



## **VPS College of Ars, Science & Commerce Lonavala**

### **Program Outcomes (PO'S)**

- **Program Name-Bachelor of Business Administration (Computer Application)**
- **Program Type-** Undergraduate Programme
- **Program Structure-** Semester Pattern with Credit System (VI Semester)
- **Program Duration-** Three Years Full Time
- **Faculty-**Commerce & Management

### **Program Outcomes-**

- 1) To produce skill oriented human resource.
- 2) To impart practical skills among students.
- 3) To make industry ready resource.
- 4) To bring the spirit of entrepreneurship.
- 5) It helps to to bridge the gap between the studies of computers and its applications.
- 6) It offers subjects which are a blend of management, commerce and computer applications.
- 7) It aims to shape computer professionals with the right moral and ethical values and can prepare students to face the challenges and opportunities in the IT industry by building strong foundations.
- 8) It is the application of theory and computing principles through project work, case studies, presentations and practical assignments.
- 9) It helps the students to understand technical problems, suggest and develop solutions.

## COURSE OUTCOMES (COs)

### FYBBA(CA) Sem I

#### Theory Papers

SR.No	Course Code	Course Name	Sem	Overall Course Outcome
1	CA-101	Business Communication	I	1. To understand what is the role of communication in personal and business world 2. To understand system and communication and their utility 3. To develop proficiency in how to write business letters and other communications in required 4 The techniques taught in this subject helps to enhance their communication skills.
2	CA-102	Principles of Management	I	1)To understand basic concept regarding Management 2)To examining how various management principles are still implemented in real world execution. 3) To develop managerial skills among the students 4) To understand different management functions and theories of management.
3	CA-103	C Language	I	5)After course completion the students will have the following learning outcomes: 6) 1.To Understanding a functional hierarchical code organization. 2.To define and manage data structures based on problem subject domain. 7)3. To Understanding a 8)defensive programming concept

4	CA 104	DBMS	I	<p>Students will be able to understand:</p> <ol style="list-style-type: none"> <li>1) The design structure of a DBMS.</li> <li>2) The design Entity Relationship Diagram</li> <li>3) Understand Overall Architecture of DBMS</li> <li>4) The working of Query Processing.</li> <li>5) Will be able to convert Unnormalised Database to Normal /with help of Normalisation</li> </ol>
5	CA-105	Business Statistics	I	<ol style="list-style-type: none"> <li>1. To understand role and importance of statistics in various business situations</li> <li>2. To develop skills related with basic statistical technique</li> <li>3. Develop right understanding regarding regression, correlation and data interpretation</li> </ol>
6	107	1. Add-On (PPA) (30 Hours)	I	<ol style="list-style-type: none"> <li>2. To understand basic algorithm,</li> <li>3. To learn different basic symbols of Flow charts.</li> <li>4. To develop logical thinking required for programming.</li> <li>5. Helps to form as base to structure program.</li> </ol>

## Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CA 106	Computer Laboratory Based on 103 & 104	1	Students will be able to: 1) Practically implement functionality of SQL queries 2) Design and practically implement working of query processing 3) Design and practically implement working of SQL
3	CA-106	Computer Laboratory Based on 103 & 104	1	Students will be able to: 1) Design applications with C Programming 2) 2) Design, implement, test and debug programs that use different data types, such as simple variables, arrays, and structures. 3) Design, implement, test and debug programs that use arrays for character strings and that use pointers for character strings. 4) Evaluate the C code for a given algorithm.

## FYBBA(CA) Sem II

### Theory Papers

SR.No	Course Code	Course Name	sem	Overall Course Outcome
1	CA-201	Organization Behavior & Human Resource Management	II	Students will be able to understand: 1) To understand the basic concept of OB 2) To develop knowledge about major trends & ability to handle cultural diversity Stress, change and to maintain work life balance. 3) To understand the basic concept of HRM 4) developing knowledge & ability of the student about HRM.
2	CA-202	Financial Accounting	II	1) To learn basic concepts related to Financial Accounting. 2) To develop right understanding regarding role and financial importance of monetary and financial

