



COSMOPOLITAN'S
VALIA C.L. COLLEGE OF COMMERCE & VALIA L.C. COLLEGE OF ARTS
D. N. Nagar, Andheri (West), Mumbai 400 053

**PROGRAM OUTCOMES, PROGRAM
SPECIFIC OUTCOMES & COURSE
OUTCOMES**

**Bachelor of Science
(Information Technology)**

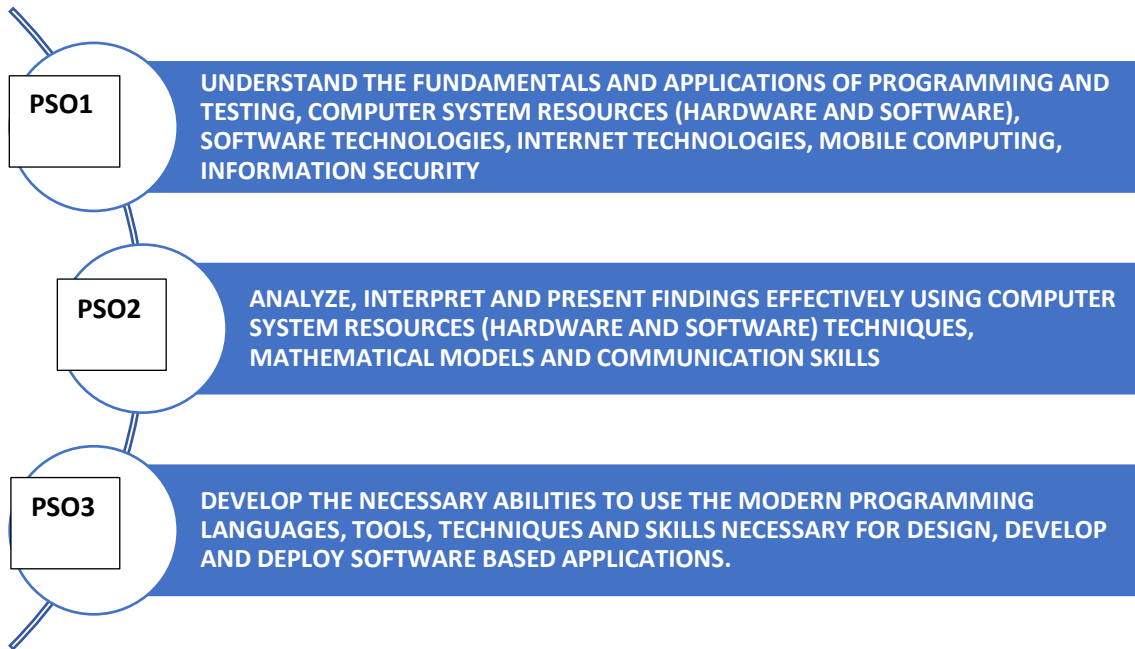
PROGRAM- Bachelor of Science (Information Technology)

PROGRAM CODE: 42300003

PROGRAM OUTCOMES

- PO1** Critical Thinking
- PO** Effective Communication
- PO** Social Interaction
- PO** Effective Citizenship
- PO5** Ethics
- PO** Environment and Sustainability
- PO** Self Directed and Lifelong Learning

PROGRAM SPECIFIC OUTCOMES



SEMESTER I

Course: Imperative Programming

COURSE OUTCOMES

- CO-1** Define various concepts and constructs of C programming.
- CO-2** Discuss the use of different constructs of C Programming (If-else, loops, Switch-case, functions, pointers, structures, unions etc.).
- CO-3** Apply different constructs of C programming to given problems.
- CO-4** Compare and contrast different concepts of C programming.
- CO-5** Evaluate the need of the concepts and constructs of C programming.
- CO-6** Create programs to solve given problems using C programming language.

Course: Digital Electronics

COURSE OUTCOMES

- CO-1** State different types of number system, their conversion and use in electronic world
- CO-2** Explain various components to design stable antilog circuits
- CO-3** Solve the problem of Minimizing the Boolean expression using Boolean algebra and design it using logic gates
- CO-4** Compare various code convertor in digital electronics
- CO-5** Summarize the importance of digital circuits
- CO-6** Design combinational and logic circuits

Course: Operating Systems

COURSE OUTCOMES

- CO-1** Describe the concept of various computer system resources.
- CO-2** Understand the role of operating system in resource management and explain various resource management mechanism.
- CO-3** Examine various resource management issues and find its solution.
- CO-4** Compare and contrast different generations of operating systems and virtualization techniques.
- CO-5** Evaluate the outcome of various commands on Linux and Windows operating system.
- CO-6** Design deadlock prevention and avoidance technique and perform operating system virtualization.

