Curriculum of BCA Program

Department of Computer Science

Faculty of Engineering and Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Assess their skills in systematic planning, designing, developing, testing and implementing complex computing applications in the field of Cloud Computing, Machine Learning, Embedded Programming, Mobile and Web Application Development.

PEO2: Apprise In-depth knowledge and sustainable learning leading to innovation, permutation, modernization and research in multidisciplinary field to fulfill global interest.

PEO3: To analyze real-world problems, design, and develop computing models/systems for multi -disciplinary domains that are feasible, suitable, economical, and socially acceptable.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Analyze their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.

PSO2: Appraise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

Code of the course: BCA5101T

Course Learning Outcomes:

 At the end of this course, student would be able to

1. Understand the brief history of computer development.
2. Describe various input devices (keyboard, mouse, scanners, etc.) and their characteristics.
3. Explain primary vs. secondary storage.
4. Differentiate between system software (operating system, utility programs) and application software (word processing, spreadsheet, etc.).
5. Understand communication protocols and channels (twisted, coaxial, fiber optic).

Code of the course: BCA5102T

Title of the course: Problem Solving through C Programming

Course Learning Outcomes:

On completion of the course, the student would be able to:

1. Understand the definition and properties of an algorithm.
2. Utilize arrays, functions (including call by value), and character arrays.
3. Master the basics of functions, including return types and scope rules
4. Handle multi-dimensional arrays and pointers to functions.
5. Access files, handle errors and manage line input and output.

Code of the course: BCA5103T

Title of the course: Basic Mathematics

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Understand the concepts of sets, subsets, equal sets, null set, universal set, finite and infinite sets.
2. Apply differentiation rules (product, quotient, chain rule, etc.).
3. Use reduction formulae for trigonometric functions.
4. Explore the functions of several variables (limits, continuity, partial differentiation).
5. Compute double and triple integrals in different coordinate systems.

SEMESTER- II

Code of the course: BCA5201T

Title of the course: Computer Networks

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Understand communication models and tasks.
2. Differentiate between asynchronous and synchronous transmission
3. Briefly understand packet switching principles
4. Describe LAN architecture and IEEE 802 standards.
5. Explore routing protocols, TCP, UDP, SNMP, SMTP, MIME, and HTTP.

Code of the Course: BCA5202T

Title of the Course: Object Oriented Programming Using C++

Course Learning Outcomes:

At the end of this course the student would be able to:

1. Understand the need for object-oriented programming (OOP) and differences between OOP and procedural programming.
2. Implement constructors, destructors, and dynamic object creation/destruction.
3. Differentiate between different forms of inheritance.
4. Handle exceptions using try-catch blocks, exception objects, and rethrowing.
5. Explore the STL components: containers, iterators, and algorithms.

SEMESTER –III

Code of the course: BCA6301T

Title of the course: Design Analysis and Algorithm

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms
2.   Explain when an algorithmic design situation calls for which design paradigm (greedy/ divide and conquer/backtrack etc.)
3.   Explain model for a given engineering problem, using tree or graph, and writethe corresponding algorithm to solve the problems
4.   Demonstrate the ways to analyze approximation/randomized algorithms (expected running time, probability of error)
5.   Examine the necessity for NP class based problems and explain the use of heuristic techniques.

Code of the course: BCA6302T

Title of the course: Operating System

Course Learning Outcomes:
At the end of this course, the student would be able to:
1.   Analyze various scheduling algorithms and process synchronization.
2.   Explain deadlock prevention and avoidance algorithms.
3.   Compare and contrast various memory management schemes.
4.   Explain the functionality of file systems, I/O systems, and Virtualization
5.   Compare iOS and Android Operating Systems.

Code of the course: BCA6303T

Title of the course: Discrete Mathematics

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Understand Set Theory, Venn Diagrams, relations, functions and apply them to Real-world Scenarios.
2.   Understand General properties of Algebraic systems and study lattices as partially ordered sets and their applications.
3.   Solve the recurrence relations and can be used to optimize algorithms.
4.   Identify the basic properties of graphs and trees and use these concepts to model simple applications
5.   Understand the concept of property of Integers

Code of the Course: BCA5203T

Title of the Course: Basic Physics

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Understand the formation of images by lenses, defects of vision, and optical instruments.
2. Apply Ohm's law and analyze simple circuits.
3. Analyze AC circuits, including power factor and resonant circuits.
4. Describe energy bands, metals, insulators, and semiconductors.

5. Explore He-Ne and semiconductor lasers.

SEMESTER –IV

Code of the course: BCA6401T

Title of the course: Database Management

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Understand the basic principles of database management systems.
2. Draw Entity-Relationship diagrams to represent simple database application scenarios
3. Write SQL queries for a given context in relational database.
4. Discuss normalization techniques with simple examples.
5. Describe transaction processing and concurrency control concepts and various Recovery Mechanisms.

Code of the course: BCA6402T
Title of the course: Data Structure

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Choose an appropriate data structure for a particular problem.
2.   Identity the appropriate data structure for given problem
3.   Solve problems based upon different data structure & also write programs.
4.   Have knowledge on the application of data structures
5.   Access how the choices of data structure & algorithm methods impact the performance of program.

Code of the course: BCA6403T

Title of the course: Client Server Computing

Course Learning Outcomes:

 At the end of this course, the student would be able to:

1.   Compare and contrast Client Software, Various applications and their issues
2.   Demonstrate programming System Calls
3.   Demonstrate basic I/O Functions available in UNIX
4.   Explain Context Switching and Protocol Software, I/O interface.
5.   Implement Socket interface, TCP, UDP in detail.

Code of the course: BCA7501T

Title of the course: Software Engineering

Course Learning Outcomes:

At the end of this course, the student would be able to: :

1.   Identify and evaluate the scope and necessity of software engineering and life cycle models
2.   Apply requirement and design engineering concepts.
3.   Design the product and process metrics in software quality towards application in software projects.
4.   Identify the necessity of risk management in software quality assurance.
5.   Identify different testing methods and metrics in a software engineering project and Will have experience and/or awareness of testing problems and will be able to develop a simple testing report

Code of the course: BCA7502T

Title of the course: Java Programming

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Develop an in depth understanding of programming in Java: data types, variables, operators, operator precedence, Decision and control statements, arrays, switch statement, Iteration Statements, Jump Statements, Using break, Using continue, return
2.   Write Object Oriented programs in Java: Objects, Classes constructors, Inheritance, Access Control, Using super, final with inheritance Overloading and overriding methods, Abstract classes, Extended classes.
3.   Develop understanding to developing exception handling: Exception handling fundamentals, Exception types, uncaught exceptions, try, catch and multiple catch statements. Usage of throw, throws and finally.
4.   Develop applications involving thread, pausing Execution with Sleep, Interrupts, Joins, and Synchronization.
5.   Develop applications involving Applet: Applet Fundamentals, using paint method and drawing polygons.

Code of the course: BCA7503T

Title of the course: Unix & Shell Programming

Course Learning Outcomes:

At the end of this course, the student would be able to:
1. To know the basic concepts of Unix Operating System.
2. Familiar with Linux commands.
3. Understand shell programming.
4. Familiar with system administration.
5. Understand various types of servers and IPC between processes on different systems.
1.

Code of the course: BCA7504T

Title of the course: Network Management & Security

Course Learning Outcomes:

At the end of this course, the student would be able to:
1.   Understand the network security, common threats, firewalls, and cryptography
2.   Classify the routing protocols and analyze how to assign the IP addresses for the given network.
3.   Understand design issues in Network Security and to understand security threats, security services and mechanisms to counter.
4.   Understand the need and use of screening router, screened host, screened subnet. Firewall logs.
5.   Examine certain attacks on networks and security related services.

Code of the course: BCA7505T

Title of the course: Big data

Course Learning Outcomes:
At the end of this course, the student would be able to:

1.   Demonstrate knowledge of Big Data, Data Analytics, challenges and their solutions in Big Data.
2.   Analyze Hadoop Framework and eco systems.
3.   Analyze MapReduce and Yarn, Work on NoSQL environment.
4.   Work on NewSQL environment, MongoDB and Cassandra.
5.   Apply the Big Data using Map-reduce programming in Both Hadoop and Spark framework.

Code of the course BCA7506T

Title of the course: Block chain

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Understand Block chain ecosystem and its services in real world scenarios.
2.   Analyze the Rrequirement of Distributed Ledger Technology and Smart contract.
3.   Design and Demonstrate end-to-end decentralized applications.
4.   Apply the Type of Block chain Technology.
5.   Acquaint the protocol and assess their computational requirements.

Code of the course: BCA7601T

Title of the course: Python Programming

Course Learning Outcomes:
At the end of this course, the student would be able to:

1.   Understand the properties and applications of the python programming language
2.   Apply programming constructs of python to develop programs
3.   Implement the input and output operations on files
4.   Analyze real-life situation-specific problems and perceive solutions
5.   To learn how to use exception handling in Python applications for error handling.

Code of the course: BCA7602T

Title of the course: Microsoft .NET Programming

Course Learning Outcomes:
At the end of this course, the student would be able to:
1.   Understand the basic architecture of .NET framework.
2.   Describe C# concepts with OOP elements.
3.   Implement the concepts of class, object, constructor, and inheritance concepts in C#.
4.   Understand different Windows tools to implement Windows applications.
5.   Develop web applications and describe advanced features of C#.

Code of the course: BCA7603T

Title of the course: Artificial Intelligence

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Understanding of AI and different search algorithms used for solving problems.
2.   Acquainted with different learning algorithms and models used in machine learning.
3.   Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning
4.   Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing.
5.   Formulate and solve problems with uncertain information using Bayesian approaches.

Code of the course: BCA7604T

Title of the course: Cyber Security

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Explain the basic concepts of computer security
2.   Devise methods for Security in operating system & networks
3.   Differentiate the various security counter measures.
4.   Devise Privacy principles and policies
5.   Manage the Cyber space.