				<p>transactions in business</p> <p>3) To cultivate right approach towards classifications of different transactions and their implications</p> <p>4) To develop proficiency preparation of basic financial as to how to write basis accounting statement - Trading and P&amp;L</p>
3	CA-203	Business Mathematics	II	<p>1) To understand role and importance of Mathematics in various business situations and while developing softwares.</p> <p>2) To develop skills related with basic mathematical technique</p>
4	CA-204	Relational database	II	<p>Students will be able to understand:</p> <p>1) Differentiate DBMS and RDBMS</p> <p>2) PL/SQL Structure</p> <p>3) Understand Transaction Concepts</p> <p>4) Understand Deadlock Mechanism</p> <p>5) Will be understand Recovery Concepts</p>
5	CA-205	Web Technology HTML-JS-CSS	II	<p>i) To know &amp; understand concepts of internet programming.</p> <p>ii) To understand how to develop web based applications using JavaScript.</p>
6	207	Add-On (Advance C) (30 Hours)	II	<p>1) Students will be able to design Program with pointers and arrays, perform pointer arithmetic, and use the preprocessor.</p> <p>2) Students will be able to design programs that perform explicit memory management.</p> <p>3) Students will be able to design and use the common data structures typically found in C programs — namely arrays, strings.</p> <p>4) Students will be able to write file handling programs.</p>

## Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CA-206	Computer Laboratory Based on 204 & 205 (2 credits each)	2	Students will be able to: 1) Practically implements of concepts. 2) Able to design web pages. 3) Able to create interactive web pages.

## SYBBA(CA) Sem III

### Theory Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CA-301	Digital Marketing	(SEM-III)	1) Implimentation of digital marketing in business 2) Apply SWOT Analysis, Seo optimization and use of various digital marketing tools
2	CA-302	Data Structure	(SEM-III)	1) To understand the concept of ADTs 2) To learn linear Data Structure 3) To understand sorting, searching, and hashing. 4) To apply Tree and Graph structure.
3	CA-303	Software Engineering	(SEM-III)	Students will be able to learn: 1. Students understand the System concept. 2. Students understand the Software Engineering Concept. 3. They will learn different Models, Tools and Techniques of software development. 4. Students will be able design and construct analysis part in software development. 5. Students will be able to implement different concept in software development.

4	CA-304	PHP	(SEM-III)	1) To understand how server side programming works on the Web. 2) Using PHP built in function and creating custom functions 3) To understand POST and GET in formSubmission. 4) To know how to receive and process form submission data. 5) Read and process data in MTSQL database.
5	CA-305	Big Data	(SEM-III)	Students will be able to understand: 1) The sructure of Big Data and itsapplication 2) The Use Of Weka Tools 3)Understand Overall Archietecture of Big Data. 4) The working of Weka Tools 5)Use of R Programming studio
6	307	AECC Environment Awareness	(SEM-III)	1. To understand Environment awareness. 2. To know different ways to protect environment. 3. To emphasis more on Environmentfriendly practices.

## Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CA-306	Computer Lab(302,304 &305)	(SEM-III)	1) To understand the concept of ADTs 2) To learn linear Data Structure 3) To understand sorting, searching, and hashing. 4) To apply Tree and Graph structure.

## SYBBA(CA) Sem IV

### Theory Papers

SR.No	Course Code	Course Name	Sem	Overall Course Outcome
1	CA-401	Networking	IV	1. Students will be able to describe about computer network. 2. Students will be able to explain understand different topologies used in networking. 3. Students will be able to classify different types of network. 4. Students will be able to describe use of connecting device used in network. 5. Students will be able to describe the elements and protocols of transport layer.
2	CA-402	Object Oriented Concepts Through CPP	IV	1. Students will be able to describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects. 2. Students will be able to explain dynamic memory management techniques using pointers, constructors, destructors, etc. 3. Students will be able to describe the concept of function overloading, operator overloading, virtual functions and polymorphism. 4. Students will be able to classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming. 5. Students will be able to demonstrate the use of various OOPs concepts with the help of programs.
3	CA-403	Operating System	IV	a) Students will be able to describe the various CPU scheduling algorithms. b) Students will be able to explain various memory management techniques. c) Students will be able to describe use disk management and disk scheduling algorithms for better utilization of external memory. d) Students will be able to describe the basics of operating systems like types and views of operating systems.