Course: Discrete Mathematics

COURSE OUTCOMES

- CO-1** Define set theory, well ordering principle and Graphs.
- CO-2** Explain language of sets and apply fundamental principle of counting
- CO-3** Illustrate isomorphism of Graphs and trees.
- CO-4** Investigate the statements true for all natural numbers, using mathematical induction.
- CO-5** Evaluate and interpret the information given, graphically.
- CO-6** Create a program in SciLab to solve various mathematical problems like permutation and combination.

Course: Communication Skills

COURSE OUTCOMES

- CO-1** Define and describe various aspects of workplace communication with the help of Seven Cs of Communication
- CO-2** Explain and classify the methods of business communication
- CO-3** Employ strategic business communication techniques and develop the skill to write formal letters
- CO-4** Compare and contrast corporate communication methods and channels
- CO-5** Experiment and evaluate the oral communication skills required in corporates
- CO-6** Create effective presentations and construct meaningful and clear business documents

SEMESTER II

Course: Object Oriented Programming

COURSE OUTCOMES

CO-1 Describe the difference between Procedure Oriented Programming and Object-Oriented Programming.

CO-2 Summarize different principles of Object-Oriented Programming and its characteristics.

CO-3 Apply the concepts of C++ programming to given problems.

CO-4 Compare and contrast the benefits and applications of Object-Oriented Programming concepts to the real world systems.

CO-5 Evaluate the advantages, disadvantages, applications of Object-Oriented Programming

CO-6 Create programs to solve given problems using Object-Oriented concepts.

Course: Microprocessor Architecture

COURSE OUTCOMES

CO-1 Describe the architecture and organization of Microprocessor along with instruction set format.

CO-2 Explain the Interfacing of memory & various I/O devices with 8085 microprocessors.

CO-3 Write assembly language programs using programming tools.

CO-4 Categorize different types of microprocessors

CO-5 Summarize importance of Microprocessor

CO-6 Design circuit for memory interfacing

Course: Web Programming

COURSE OUTCOMES

CO-1 Define basic working of Internet and World wide web

CO-2 Explain about static web pages using Hyper Text Markup Language(HTML)

CO-3 Illustrate and design interactive web pages using client-side script (JavaScript).

CO-4 Compare server-side scripting and client- side scripting, and design interactive web pages using server-side script (PHP).

CO-5 Summarize how to store and retrieve data from a server using PHP.

CO-6 Designing web pages using JavaScript, php and using tags in HTML.

Course: Numerical and Statistical Methods

COURSE OUTCOMES

- CO-1** Define the differential equation, which is clearly used in almost every field of science.
- CO-2** Discuss mathematical modelling in Engineering problem.
- CO-3** Calculate fit curve using tabular data.
- CO-4** Investigate coding and decode algorithms
- CO-5** Compare future opportunities and risks which is the most prominent application of regression analysis in business.
- CO-6** Create program in SciLab to solve mathematical problem like Bisection Method etc.

Course: Green Computing

COURSE OUTCOMES

- CO-1** Define the knowledge objective and standards in green computing to know the variety of technologies applied in building a green system.
- CO-2** Discuss the various laws, standards and protocols for regulating green IT and understand the technologies that conform to low-power computation.
- CO-3** Classify different techniques to reduce the paper use and its implementation in real world.
- CO-4** Compare different techniques of recycling, reuse and refurbished e-waste.
- CO-5** Evaluate the use of different tools to help monitor and design green systems.
- CO-6** Create a report on how green computing techniques can be applied in any of the real problem faced by the society.

SEMESTER III

Course: Python Programming

COURSE OUTCOMES

CO-1 Define the structure of Python programming language to acquire the skills for its implementation.

CO-2 Discuss complex data structures in Python and also explain the complete implementation of objectoriented programming.

CO-3 Examine the implementation of functions, list, tuples, directories and regular expressions.

CO-4 Test and compare the outputs of all the methodologies in different scenario.

CO-5 Assess database connectivity with MySQL for data manipulation.

CO-6 Design and implement GUI application with database connectivity.

Course: Data Structures

COURSE OUTCOMES

CO-1 List and define different data structures.

CO-2 Categorize data structures with respect to type of memory used and type of data stored.

CO-3 Calculate the time required for searching data in different data structures.

CO-4 Compare advantages and disadvantages of various data structures.

CO-5 Evaluate the need of various data structures

CO-6 Create programs to perform various kind of operations on different data structures.

