B.Sc. Computer Science

Programme-Specific Objectives

1. To provide a strong basis in the science of computers.
2. To provide a firm grounding in the Mathematics involved in computation, in order to enable the above.
3. To prepare and motivate the student to pursue higher studies in the area of Computer Science / Applications / Technology.
4. To prepare the student with the skills necessary to gain meaningful employment in the area of software development and related areas.
5. Overall, to provide an ambience for the student to gain knowledge and skills in currently important aspects of Computer Science and to pursue a specialization of her choice.
6. To also equip the student with language and communication abilities, an appreciation for other disciplines and skills, a social and environmental consciousness and a strong value base.

Course Objectives and Outcomes

Semester 1

1) 1MCS01 - Introduction to Computers and Digital Logic

Objectives:

1. To learn the functional units of a digital computer and various representation codes.
2. To learn the basic logic gates.
3. To learn to simplify Boolean functions.
4. To learn to design combinational circuits.
5. To learn sequential circuits, both synchronous and asynchronous.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand number systems, conversions among them and binary arithmetic.
2. Solve conversion and arithmetic problems in binary and decimal number systems using complements.
3. Use various techniques learnt to simplify Boolean functions and design gated circuits to realize the Boolean functions.
4. Understand specific real-world problems, formulate the problem as a Boolean function and design combinational circuits from scratch to solve the problem.
5. Explain the basic types and circuitry of flip-flops and registers.
6. Explain the design of asynchronous and synchronous counters.

2) 1MCS02a - Problem Solving Techniques

Objectives:

1. To imbibe a systematic approach to problem solving.
2. To learn C language and implement solutions using the various features of C.
3. To learn efficient algorithms to solve standard basic problems thus laying a firm foundation for designing algorithmic solutions to problems.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the notions of algorithms, programs and problem solving strategies.
2. Write C programs to solve simple problems.
3. Identify and fix bugs in / determine output of a given code snippet.
4. Explain the approach and algorithms to solving specific basic problems learnt.

3) 1MCSP1a - Practical I: Problem Solving Techniques Laboratory

Objectives:

1. To learn to code, debug and execute programs in C Language in an IDE.

Outcomes:

Upon completion of the course, the student will be able to

1. Code, debug and execute a C program in an IDE.
2. Implement the algorithms for the given problems in C.

4) 1AMCS1 - Allied Mathematics I

Objectives:

1. To learn the theory of equations, calculus, graph theory and numerical methods in order to provide a firm mathematical foundation.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concepts of equations and apply the methods of finding the roots of equations.
2. Apply Integral Calculus to solve specific problems.
3. Understand graph theory.
4. Apply numerical methods to solve algebraic and transcendental equations.
5. Solve numerical interpolation problems using various formulae.

Semester 2

5) 2MCS03 - Computer Architecture

Objectives:

1. To learn the concepts that are building blocks of computer architecture.
2. To learn Control Unit design.
3. To know the concepts of pipelining.
4. To learn the architecture of I/O Interface and Memory.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the fundamentals of Register Transfer Language.
2. Write any given expression in various instruction formats.
3. Calculate effective address of operands in a given instruction, for various addressing modes.
4. Understand design of the Control Unit.
5. Apply computer arithmetic algorithms to solve simple problems.
6. Explain the concept of pipelining and design a pipeline for a simple problem.
7. Explain I/O Interface concepts.

8. Explain the architecture and working of Main Memory, Associative Memory and Cache Memory.

6) 2MCS04a – Object Oriented Programming with C++

Objectives:

1. To appreciate the need for and characteristics of object orientation.
2. To learn the grammar of and to use the programming constructs of the C++ programming language.
3. To learn to implement programs in C++ covering the object-oriented concepts.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the various basic concepts of Object-orientation.
2. Conceptualize a given problem in an object-oriented way.
3. Write a program to solve simple problems, by applying the concepts of object orientation and basic features of C++.
4. Find any bug in a given program snippet and fix it.
5. Determine the output of a given program snippet.

7) 2MCSP2a - Practical II: C++ Laboratory

Objectives:

1. To learn to code, debug and execute programs in C++ in an IDE.

Outcomes:

Upon completion of the course, the student will be able to

1. Design classes and draw class diagrams for the given problems.
2. Write programs in C++.
3. Code, debug and execute a C++ program to solve the given problems in an IDE.