Code of the course BCA7605T

Title of the course: Edge Computing

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Understand the principles, architectures of fog computing
2.   Understand the communication ,storage, computation and management of fogs
3.   Design and Implement Internet of Everything (IoE) applications through fog Computing architecture
4.   Analysis the performance of the applications developed using fog architecture
5.   Understand the security and privacy issues of fog computing

Code of the course: BCA7606T

Title of the course: Data Mining

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Learn to apply various data mining techniques into various areas of different domains.
2.   Be able to interact competently on the topic of data mining for business intelligence.
3.   Apply various prediction techniques.
4.   Learn about supervised and unsupervised learning technique.
5.   Develop and implement machine learning algorithms

Code of the course: BCA8701T

Title of the course: Research Methodology

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Demonstrate the ability to choose methods appropriate to research aims and objectives.
2.   Understand the limitations of particular research methods.
3.   Develop skills in qualitative and quantitative data analysis and presentation.
4.   Develop advanced critical thinking skills.
5.   Ability to write and publish a technical research paper and review papers effectively

Code of the course: BCA8703T

Title of the course: Business Intelligence

Course Learning Outcomes:

At the end of this course, the student would be able to:
1. Understand key concepts and issues related to business intelligences and decision support systems.
2. Understand concepts like data warehouses, design methods, data extracting, transforming and loading processes and OLAP systems.
3. Define how BI will help an organization and whether it will help yours
4. Identify the technological architecture that makes up BI systems
5. Learn to use basic BI tools, mathematical models.

Code of the course BCA8704T

Title of the course: Machine Learning

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Understand the concepts of various machine learning strategies.
2. Handle computational data and learn ANN learning models.
3. Solve real world applications by selecting suitable learning model.
4. Boost the performance of the model by combining results from different approaches.
5. Recognize and classify sequencing patterns using HMM.

Code of the course BCA8705T

Title of the course: R. Programming

Course Learning Outcomes:

At the end of this course, the student would be able to:

1.   Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.
2.   Describe key terminologies, concepts and techniques employed in Statistical Analysis.
3.   Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety   of problems.
4.   Perform simple arithmetic and statistical operations in R.
5.   Conduct and Interpret a variety of Hypothesis Tests to aid Decision Making.

Code of the course: BCA8801T

Title of the course: Software Testing

Course Learning Outcomes:
At the end of this course, the student would be able to:
1.   Analyze requirements to determine appropriate testing strategies.
2.   Apply a wide variety of testing techniques in an effective and efficient manner.
3.   Compute test coverage and yield according to a variety of criteria.
4.   Evaluate the limitations of a given testing process and provide a succinct summary of those limitations.
5.   The broad education necessary to analyze the local and global impact of computing and engineering solutions on individuals, organizations, and society (engineering impact assessment skills)
6.   Recognition of the need for, and an ability to engage in continuing professional development and life-long learning (continuing education awareness)

Code of the course: BCA8802T

Title of the course: Fundamentals of Data Science

Course Learning Outcomes:

At the end of this course, the student would be able to:
1.   Describe what Data Science is and the skill sets needed to be a data scientist
2.   Ability to learn the R Programming
3.   Explain the significance of exploratory data analysis (EDA) in data science.
4.   Explore the Various Data Science Applications
5.   Understand the various tools for Data Science and its Analysis

Code of the course: BCA8803T

Title of the course: Cloud computing

Course Learning Outcomes:

At the end of this course, the student would be able to:

1. Use practical cloud applications in daily life.
2. Apply various cloud services in real time applications.
3. Collaborate with different practical web applications for business management.
4. Explain recent research results in cloud computing and identify their pros and cons.
5. Solve a real-world problem using cloud computing through group collaboration.

Code of the course: BCA8804T

Title of the course: Internet of Things

Course Learning Outcomes:
At the end of this course, the student would be able to:
1.   Understand how to program on embedded and mobile platforms including different Microcontrollers like ESP8266, Raspberry Pi, Arduino and Android programming
2.   Create sensor data available on the Internet (data acquisition)
3.   Analyze and visualize sensor data
4.   Design methodology and hardware platforms involved in IoT.
5.   Evaluate different protocols used in IoT

Code of the course: BCA8805T

Title of the course: Mobile Application Development

Course Learning Outcomes:

At the end of this course, the student would be able to:
1.   Understand Android platform and its architecture.
2.   Understand and learn how to integrate basic phone features, multimedia, camera, and location-based services in Android applications.
3.   Mobile marketplace (Android, iOS).
4.   Analyze and discover your own mobile app for simple needs.
5.   Understand and carry out functional test strategies for mobile applications

B.Tech (Computer Science) Program
Department of Computer Science
Faculty of Engineering and Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: The program will produce graduates who will be competent professionals in IT industry, academics, government, or entrepreneurs.

PEO2: The graduates will be able to adapt to the fast changing world of Information Technology needs and will become effective collaborators and through latest & innovative methodologies, they will be able to address the social, technical and business challenges.

PEO3: Graduates will be a good team player and in course of time will be able to lead the team to find solutions and improvements in their field of expertise or become entrepreneurs and play the leading roles in enterprises.

PEO4: The graduates will be able to display interpersonal skills, communicate efficiently and effectively and will be able to lead/function in multiple disciplinary teams.

PEO5: Graduates will be able to understand the need for lifelong learning and IT skill upgradation, through taking up certifications or higher education.

PEO6: Graduates will be able to understand professional and ethical responsibilities.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: The graduates are proficient in fundamental principles and methods of Computer Science, Mathematical and Scientific reasoning and are able to: a) Apply fundamental concepts of integration, differentiation, vector calculus, probability & statistics, and discrete mathematics. b) Design, create & evaluate algorithms appropriate to specific problems.

PSO2: The graduates possess in-depth knowledge of various components of hardware and system software. The students have thorough understanding of/to: a) Describe, identify and illustrate desktop, network and server environments b) Apply networking concepts to build efficient networks and troubleshoot them c) Ability to employ cloud concepts to illustrate cloud computing solutions d) Basic and advanced elements of information security to solve problems and foresee threats e) Classify various information security threats and trends in the current IT world, and illustrate them.

PSO3: The graduates are competent in object oriented programming languages and possess basic knowledge of several other programming languages and can create first level programs.

PSO4: The graduates exhibit knowledge of diverse software engineering practices and project management, can work as a team leader/team member and communicate efficiently with team in developing software of multidisciplinary nature.

PSO5: The graduates possess ability to explore emerging technologies and provide innovative solutions to real time problems within constraints such as financial, environmental, social and ethical.

SEMESTER-I

Code of the course: BCS5101T
Title of the course: Engineering Physics

Course Learning Outcomes:

At the end of this course, Student would be able to:

1. Ability to understand the principles of interference of light using Michelson's interferometer
2. Understanding of polarization phenomena including plane, circular, and elliptically polarized light.
3. Determine the wavelength of light using diffraction grating.
4. Explain X-ray diffraction and Bragg's Law, as well as Hall Effect theory and its applications.
5. Understanding of the postulates of the special theory of relativity.

Code of the course: BCS5102T

Title of the course: Engineering Mathematics-I

Course Learning Outcomes:

At the end of this course ,Students would be able to:

1. Capability to apply definite integrals to calculate surface areas and volumes of revolutions.
2. Understanding of Rolle's Theorem and mean value theorems, and their applications.
3. Ability to calculate limits of sequences of numbers and infinite series.
4. Proficiency in calculating directional derivatives and gradients.
5. Ability to understand and apply scalar and vector line integrals, scalar and vector surface integrals, as well as concepts of gradient, curl, and divergence.

Code of the course: BCS5103T

Title of the course: Fundamentals of Computer

Suggested E-resources:

http://docs.google.com/folderview?id=0BywNw06KwzUPNU9YTEFVZURGS1E

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1. Identify and differentiate between different types of computers such as PC, desktop, servers, workstation, parallel computing, and supercomputers.
2. Define memory and its role in storing data and information.
3. Understand the concepts of LAN, MAN, and WAN and their significance in networking.
4. Create and print merged documents, format characters and paragraphs, and design page layouts.
5. Design and run slide shows, control presentations, and print presentations.

Code of the course: BCS5104T

Title of the course: Basic Electrical & Electronics Engineering

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1.   Define and explain key concepts in Electrical Engineering such as electric current, electromotive force, and electric power.
2.   Calculate Root Mean Square and Average Value of alternating currents and voltages.
3.   Explain the principle of operation of DC machines as motors and generators
4.   Understand the operation of transistors as amplifiers and introduce basic concepts of digital electronics including Boolean algebra, the binary system, and logic gates
5.   Classify and discuss Integrated Circuits (ICs) and their applications in various electronic devices.

Code of the course: BCS5201T

Title of the course Engineering Chemistry

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1. Describe the characteristics of solid fuels, including coal and its carbonization process.
2. Analyse flue gas using Orsat's apparatus and interpret the results.
3. Discuss organic electronic materials, including conducting polymers.
4. Explain the manufacturing process of Portland cement using Rotary Kiln Technology.
5. Explore advances in marine and terrestrial product chemistry

Code of the course: BCS5202T

Title of the course : Engineering Mathematics-II

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1. Understand the equation of a sphere and its intersection with a plane
2. Analyze the consistency of systems of linear simultaneous equations and solve them
3. Apply vector calculus to solve problems in physics, engineering, and other fields
4. Expand simple functions in Fourier Series, half-range Fourier sine and cosine series, and change of interval
5. Identify and analyze real-world applications of mathematical concepts in physical and mathematical disciplines.

Code of the course: BCS5203T

Title of the course: Programming for Problem Solving

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1. Explain the structure of a C program and the concept of preprocessor.
2. Understand the concept of command line arguments and arrays in C.
3. Understand file handling in C (fscanf, fprintf, feof, fopen, fclose, fread, fwrite).
4. Explain the concept of functions in C and passing parameters by value and reference.
5. Represent algorithms using flowcharts, pseudo code, and step-by-step procedures.

Code of the course: BCS5204T

Title of the course: Basic Civil Engineering

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1. Perform basic hand fill tests and understand water and waste water quality characteristics, drinking water standards, road traffic, traffic control, traffic signals, and intersections
2. Identify the principles of planning, elementary principles, and basic requirements for building planning, elevation, and section of a residential building.
3. Understand the types of loads acting on a building, types of brick bonds, typical building layout, symbols used in electrical layout, symbols used for water supply, plumbing, and sanitation
4. Introduce modern tools, including theodolite, total station, GPS, GIS, and RS
5. Develop problem-solving skills and critical thinking in civil engineering applications.