				e) Students will be able to explain deadlock, identify deadlock and removal of deadlock.
4	CA-404	Advance PHP	IV	1) To know & understand concepts of PHP. 2) To design valid, well-formed, scalable, and meaningful pages using emerging technologies. 3) To develop and implement Database Driven Websites 4) Learn AJAX to make our application more dynamic.
5	CA-405 Project	Project	IV	Practical execution of learned theory concepts.
6		ADD-On (30 Hours)		

### Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CA-406	Computer Laboratory Based on 402,404 (2 credits each) (2 credits each)	IV	1.Students will be able to design, implement, test, debug and document programs in C++. 2.Students will be able to develop Inheritance programs. 3.Students will be able to implement polymorphism in C++ Programs. 4.Students will be able to design Filehandling programs. 5. Students will be able to develop Template, Exception handling programs.

### TYBBA(CA) Sem V

Theory Papers				
SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	501	Cyber Security	SEM-V	1)Have a good understanding of Cyber Security and the Tools. 2)Identify the different types of Cyber Crimes. 3)Have a good understanding of Cyber laws 4)To develop Cyber forensics awareness. 5)Identify attacks, security policies and credit card frauds in mobile and Wireless Computing Era.

2	502	Object Oriented Software Engineering	SEM-V	<p>Students will be able to understand:</p> <ol style="list-style-type: none"> <li>1) Students will be able to Design and implement structured, robust, maintainable object-oriented systems across multiple platforms and appropriate programming languages from the specifications</li> <li>2) Students will be able to build teamwork and management skills to divide tasks and effectively develop projects in large software teams</li> <li>3) Students will be able to Determine industry standard documentation requirements, analysis, and design through testing and verification</li> <li>4) Students will be able to describe Object Model and Dynamic Model of system functionality and performance from the requirements</li> <li>5) Student will be able to Research, evaluate and use various CASE tools for object-oriented software engineering including IDE's, SDK's, and version control system</li> </ol>
3	503	Core Java	SEM-V	<p>Student can be able</p> <ol style="list-style-type: none"> <li>1. To Understand the basic concept of java and oops.</li> <li>2. To write their own functions in java</li> <li>3. To create any user defined exception</li> <li>4. To create their own packages</li> <li>5. To be able to deal with text files.</li> <li>6. To be able to create Frame.</li> </ol>
4	504	Python	SEM-V	<p>On completion of the course, student will be able</p> <ol style="list-style-type: none"> <li>1. Define and demonstrate the use of built-in data structures “lists” and “dictionary”.</li> <li>2. Design and implement a program to solve a real world problem.</li> <li>3. Design and implement GUI application and how to handle exceptions and files</li> </ol>
5	505	(DSE) Project	SEM-V	<ol style="list-style-type: none"> <li>1. Students will be able to implement different learned concept related to database, software engineering and different programming language in actual software development.</li> </ol>

6	507	Add on Course-IOT(30 Hours)	SEM-V	1.To understand different computing devices used in IOT. 2.To know mechanical and digital machines provided with unique identifiers used in IOT. 3.To understand how different devices are used to transfer data over a network without requiring human-to-human or human-to-computer interaction
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### Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	506	LAB Course Based on 503 and 504	5	Students will be able to: 1) Practically implements of concepts. 2) Able to design web pages. 3) Able to create interactive web pages.

## TYBBA(CA) Sem VI

### Theory Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	601	Recent Trends in IT	VI	1) Students will be able to describe the concept of Software development life cycle (traditional vs. modern). 2) Students will be able to explain the concept of Distributed databases. 3) Students will be able to describe concept of Data Mining, Data Warehouse . 4) Students will be able to interpret the concept of Network Security. 5) Students will be able to classify types of computing in detail.

2	602	Software Testing	VI	<p>1) Students will be able to explain fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.</p> <p>2) Students will be able to classify various software testing issues and solutions in software unit test; integration, regression, and system testing.</p> <p>3) Students will be able to describe how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.</p> <p>4) Students will be able to explain the advanced software testing topics, such as object-oriented software testing methods, and component- based software testing issues, challenges, and solutions.</p> <p>5) Students will be able to explain software test automation problems and solutions.</p>
3	603	Advanced Java	VI	<p>1) Students will be able to design Internet Programming, using Java Applets.</p> <p>2) Students will be able to apply event handling on AWT and Swing components.</p> <p>3) Students will be able to design database through Java programs, using Java Data Base Connectivity (JDBC).</p> <p>4) Students will be able to design dynamic web pages, using Servlets and JSP.</p> <p>5) Students will be able to design a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) &amp; Swings.</p>

4	604	Android Programming	VI	1. Student will be able to write simple GUI applications, use built-in widgets and components, work with the database to store data locally, and muchmore. 2. Demonstrate their understanding of the fundamentals of Android operating systems Demonstratetheir skills of using Android software development tools
5	605	SoftwareProject-II	VI	1. Practical execution of Theroy learned concepts of Vb. net and Java. 2. Students able to develop softwareon their own with creativity and innovations. 3. Forms as base to entry into IT industires.

## Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	606	LAB Course Basedon 603 and 404	6	Students will be able to: 1) Practically implements of concepts. 2) Able to design web pages. 3) Able to create interactive web pages.

## **Program Outcomes**

**Program Name-** Bachelor of Science (Computer Science)

**Program Type-** Undergraduate Programme

**Program Structure-** Semester Pattern with Credit System (VI Semester)

**Program Duration-** Three Years Full Time

**Faculty-** Science

### **Program Outcomes**

- 1) To develop problem solving abilities using a computer.
- 2) To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
- 3) To imbibe quality software development practices.
- 4) To create awareness about process and product standards.
- 5) To train students in professional skills related to Software Industry.
- 6) To prepare necessary knowledge base for research and development in Computer Science.
- 7) To help students build-up a successful career in Computer Science.

## F.Y.B.S.C(Computer Science)

### Theory Papers

no	Course Code	Course Name	Sem	Overall Course Outcome
1	CS-111	Problem Solving using Computer and 'C' Programming - I	I	<ol style="list-style-type: none"> <li>1. To explore algorithmic approaches to problem solving.</li> <li>2. To develop modular programs using control structures and arrays in 'C'.</li> </ol>
2	CS-112	Database Management Systems	I	<ol style="list-style-type: none"> <li>1. To understand user requirements and frame it in data model using appropriate set, function, and relational models.</li> <li>2. Understand normalization of tables and relational database design.</li> <li>3. Apply E-R Model design for given requirements and use the same intodatabase tables.</li> <li>4. Implementing SQL for creations, manipulation and querying of data in databases.</li> </ol>
3	MTC-111	Matrix Algebra	I	<ol style="list-style-type: none"> <li>1. Students learned to perform certain operation on Matrices</li> <li>2. Students understood to solve linear system of equation</li> <li>3. Student learned to apply their skills and knowledge about linear transformation and studied terminology</li> <li>4. Student understood the concept of determinant and it's applications to solve system of equations</li> </ol>
4	MTC-112	Discrete Mathematics	I	<ol style="list-style-type: none"> <li>1. Students will learn the basic concepts of sets, permutations, relations, graphs, trees and finite state machines.</li> <li>2. A students should be able to work with graphs and identify certain parameters and properties of the given graphs.</li> <li>3. A students should be able to perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.</li> </ol>

5	ELC-111	Semiconductor Devices and Basic Electronic Systems	I	1. To study various types of semiconductor devices 2. To study elementary electronic circuits and systems
6	ELC 112	Principles of Digital Electronics	I	On completion of this course, students will be able to: 1. Familiar with concepts of digital electronics 2. Learn number systems and their representation 3. Understand basic logic gates, Boolean algebra and K-maps 4. Learn arithmetic circuits, combinational circuits and sequential circuits
7	CSST 111	Descriptive Statistics	I	1. To be able to tabulate and make frequency distribution of the given data. 2. To be able to use various graphical and diagrammatic techniques and interpret it. 3. To be able to apply various measures of central tendency, dispersion, skewness and kurtosis appropriately. 4. To be able to apply the theory of attributes and make use of it in testing of hypothesis.
8	CSST 112	Mathematical Statistics	I	1)ability to apply statistical tools and techniques. 2)a student should be well equipped to learn and apply acquired techniques in computer based applications  3)To be able to apply probability in real life situation.4)To be able to apply basic probability distributions

### Practical Papers

No.	Course Code	Course Name	Semester	Overall Course Outcome
1	CS103	Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems	I	On completion of this course, students will be able to: 1. Devise pseudo codes and flowchart for computational problems. 2. Write, debug and execute simple programs in 'C'. 3. Create database tables in PostgreSQL.