8) 2AMCS2 - Allied Mathematics II

Objectives:

1. To learn the theory of matrices, differential equations, Laplace and Fourier transforms and numerical methods in order to provide a firm mathematical foundation.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concept of matrices and their manipulations.
2. Solve differential equations.
3. Understand the Laplace Transform and its applications.
4. Understand the Fourier series and solve problems.
5. Use numerical methods to solve integration and differential equation problems.

Semester 3

9) 3MCS05 - Data Structures and Algorithms

Objectives:

1. To learn linear and non-linear data structures.
2. To learn the basic algorithmic approaches and simple applications of the same.
3. To learn specific searching and sorting algorithms.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the various linear and non-linear data structures.
2. Describe the computer representation of linear and non-linear data structures.
3. Choose the appropriate data structure for simple problems.
4. Given a binary tree, traverse the tree using the traversal algorithms learnt.
5. Given a graph, traverse the graph using the traversal algorithms learnt.
6. Understand the algorithmic design strategies of Divide-and-Conquer, Greedy and Dynamic Programming and know how these strategies are applied to solve the given specific problems.
7. Explain specific searching and sorting algorithms and their characteristics.
8. Understand how to apply the specific algorithms learnt for searching and sorting, to solve any given problem.

10) 3MCS06a – Programming in Java

Objectives:

1. To understand the basic characteristics of Java.
2. To know the principles of packages and interfaces.
3. To learn exceptions and I/O streams.
4. To learn Threads in Java.
5. To understand AWT controls.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the various concepts and constructs involved in Java programming language.
2. Develop Java programs using basic Java constructs, interfaces and packages.
3. Design and develop user-defined exceptions.
4. Develop Java applications with threads.
5. Develop interactive Java Applet programs.
6. Develop programs with AWT controls.
7. Identify bugs in given code snippets and fix them.
8. Determine the output of a given program snippet.

11) 3MCSP3a - Practical III: Java Laboratory

Objectives:

1. To learn to code, debug and execute programs in Java.

Outcomes:

Upon completion of the course, the student will be able to

1. Write simple programs in Java.
2. Code, debug and execute a Java program to solve the given problems.
3. Create applications using Applets and AWT.

12) 3APCS1 - Allied Physics I

Objectives:

1. To gain knowledge of the fundamental concepts of Physics and the application of Mathematics in the physical world.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand properties of matter, statics and dynamics.
2. Understand the concepts of sound and wave mechanics.
3. Understand the fundamentals of low temperature Physics and its uses.
4. Understand the properties of light.
5. Understand basic concepts of Semiconductor Physics, electronic gates, combinational circuits and sequential circuits.

Semester 4

13) 4MCS07a - Markup and Scripting Languages

Objectives:

1. To understand the difference between server-side and client-side programming.
2. To learn HTML5 for designing web pages.
3. To learn XML to represent data and create user-defined tags.
4. To learn scripting languages for client-side programming.

Outcomes:

Upon completion of the course, the student will be able to

1. Design simple web pages using HTML5 and XHTML.
2. Represent web data and create user-defined tags using XML.
3. Use JavaScript, VBScript and PHP to develop client-side scripting.
4. Create interactive web sites using PHP and MySQL/SQL.
5. Explain the various concepts and language constructs learnt in HTML5, XML, Javascript, VBScript and PHP.
6. Spot errors and debug code in any of these markup or scripting languages.
7. Determine the output of a code snippet.

14) 4MCS08 - Operating Systems

Objectives:

1. To learn the basic concepts and responsibilities of operating systems.
2. To understand any operating system based on the concepts studied.

Outcomes:

Upon completion of the course, the student will be able to

1. Articulate the main concepts, key ideas, strengths, limitations and core issues of operating systems.
2. Explain and solve problems using process and resource management algorithms.
3. Understand process synchronization.
4. Explain and solve problems using algorithms in deadlock handling.
5. Describe memory management techniques.
6. Calculate physical memory address, given a virtual memory address, based on the memory architecture.
7. Apply page replacement algorithms to solve problems.
8. Explain the basic concepts of file management.
9. Use disk scheduling algorithms to calculate effective access time.