Code of the course: BCS5205T

Title of the course: Engineering Mechanics

Course Learning Outcomes:

At the end of this course ,Students would be able to :

1.   Understand the fundamental laws of mechanics and apply them to solve problems related to statics of particles and rigid bodies.
2.   Analyze different types of friction and their effects on mechanical systems.
3.   Apply the principles of kinematics to analyze the motion of particles and rigid bodies.
4.   Gain exposure to variational mechanics and understand the principles of Hamilton and Lagrange equations.
5.   Determine the centroid and moment of inertia of various shapes and composite sections.

Code of the course: BCS6301T
Title of the course: Data Structures and Algorithms

Course Learning Outcomes:

   At the end of the Course, Students would be able to :

1.   Identify the difficulties in estimating the exact execution time of algorithms.

2.   Perform operations on sparse matrices, including transposition and multiplication.

3.   Compare arrays and linked lists as data structures in terms of performance and use cases.

4.   Compare arrays and linked lists as data structures in terms of performance and use cases.

5.   Analyze the time complexity of sorting algorithms for different input characteristics.

Code of the course: BCS6302T
Title of the course: Advanced Programming

Course Learning Outcomes:

At the end of the Course, Students would be able to :

1. Develop and Execute simple Python programs.
2. Structure a Python program into functions.
3. Using Python lists, tuples to represent compound data
4. Develop Python Programs for file processing

Code of the course: BCS6303T
Title of the course: Digital Electronics

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Explain sign and magnitude representation, fixed point representation, and complement notation.

2. Comprehend the characteristics and operation of TTL logic gates, especially TTL NAND gates.

3. Apply variable mapping and the Quinn-McKlusky minimization techniques for logic simplification.

4. Design logic circuits using a diode switching matrix.

5. Explain the function of different types of registers, including buffer registers and shift registers.

Code of the course: BCS6304T
Title of the course: Advanced Engineering Mathematics

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Apply optimization techniques to engineering problems.

2. Formulate and solve linear programming problems.

3. Understand and utilize number theory concepts in computational contexts.

4. Use Laplace transforms to solve differential equations and boundary value problems.

5. Implement numerical methods to solve interpolation, differentiation, integration, and ordinary differential equations..

Code of the course: BCS6305T
Title of the course: Entrepreneurship Development

Course Learning Outcomes:

Leaner(s) shall be able to:

1.   Comprehend the vital role of entrepreneurship in innovation and economic development.
2.   Exhibit key entrepreneurial skills including leadership, decision-making, and risk management.
3.   Plan and evaluate business enterprises through thorough research and analysis.
4.   Apply knowledge of intellectual property, taxation, and government policies in entrepreneurial endeavors.
5.   Recognize and pursue entrepreneurial opportunities within the engineering field.

Code of the course: BCS6401T
Title of the course: Computer Organization And Architecture

Course Learning Outcomes:

At the end of the course, Students would be able to:

1.   Understand the basics of instructions sets and their impact on processor design

2.   Demonstrate an understanding of the design of the functional units of a digital computer system.

3.   Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory.

4.   Design a pipeline for consistent execution of instructions with minimum hazards.

5.   Manipulate representations of numbers stored in digital computers

Code of the course: BCS6402T
Title of the course: Linux and Shell Programming

Course Learning Outcomes:

At the end of the course, Students would be able to:

1.   Understand basic UNIX/Linux commands for file management and system information.

2.   Create and edit files using the vi editor, including advanced editing techniques.

3.   Customize the X work environment and applications using the xinitrc file.

4.   Manipulate the directory stack and understand process management in shell scripting.

5.   Use built-in functions, maintain command history, and create aliases for commands.

Code of the course: BCS6403T
Title of the course: Introduction to Database System

Course Learning Outcomes:

At the end of the course, Students would be able to :

1. Understand the historical context and evolution of DBMS.
2. Distinguish between file systems and DBMS, and explain the advantages of DBMS.
3. Design and implement data models using the ER model for complex enterprise scenarios.
4. Execute relational algebra and calculus operations to manipulate and query relational databases.
5. Define and apply Boyce-Codd Normal Form (BCNF) and Third Normal Form (3NF).

Code of the course: BCS6405T
Title of the course: Discrete Mathematics

Course Learning Outcomes:

At the end of the course, Students would be able to:

1.   Understand and calculate the cardinality of infinite sets.

2.   Study equivalence relations, congruence relations, and equivalence classes.

3.   Utilize vacuous, trivial, direct, indirect (contrapositive and contradiction), constructive, and non-constructive proofs.

4.   Analyze adjacency and incidence matrices, degrees of vertices, and subgraphs.

5.   Use logical operations (conjunction, disjunction, implication, biconditional).

Code of the course: BCS6406T
Title of the course: Principles of Economics for Engineers

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Understand the nature and definition of economics.
2. Analyze elasticity of demand and its role in decision-making.
3. Explain producer equilibrium using isoquants.
4. Explore the concepts related to national income, inflation, and unemployment.
5. Explain fiscal policy, its objectives, and its tools.

Code of the course: BCS7501T
Title of the course: Operating System

Course Learning Outcomes:

At the end of the course,Students would be able to :

1.   Understand the fundamental concepts and structure of operating systems

2.   Evaluate scheduling criteria, goals, performance metrics, and various scheduling algorithms (FCFS, SJF, shortest remaining time, round robin, priority scheduling, multilevel queue scheduling, multilevel feedback queue scheduling, fair share scheduling)

3.   Explain the system model, resource types, and the deadlock problem.

4.   Understand Belady's anomaly, distance string, and paging system design issues (local versus global allocation policies, load control, page size, shared pages, cleaning policy, TLB reach, inverted page table, I/O interlock).

5.   Learn about file system operations and overview of file systems in Linux and Windows.

Code of the course: BCS7502T
Title of the course: Design and Analysis Of Algorithms

Course Learning Outcomes:

 At the end of the course ,Students would be able to:

1.   Implement and analyze Binary Search, Merge Sort, Quick Sort, and Strassen's matrix multiplication algorithms.

2.   Use Backtracking algorithms to solve combinatorial problems

3.   Apply the KMP Matcher and Boyer-Moore algorithms to pattern matching problems.

4.   Define and comprehend multicommodity flow, flow shop scheduling, and network capacity assignment problems.

5.   Prove the NP-Completeness of problems like the Satisfiability problem and Vertex Cover Problem.

Code of the course: BCS7503T
Title of the course: Java Programming

Course Learning Outcomes:

At the end of the course,Students would be able to :

1.   Implement fundamental programming constructs (variables, data types, operators, control structures).

2.   Understand the types of inheritance and use of the 'super' keyword.

3.   Use try, catch, finally, throw, and throws in exception handling.

4.   Implement serialization and deserialization of objects.

5.   Understand JDBC connectivity and perform database operations.

Code of the course: BCS7504T

Title of the course: Computer Based Numerical and Statistical Techniques

Course Learning Outcomes:

At the end of the course,Students would be able to :

1.   Implement Newton's method and analyze its rate of convergence.

2.   Understand operational counts and the importance of pivoting and scaling in Gaussian elimination.

3.   Apply the power method, Jacobi's method, and Householder's method for computing eigenvalues and eigenvectors.

4.   Implement Euler's methods and conduct local and global error analysis.

5.   Use probability functions, density functions, and distribution functions.

Code of the course: BCS7506T

Title of the course: Probability and Queuing Theory

Course Learning Outcomes:

At the end of the course,Students would be able to :

1.   Understand the axioms of probability.
2.   Apply the central limit theorem for independent and identically distributed random variables.
3.   Classify random processes.
4.   Explore single and multiple server queueing models.
5.   Study series queues and open Jackson networks.

Code of the course: BCS7361T
Title of the course: Theory of Computation

Course Learning Outcomes:

Leaner(s) shall be able to:

1.   Develop capabilities to design and develop formulations for computing models Learn about Automata theory and its application in Language Design .

2.   Identify computing model applications in diverse areas Learn about Turing Machines and Pushdown Automata and understand Linear Bound Automata and its applications.

3.   Discuss key notions of computation, such as algorithm, computability, decidability, reducibility, and complexity, through problem solving .

4.   Solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation

Code of the course: BCS7602T
Title of the course: Computer Network

Course Learning Outcomes:

Learner(s) shall be able to:
1.   Illustrate the working principle of different protocols at different layers.
2.   Install and configures workstations, servers and networked printers, internet working devices such as switches and routers.
3.   Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
4.   **E**xpertise in some specific areas of networking such as the design and maintenance of individual networks.
5.   Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure.

Code of the course: BCS7603T
Title of the course: Reasoning and Thinking

Course Learning Outcomes:

At the end of the course , Students would be able to :

1. Understand the importance of continual learning and adapting new skills.

2. Solve thought-provoking word and rebus puzzles, and word-link builder questions.

3. Utilize shortcuts for multiplying three and higher digit numbers..

4. Develop skills for positive impression management during recruitment processes.

5. Enhance verbal reasoning skills through targeted exercises and practice.

Code of the course: BCS7605T
Title of the course: Engineering Ethics and Professionalism

Course Learning Outcomes:

At the end of the course,Students would be able to :

1.   Demonstrate an understanding of morals, values, and ethics, including integrity, work ethic, and service learning.
2.   Apply ethical theories (such as Kohlberg's and Gilligan's) to engineering dilemmas.
3.   Recognize engineering as a form of experimentation.
4.   Assess safety and risk in engineering contexts.
5.   Explore ethical challenges related to multinational corporations, environmental impact, and computer ethics.

Code of the course: BCS8701T
Title of the course: Compiler Design

Course Learning Outcomes:

At the end of the course, Students would be able to :
1. Understand the different representations of intermediate code between various phases of compiler and functionality of each phase involved in the compilation process .
2. Gain knowledge about LR parsers, including SLR, canonical LR, and LALR parsing tables.
3. Understand different forms of intermediate code such as postfix notation and three-address code.
4. Learn about different data structures used in implementing symbol tables.
5. Learn the issues in designing a code generator and how to generate code from a DAG.