2	MTC-113	Mathematics Practical	I	<p>Students will be able to</p> <ol style="list-style-type: none"> <li>1. Solve the problems based on applications of matrices.</li> <li>2. solve logical proofs of arguments using laws of logic</li> <li>3. Apply knowledge of matrices to solve system of linear equations</li> <li>4. solve the problems based on counting principles and recurrence relation</li> <li>5. Study various commands for maxima software and use to verify the results</li> </ol>
3	ELC-113	Electronics Practical	I	<p>On completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1) Measure of AC/DC voltage and Current – on different ranges</li> <li>2) Test of Diodes &amp; Transistors</li> <li>3) Measure of amplitude and frequency of Sine/Square waveform</li> <li>4) Measure of Phase with the help of RC circuit</li> <li>5) Learn Lissajous figures</li> <li>6) Learn use of Component testing facility</li> </ol>
4	CSST-113	Statistical Practical Paper-I	I	<ol style="list-style-type: none"> <li>1) To understand real life application of statistics</li> <li>2) To be able to analyse data by using MS-EXCEL</li> <li>3) To be able to solve and apply descriptive statistics for grouped and ungrouped data</li> <li>4) To be able to apply probability in computer science</li> </ol>

## F.Y.B.S.C(Computer Science) Sem II

### Theory Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS-121	Advanced 'C' Programming	I	1) Develop modular programs using control structures, pointers, arrays, strings and structures 2) Design and develop solutions to real world problems using C.
2	CS-122	Relational Database Management Systems	II	1. Use database techniques such as SQL & PL/SQL. They can write Cursors, Functions and Triggers in PostgreSQL. 2. Use advanced database Programming concepts 3. Explain transaction management in relational database System. 3. Explain deadlock and identify it with different techniques and protocols. 4. Understand Database Recovery techniques, database Security methods and encryption techniques. 5. Understand different types of databases.
3	MTC-121	Linear Algebra	II	1. student learned to perform certain operation on vectors, algebraically and interprets result . 2. Students understood the eigenvalues and eigenvectors and defend their arguments regarding different types of problems. 3. Student learned to apply their skills and knowledge to find projections from higher dimensional spaces on lower dimensional spaces 4. Student got idea about current and future role of mathematics to solve the problems
4	MTC-122	Graph Theory	II	After learning the course students should be able to 1. Solve problems using basic graph theory 2. Determine whether graphs are Hamiltonian and/or Eulerian 3. Solve problems involving vertex and edge connectivity, planarity. 4. Demonstrate different traversal methods for trees and graphs.
5	ELC-121	Instrumentation System	II	1. To get familiar with basic and smart instrumentation system 2. Study of Sensors and actuators and its application 3. Study of Operational Amplifier and its basic circuits

6	ELC-122	Basics of Computer Organization	II	1. To get familiar digital sequential circuits 2. To study Basic computer Organization 3. To study Memory architecture
7	CSST-121	Methods of Applied Statistics	II	1. Students will be able to understand concept of correlation and make use of it in real life situations. 2. Students will be able to apply regression analysis appropriately. 3. Students will be able to know the applicability of multiple/ partial regression analysis appropriately and use it practically. 4. Students will be able to know about time series and its components and can use methods to estimate trends appropriately.
8	CSST-122	Continuous Probability Distributions & Testing of Hypothesis	II	1) ability to apply statistical tools and techniques. 2) a student should be well equipped to learn and apply acquired techniques in computer based applications 3) To be able to apply continuous probability distributions in real life situation. 4) To be able to apply Testing of hypothesis

### Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS-123	Practical Course on Advanced 'C' Programming and Relational Database Management Systems	II	On completion of this course, students will be able to: 1. Write, debug and execute programs using advanced features in 'C' like string, pointer, structure and file handling. 2. To use SQL & PL/SQL. 3. Write and execute complex PL/SQL queries. 4. To perform advanced database operations like functions, procedures, Cursor, triggers and exception handling.