15) 4MCS09 - Computer Graphics

Objectives:

1. To learn the basic concepts of computer graphics devices.

2. To learn the mathematical basis of and how to apply 2D and 3D transformation.
3. To learn about plane and space curves.
4. To learn some fundamental algorithms in raster scan graphics.
5. To learn various clipping and hidden line and hidden surface removal algorithms.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the working of various 2D graphical devices.
2. Know the mathematical basis for 2D and 3D transformations.
3. Apply 2D and 3D transformations on a graphical image.
4. Explain the basic types of curve representations.
5. Understand basic algorithms for line-drawing, circle-drawing, image compression and polygon-filling for raster scan systems.
6. Apply clipping and hidden line/surface removal algorithms.

16) 4MCSP4b - Practical IV: Markup and Scripting Languages Laboratory

Objectives:

1. To design interactive web pages using Scripting languages, Markup languages and a database, using an IDE.

Outcomes:

Upon completion of the course, the student will be able to

1. Design simple web pages using the markup languages, HTML and XHTML.
2. Create dynamic web pages using Javascript, VBScript and PHP.
3. Represent web data using XML while creating websites.
4. Develop a program implementing cookies both using JavaScript and using PHP.
5. Use MySQL/SQL and PHP to design pages with data stored in a database.

17) 4APCS2 - Allied Physics II

Objectives:

1. To gain knowledge of the fundamental concepts of Physics and the application of Mathematics in the physical world.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concepts of modern Physics such as Nuclear Physics and Relativity.
2. Understand the concepts of electricity and magnetism.
3. Understand the fundamentals of communication electronics.
4. Understand the basic concepts in fibre optics.
5. Understand the basic concepts of basic electronic devices.

18) 4APCSP - Allied Physics Practical

Objectives:

1. To gain practical knowledge of the fundamental concepts of Physics.

Outcomes:

Upon completion of the course, the student will be able to

1. Gain a clear, practical understanding through lab experiments, of properties of matter, sound, light, electricity and magnetism, semiconductors and electronics.

Semester 5

19) 5MCS10b – Web Application Development

Objectives:

1. To learn the concepts of Web 2.0 and ASP.NET.
2. To learn programming in C#.
3. To learn to interface databases with the web application using ADO.NET.

Outcomes:

Upon completion of the course, the student will be able to

1. Develop web applications using C# in the .NET Framework.
2. Explain the various concepts of ASP.NET and programming constructs and features of C#.
3. Create a web page and use ASP.NET controls.
4. Explain the concepts of ADO.NET.
5. Write code to interface a web application with a database using ADO.NET.
6. Understand the exception handling mechanism in ASP.NET and write code to implement this in programs.
7. Identify bugs in a C# code snippet and fix them.
8. Determine the output of a given C# code snippet.

20) 5MCS11 - Computer Networks

Objectives:

1. To learn the basic terminology of computer networking.
2. To learn OSI Reference Model with the functions of and protocols and algorithms involved in each layer.
3. To learn basics of TCP/IP protocol suite.

Outcomes:

Upon completion of the course, the student will be able to

1. Describe the basic aspects of computer networks, viz. network topologies, transmission modes, network categories, protocols and standards.
2. Understand in order to compare and contrast the features of OSI Reference Model and TCP/IP protocol suite.
3. Explain the responsibilities of each of the seven network layers.
4. Understand the protocols and algorithms connected with each layer.
5. Solve problems using error detection and correction methods.
6. Apply routing algorithms to calculate the shortest route in a given network.
7. Apply the Token Bucket Algorithm to avoid congestion in a given network.

21) 5MCS12b – Personal Software Process

Objectives:

1. To learn the concept of software process and PSP.
2. To learn the various phases in a software project and the importance of planning.
3. To learn the key software metrics.
4. To learn the basics of software quality management.
5. To learn the Agile Process Model.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concepts and importance of software process and the application of PSP.
2. Explain the basics of project planning.
3. Describe the important metrics used in measuring software size, and estimating software size, resources and schedule.
4. Estimate software size using function point method and PROBE size estimating method.
5. Articulate the important PSP metrics in the GQM paradigm.
6. Explain the concepts involved in software quality including benchmarking, yield management and defect removal and prevention.
7. Describe the aspects of design in the software process.
8. Understand the Agile Process Model.

22) 5MCS13a – Microprocessors

Objectives:

1. To learn the architecture and instruction set of the 8085 microprocessor.
2. To learn the basic concepts of select programmable interface devices.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the various aspects of the architecture of the 8085 microprocessor.
2. Know the instruction set of the 8085 microprocessor.
3. Explain the 8085 stack, subroutines and interrupts.
4. Write simple assembly language programs.
5. Explain the basic concepts of interfacing devices with the 8085 microprocessor.
6. Learn the architecture and pin functions of select programmable interface devices.