Code of the course: BCS8702T
Title of the course: Mobile Computing

Course Learning Outcomes:

At the end of the course, Students would be able to :

1.   Identify and analyze issues related to adaptability in mobile computing, including transparency and environmental constraints.

2.   Analyze different data dissemination techniques and their effectiveness in mobile environments.

3.   Evaluate unicast and multicast discovery techniques, advertisements, and service catalogs.

4.   Understand the challenges and strategies for managing database systems in mobile environments.

5.   Discuss various routing protocols, including GSR (Global State Routing), DSDV (Destination-Sequenced Distance Vector), DSR (Dynamic Source Routing), AODV (Ad Hoc On-Demand Distance Vector), and TORA (Temporary Ordered Routing Algorithm).

Code of the course: BCS8703T
Title of the course: Artificial Intelligence

Course Learning Outcomes:

At the end of the course , Students would be able to :

1. Understand and articulate the meaning and definition of artificial intelligence (AI).

2. Apply and analyze search strategies to solve the informed and uninformed problems.

3. Design and evaluate intelligent expert models for perception and prediction from intelligent environment.

4. Demonstrate and enrich knowledge to select and apply ai tools to synthesize information and develop models within constraints of application area.

5. Examine the issues involved in knowledge bases, reasoning systems and planning.

Code of the course: BCS8704T
Title of the course: Human Computer Interface

Course Learning Outcomes:

At the end of the course , Students would be able to:

1.   Understand the human input-output channels, including sensory and motor functions.

2.   Apply iteration and prototyping methods in the design process.

3.   Design adaptive help systems and effective user support systems.

4.   Understand goals and task hierarchies in cognitive modeling.

5.   Identify sources of information and data collection methods.

Code of the course: BCS8705T
Title of the course: Ethical Hacking
Course Learning Outcomes:

At the end of the course , Students would be able to:
1. Understand the significance of Ethical Hacking.

2. Understand the methods of scanning and looking for footprints,

3. Analyze the methods involved in hacking systems and wireless networks.

4. Implement cryptography algorithms,

5. Understand the security aspects need to be adopted against hacking.

Code of the course: BCS8706T
Title of the course: IOT
Course Learning Outcomes:

At the end of the course , Students would be able to:
1.   Understand how to program on embedded and mobile platforms including different Microcontrollers like ESP8266, Raspberry Pi, Arduino and Android programming

2.   Analyze the principles of Service-oriented Architecture (SoA) and gateways.

3.   Integrate sensors and actuators with Arduino to create functional IoT applications.

4.   Implement IoT projects using Raspberry Pi, integrating sensors and actuators.

5.   Evaluate security considerations in cloud computing for IoT applications.

Code of the course: BCS8707T
Title of the course: Information Theory and Coding
Course Learning Outcomes:

At the end of the course , Students would be able to:
1. Overview of probability theory and the significance of "Information" in communication.
2. Derive equations for entropy, mutual information, and channel capacity.
3. Implement various source coding algorithms and analyze their performance.
4. Design linear block codes and cyclic codes (encoding and decoding).
5. Perform mathematical analysis and verify concepts using MATLAB

Code of the course: BCS8708T

 Title of the course: Advanced Database Management System

Course Learning Outcomes:

At the end of the course , Students would be able to :

1.   Develop database designs for specific applications, such as banking enterprises, using Unified Modeling Language (UML).

2.   Perform set operations, aggregate functions, nested subqueries, and complex queries.

3.   Understand complex data types, structured types, and inheritance in SQL.

4.   Transform relational expressions and estimate statistics of expression results.

5.   Handle deadlocks and perform insert and delete operations

Code of the course: BCS8709T
Title of the course: Robotics

Course Learning Outcomes:

Leaner(s) shall be able to:
1. Understand the fundamental scientific and technological principles underlying robotics.
2. Learn about common sensors such as encoders, tachometers, and strain gauge-based force-torque sensors.
3. Use simulations and experiments to analyze and understand kinematics problems in robotics.
4. Formulate and solve constraint and loop-closure equations in parallel manipulators.
5. Derive and apply manipulator Jacobians for both serial and parallel manipulators.

Code of the course: BCS8710T
 Title of the course: Cloud Computing

Course Learning Outcomes:

At the end of the course, Students would be able to :

1.   Analyze ethical issues in cloud computing and evaluate its business impact and economics.

2.   Analyze data center design, interconnection networks, and architectural design of compute and storage clouds.

3.   Identify and describe hypervisors like VMware, KVM, and Xen.

4.   Discuss design principles, policy implementation, and architecture for cloud security.

5.   Analyze various cloud applications, including protein structure prediction, data analysis, satellite   image   processing,   CRM,   ERP,   and   social   networking.

SEMESTER-VIII

Code of the course: BCS8801T
Title of the course: Digital Image Processing

Course Learning Outcomes:

At the end of the course , Student would be able to :
1. Understand the process of image acquisition and the representation of color images.
2. Apply various intensity transform functions and understand their effects on images.
3. Understand the image degradation process and various restoration techniques.
4. Apply Huffman coding and arithmetic coding for image compression.
5. Implement and analyze regional descriptors for image representation and processing.

1.

Code of the course: BCS8802T
Title of the course: Machine Learning
Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Recognize the characteristics of machine learning strategies
2. Analyze and Apply the suitable supervised learning methods for real-world problems
3. Identify and integrate more than one technique to enhance the performance of learning
4. Create a suitable unsupervised learning model for handling unknown patterns
5. Design a model to handle large datasets with online learning

Code of the course: BCS8803T
Title of the course: Parallel computing

Course Learning Outcomes:

After studying this course students will be able to:

1.   Understand the core concepts and classifications of parallel computing.
2.   Understand the concept of computation in parallel computing.
3.   Analyze the performance in parallel computing scenarios.
4.   Understanding about parallel computing and Programming.
5.   Analyze various scheduling techniques in parallel computing.

Code of the course: BCS8804T
Title of the course: Data Science
Course Learning Outcomes:

At the end of this course, the students will be able to:

1.   Define the data science process
2.   Understand different types of data description for data science process
3.   Gain knowledge on relationships between data
4.   Use the Python Libraries for Data Wrangling
5.   Apply visualization Libraries in Python to interpret and explore data

Code of the course: BCS8805T

Title of the course: Distributed System

Course Learning Outcomes:

At the end of the course, Students would be able to :

1.	Gain knowledge in issues for constructing the distributed systems .

2.	Examine how the message oriented communication can be done in a Distributed system to achieve the synchronous and asynchronous communication.

3.	Implement the suitable clock Synchronization algorithms to manage the Resources in a distributed operating system environment.

4.	Compare the client and data centric consistency models to improve Performance and scalability in terms of memory.

5.	Analyse issues dealing with recovery failure and able to implement Distributed file system in Network file system.

Code of the course: BCS8806T
Title of the course: Cryptography and security

Course Learning Outcomes:

 At the end of the course, Students would be able to :

1.   Apply cryptographic principles to design secure communication systems.
2.   Evaluate the security of cryptographic algorithms and protocols.
3.   Implement encryption and decryption techniques.
4.   Analyze the trade-offs between security and efficiency.
5.   Understand the role of cryptography in real-world applications, including secure messaging, digital signatures, and authentication.

Code of the course: BCS8807T
Title of the course: Big data
Course Learning Outcomes:
At the end of the course , Students would be able to

1.   Understand the fundamentals of big data analytics.
2.   Describe the components and architecture of Hadoop.
3.   Learn how to process data with Hadoop using MapReduce.
4.   Apply prescriptive analysis to recommend actions based on data insights.
5.   Understand I/O formats and advanced MapReduce concepts like Map-side join, Reduce-side join, and secondary sorting.

Code of the course: BCS8808T
Title of the course: Hardware Testing And Fault Tolerance

Course Learning Outcomes:

At the end of the course, Students would be able to :

1.   Learn about test pattern generation, fault coverage, and the types of tests such as exhaustive, pseudo-exhaustive, pseudo-random, and deterministic testing.

2.   Use fault simulation to estimate fault coverage and build a fault dictionary.

3.   Understand and apply test pattern generation algorithms such as the D-algorithm, Critical Path Tracking, and the PODEM algorithm.

4.   Understand fault models and functional tests for memories, including Memory BIST. Implement N modular redundancy and understand the roles of watchdog processors and Byzantine failures.

Code of the course: BCS8809T
Title of the course: Real Time System

Course Learning Outcomes:

At the end of the course, Students would be able to :
1.   Understand the real-time concepts such as premptive multitasking, task priorities.
2.   Develop the Priority inversions, mutual exclusion, context switching, and synchronization, interrupt ,Latency and response time, and semaphores.
3.   Summarize the real-time operating system kernel is implemented.
4.   Construct a real-time system on an embedded processor.
5.   Design the real time operating systems like RT Linux, Vx Works, MicroC /OSII, Tiny OS.

Code of the course: BCS8810T
Title of the course: Information Retrival System

Course Learning Outcomes:

   At the end of the course,Students would be able to:
1.   Apply the clustering algorithms like hierarchical agglomerative clustering   and k-means algorithm.
2.   Understand relevance feedback in vector space model and probabilistic model.
3.   Analyse the N-grams are used for detection and correction of spelling errors.
4.   Understand the method of Regression analysis to Understanding estimate the probability of relevance.
5.   Design the method to build inverted index.

Curriculum of Master of Computer Application Program
Department of Computer Science
Faculty of Engineering and Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To develop the ability to excel in a professional career and/or higher education excellence through the knowledge acquisition of computing, mathematics, and information communication technology.

PEO2: To extend the capability to plan, analyze, design, code, test, enforce and hold the software program product.

PEO3: To excel in professionalism, moral attitude, conversation skills, team building, and adapting the latest ICT tools/techniques.

PEO4: To analyze real-world problems, design, and develop computing models/systems for multidisciplinary domains that are feasible, suitable, economical, and socially acceptable.

PEO5: To develop the capabilities to pursue higher studies and establish a research practice for the contribution to academia/industry and multidisciplinary research.

PEO6: To enhance the capabilities to initiate startups and become entrepreneurs in various domains of computer science and Information technology.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: The ability to remember and understand the basic concept of associated subjects and Computer Fundamentals, Computer Programming, Design, and Analyze different Network Techniques.