2	MTC-123	Mathematics Practical -II	II	Students will be able to 1. Solve the problems based on vector spaces, eigen values and eigenvectors of a matrix, orthogonality of matrices, special type of linear combinations called as Affine combination 2.Solve the problems based on concept of graphs, Connected graphs and various algorithms, Eulerian and hamiltonian graphs, Trees 3. Verify the results obtained using maxima software
3	ELC-123	Electronics Practical	I	1. To study various electronics devices 2. Hands-on Experience of electronics circuits
4	CSST-123	Statistical Practical Paper-II	II	1)To understand real life application of statistics 2)To be able to analyse data by using MS-EXCEL 3)To be able to solve and apply correlation and regression 4)To be able to apply testing of hypothesis, time series in field of computer

### S.Y.B.S.C(Computer Science) Sem III

Theory Papers				
SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS - 231	Data Structures and Algorithms – I	3	1. To use well-organized data structures in solving various problems. 2. To differentiate the usage of various structures in problem solution. 3. Implementing algorithms to solve problems using appropriate data structures.

2	CS-232	Software Engineering	3	<p>1. Understand, Compare and Select Process Model for software development.</p> <p>2. Identify and analyse requirement and prepare requirement model.</p> <p>3. prepare SRS, project plan.</p> <p>4. Design by using UML and Prepare Design document</p>
3	MTC-231	Groups & Coding Theory	FIRST	<p>A student should be able to</p> <ul style="list-style-type: none"> <li>•recall basic facts , display knowledge of conventions and recognize basic geometrical figures and graphical displays, state important facts.</li> <li>•get a relational understanding of mathematical concepts and concerned structures, and follow the patterns involved, mathematical reasoning.</li> <li>•apply their skills and knowledge</li> <li>•get adequate exposure to global and local concerns.</li> </ul>
4	MTC-232	Numerical Techniques	3	<p>1. Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems</p> <p>2. Apply numerical methods to obtain approximate solutions to mathematical problems</p> <p>3. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.</p>
5	EL-211	Microcontroller Architecture & programming	3	<p>1. To write programs for 8051 microcontroller</p> <p>2. To interface I/O peripherals to 8051 microcontroller</p> <p>3. To design small microcontroller based projects</p>

6	EL-212	Digital Communication & Networking	3	<p>1. Ability to understand the basic blocks of communication system and types of communication.</p> <p>2. Learning about modulation and demodulation techniques, digital modulation and analog modulation.</p> <p>3. Learning about multiplexing and demultiplexing techniques.</p> <p>4. Ability to understand the basic concepts of networking &amp; operating technologies of networking.</p>
7	AECC-I	Environmental Awareness	FIRST	<p>1. To make awareness among the students and make them sensible human being towards different aspects of environment.</p> <p>2. To set the students on the path of sustainable development.</p>
8	AECC-II	Language Communication-I (English)	3	<p>1. Students will be able to get acquainted with language skills in multivalent contexts.</p> <p>2. Students will be able to acquaint speaking skills in various contexts.</p> <p>3. Students will be able to acquaint and familiarize with advanced writing skills and soft skills.</p> <p>4. Students will be able to bridge the gap between general communication skills and professional skills.</p> <p>5. Students will be able to appreciate and analyze short stories and poetries.</p>

### Practical papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS 223	CS-233 (Practical course on CS 231 and CS 232)	3	1.Understand algorithms and its analysis procedure. 2.understand to design and implement various data structures. 3.undesrtand complexity of various algorithms and develop application byusing them
3	MTC-233	Mathematics Practical: Python Programming Language-I	3	Familiarity with Python Programming, Learning basic and intermediate level programming in Python
4	EL-233	Electronics practical	3	1. Understand and develop programming skills using Embedded 'C' Language 2. Interpretate the programe by using parallel ports and Timers 3.Interface ADC,Stepper motor with 8051 4.Understand ,analyaze the various modulation Techniques 5. Interpretate the concept of Networking

### S.Y.B.S.C(Computer Science) Sem IV

### Theory Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS-241	Data Structures and Algorithms -II	4	On completion of this course students will be able to •Implementation of different data structures efficiently. •Usage of well-organized data structures to handle large amount of data. •Usage of appropriate data structures for problem solving