23) 5MCS14b - Database Management Systems

Objectives:

1. To understand the need for and functions & benefits of DBMSs.
2. To learn the E-R model and basic operations of Relational Algebra.
3. To learn Relational Database concepts and Normalization concepts.
4. To learn SQL.
5. To learn the fundamental concepts of transaction processing and database system architectures.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the characteristics and components of database management systems.
2. Understand E-R Model and construct an E-R diagram for a given simple database.
3. Know the fundamental operations of Relational Algebra and construct expressions.
4. Describe the features of an RDBMS.
5. Write DDL statements and SQL queries.
6. Detect and fix errors in SQL statements, and identify the output of given code.
7. Explain the use of assertions and triggers, and write SQL code to implement them.
8. Understand normalization concepts and compare the various normal forms.

9. Understand transaction management and storage file structure of DBMSs.
10. Describe the various types of database system architectures.

24) 5MCSP5b - Practical V: Web Application Development Laboratory

Objectives:

1. To learn to code, debug and execute programs in C# on the ASP.NET framework.

Outcomes:

Upon completion of the course, the student will be able to

1. Develop simple web application using ASP.NET controls.
2. Code, debug and execute a C# program to solve the given problems using the .NET framework.
3. Interface a .NET web application to a database using ADO.NET.

25) 5MCSP6b - Practical VI: Database Management Systems Laboratory

Objectives:

1. To learn to create a database of tables for a given schema, and write SQL code or PL/SQL block to implement queries / triggers on the database.

Outcomes:

Upon completion of the course, the student will be able to

1. Create a database with requisite tables, primary keys and foreign keys.
2. Write SQL code / PL/SQL block to implement given queries and triggers.

Semester 6

26) 6MCS15b - The UNIX Operating System

Objectives:

1. To understand the salient features and components of UNIX.
2. To learn the basic commands and utilities of UNIX.
3. To learn UNIX Shell programming.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the structure of UNIX operating system and file system.
2. Understand the various types of commands in UNIX.
3. Understand pipes, filters and redirections.
4. Write shell scripts using basic commands and filters.
5. Explain shell script commands and program constructs.
6. Spot bugs in shell scripts or code snippets and debug them.
7. Determine the output of a given shell script of program code.

27) 6MCS16a – Mobile Application Development

Objectives:

1. To learn the components and structure of mobile application development frameworks for Android OS based mobiles.
2. To learn how to develop simple android applications.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the basics of Android devices and the Android platform.
2. Explain the basic building blocks of Android programming required for App development.
3. Explain the components used in Activity Life Cycle.
4. Understand how to create basic user interfaces with layouts, views and fragments.
5. Explain persistence and data storage mechanism in Android.
6. Describe advanced application concepts like Networking, Animations and Google Maps services.
7. Develop and publish Android applications to Android Market.

28) 6MCS17a - Cloud Computing

Objectives:

1. To understand the concept of and need for cloud computing.
2. To learn of the different types of cloud services.
3. To become familiar with some of the organizations providing cloud services and the various pros and cons of cloud services.
4. To gain an appreciation of the emergence of cloud as an essential collaborating computing paradigm.

Outcomes:

Upon completion of the course, the student will be able to

1. Explain the main concepts, strengths and limitations of cloud computing.
2. Articulate the ways in which cloud computing is relevant to all.
3. Describe the various services that are available on the cloud.
4. Understand how to use cloud storage and services.
5. Understand how collaboration on cloud services is done.

29) 6MCS18a - Artificial Intelligence

Objectives:

1. To gain an understanding of what Artificial Intelligence is nd an appreciation of the kind of problems AI can help solve.
2. To learn the heuristic search and knowledge representation concepts that are fundamental to Artificial Intelligence.
3. To learn Game Playing techniques, types of learning and fundamentals of Expert Systems.
4. To learn the basic programming paradigm in the AI programming languages LISP and PROLOG.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the need and basic concepts of Artificial Intelligence.
2. Understand the algorithms involved in heuristic search.
3. Understand the importance and basics of knowledge representation.
4. Learn the concepts in game playing and working of the Minimax and Iterative deepening procedures.
5. Know the basics of AI programming languages, specifically LISP and PROLOG.
6. Understand the types of Learning.

