

Computer Science, Mathematics

Programme Outcomes (PO)

1. Acquire theoretical and practical knowledge in the fundamental concepts in Computer Science and Mathematics, including algorithms, data structures, calculus, linear algebra, and discrete mathematics.
2. Inculcate advanced problem-solving skills, utilizing computational and mathematical techniques to devise effective solutions for real-world problems.
3. The program will develop students to gain knowledge across disciplines, fostering the ability to apply principles from Computer Science to solve Mathematical problems and vice versa, addressing real-time challenges with an integrated approach.
4. Instil lifelong learning, encouraging graduates to stay updated with emerging technologies and mathematical theories throughout their careers.
5. Pursue advanced studies and research in both Computer Science and Mathematics, with a strong foundation for future academic endeavours.
6. Equip with moral values and professional ethics to take-up responsibilities and reach out to the societal needs.

Semester - I

Course Title : ICSCDSC1-PSTC : Problem Solving Techniques Using ‘C’

Course Outcomes (CO)

1. Learn fundamental concepts of algorithm design and analysis process and asymptotic notations
2. Understand various problem-solving techniques and design efficient algorithms to solve a given problem.
3. Comprehend the basic elements and the control structures of C programming and apply it to solve problems
4. Write C programs using functions, arrays, pointers and compile, debug and execute the programs.

Course Title : MATDSCT 1.1: Algebra - I and Calculus – I

Course Outcomes (CO)

1. Learn to solve system of linear equations.
2. Solve the system of homogeneous and non homogeneous linear of m equations in n variables by using concept of rank of matrix, finding eigen values and eigen vectors.
3. Sketch curves in Cartesian, polar and pedal equations.
4. Students will be familiar with the techniques of integration and differentiation of function with real variables.
5. Identify and apply the intermediate value theorems and L'Hospital rule.

Semester – I Open Elective

Course Title : MATOE 1.1: Financial Mathematics

The students will be able to:

1. Translate the real word problems through appropriate mathematical modelling.
2. Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business.
3. Problem solving techniques for aptitude problems.
4. Prepare themselves for various competitive examinations.
5. Applications of simple formulae
6. Acquaintance to various elementary concepts
7. Acquaintance to shortcut methods
8. To improve and learn basic mathematics skills.

Semester - II

Course Title : 2CSCDSC2-DS : Data Structures

Course Outcomes (CO)

1. Understand fundamental concepts of data structures, space, and time complexity.
2. Design algorithms for various operations (creation, insertion, deletion, and traversal) on linear data structures
3. Design algorithms for various operations (creation, insertion, deletion, and traversal) on Non-linear data structures
4. Explain the applications of data structures
5. Implement various searching and sorting techniques
6. Implement the data structures using a programming language.

Course Title : MATDSCT 2.1: Algebra - II and Calculus – II

Course Outcomes (CO)

This course will enable the students to

1. Recognize the mathematical objects called Groups.
2. Link the fundamental concepts of groups and symmetries of geometrical objects.
3. Explain the significance of the notions of Cosets, normal subgroups and factor groups.
4. Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
5. Find the extreme values of functions of two variables.

Semester – II Open Elective

Course Title : MATOET 2.1: Quantitative Mathematics

Course Outcomes (CO)

This course will enable the students to

1. Integrate concept in international business concept with functioning of global trade.
2. Evaluate the legal, social and economic environment of business.
3. Apply decision-support tools to business decision making.
4. Will be able to apply knowledge of business concepts and functions in an integrated manner.

Semester - III

Course Title : 3CSCDSC3-OOPJ : Object Oriented Programming Using Java

Course Outcomes (CO)

1. Interpret the object-oriented principles and analyze language fundamentals.
2. Apply and understand the notions of Data Abstraction, Inheritance, Polymorphism, Interfaces and use them productively.
3. Understand the I/O functionality to analyze and use appropriate mechanisms to handle exceptions.
4. Design dynamic and interactive applets and implement event handling mechanism.
5. Analyze the need and synchronization of threads and implement multithreading effectively.
6. Develop dynamic web applications through Networking.

Course Title : MATDSC3.1: Ordinary Differential Equations and Real Analysis – I

Course Outcomes (CO)

This course will enable the students to

1. Solve first-order non-linear differential equations and linear differential equations.
2. To model problems in nature using Ordinary Differential Equations.
3. Formulate differential equations for various mathematical models
4. Apply these techniques to solve and analyze various mathematical models.
5. Understand the fundamental properties of the real numbers that lead to define sequence and series, the formal development of real analysis.
6. Learn the concept of Convergence and Divergence of a sequence.
7. Able to handle and understand limits and their use in sequences, series, differentiation, and integration.
8. Apply the ratio, root, alternating series, and limit comparison tests for convergence and absolute convergence of an infinite series.