PSO2: The proficiency to understand, evaluate and analyze the design and algorithm concepts of computer architecture, Operating systems, Computer Networks, Software Engineering, Design and Analysis of Algorithms, Compiler Design, Artificial Intelligence, etc

PSO3: The ability to design and solve problems in the field of Interdisciplinary subjects by applying the knowledge acquired from Data analysis, Software development & other allied topics.

PSO4: The skills to develop, adopt, and assess the latest innovative industry best practices, then analyze and comprehend the young mindsets accordingly to their attitude toward higher studies, research, and to possess a successful path as a young entrepreneur.

PSO5: Analyze their abilities in systematic planning, developing, testing, and executing complex computing applications, in the field of Social Media and Analytics, Web Application Development, and Data Interpretations.

SEMESTER–I

Code of the Course: MCA9101T

Title of the Course: Advanced IT Management

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Define information and its necessity in business organizations.
2. Recognize the components of a computer system, including I/O and auxiliary storage devices.
3. Describe the characteristics of MS-DOS and Unix operating systems.
4. Explain the basics of Word processing software packages.

5. Identify and explain recent developments in information and communication technology (ICT).

Code of the course: MCA9102T
Title of the Course: Advanced Programming
Course Learning Outcomes:
 At the end of the course, Student would be able to:
1. Implement and analyze sorting algorithms, including selection, bubble, and insertion sorts.
2. Understand and apply expressions, operators, and their precedence and evaluation order.
3. Use one-dimensional and multi-dimensional arrays, including array handling techniques.
4. Declare and use structures and unions, including pointer to structure, array of structure, and self-referential structures.
5. Implement read and write functions for data files.

Code of the Course: MCA9103T
Title of the Course: Operating System and Shell Programming
Course Learning Outcomes:
At the end of the course ,Student would be able to:
1. Explain the functions, characteristics, and structures of different types of operating systems including simple batch, multiprogramming, timeshared, personal computer, parallel, distributed, and real-time systems.
2. Compare and contrast different page replacement algorithms.
3. Understand and describe file system interfaces including access methods, directory structures, and protection mechanisms.
4. Perform I/O operations in the shell, use control structures, loops, and subprograms, and create shell scripts.
5. Identify the key security problems and user authentication methods.

Code of the Course: MCA9105T
Title of the Course: Human Computer Interface
Course Learning Outcomes:
At the end of the course, Student will be able to:
1. Analyze how human cognitive processes and emotional states impact interaction with computers.
2. Identify and apply principles that support usability in interface design.
3. Evaluate and select appropriate evaluation methods for different stages of the design process.
4. Explain linguistic models and their application to interface design.
5. Understand the dynamics of face-to-face communication and its implications for HCI.

Code of the Course: MCA9106T
Title of the course: Big Data
Course Learning Outcomes:
At the end of the course , Students would be able to:

1. Understand the concept of Basically Available Soft State Eventual Consistency (BASE).
2. Identify and describe open-source technologies used for Big Data analytics.
3. Apply the 90/10 rule of critical thinking in data analysis.
4. Define target variables and use various predictive analytics techniques.
5. Understand the need for Hadoop and why it is preferred over traditional RDBMS.

Code of the Course: MCA9107T
Title of the course: Management Information System
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Understand and define the meaning and various definitions of management..
2. Define motivation and explain major theories of motivation including Maslow, Herzberg, and McGregor.
3. Analyze the economic, organizational, and behavioral impacts of information systems on organizations.
4. Identify and explain major types of systems in organizations including ESS, MIS, DSS, and TPS.
5. Explain the importance of disaster management in the context of MIS and information security challenges.

Code of the course: MCA9201T
Title of the course: Advanced Database Management Systems
Course Learning Outcomes:

At the end of the course ,Students would be able to :

1. Understand the principles of relational databases and the basics of database design.
2. Utilize aggregate functions and create complex queries in SQL.
3. Describe and use complex data types, structured types, inheritance, and object identity in SQL.
4. Apply techniques for transforming relational expressions, estimating statistics, and choosing evaluation plans for query optimization.
5. Implement concurrency control protocols, including lock-based, timestamp-based, validation-based protocols, and multiple granularity.

Code of the course: MCA9202T
Title of the course: Computer Organization
Course Learning Outcomes:
At the end of course ,Students would be able to :
1. Understand primary memory concepts, including bits, memory addresses, byte ordering, error-correcting codes, and cache memory.
2. Describe and design basic digital logic circuits, including combinational and arithmetic circuits.
3. Analyze the technological and economic forces shaping the computer spectrum.
4. Understand the IJVM memory model, instruction set, and compilation from Java to IJVM.
5. Learn about the addressing modes and introduction to assembly language programming.

Code of the course: MCA9203T
Title of the course: Advanced Object Oriented Programming
Course Learning Outcomes:
At the end of the course, Students would be able to :
1. Understand the structure and syntax of classes and objects in C++
2. Explore different types of inheritance: single, multilevel, hierarchical, hybrid, and multiple inheritance.
3. Learn how to override base class members in derived classes.
4. Implement exception handling using try, throw, and catch blocks.
5. Apply container classes in practical applications.

Code of the course: MCA9204T
Title of the course: Distributed Cloud Computing
Course Learning Outcomes:
At the end of the course , Student will be able to:
1. Understand the role of computer clusters in scalable parallel computing.
2. Summarize the concept of cloud computing and its fundamental system model.
3. Gain knowledge about Service Oriented Architecture (SOA) and its components like services, message-oriented middleware, and workflow in SOA.
4. Explain CryptDb and the various onion encryption layers, including DET (Deterministic Encryption), RND (Randomized Encryption), OPE (Order-Preserving Encryption), JOIN, SEARCH, HOM (Homomorphic Encryption), and FPE (Format-Preserving Encryption).
5. Learn about Numpy and its advantages over Python lists.

Code of the course: MCA9205T
Title of the course: Software Testing
Course Learning Outcomes:
At the end of the course , Students will be able to:

1. Understand and articulate the terminology used in software verification and validation (V&V).
2. Explain the impracticality of testing all possible data inputs and execution paths in a software system.
3. Identify different types of software products, including requirements, specifications, designs, implementations, and changes.
4. Differentiate between levels of software testing: Unit testing, integration testing, system testing, and regression testing.
5. Implement problem tracking and test activity tracking mechanisms.

Code of the course: MCA9206T
Title of the course: Business Intelligence
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Identify the major frameworks of computerized decision support system
2. Categorize complex business problems in terms of analytical models
3. Demonstrate ethical decision-making in structured or unstructured Problems .
4. Compare the impact of business reporting, information visualization, and dashboards .
5. Adapt data mining tools, neural networks, web mining, web analytics .

Code of the Course: MCA9301T
Title of the Course: Advanced Java and Internet Programming
Course Learning Outcomes:
At the end of the course , Students would be able to:

1. To understand the terms related to the Internet and how the Internet is changing the world.
2. To understand how computers are connected to the Internet and demonstrate the ability to use the World Wide Web.
3. Demonstrate an understanding of and the ability to use electronic mail and other internet based services.
4. Understand the design principles of Web pages and how they are created
5. To develop an ability to create basic Web pages with HTML.

Code of the Course: MCA9302T
Title of the Course: Machine Learning with Python
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Demonstrate understanding of modern version control tools.
2. Exhibit facility with a Linux command line environment.
3. Demonstrate understanding of the role of testing in scientific computing, and write UNIT tests in Python.
4. Use command line tools to write and edit code.
5. Develop publication-ready graphics fro

Code of the Course: MCA9303T
Title of the Course: Essentials of Data Science
Course Learning Outcomes:
At the end of this course, the students will be able to:
1. Define the data science process
2. Understand different types of data description for data science process
3. Gain knowledge on relationships between data
4. Use the Python Libraries for Data Wrangling
5. Apply visualization Libraries in Python to interpret and explore data

Code of the Course: MCA9304T
Title of the Course: Data Warehouse and Data Mining
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Interpret the problem in real time applications, and apply the appropriate data mining technique for effective results.
2. Apply different conceptions of data mining and compute OLAP operations.
3. List associations and correlations in the given Information domain.
4. Apply basic techniques of classification for various applications like banks, health organizations etc.
5. Analyze the real time data using various clustering techniques.

Code of the Course: MCA9305T
Title of the Course: Human Resource Management
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Understanding of the evolution, objectives, and functions of HRM.
2. Implement appropriate recruitment sources, methods, and selection processes to attract and place suitable candidates.
3. Evaluate the effectiveness of training initiatives and implement career development and succession planning strategies.
4. Foster employee motivation, engagement, and positive relations through effective communication, grievance handling, and disciplinary procedures.
5. Demonstrate awareness of ethical issues in HRM and integrate ethical principles into HR practices and leadership.

Code of the Course: MCA9306T
Title of the Course: Digital Marketing
Course Learning Outcomes:
1. Recognize the significance of online marketing campaigns.
2. Explore web analytics tools for data-driven decision-making.
3. Conduct keyword research and implement on-page and off-page SEO.
4. Create successful social media advertising campaigns.
5. Develop effective email campaigns.

Code of the Course: MCA9307T
Title of the Course: Deep Learning
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Explain the basics in deep neural networks
2. Apply Convolution Neural Network for image processing
3. Apply Recurrent Neural Network and its variants for text analysis
4. Apply model evaluation for various applications
5. Apply autoencoders and generative models for suitable applications

Code of the Course: MCA9308T
Title of the Course: Agile Development Process
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Interpret the concept of agile software engineering and its advantages in software development.
2. Analyze the core practices behind several specific agile methodologies.
3. Identify the roles and responsibilities in agile projects and their difference from projects
4. Access implications of functional testing, Unit testing, and continuous integration.
5. Determine the role of design principles in agile software design.

Code of the Course: MCA9401T
Title of the Course: Network Programming
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Learn about TCP/IP protocols and their role in communication.
2. Develop servers that can handle multiple clients.
3. Implement a UDP echo server and a UDP echo client.
4. Explore raw sockets for low-level communication.
5. Gain insights into SNMP network management concepts.

Code of the Course: MCA9402T
Title of the Course: Big Data Analytics
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Understanding the main challenges associated with processing and analyzing large-scale data.
2. Learn about materialized views, distribution models, and consistency.
3. Analyze data using Hadoop and understand its distributed file system (HDFS).
4. Explore classic MapReduce and YARN.
5. Run big data processing pipelines on Google Cloud or Amazon AWS.