7. Explain the basics concepts of Expert Systems.

30) 6MCSP7b - Practical VII: UNIX Programming Laboratory

Objectives:

1. To learn to code, debug and execute programs in UNIX using shell scripts.

Outcomes:

Upon completion of the course, the student will be able to

1. Write shell scripts.
2. Code, debug and execute shell scripts.
3. Solve the given problems through shell scripts.

31) 6MCSP8a - Practical VIII: Mobile Application Development Laboratory

Objectives:

1. To learn to code, debug and run Android Apps using Android Studio.

Outcomes:

Upon completion of the course, the student will be able to

1. Write programs to create Android Apps.
2. Code, debug and run the programs.
3. Create Apps for the given problems through Android programming.
4. Design and develop simple Android Apps.

Elective Stream 1

1) 5ECS1DS - Distributed Systems

Objectives:

1. To learn the basic hardware and software requirements of a distributed system.
2. To learn the different aspects of distributed system architecture.

Outcomes:

Upon completion of the course, the student will be able to

1. To explain the concepts of distributed systems at the hardware and software levels.
2. To understand the concepts of remote procedure call.
3. To know the concept of processes with repsect to distributed systems, and the challenges involved, viz. threads, naming, consistency and replication.
4. To know the synchronization algorithms.
5. To understand the concept of fault tolerance and security mechanisms.
6. To explain the architecture of object-based systems and distributed file systems, with special reference to CORBA and NFS.

2) 6ECS2MC - Mobile Communications

Objectives:

1. To learn the concepts of mobile communication, various modulation techniques, coding and medium access control techniques used in mobile communication.
2. To gain familiarity with the mobile network protocol stack and its functions.
3. To learn basics of satellite systems in this context and wireless LAN.

Outcomes:
Upon completion of the course, the student will be able to

1. Understand the fundamental concepts of mobile communications and wireless transmission.
2. Explain the concept and aspects of modulation.
3. Differentiate between the different medium access control methods, viz. CDMA, SDMA, TDMA and FDMA.
4. Explain the applications and basic concepts of Satellite systems.
5. Understand the architecture of Wireless LAN technologies.
6. Understand the Mobile network layer and its characteristics.

Elective Stream 2

1) 5ECS1NS - Network Security

Objectives:

1. To learn the importance of network security and its principles and basic concepts.
2. To gain familiarity about the various internet security protocols

Outcomes:
Upon completion of the course, the student will be able to

1. Understand the need for security and the different approaches and principles of security.
2. Describe the various internet security protocols.
3. Explain the concept and types of user authentication, and Kerberos concepts.
4. Understand the concepts of firewalls and VPNs.
5. Explain the aspects of cryptography through case studies.

2) 6ECS2CR – Cryptography

Objectives:

1. To learn the evolution of cryptographic systems.
2. To understand public key encryption standards, algorithms and protocols.
3. To learn the concepts of message authentication and digital signatures.

Outcomes:
Upon completion of the course, the student will be able to

1. Understand the important role of cryptography in network security.
2. Learn of various encryption techniques from classical to modern.
3. Understand the important aspects of number theory used in cryptography.
4. Understand the RSA algorithm and connected protocols.
5. Learn the importance of message authentication and understand the secure hash algorithm.
6. Describe the technique, protocols and standards for digital signature.

Elective Stream 3

1) 5ECS1CD - Principles of Compiler Design

Objectives:

1. To learn the various aspects involved in compiler design.

2. To acquire knowledge of the design aspects in the various steps of a language compiler.

Outcomes:
Upon completion of the course, the student will be able to
1. Understand the various aspects of compiler design.
2. Explain the steps involved in the design of a lexical analyser.
3. Describe the various types of parsers and the design aspects involved.
4. Understand syntax-directed translation schemes and symbol tables.
5. Learn about Code Optimization principles and Code generation.
6. Understand code optimization techniques.

2) 6ECS2UN - System Programming with UNIX

Objectives:
1. To gain an in-depth knowledge of the architecture and APIs of the UNIX operating system and file system.

Outcomes:
Upon completion of the course, the student will be able to
1. Understand UNIX operating system and file system architecture.
2. Learn processes, signals, sockets and related data structures and kernel support.
3. Learn file, process, signals and sockets concepts and APIs.
4. Learn System V messages, semaphores and shared memory concepts and APIs.

Elective Stream 4

1) 5ECS1DA - Design and Analysis of Algorithms

Objectives:
1. To learn how to measure performance of an algorithm.
2. To learn various algorithm design strategies.
3. To gain a good understanding of how to derive performance metrics for algorithms and understand how to compare them.