Semester – III Open Elective

Course Title : MATOET 3.1(B): Business Mathematics

Course Outcomes (CO)

This course will enable the students to:

1. Understand number system and fundamental operations
2. Understand the concept of linear quadratic and simultaneous equations and their applications in real life problems.
3. Understand and solve the problems based on Age.

Semester - IV**Course Title : 4CSCDSC4-OS : Operating Systems****Course Outcomes (CO)**

1. Understand the structure and functionalities of an Operating System and the concept of process
2. Understand CPU Scheduling algorithms
3. Describe different memory management techniques
4. Describe different disk space allocation methods and free space management techniques
5. Learn Case Studies of Linux and Windows Operating Systems.

Course Title : MATDSCT 4.1: Partial Differential Equations and Integral Transforms**Course Outcomes (CO)**

This course will enable the students to

1. Solve the Partial Differential Equations of the first order and second order
2. Formulate, classify and transform partial differential equations into canonical form.
3. Solve linear and non-linear partial differential equations using various methods; and apply these methods to solving some physical problems.
4. Able to take more courses on wave equation, heat equation, and Laplace equation.
5. Solve PDE by Laplace Transforms and Fourier Transforms.

Semester - V

Paper V-Course Title : 5CSCDSC6-DMS:DBMS Database Management Systems

Course Outcomes (CO)

1. Understand database concepts, data models and architecture
2. Understand relational algebra and normalize databases.
3. Apply SQL queries to retrieve and manage databases
4. Gain knowledge about indexing, transaction processing and concurrency techniques.

Paper VI-Course Title : 5CSCDSC7-AIA:Artificial Intelligence and Applications

Course Outcomes (CO)

1. Understand the basics of AI, AI applications and Search Techniques and apply difficult real life problems in a state space representation so as to solve them using AI
2. Understand the ways of representing facts and knowledge.
3. Understand and Analyze the syntax, semantics, and pragmatics of a statement written in a natural language.
4. Explain the structure of agents, its functions and the ways of improving the performance of intelligent agents in AI

Semester - V

Paper V Course Title : MATDSCT5.1- Real Analysis-II and Complex Analysis

Course Outcomes (CO)

1. Carry out certain computations such as computing upper and lower Riemann sums as well integrals
2. Describe various criteria for Integrability of functions.
3. Exhibit certain properties of mathematical objects such as integrable functions, analytic functions, harmonic functions and so on.
4. Prove some statements related to Riemann integration as well as in complex analysis
5. Carry out the existing algorithms to construct mathematical structures such as analytic functions
6. Applies the gained knowledge to solve various other problems.

Paper VI Course Title : MATDSCT 5.2: Advanced Algebra and Discrete Mathematics

Course Outcomes (CO)

This course will enable the students to:

1. Know the significance of normal subgroups and quotient groups.
2. Understand structure preserving mapping between two algebraic structures of the same type.
3. Know the algebraic structures having the same structure with different elements.
4. Identify and analyze the algebraic structures such as ring, field and integral domain
5. Learn the properties of the above-mentioned algebraic structures.
6. Handle various mathematical operations like rules for counting, arrangements and selections with repetitions.
7. Understand recurrence relation and solving them.
8. Study the graphs which are used to model pair wise relations between the objects which helps in understanding the networking, optimization, matching and operation.

Semester - VII

Paper VII -Course Title : Python Programming

Course Outcomes (CO)

1. Understand various data types and packages in Python
2. Write simple Python programs
3. Understand advanced features of Python and develop applications using GUI

Paper VIII-Course Title : Computer Networks

Course Outcomes (CO)

1. Understand basic concepts of networks, network hardware and network software and describe various standard network models
2. Understand data communication, various transmission media and familiarize with modulation, multiplexing and switching.
3. Analyze error detection and correction, data link protocols, understand the role of medium access control sub layer
4. Implement and analyze routing and congestion issues in network design
5. Familiarize with network security, DNS, email and encryption algorithms

Semester - VI

Paper VII Course Title: MATDSCT 6.1: Linear Algebra and Calculus of Variations

Course Outcomes (CO)

The students will be able to:

1. Understand the concepts of Vector spaces, subspaces, bases dimension and their properties.
2. Become familiar with the concepts Eigen values and eigen vectors, minimal polynomials, linear transformations etc.
3. Learn properties of inner product spaces and determine orthogonality in inner product spaces.
4. Prove various statements in the context of vectors spaces.
5. Realise importance of adjoint of a linear transformation and its canonical form.

Paper VIII-Course Title: MATDSCT 6.2: Numerical Analysis

Course Outcomes (CO)

The students will be able to:

1. Describe various operators arising in numerical analysis such as difference operators, shift operators and so on.
2. Articulate the rationale behind various techniques of numerical analysis such as finding roots, integrals and derivatives.
3. Reproduce the existing algorithms for various tasks as mentioned previously in numerical analysis.