Code of the Course: MCA9403T
Title of the Course: Neural Network
Course Learning Outcomes:
At the end of the course, students should be able to:
1. Describe the basics of ANN and comparison with Human brain.
2. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modelling.
3. Understand the concepts and techniques of neural networks through the study of the most important neural network models.
4. Evaluate whether neural networks are appropriate to a particular application.
5. Apply neural networks to particular applications, and to know what steps to take to improve performance.

Curriculum of M.Sc. (Information Technology) Program
Faculty of Engineering and Technology
PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To develop the ability to excel in a professional career and/or higher education excellence through the knowledge acquisition of computing, mathematics, and information communication technology.

PEO2: To extend the capability to plan, analyze, design, code, test, enforce and hold the software program product.

PEO3: To excel in professionalism, moral attitude, conversation skills, team building, and adapting the latest ICT tools/techniques.

PEO4: To analyze real-world problems, design, and develop computing models/systems for multidisciplinary domains that are feasible, suitable, economical, and socially acceptable.

PEO5: To develop the capabilities to pursue higher studies and establish a research practice for the contribution to academia/industry and multidisciplinary research.

PEO6: To enhance the capabilities to initiate startups and become entrepreneurs in various domains of computer science and Information technology.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: The ability to remember and understand the basic concept of associated subjects and Computer Fundamentals, Computer Programming, Design, and Analyze different Network Techniques.

PSO2: The proficiency to understand, evaluate and analyse the design and algorithm concepts of computer architecture, Operating systems, Computer Networks, Software Engineering, Design and Analysis of Algorithms, Compiler Design, Artificial Intelligence, etc

PSO3: The ability to design and solve problems in the field of Interdisciplinary subjects by applying the knowledge acquired from Data analysis, Software development & other allied topics.

PSO4: The skills to develop, adopt, and assess the latest innovative industry best practices, then analyze and comprehend the young mindsets accordingly to their attitude toward higher studies, research, and to possess a successful path as a young entrepreneur.

PSO5: Analyze their abilities in systematic planning, developing, testing, and executing complex computing applications, in the field of Social Media and Analytics, Web Application Development, and Data Interpretations.

SEMESTER –I

Code of the Course: MIT9101T
Title of the Course: Advanced IT Management
Course Learning Outcomes:
At the end of the course , Students would be able to:

1. Define information and its necessity in business organizations. Identify the qualities and value of information.
2. Recognize and describe the components of a computer system, including I/O and auxiliary storage devices.
3. Describe the characteristics of MS-DOS and Unix operating systems.
4. Explain the basics of desktop publishing and identify common desktop publishing software packages.
5. Identify and explain recent developments in information and communication technology (ICT).

Code of the course: MIT9102T
Title of the Course: Advanced Programming
Course Learning Outcomes:
At the end of the course, Student would be able to:
1. Implement and analyze sorting algorithms, including selection, bubble, and insertion sorts.
2. Understand and apply expressions, operators, and their precedence and evaluation order.
3. Use one-dimensional and multi-dimensional arrays, including array handling techniques.
4. Declare and use structures and unions, including pointer to structure, array of structure, and self-referential structures.
5. Implement read and write functions for data files.

Code of the Course: MIT9103T
Title of the Course: Operating System and Shell Programming
Course Learning Outcomes:
At the end of the course ,Student would be able to:
1. Explain the functions, characteristics, and structures of different types of operating systems including simple batch, multiprogramming, timeshared, personal computer, parallel, distributed, and real-time systems.
2. Compare and contrast different page replacement algorithms.
3. Understand and describe file system interfaces including access methods, directory structures, and protection mechanisms.
4. Perform I/O operations in the shell, use control structures, loops, and subprograms, and create shell scripts.
5. Identify the key security problems and user authentication methods.

Code of the Course: MIT9105T
Title of the Course: Human Computer Interface
Course Learning Outcomes:
At the end of the course, Student will be able to:
1. Analyze how human cognitive processes and emotional states impact interaction with computers.
2. Identify and apply principles that support usability in interface design.
3. Evaluate and select appropriate evaluation methods for different stages of the design process.
4. Explain linguistic models and their application to interface design.
5. Implement the dynamics of face-to-face communication and its implications for HCI.

Code of the Course: MIT9106T
Title of the course: IT Law and Patent
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Recall federal trademark registration procedures.
2. Interpret the concept of trade dress and its relationship to functionality.
3. Apply knowledge of secondary meaning and descriptive marks.
4. Evaluate judgments based on criteria and standards in trademark disputes.
5. Create a coherent understanding of trade secrets and their importance.

Code of the Course: MIT9107T
Title of the course: Embedded System

Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Recall basic knowledge about fundamentals of microcontrollers.
2. Explain a basic knowledge about programming, system control, devices and buses to perform a specific task in embedded networking.
3. Apply knowledge about basic concepts of circuit emulators.
4. Evaluate knowledge about Life cycle of embedded design and its testing
5. Develop programming skills in embedded systems for various applications.

Code of the course: MIT9201T
Title of the course: Advanced Database Management Systems
Course Learning Outcomes:
At the end of the course ,Students would be able to :
1. Understand the principles of relational databases and the basics of database design.
2. Utilize aggregate functions and create complex queries in SQL.
3. Describe and use complex data types, structured types, inheritance, and object identity in SQL.
4. Apply techniques for transforming relational expressions, estimating statistics, and choosing evaluation plans for query optimization.
5. Implement concurrency control protocols, including lock-based, timestamp-based, validation-based protocols, and multiple granularity.

Code of the course: MIT9202T
Title of the course: Computer Architecture
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Understand the theory and architecture of central processing unit.
2. Analyze some of the design issues in terms of speed, technology, cost, performance.
3. Design a simple CPU with applying the theory concepts.
4. Learn the concepts of parallel processing, pipelining , interprocessor communication.
5. Exemplify in a better way the I/O and memory organization.

Code of the course: MIT9203T
Title of the course: Advanced Object Oriented Programming
Course Learning Outcomes:
At the end of the course, Students would be able to :
1. Understand the structure and syntax of classes and objects in C++
2. Explore different types of inheritance: single, multilevel, hierarchical, hybrid, and multiple inheritance.
3. Learn how to override base class members in derived classes.
4. Implement exception handling using try, throw, and catch blocks.
5. Apply container classes in practical applications.

Code of the course: MIT9204T
Title of the course: Distributed Cloud Computing
Course Learning Outcomes:
At the end of the course , Student will be able to:
1. Understand the role of computer clusters in scalable parallel computing.
2. Summarize the concept of cloud computing and its fundamental system model.
3. Gain knowledge about Service Oriented Architecture (SOA) and its components like services, message-oriented middleware, and workflow in SOA.
4. Explain CryptDb and the various onion encryption layers, including DET (Deterministic Encryption), RND (Randomized Encryption), OPE (Order-Preserving Encryption), JOIN, SEARCH, HOM (Homomorphic Encryption), and FPE (Format-Preserving Encryption).
5. Learn about Numpy and its advantages over Python lists.

Code of the course: MIT9205T
Title of the course: Modeling and Simulation
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Understand the system concept and apply functional modeling method to model the activities of a static system
2. Understand the behavior of a system simulation and create an analogous model for a dynamic system
3. Simulate the operation of a continuous system and make improvement according to the simulation results
4. Simulate the operation of a dynamic system and make improvement according to the simulation results
5. Solve the solutions of problems based on GPSS.

Code of the course: MIT9206T
Title of the course: Digital Signal Processing
Course Learning Outcomes:
At the end of the course , Students would be able to:

1. List the properties of discrete time systems.
2. Interpret block diagrams of LTI systems.
3. Apply sampling techniques in both time and frequency domains.
4. Evaluate the advantages of Decimation-in-Time and Decimation-in-Frequency FFT Algorithms.
5. Design FIR filters using Windowing methods: Rectangular, Hamming, and Kaiser windows.

Code of the Course: MIT9301T
Title of the Course: Block Chain
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Describe decentralization and consensus mechanisms in Blockchain.
2. Interpret the applications of smart contracts in Blockchain.
3. Compare and contrast permissioned and permissionless Blockchains.
4. Evaluate the integration challenges of Blockchain with IoT devices.
5. Design Blockchain governance models and evaluate consensus algorithms.

Code of the Course: MIT9302T
Title of the Course: Advanced AI
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Apply ensemble methods, GANs, and Bayesian networks to solve complex problems.
2. Explore state-of-the-art deep learning models and their applications in real-world scenarios.
3. Evaluate the performance of NLP models and optimize them for different applications.
4. Analyze the performance of RL algorithms in environments with varying complexities and dynamics.
5. Discuss ethical considerations related to AI technologies, including bias, fairness, and transparency.

Code of the Course: MIT9303T
Title of the Course: Robotic Process Automation
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Describe various use cases and applications of RPA.
2. Interpret the setup of development environments for RPA projects.
3. Apply business process analysis techniques for RPA.
4. Analyze cognitive RPA and Artificial Intelligence (AI) integration in automation.
5. Develop strategies to address the impact of RPA on job roles and workforce.

Code of the Course: MIT9304T
Title of the Course: Essentials of Data Science
Course Learning Outcomes:
At the end of this course, the students will be able to:
1. Define the data science process
2. Understand different types of data description for data science process
3. Gain knowledge on relationships between data
4. Use the Python Libraries for Data Wrangling
5. Apply visualization Libraries in Python to interpret and explore data

Code of the Course: MIT9305T
Title of the Course: Cyber Forensies
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. List legal and ethical considerations in cyber investigations.
2. Explain digital forensic investigation methodologies.
3. Utilize file system analysis techniques for data recovery.
4. Evaluate real-world case studies in network forensic investigations.
5. Implement and Assess forensic analysis on mobile devices

Code of the Course: MIT9306T
Title of the Course: Digital Marketing
Course Learning Outcomes:
1. Recognize the significance of online marketing campaigns.
2. Explore web analytics tools for data-driven decision-making.
3. Conduct keyword research and implement on-page and off-page SEO.
4. Create successful social media advertising campaigns.
5. Develop effective email campaigns.