Course: Computer Networks

COURSE OUTCOMES

CO-1 Describe important features of computer network

CO-2 Discuss networking protocols, and their hierarchical relationship in the context of a conceptual model, such as the Open Systems Interconnection Model and Transmission Control Protocol/Internet Protocol framework.

CO-3 Examine the Open Systems Interconnection Model layers with their services and protocols

CO-4 Differentiate between wired media and wireless media

CO-5 Summarize the importance of computer networks in our daily life

CO-6 Design various servers using appropriate protocol

Course: Database Management System

COURSE OUTCOMES

- CO-1** Describe the database architecture, data Models and database Design.
- CO-2** Discuss Normalization, Relational Algebra and Calculus
- CO-3** Illustrate the concept of Constraints and views.
- CO-4** Categorize different types of Transaction Management
- CO-5** Summarize and implement the PL-SQL programs using different control structures and looping statements.
- CO-6** Develop the PL-SQL programs and learn database connectivity.

Course: Applied Mathematics

COURSE OUTCOMES

- CO-1** Define the complex numbers and matrices
- CO-2** Discuss the data using Laplace and Inverse Laplace transformations
- CO-3** Solve the sums using integration.
- CO-4** Categorize differentiation under integral sign.
- CO-5** Evaluate Beta and Gamma functions with examples.
- CO-6** Generalize the concept of double and triple integral.

SEMESTER IV

Course: Core Java

COURSE OUTCOMES

- CO-1** Describe Java platform and language, followed by instructions for setting up a development environment consisting of a Java Development Kit (JDK).
- CO-2** Explain the fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries.
- CO-3** Illustrate and implement about the OOP concept of inheritance and packages.
- CO-4** Test data from different sources and destinations using various classes, interfaces, and methods that is available to read data from the file.
- CO-5** Summarize windows-based application using AWT (Abstract Windows Toolkit).
- CO-6** Develop Web forms using GUI.

Course: Introduction to Embedded Systems

COURSE OUTCOMES

- CO-1** Describe the architecture and organization of Microcontrollers
- CO-2** Explain the Interfacing of memory & various I/O devices with 8051 microcontrollers.
- CO-3** Write assembly language programs using programming tools.
- CO-4** Categorize different types of microcontrollers
- CO-5** Summarize importance of Microcontroller
- CO-6** Construct circuit for memory interfacing with 8051

Course: Computer Oriented Statistical Techniques

COURSE OUTCOMES

- CO-1** Define measures of central tendencies and measures of dispersion.
- CO-2** Explain sampling theory to establish relationship existing between population and samples.
- CO-3** Use of estimate statistical parameters and hypothesis testing.
- CO-4** Analysing small sampling distributions.
- CO-5** Evaluate correlation and regression theory to study relationship between two or more variables
- CO-6** Create Program Using R software to find Measures of Central tendencies.

Course: Software Engineering

COURSE OUTCOMES

- CO-1** Describe various software engineering approaches.
- CO-2** Explain the use of different software engineering approaches
- CO-3** Apply software models, techniques and technologies to bring out Innovative solutions for software development.
- CO-4** Compare different software engineering models
- CO-5** Evaluate the need of different concepts of software engineering
- CO-6** Develop a project by applying appropriate software engineering principles.

Course: Computer Graphics and Animation

COURSE OUTCOMES

- CO-1** Describe various concepts of computer graphics and animation and study its application in different domains.
- CO-2** Explain the concepts related to scan conversion, 2D and 3D coordinate system, light and colour representation technology, image compression mechanism.
- CO-3** Solve 2D and 3D transformation and scan conversion problem, illustrate techniques of animation.
- CO-4** Compare various 2D and 3D computer graphics technologies.
- CO-5** Choose suitable graphic function for your computer graphic design.
- CO-6** Create an object using scan conversion algorithm, perform 2D and 3D transformation on a given object and create computer animation design.

SEMESTER V

Course: Software Project Management

COURSE OUTCOMES

- CO-1** Describe project management and overview of project planning, and selection of appropriate project approach.
- CO-2** Discuss project management and overview of project planning
- CO-3** Illustrate how to overcome obstacles in project.
- CO-4** Compare and contrast the stages of SDLC and Different software project development models.
- CO-5** Summarize the importance of Software quality and the process of project closure.
- CO-6** Demonstrate the system design including screen layouts, process diagrams, pseudocode and documentation.