2	CS-242	Computer Networks-I	4	<p>1. Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers.</p> <p>2. Understand the working of various protocols.</p> <p>3. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies</p>
3	MTC-241	Computational Geometry	II ( Second)	<p>students can construct algorithms for simple geometrical problems, implement computational geometry algorithms, solving problems within computational geometry and practical</p>
4	MTC-242	Operation Research	4	<p>A student should be able to</p> <ul style="list-style-type: none"> <li>• recall basic facts , display knowledge of conventions and recognize basic geometrical figures and graphical displays, state important facts.</li> <li>• get a relational understanding of mathematical concepts and concerned structures, and follow the patterns involved, mathematical reasoning.</li> <li>• apply their skills and knowledge</li> <li>• get adequate exposure to global and local concerns.</li> </ul>



5	ELC-241	Embedded System Design	4	<p>To understand the difference between general computing and the Embedded systems.</p> <p>2.To know the fundamentalsof embedded systems.</p> <p>3.Understand the use of Single board Computer (Such as Raspberry Pi) for an embedded system application.4.Familiar with the programming environment todevelop embedded systems and their interfaces with peripheral devices. 5.To develop familiarity with tools used to develop in an embedded environment.</p>
6	ELC-242	Wireless Communication and Internet of Things	4	<p>1.Explore themselves and develop new IoT based applications.</p> <p>2.Get introduce to upcoming technology of Internet of Things</p> <p>3.Understand working principles of short range communication application</p> <p>4.Become familiar with 3G and 4G Cellular Network Technologies for Data Connections. 5. Know working of wireless technologies such as Mobile communication, GSM, GPRS</p>
8	AECC-III	Environmental Awareness	4	<p>1. To make awareness among the students and make them sensible human being towards different aspects of environment. 2. To set the students on the path of sustainable development.</p>

9	AECC-IV	English	4	<p>1. Students are able to use English in Multimedia effectively.</p> <p>2. Students are able to acquire English Speaking Skills in various context.</p> <p>3. Students are familiarized with advanced writing skills and soft skills.</p> <p>4. Students are capable to develop competency in English language.</p> <p>5. Students are able to learn the difference between professional communication.</p>
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### Practical papers

SR.No	Course Code	Course Name	Sem	Overall Course Outcome
1	CS-243	Practical course on CS 241 and CS242	4	<p>1. Understand algorithms and its analysis procedure.</p> <p>2. Understand to design and implement various data structures.</p> <p>3. Understand complexity of various algorithms and develop application by using them.</p> <p>4. To recall networking concepts.</p> <p>5. To apply networking concepts</p>

2	MTC-243	Mathematics Practical: Python Programming Language-II	4	1. To study operations research using Python. 2. To apply concepts of operations research using python. 3. To solve problems of operations research using python. 4. To perform graph plotting using pyhon.
3	ELC-243	Electronics Practicals	4	1. To design and develop own smart applications using Rasberry-Pi. 2. To write Python program for simple applications. 3. To build own IoT basedsystem.

## T.Y.B.S.C(Computer Science) Sem V

Theory Papers				
SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS-351	Operating Systems – I	V	1) Understand design structure of a simple editor. 2) Revise and learn design structure of Assembler and macro processor for an hypothetical simulated computer. 3) Learn working of linkers and loaders. 4) Evaluate working of debuggers and development utilities. 5) Apply debuggers and development utilities for debugging of programs. 6) Define complexity of Operating systems as a software.
2	CS-352	Computer Networks II	V	On completion of the course, student will be able to– 1) Student will understand the different protocols of Application layer. 2) Develop understanding of technical aspect of Multimedia Systems 3) Develop various Multimedia Systems applicable in real time. 4) Identify information security goals. 5) Understand, compare and apply cryptographic techniques for data security
3	CS-353	Web Technologies – I	V	On completion of the course, student will be able to– 1) Understand how to develop dynamic and interactive Web Page
4	: CS - 354	Foundations of Data Science	V	On completion of the course, student will be able to– 1) Perform Exploratory Data Analysis 2) Obtain, clean/process, and transform data. 3) Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization. 4) Demonstrate proficiency with statistical analysis of data. 5) Present results using data visualization techniques. 6) Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.
5	CS - 355	Object Oriented Programming using Java - I	V	On completion of the course, student will be able to– 1) Understand the concept of classes, object, packages and Collections. 2) To develop GUI based application.