Code of the Course: MIT9307T
Title of the Course: Deep Learning
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Explain the basics in deep neural networks
2. Apply Convolution Neural Network for image processing
3. Apply Recurrent Neural Network and its variants for text analysis
4. Apply model evaluation for various applications
5. Apply autoencoders and generative models for suitable applications

Code of the Course: MIT9308T
Title of the Course: Digital Image Processing
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Enhance a poor quality image.
2. Develop and implement algorithms for digital image processing.
3. Explore the novel application of image processing.
4. Develop the coding of lossy compression techniques .
5. Analyse the image represent the point, line and edge representation.

Code of the Course: MIT9401T
Title of the Course: Fuzzy System and Algorithm
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Define fuzzy logic and its fundamental principles.
2. Identify the components and structure of Fuzzy Logic Controllers (FLCs).
3. Apply fuzzy classification methods in real-world datasets.
4. Evaluate fuzzy decision-making models and apply them to decision problems.
5. Develop fuzzy control systems for chaotic systems.

Code of the Course: MIT9402T
Title of the Course: Cloud Virtualization
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Define cloud computing and its key characteristics.
2. Interpret and contrast Type 1 (bare-metal) and Type 2 (hosted) hypervisors.
3. Apply knowledge of cloud service models (IaaS, PaaS, SaaS) to specific deployment scenarios.
4. Evaluate performance monitoring tools and optimization strategies for VMs.
5. Develop applications using serverless computing and Function as a Service (FaaS) platforms.

Code of the Course: MIT9403T
Title of the Course: Edge Computing
Course Learning Outcomes:
At the end of the course , Students would be able to:
1. Recall the key concepts of edge devices, edge networks, and edge analytics.
2. Explain different types of edge devices (sensors, gateways, servers) and their roles.
3. Utilize Edge Computing platforms (AWS Greengrass, Azure IoT Edge, Google Cloud IoT Edge) for deploying edge applications.
4. Evaluate the effectiveness of Edge Computing in industrial applications (manufacturing, logistics, healthcare) through case studies.
5. Propose future trends in Edge Computing, such as AI integration and synergies with 5G networks, based on current research and industry developments.

Curriculum of M.Tech (Software Engineering) Program
Department of Computer Science
Faculty of Engineering and Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Have advanced knowledge and skills in diverse areas of Computer Science and Engineering to develop real-world computing applications

PEO2: Be able to take up research oriented projects and entrepreneurship endeavors equipped with professional skills and team-work culture in Computer Science and Engineering.

PEO3: Have balanced insight into various advanced technologies in the field of Computer Science and Engineering through lifelong learning

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Design and analyze hardware and software systems in wide areas of Computer Science and Engineering

PSO2: Carryout Research & Development in the modern computing environment

SEMESTER –I

Code of the Course: MCS9101T

Title of the Course: Software Engineering Design Methodology

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Explain the importance of computer-assisted environments in software development.

2. Utilize Unified Modeling Language (UML) for software design and documentation.

3. Apply modeling tools to design interactions, use cases, activity diagrams, and state machines.

4. Understand the classification, features, strengths, and weaknesses of CASE tools.

5. Estimate project costs using methods such as Function Points and COCOMO.

Code of the Course: MCS9102T

Title of the Course: Software Architecture

Course Learning Outcomes:

At the end of the course, Students would be able to :

1. Understand the differences between functional and non-functional architectures.

2. Discuss the importance of separating policy and implementation, as well as interface and implementation.

3. Explain the concepts of implicit invocation, repositories, interpreters, process control, and heterogeneous architectures.

4. Discuss the importance of profiling, software libraries, testing, and debugging in the development environment.

5. Define and discuss key aspects of software quality including changeability, efficiency, and interoperability.

Code of the course: MCS9103T

Title of the course: Software Metrics and Software
Management

Course Learning Outcomes:

At the end of the course , Students would be able to :

1. Understand the fundamentals of Software Project Management (SPM) including its objectives and the management spectrum.

2. Learn about different types of Work Breakdown Structures (WBS) and how to organize personnel for a project.

3. Familiarize with error tracking and various types of software reviews.

4. Understand the objectives and principles of Software Quality Assurance (SQA) and testing.

5. Familiarize with various Software Project Management Tools including CASE Tools, Planning, and Scheduling Tools like MS-Project.

Code of the course: MCS9104T

Title of the course: Advanced Data Structures

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Explore multidimensional trees and their use cases in organizing data efficiently

2. Apply randomized algorithms in various applications, considering their advantages and limitations.

3. Understand algorithms for computing convex hulls and Voronoi diagrams.

4. Apply these algorithms to solve practical problems such as network flow optimization and matching.

5. Utilize linear programming and primal-dual algorithms in the design of approximation

algorithms.

Code of the course: MCS9105T

Title of the course: High Level System Design and Modeling

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the design representation of digital systems and the levels of abstraction involved.

2. Identify and comprehend state-oriented models such as finite-state machines, Petri nets, and hierarchical concurrent finite-state machines.

3. Recognize the characteristics of conceptual models in embedded systems design including concurrency, state transitions, hierarchy, and synchronization.

4. Analyze the advantages of executable specifications and the strengths of the PSM model including hierarchy, state transitions, concurrency, and exception handling.

5. Understand basic partitioning algorithms such as random mapping, hierarchical clustering, multistage clustering, group migration, radio cut, and simulated annealing.

Code of the Course: MCS9106T

Title of the Course: Client Server Based IT Solution

Course Learning Outcomes:

At the end of the course , Students would be able to :

1. Understand the concept of client-server technology and its role in heterogeneous computing environments.

2. Define the client-server model and its components, including motivations and terminology.

3. Define the client-server model and its components, including motivations and terminology.

4. Study interactive server algorithms, concurrent server algorithms, and address the problem of server deadlock.

5. Discuss the design of client-server applications using frameworks to enhance portability and maintainability.

M.Tech(SE) Syllabus for Semester-II

Code of the Course: MCS9201T

Title of the Course: Security Analysis of Software

Course Learning Outcomes:

At the end of the course , Students would be able to :

1. Understand the concepts of threats, risks, vulnerabilities, and safeguards in computer security.

2. Learn about access control mechanisms including access control matrix, access control lists, and capabilities.

3. Explore integrity policies such as the Biba model and Clark-Wilson model.

4. Understand the principles, models, architecture, and organization of intrusion detection systems.

5. Discuss the purposes and components of administrative policies including backup policies, email security, wireless policies, and incident response policies.

Code of the Course: MCS9202T

Title of the Course: Software Verification, Validation and Testing

Course Learning Outcomes:

At the end of the course, students would be able to:

1. Understand the terminology used in Verification and Validation (V&V) in software engineering.

2. Discuss the theoretical foundations behind V&V, including the impracticality of testing all data and paths.

3. Identify different types of software products including requirements, specifications, designs, implementations, and changes.

4. Understand various testing techniques and their applicability such as functional testing, structural testing, error-oriented testing, and integration strategies.

5. Explore V&V standards, problem tracking, test activity tracking, and assessment methodologies.

Code of the Course: MCS9203T

Title of the Course: Advanced Database System

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the principles and importance of Concurrency Control in Database Management Systems (DBMS).

2. Explore Semantic Database Models and Systems, including their advantages and applications.

3. Explore Extension Techniques for relational databases, including Object/Relational Systems and Open ODB.

4. Learn about SQL extensions for OODBMS, including User-Defined Abstract Data Types (ADT), Routines, and ADT Subtypes with Inheritance.

5. Understand Language Bindings for accessing and manipulating data in different programming languages within the context of database management systems.

Code of the Course: MCS9204T

Title of the Course: Distributed Operating System

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the motivation behind distributed systems and their significance.

2. Explore concepts such as Global State, Cuts of a Distributed Computation, and Termination Detection in distributed systems.

3. Analyze the performance of different Distributed Mutual Exclusion Algorithms through comparative analysis.

4. Study various Deadlock Detection Algorithms, including Centralized, Distributed, and Hierarchical approaches.

5. Study the Byzantine Agreement Problem and its applications and case studies of Distributed File Systems, including the SUN Network File System, CODA, and the X-Kernel Logical File System.

Code of the Course: MCS9205T

Title of the Course: Knowledge Management System

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand Knowledge Management from the system perspective to the organizational perspective.

2. Identify key components of Knowledge Management foundations and supporting technology.

3. Distinguish among Knowledge Management Processes and corresponding systems.

4. Analyze the impacts of Knowledge Management on people, process, product and organization.

5. Characterize and design Knowledge capture systems based on different methodologies and technologies

Code of the course: MCS9206T

Title of the course: Software Reliability

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the basic concepts and importance of Software Reliability.

2. Identify different classes of software reliability models.

3. Explore Time between Failure reliability models and their application in software reliability analysis.

4. Examine Fault Injection model of Software Reliability and its significance in software testing.

5. Learn techniques for modeling software reliability and predicting system behavior under different conditions.

Code of the Course: MCS9207T

Title of the Course: Software Quality Management

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the principles of Software Quality Management (SQM).

2. Analyze the representational theory of measurement and its implications in software metrics.

3. Interpret the results of software metrics analysis to make informed decisions.

4. Measure the structure of software products using structural measures.

5. Apply object-oriented metrics to evaluate the quality and performance of software systems built using a component-based approach.

Code of the course: MCS9208T

Title of the course: Software Reuse

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the concepts and importance of Software Reuse in Software Engineering.

2. Explore different aspects of Software Reuse, including Organizational, Technical, and Economic aspects.

3. Identify Usability Attributes of reusable software components.

4. Apply Abstraction and Parameterization Techniques in Object-Oriented Domain Engineering.

5. Explore various Software Reuse Technologies, including Component-Based Software Engineering and COTS (Commercial Off-The-Shelf) based development.

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SEMESTER-III
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Code of the Course: MCS9301T

Title of the Course: Digital Image Processing

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the concepts of image acquisition and digitization .