Course: Internet of Things

COURSE OUTCOMES

- CO-1** Define the equation of IoT and describe the concept of different building blocks of IoT.
- CO-2** Explain different technologies used to develop IoT solution.
- CO-3** Examine the role of different people in making IoT, illustrate the use and issues of IoT technology in various domains.
- CO-4** Compare different technologies and business models used in IoT product development.
- CO-5** Estimate suitable business model for a given IoT solution.
- CO-6** Create a secure API plan and a business model for a given IoT product. Develop an IoT prototype using Arduino and Raspberry Pi board.

Course: Advanced Web Programming

COURSE OUTCOMES

- CO-1** Define the key concepts of C# and ASP.NET.
- CO-2** Explain web Forms fundamentals and Form controls in ASP.NET
- CO-3** Apply different state management, styles, menu controls, master page concepts to design a web page
- CO-4** Compare and contrast different controls and concepts in ASP.NET
- CO-5** Evaluate the need and application of different controls and concepts in ASP.NET
- CO-6** Create a website using all the concepts of ASP.NET

Course: Artificial Intelligence

COURSE OUTCOMES

- CO-1** Describe some important features of Artificial Intelligence
- CO-2** Explain Artificial Intelligence techniques, such as search algorithms, min-max algorithm, neural networks and tracking.
- CO-3** Apply Artificial Intelligence techniques for problem solving.
- CO-4** Test the problem of state space, graph, design heuristics with different search or game-based techniques.
- CO-5** Evaluate the importance of Artificial Intelligence.
- CO-6** Design Artificial Intelligence based application

Course: Enterprise Java

COURSE OUTCOMES

- CO-1** Describe Java Enterprise Edition (JEE) architectural components along with various session management techniques and Servlet creation.
- CO-2** Explain Enterprise JavaBean (EJB) architectural components and different types of EJBs.
- CO-3** Illustrate Java EE technologies with practical implementation.
- CO-4** Test the code and compare the results in different scenarios.
- CO-5** Evaluate reusable software components using EJB to implement business logic for an enterprise application.
- CO-6** Develop a demo project with given software requirements.

SEMESTER VI

Course: Software Quality Assurance

COURSE OUTCOMES

- CO-1** Define the concepts of Software Quality Assurance
- CO-2** Explain different software testing techniques
- CO-3** Apply software testing techniques to software projects
- CO-4** Investigate the reasons for defects in the software and analyze the principles of software testing to be implemented to prevent and remove bugs.
- CO-5** Evaluate different software testing techniques and when to use them
- CO-6** Design a software testing strategy for a software project

Course: Security in Computing

COURSE OUTCOMES

- CO-1** Describe the importance of information security and study various layers of computer security.
- CO-2** Explain various security models and different techniques used in computer security.
- CO-3** Examine security techniques implemented on various layers of computer security.
- CO-4** Analyse different computer security risk and compare various security model used to harden the computer security.
- CO-5** Estimate best security strategies to remediate security risk.
- CO-6** Configure various security protocols on a given network topology.

Course: Business Intelligence

COURSE OUTCOMES

- CO-1** Describe the concepts and components of Business Intelligence (BI).
- CO-2** Explain different types of mathematical models used in BI.
- CO-3** Illustrate and use the technologies and tools that make up BI (e.g. Data warehousing, Data reporting and use of Online analytical processing (OLAP)).
- CO-4** Compare different data mining techniques used to identify how various business intelligence systems can contribute to organizational success.
- CO-5** Evaluate the use of BI for supporting decision making in an organization using mathematical models.
- CO-6** Design the technological architecture that supports BI systems and also can plan the implementation of a BI system.

Course: Principles of Geographic Information systems

COURSE OUTCOMES

- CO-1** Describe the GIS systems, GI Science and GI Applications.
- CO-2** Explain the basic principles of modern spatial data and structures.
- CO-3** Illustrate the theoretical concepts of digital input of Geospatial data, functions of geographic information systems.
- CO-4** Test the data quality and management: Errors, accuracy, precision and scale
- CO-5** Compare and assess different GIS software models.
- CO-6** Develop practical applications in GIS that highlight the technical skills.

Course: Cyber Laws

COURSE OUTCOMES

- CO-1** Describe the “Information Technology Act, 2000” in detail and sections under the Act,
- CO-2** Discuss Case Studies on how do various cyber-crimes happen like Hacking, Cyber Fraud.
- CO-3** Illustrate e-contracts if they plan to start up an online business and what should be the clauses mentioned including its terms and conditions.
- CO-4** Appraise the knowledge about the rights of a Consumer in India.
- CO-5** Summarize the Understanding of Relationship Between Commerce and Cyberspace.
- CO-6** Create the Legal and Policy Developments in Various Countries To Regulate Cyberspace