Outcomes:
Upon completion of the course, the student will be able to
1. Appreciate the need for performance measurement of algorithms and asymptotic notation.
2. Explain the various algorithmic design strategies with their characteristics.
3. Write and explain algorithms for specific problems, keeping to one of these design strategies.
4. Analyze the specific algorithms and express their performance complexity in asymptotic notation.
5. Understand lower bound theory and methods to establish the lower bound for solving specific problems.

2) 6ECS2PA - Parallel Algorithms

Objectives:
1. To learn the fundamentals of parallel processing.

2. To learn to visualize specific known algorithms as parallel algorithms.

Outcomes:
Upon completion of the course, the student will be able to

1. Appreciate the need for parallel algorithms in the modern computing scenario.
2. Understand the PRAM algorithm and optimization.
3. Learn specific elementary parallel algorthms.
4. Implement matrix multiplication as parallel algorithm.
5. Learn various sorting methods as parallel algorithms.
6. Understand how specific algorithms on graphs can be designed as parallel algorithms.

Elective Stream 5

1) 5ECS1IP - Digital Image Processing

Objectives:

1. To gain knowledge of the various characteristics and aspects of digital images.
2. To learn how to apply spatial and frequency filters for intensity and image enhancements.
3. To learn the methods of image segmentation.
4. To learn the basics of colour image processing.

Outcomes:
Upon completion of the course, the student will be able to

1. Understand the fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
2. Understand the concept of filters.
3. Understand simple image enhancement techniques in spatial and frequency domains.
4. Explain image segmentation techniques.
5. Learn the basics of colour image processing.

2) 6ECS2LP - Natural Language Processing

Objectives:

1. To learn the basic concepts of natural language processing and the associated mathematical concepts.
2. To learn the concept of parsing of context-free grammars with respect to English.
3. To learn lexical, syntactic and semantic processing concepts for English language processing.
4. To understand the complexities and methods of word sense disambiguation.

Outcomes:
Upon completion of the course, the student will be able to

1. Understand language models and algorithms.
2. Understand the use of automata in English language parsing.
3. Learn of the various classes of words and parts of speech in English and to understand the method of tagging PoS.
4. Learn to represent English as a context-free grammar.
5. Understand how to parse sentences in the lexical, morphological, syntactic and semantic levels.

6. Understand the challenges and solutions in word sense disambiguation.

Elective Stream 6

1) 5ECS1DM - Data Mining

Objectives:

1. To appreciate the types of problems for which Data Mining is used.
2. To learn the various issues involved in Data Mining, and how to handle them.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the concept of data discovery in various types of databases, and the need for data mining.
2. Understanding the various methods of data preprocessing.
3. Understand the need for data reduction and strategies to perform data reduction.
4. Learn the rules and algorithms involved in association rule mining.
5. Understand supervised and unsupervised learning techniques, including classification, prediction and clustering.

2) 6ECS2DW - Data Warehousing

Objectives:

1. To understand the building blocks, architecture, principles and quality control in the context of data warehousing.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the fundamental concepts of data warehousing.
2. Explain the various aspects of planning and warehouse project management.
3. Describe the architectural components of a DW.
4. Understand the decision-making process for selection of infrastructure for a DW.
5. Understand the dimensions of quality control with respect to a DW.
6. Learn the importance of OLAP, its features and functions.

Subjects in Part IV

1) OVE – Value Education

Objectives:

1. To imbibe a sense of personal, community, societal, environmental, cultural and national values.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand why values are essential for living.
2. Know one’s personal, civic, community, societal and environmental responsibilities and the importance of adhering to them.
3. Appreciate the greatness of India’s art, culture, heritage and traditions.
4. Strengthen own patriotic values and respect for the country.

2) OEST - Environmental Studies (Theory)

Objectives:

1. To study the nature of and facts about the environment.
2. To appreciate the importance of the environment by assessing its impact on the human world.
3. To study the dynamic processes and understand the features of the earth's interior and surface.
4. To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the issues and conservation measures related to all types of renewable and non-renewable resources.
2. Explain the concept and types of Ecosystems.
3. Understand Biodiversity and its conservation,
4. Describe the types of Pollution, and its prevention and control measures.
5. Understand the impact of Human Population.