2. Classify image enhancement techniques and apply these techniques in both spatial and frequency domain.

3. Recognize the types of noise present in images and apply appropriate image restoration techniques. Categorize image segmentation techniques and apply these techniques

4. Analyze various image representation techniques & descriptors and understand its importance to computer vision.

5. Implement basic morphological image processing techniques on images and understand color models for images

Code of the Course: MCS9302T

Title of the Course: Embedded Software and System

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Understand the fundamental concepts of embedded systems, including their definition, characteristics, and various applications.
2. Learn cross-compilation and cross-debugging techniques essential for developing embedded software on different platforms.
3. Explore various processor architectures commonly used in embedded systems and understand their advantages and limitations.
4. Acquire knowledge of debugging techniques specific to embedded systems to identify and resolve software issues.
5. Implement secure coding practices and understand cryptographic algorithms used to enhance security in embedded systems.

Code of the Course: MCS9303T

Title of the Course: Sensor Network

Course Learning Outcomes:

At the end of the course, Student would be able to :

1. Understand the basic knowledge about wireless sensor networks.

2. Design/Architect sensor networks for various applications.

3. Analyze various communication models for an energy efficient sensor network.

4. Identify suitable routing protocols for wireless sensor networks.

5. Solve the problems related to the wireless sensor networks and evaluate the performance of sensor networks and identify bottlenecks.

Code of the Course: MCS9304T

Title of the Course: Agile Development Process

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Interpret the concept of agile software engineering and its advantages in software development.
2. Analyze the core practices behind several specific agile methodologies.
3. Identify the roles and responsibilities in agile projects and their difference from projects
4. Access implications of functional testing, Unit testing, and continuous integration.
5. Determine the role of design principles in agile software design.

Code of the Course: MCS9305T

Title of the Course: Software Engineering Economics

Course Learning Outcomes:

 At the end of the course, Students would be able to:

1. Understand the subject related concepts and contemporary issues

2. Solve social issues and engineering problems

3. Apply the Macroeconomics and Microeconomic in advance

4. Apply and practice software Eco system

5. An Ability to use techniques, skills and modern engineering tools necessary for Software Engineering Economics practice

Code of the Course: MCS9306T

Title of the Course: Object Oriented Analysis and Design

Course Learning Outcomes:

At the end of the course, Students would be able to:

1. Understand basic concepts of object oriented approach through unified process.
2. Compare herd software development life cycle through object oriented approach
3. Recognize the object modeling and emerging phases of UML with static and dynamic behavior for an interactive design process.
4. Identify the roles of classes and various relationships associated with the objects
5. Create classes as per object oriented design principles, standards and guidelines.

Post Graduate Diploma in Computer Application Program

Department of Computer Science

Faculty of Engineering and Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To develop the ability to excel in a professional career and/or higher education excellence through the knowledge acquisition of computing, mathematics, and information communication technology.

PEO2: To extend the capability to plan, analyze, design, code, test, enforce and hold the software program product.

PEO3: To excel in professionalism, moral attitude, conversation skills, team building, and adaptingthe latest ICT tools/techniques.

PEO4: To analyze real-world problems, design, and develop computing models/systems for multidisciplinary domains that are feasible, suitable, economical, and socially acceptable.

PEO5: To develop the capabilities to pursue higher studies and establish a research practice for the contribution to academia/industry and multidisciplinary research.

PEO6: To enhance the capabilities to initiate startups and become entrepreneurs in various domains of computer science and Information technology.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: The ability to remember and understand the basic concept of associated subjects and Computer Fundamentals, Computer Programming, Design, and Analyze different Network Techniques.

PSO2: The proficiency to understand, evaluate and analyse the design and algorithm concepts of computer architecture, Operating systems, Computer Networks, Software Engineering, Design and Analysis of Algorithms, Compiler Design, Artificial Intelligence, etc

PSO3: The ability to design and solve problems in the field of Interdisciplinary subjects by applying the knowledge acquired from Data analysis, Software development & other allied topics.

PSO4: The skills to develop, adopt, and assess the latest innovative industry best practices, then analyze and comprehend the young mindsets accordingly to their attitude toward higher studies, research, and to possess a successful path as a young entrepreneur.

PSO5: Analyze their abilities in systematic planning, developing, testing, and executing complex computing applications, in the field of Social Media and Analytics, Web Application Development, and Data Interpretations.

SEMESTER –I

Code of the Course: PCA8101T

Title of the Course: Introduction to IT

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. List and define information and its necessity in business organizations. Identify the qualities and value of information.

2. Explain the components of a computer system, including I/O and auxiliary storage devices.

3. Apply the characteristics of MS-DOS and Unix operating systems.

4. Analyze the basics of desktop publishing and identify common desktop publishing software packages.

5. Create and explain recent developments in information and communication technology (ICT).

Code of the course: PCA8102T

Title of the Course: Introduction to Programming

Course Learning Outcomes:

At the end of the course, Student would be able to:

1. Recall and analyze sorting algorithms, including selection, bubble, and insertion sorts.
2. Interpret and apply expressions, operators, and their precedence and evaluation order.
3. Apply one-dimensional and multi-dimensional arrays, including array handling techniques.
4. Analyze and use structures and unions, including pointer to structure, array of structure, and self-referential structures.
5. Implement read and write functions for data files.

Code of the Course: PCA8102P
Title of the Course: Introduction to Programming Lab.

Code of the Course: PCA8103T

Title of the Course: Operating System and Shell Programming

Course Learning Outcomes:

At the end of the course ,Student would be able to:

1. Recall the functions, characteristics, and structures of different types of operating systems including simple batch, multiprogramming, timeshared, personal computer, parallel, distributed, and real-time systems.

2. Interpret and contrast different page replacement algorithms.

3. Utilize and describe file system interfaces including access methods, directory structures, and protection mechanisms.

4. Evaluate I/O operations in the shell, use control structures, loops, and subprograms, and create shell scripts.

5. Design and Identify the key security problems and user authentication methods.

Code of the Course: PCA8105T

Title of the Course: Discrete Mathematics

Course Learning Outcomes:

At the end of the course, Student will be able to:

1. List the sets, relations, functions and discrete structures.
2. Explain logical reasoning for the problems.
3. Apply the Probability theory for the real world problems.
4. Analyze the problems and solve recurrence relations.
5. Develop and solve real world problems using graphs and trees.

Code of the Course: PCA8106T

Title of the course: Big Data

Course Learning Outcomes:

At the end of the course , Students would be able to:

1. Recall the concept of Basically Available Soft State Eventual Consistency (BASE).

2. Interpret and describe open-source technologies used for Big Data analytics.

3. Apply the 90/10 rule of critical thinking in data analysis.

4. Analyze target variables and use various predictive analytics techniques.

5. Design the need for Hadoop and why it is preferred over traditional RDBMS.

Code of the Course: PCA8107T

Title of the course: Management Information System

Course Learning Outcomes:
At the end of the course , Students would be able to:

1. Recall and define the meaning and various definitions of management..
2. Explain motivation and explain major theories of motivation including Maslow, Herzberg, and McGregor.
3. Utilize the economic, organizational, and behavioral impacts of information systems on organizations.
4. Analyze and explain major types of systems in organizations including ESS, MIS, DSS, and TPS.
5. Implement the importance of disaster management in the context of MIS and information security challenges.

Code of the course: PCA8201T

Title of the course: Advanced Database Management Systems

Course Learning Outcomes:

At the end of the course ,Students would be able to :

1. List the principles of relational databases and the basics of database design.

2. Describe and use complex data types, structured types, inheritance, and object identity in SQL.

3. Utilise aggregate functions and create complex queries in SQL.

4. Analyse techniques for transforming relational expressions, estimating statistics, and choosing evaluation plans for query optimization.

5. Implement concurrency control protocols, including lock-based, timestamp-based, validation-based protocols, and multiple granularity.

Code of the course: PCA8202T

Title of the course: Computer Organization

Course Learning Outcomes:

At the end of course ,Students would be able to :

1. Recall primary memory concepts, including bits, memory addresses, byte ordering, error-correcting codes, and cache memory.
2. Explain and design basic digital logic circuits, including combinational and arithmetic circuits.
3. Apply the technological and economic forces shaping the computer spectrum.
4. Evaluate the IJVM memory model, instruction set, and compilation from Java to IJVM.
5. Implement the addressing modes and introduction to assembly language programming throug Microprocessor.

Code of the course: PCA8203T

Title of the course: Object Oriented Programming

Course Learning Outcomes:

At the end of the course, Students would be able to :
1. List the structure and syntax of classes and objects in C++
2. Explain different types of inheritance: single, multilevel, hierarchical, hybrid, and multiple inheritance.
3. Apply how to override base class members in derived classes.
4. Evaluate container classes in practical applications.
5. Implement exception handling using try, throw, and catch blocks.

Code of the course: PCA8204T
Title of the course: Distributed Cloud Computing

Course Learning Outcomes:

At the end of the course , Student will be able to:

1. List the role of computer clusters in scalable parallel computing.
2. Explain the concept of cloud computing and its fundamental system model.
3. Utilize knowledge about Service Oriented Architecture (SOA) and its components like services, message-oriented middleware, and workflow in SOA.
4. Evaluate CryptDb and the various onion encryption layers, including DET (Deterministic Encryption), RND (Randomized Encryption), OPE (Order-Preserving Encryption), JOIN, SEARCH, HOM (Homomorphic Encryption), and FPE (Format-Preserving Encryption).
5. Design and implement models to define database structure and relationships using Django's ORM.

Code of the course: PCA8205T

Title of the course: Software Testing

Course Learning Outcomes:

At the end of the course , Students will be able to:

1. Recall and Understand the terminology used in software verification and validation (V&V).
2. Explain the impracticality of testing all possible data inputs and execution paths in a software system.
3. Apply and Identify different types of software products, including requirements, specifications, designs, implementations, and changes.
4. Analyse the levels of software testing: Unit testing, integration testing, system testing, and regression testing.
5. Implement problem tracking and test activity tracking mechanisms.

Code of the course: PCA8206T

Title of the course: System Programming

Course Learning Outcomes:

At the end of the course, Student will be able to:

1. Recall and explain C programming language fundamentals including variables, loops, control flow, and pointers.

2. Interpret the representation of integers and floating-point numbers in computer systems.

3. Utilize pointers effectively for memory management and data manipulation in C programming.

4. Analyze memory hierarchy and caching mechanisms to optimize memory usage in programs.

5. Develop multi-threaded applications using processes and threads for concurrent programming.