and the intercept of the equation

Course Outcomes (CO)

K1 to K4	CO1	Select appropriate Statistical techniques for summarizing and displaying business data.
	CO2	Understand the measures of central tendency, symmetrical and asymmetrical distribution
	CO3	Identify and carryout basic statistical analyses used in sociological inquiry.
	CO4	Analyze and draw inferences from business data using appropriate statistical methods.

Programme Code :14		B.Com CA		
Course Code: 20UCC2A2		BUSINESS STATISTICS		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To give basic knowledge about statistical concepts.
2. To solve the modern business problems using various statistical techniques
3. To estimate the mean and standard deviation of the marginal distribution of the response variable and use this information to inform a business decision

Course Outcomes (CO)

K1 to K4	CO1	Select appropriate Statistical techniques for summarizing and displaying business data
	CO2	Interpret correlation coefficients and Formulate regression line by identifying dependent and independent variables.
	CO3	Identify and carryout basic statistical analyses used in sociological inquiry.
	CO4	Analyze and draw inferences from business data using appropriate statistical methods.

Programme Code :16		BBA		
Course Code : 20UBB2A2		MATHEMATICS FOR MANAGEMENT – II		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives

1. To understand various mathematical applications in industries.
2. To know the mathematical tools that are needed to solve optimization Problems.
3. To understand the Decision making for real time environment.

Course Outcomes (CO)

K1 to K4	CO1	Remembering to use the variables for formulating mathematical models in management.
	CO2	Understanding the concept of Transportation and Assignment models
	CO3	Applying the fundamental concept of Queuing theory.
	CO4	Analyzing CPM and PERT techniques, to plan, schedule, and control project activities.

Programme Code :17		BBA CA		
Course Code : 20UBA2A2		MATHEMATICS FOR MANAGEMENT – II		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives
1. To understand various mathematical applications in industries.
2. To know the mathematical tools that are needed to solve optimization Problems.
3. To understand the Decision making for real time environment.

Course Outcomes (CO)

K1 to K4	CO1	Remembering to use the variables for formulating mathematical models in management.	
	CO2	Understanding the concept of Transportation and Assignment models	
	CO3	Applying the fundamental concept of Queuing theory.	
	CO4	Analyzing CPM and PERT techniques, to plan, schedule, and control project activities.	

Programme Code :11		Computer Technology		
Course Code : 20UCT2A2		Operations Research		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives
1. To understand the concept of Linear Programming Problem
2. To explain the various mathematical applications in industries
3. To show the optimization concepts in real time environment

Course Outcomes (CO)

K1 to K4	CO1	Remembering the replacement problem.
	CO2	Understanding the notions of Linear Programming in solving Transportation Problems and Assignment Problems.
	CO3	Applying the fundamental concept of inventory control and Queuing theory.
	CO4	Knowing the application of CPM & PERT

Programme : BCA		BCA		
Course Code: 20UCA2A2		**COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS**		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives
1. To demonstrate the mathematical concepts underlying the numerical methods considered.
2. To understand the concepts in statistical techniques.
3. To motivate students an intrinsic interest in statistical thinking.

Course Outcomes (CO)

K1 to K4	CO1	Finding the unknown values in simultaneous linear equations using some methods in Numerical Techniques.	
	CO2	Extending the idea of finding the integration of simple functions using Numerical Techniques.	
	CO3	Choosing the concept of measures of central tendency and dispersion.	
	CO4	Analyzing the concept of sampling and some of the Statistical Tests.	

Program Code :19		B.Com (Banking & Insurance)		
Course Code: 20UCB2A2		BUSINESS STATISTICS		
Batch 2020-2023	Semester II	Hours / Week 6	Total Hours 90	Credits 5

Course Objectives
1. To give basic knowledge about statistical concepts.
2. To solve the modern business problems using various statistical techniques
3. To Understand the Correlation and Regression problems.

Course Outcomes (CO)

K1 - K4	CO1	Select appropriate Statistical techniques for summarizing and displaying business data
	CO2	Understand and use the basic measure of central tendency.
	CO3	Identify and carryout basic statistical analyses used in sociological inquiry.
	CO4	Analyze and draw inferences from business data using appropriate statistical methods.