3) OESPV - Environmental Studies Project and Viva-Voce

Objectives:

1. To undertake a field trip that gives a practical exposure to some aspect of the environment that was studied. This is in order to develop an appreciation for the environment and a deeper understanding of its importance.

Outcomes:

Upon completion of the course, the student will be able to

1. Correlate what has been studied regarding the environment and the knowledge gained during the field trip.
2. Create a project report covering the knowledge gained during the field trip, relating it with what was learnt about the environment.
3. Cogently present the project work and answer questions on the project report.

4) SAR1 - Analytical Reasoning I

Objectives:

1. To gain mathematical and verbal reasoning skills in preparation for various competitive examinations.

Outcomes:

Upon completion of the course, the student will be able to

1. Solve problems in the given areas of objective arithmetic using simple methods and tricks.
2. Solve verbal reasoning problems of the given types.
3. Improve the speed of calculations while solving such problems.

5) SAR2 - Analytical Reasoning II

Objectives:

1. To gain mathematical and verbal reasoning skills in preparation for various competitive examinations.

Outcomes:

Upon completion of the course, the student will be able to

1. Solve problems in the given areas of objective arithmetic using simple methods and tricks.
2. Solve verbal reasoning problems of the given types.
3. Improve the speed of calculations while solving such problems.

6) SAR3 - Analytical Reasoning III

Objectives:

1. To gain mathematical and verbal reasoning skills in preparation for various competitive examinations.

Outcomes:

Upon completion of the course, the student will be able to

1. Solve problems in the given areas of objective arithmetic using simple methods and tricks.
2. Solve verbal reasoning problems of the given types.
3. Improve the speed of calculations while solving such problems.

7) OQCC - Quality Control Circles (Theory)

Objectives:

1. To develop the skill to solve problems using a systematic approach, both as an individual and in a team.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the importance, functions and structure of quality control circles.
2. Identify problems and formulate them in a formal, structured manner.
3. Understand and use the various problem solving tools.
4. Understand and implement the process of PDCA to solve problems.
5. Gain an understanding of leadership and motivation.

8) OQCCP - Quality Control Circles (Presentation)

Objectives:

1. To work as a part of a Quality Control Circle.
2. To identify and solve problems.
3. To develop team spirit and leadership qualities.
4. To acquire presentation skills.

Outcomes:

Upon completion of the course, the student will be able to

1. Function as a part of a Quality Control Circle.
2. Identify and solve problems in a team as part of QCC.

3. Understand the importance of team work and leadership in a QCC.
4. Learn to make presentations of solved problems to an audience, effectively and within a stipulated time.

9) SMMT – Multimedia (Theory)

Objectives:

1. To learn the fundamental aspects of multimedia systems.
2. To learn the basics of Adobe Photoshop for image manipulation.
3. To learn Macromedia Flash to create basic 2D animation.
4. To develop an interest in image editing and animation.

Outcomes:

Upon completion of the course, the student will be able to

1. Describe the features, concepts and types of multimedia systems.
2. Describe the features, tools and techniques available in Adobe Photoshop.
3. Describe the features, tools and techniques available in Macromedia Flash.

10) SMMP – Multimedia (Practical)

Objectives:

1. To learn to use some of the tools available in Adobe Photoshop for image editing.
2. To learn to use some of the tools available in Macromedia Flash for 2D animation.

Outcomes:

Upon completion of the course, the student will be able to

1. Use basic tools and techniques of Adobe Photoshop and Macromedia Flash.

11) SOST - Office Suite Specialist (Theory)

Objectives:

1. To learn to use the important features of Microsoft Word, Excel and Powerpoint effectively.

Outcomes:

Upon completion of the course, the student will be able to

1. Understand the powerful features of the word processor, spread sheet and presentation software provided by Microsoft in its Office Suite.
2. Understand how to use the various features in Microsoft Word, Excel and Powerpoint to effectively create documents, spreadsheets and presentations.

12) SOSP - Office Suite Specialist (Practical)

Objectives:

1. To gain hands-on experience in using the various features of Microsoft Word, Excel and Powerpoint in an efficient way.

Outcomes:

Upon completion of the course, the student will be able to

1. Work with documents, edit & format text, and do proofing, printing and publishing with Word.
2. Use Excel to enter, manage and format data and cells.
3. Use formulae in Excel.

4. Create presentations and use themes, layouts, transitions, animation and master slides in Powerpoint.
5. Use pictures, graphics, shapes, tables, charts, SmartArt, notes, objects, sound and video in Powerpoint presentations.