6	CS - 356	Theoretical Computer Science	V	Course Outcomes On completion of the course, student will be able to– 1) Understand the use of automata during language design. 2)Relate various automata and Languages.
7	CS-3510	Python Programming	V	On completion of the course, student will be able to– 1) Develop logic for problem solving 2)Determine the methods to create and develop Python programs by utilizing the data 3)structures like lists, dictionaries, tuples and sets. 4) To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc. 5)To write python programs and develop a small application project
8	CS-3511	Blockchain Technology	V	Course Outcomes On completion of the course, student will be able to– 1. Learn the fundamentals of Blockchain Technology. 2. Learn Blockchain programming 3. Basic knowledge of Smart Contracts and how they function

### Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS - 357	Practical Course based on CS - 351	V	After completion of this course students will be able to understand the concept of 1. Process synchronization 2. Processes and Thread Scheduling by operating system 3. Memory management by operating system using with the help of various schemes
2	CS - 358	Practical Course based on CS - 353 and CS - 354	V	1)Understand how to develop dynamic and interactive Web Page 2) Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions. 3) Perform exploratory data analysis
3	CS - 359	Practical Course based on CS - 355	V	1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs. 2. Read and make elementary modifications to Java programs that solve real-world problems. 3. Validate input in a Java program.

## T.Y.B.S.C(Computer Science) Sem VI

### Theory Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS - 361	Operating Systems-II	VI	After completion of this course students will be able to understand the concept of 1. Management of deadlocks and File System by operating system 2. Scheduling storage or disk for processes 3. Distributed Operating System and its architecture and the extended features in mobile OS.
2	CS - 362	Software Testing	VI	1) To understand various software testing methods and strategies. 2)To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software. 3)To design test cases and test plans, review reports of testing for qualitative software. · 4. To understand latest testing methods used in the software industries.
3	CS - 363	Web Technologies -II	VI	Course Outcomes On completion of the course, student will be able to– • Build dynamic website. • Using MVCbased framework easy to design and handling the errors in dynamic website
4	CS - 364	Data Analytics	VI	On completion of the course, student will be able to– 1)Use appropriate models of analysis, assess the quality of input, and derive insight from results. 2)Analyze data, choose relevant models and algorithms for respective applications 3) Understand different data mining techniques like classification, prediction, clustering and association rule mining 4) Apply modeling and data analysis techniques to the solution of real world business problems

5	CS-365	Object Oriented Programming using Java – II	VI	<p>Students will be able to understand:</p> <ol style="list-style-type: none"> <li>1. To learn the advance concept of PHP Programming.</li> <li>2. To learn XML programming concepts in PHP.</li> <li>3. To learn Sending emails using php script.</li> <li>4. Learn JavaScript handling.</li> <li>5. Learn AJAX</li> <li>6. Drupal - CMS</li> </ol>
6	CS - 366	Compiler Construction	VI	<p>On completion of the course, student will be able to–</p> <ul style="list-style-type: none"> <li>• Understand the process of scanning and parsing of source code.</li> <li>• Learn the conversion code written in source language to machine language.</li> <li>• Understand tools like LEX and YACC.</li> </ul>
7	CS - 3610	Software Testing Tools	VI	<ol style="list-style-type: none"> <li>1) To understand various software testing methods and strategies.</li> <li>2) To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.</li> <li>3) To design test cases and test plans, review reports of testing for qualitative software.</li> <li>4. To understand latest testing tools used in the software industries.</li> </ol>
8	CS - 3611	Project	VI	<p>After completion of this course, students will gain</p> <ol style="list-style-type: none"> <li>1. Understand application of Computer Graphics</li> <li>2) Learn how to create the graphical objects by using algorithms</li> <li>3. Apply transformation for manipulate the graphical objects</li> <li>4. Apply clipping and hidden surface elimination for rendering the graphical objects</li> </ol>

## Practical Papers

SR.No	Course Code	Course Name	Semester	Overall Course Outcome
1	CS - 367	Practical Course based on CS - 361	VI	After completion of this course students will be able to understand the concept of 1. Management of deadlocks by operating system 2. File System management 3. Disk space management and scheduling for processes
2	CS - 368	Practical Course based on CS - 363 and CS - 364	VI	Course Outcomes: 1) Build dynamic website. 2) Using MVC based framework easy to design and handling the errors in dynamic website.
3	CS - 369	Practical Course based on CS - 365	VI	Course Outcomes: 1. To Learn database Programming using Java 2. Understand and Create dynamic web pages using Servlets and JSP. 3. Work with basics of framework to develop secure web applications