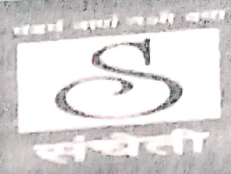




SAVPM

Sancheti College of Arts, Commerce & Science
Affiliated To Savitribai Phule Pune University



Program Outcomes & Course Outcomes

Program Outcomes

B.B.A. (Computer Application)

After Completion of B.B.A. Programme the student will be able to learn:

1. Apply knowledge of computing fundamentals, mathematics and domain knowledge Appropriate for the conceptualization of computing models.
2. Identify, analyze, formulate, Design and develop the real world requirements by critical Thinking for complex problems in IT enabled services. (Critical Thinking & problemSolving approach)
3. Recognize the need and adopt appropriate tools and techniques for modern computing Practices. (Usage of modern tools)
4. Make use of ethical practices and cyber regulations in the computing field for Managing software projects in diverse environments. (Ethics & Management)
5. Understand the societal, environmental and moral values and its impact with respect to Computing, communication, literary and professional practice. (Social responsibility)
6. Communicate effectively with society at large, such as, being able to comprehend and Write effective reports, design documentation and make effective presentations.(communication & team work)
7. Recognize the need for, and have the preparation and ability to engage in independent And life-long learning in the broadest context of technological change (Lifelong learning).



Course Outcomes

B.B.A. (Computer Application)

F.Y.B.B.A.

SEMESTER I

CA-101: BUSINESS COMMUNICATION SKILLS

On completion of this course, students will be able to:

- Apply communication theories. Show an understanding of opportunities in the field of communication.
- Demonstrate critical and innovative thinking.
- Display competence in oral, written, and visual communication
- Use current technology related to the communication field.
- Demonstrate positive group communication exchanges.

CA-102: Principles of Management

On completion of this course, students will be able to:

- To learn basic aspects of management thinking
- Develop ability of managerial thinking & cultivate business acumen
- To understand different approaches of management scientist to management thought & philosophy
- To help to understand various approaches of management thinking
- To understand different functions of management & their roles.
- Develop ability to organise various programs & events.
- To understand the themes in modern management & changes in the business.

CA- 103: C Language

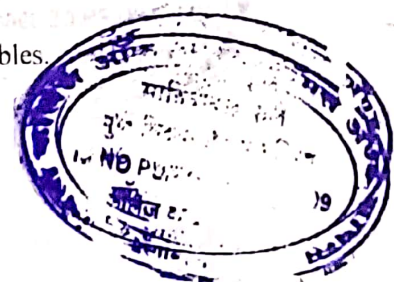
On completion of this course, students will be able to:

- To Explore algorithmic and flowchart approaches to problem solving.
- To Familiar with Fundamentals
- Developing Conditional and Iterative statement
- Practice on Program to develop logical thinking.
- Ability to work with Advance concept-arrays, Strings
- Understanding a concept of functional: Modular concept.
- Ability to work with Pointer in c.
- To learn User define data types: structure, union

CA-104: DBMS (DATABASE MANAGEMENT SYSTEMS)

On completion of this course, students will be able to:

- To understand the file structure and its organization.
- Students get the knowledge of Relational Database concepts which is the basic requirements of every organization.
- Give a description of the Database Management structure.
- Students are able to Compare relational
- model with the Structured Query Language (SQL)
- Students are able to normalize the complex data into simple tables.



- To apply the various concepts in business situation
- To examine concept of discounts in different business solutions.
- To work with simple and compound interest, annuities, invoice preparation, trade discounts, taxes, and depreciation problems in various.
- To perform the matrix operations
- To develop linear programming (LP) models.
- To understand the mathematical tools that are needed to solve optimization problems using mathematical software to solve the proposed models.

CA-204: RELATIONAL DATABASE

On completion of this course, students will be able to:

- Understanding of various RDBMS products
- Use of relational database
- To get knowledge of Front End and Backend
- Helps student to learn different types of data models
- To understand various data types, operators, functions and control statements
- Students get the knowledge of Relational Database concepts which is the basic requirements of every organization.
- Understanding use of transaction and effect on database
- Application of properties
- Understanding of various states.
- To understand concept of concurrency control and recovery system.
- To understand various concepts of it based on real life examples.

CA-205: Web Technology (HTML- JS-CSS)

On completion of this course, students will be able to:

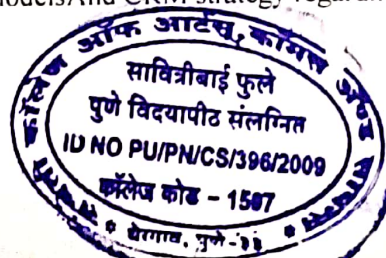
- Learn client and server, HTTP, FTP, IP protocols, WWW, Response and Request mechanism.
- Details how to design a website its look and feel, its planning etc.
- All html tags and how to create webpage using html.
- CSS in detail with its implementation for creating website.
- Understand how to develop web based applications.

S. Y. B.B.A. SEMESTER III

CA-301: Digital Marketing

On completion of this course, students will be able to:

- Helps the students to get to know about Ecommerce Concept
- Understanding what is Internet Marketing
- Students get the knowledge of what are Digital Marketing concepts which is the basic requirements of every organization when it targets a new Group.
- Students get Knowledge for Doing Project and understanding the flow of System and to attract the audience.
- Students get the knowledge of Various Keys supports of SWOT analysis: Strengths, Weaknesses, Opportunities, and Threats and how to write various queries using Relational algebra concepts.
- Give the detail description on Optimization of Web sites and why it is necessary
- Explained how MS Expression Web works and what are various uses
- Students are able to understand the concept of SEO Optimization and what are essential factors involved in it and how to write the SEO along with its importance in Digital world.
- Students are able to understand the concept of Introduction to CRM
- Give details description of what is CRM platform and how it is helpful in Digital Marketing.
- Explained various stages of CRM models and CRM strategy regarding it.



- Understanding Social Media Marketing Social Networking.
- Understanding the concepts of Webanalytics – levels
- Understanding the different Modes of Social Media Marketing and how actually it works
- Understanding the Resource planning And in terms of Cost estimating, Cost budgeting, Cost control

CA-302: Data Structure

On completion of this course, students will be able to:

- To understand need and types of data structure. Ability to analyze algorithms and algorithm correctness.
- To understand and implement different searching and sorting techniques
- To learn linear data structure linked list and solution for specific problems.
- To learn linear data structure stack and solution for specific problems.
- To learn linear data structure queue and solution for specific problems.
- To learn Non-linear data structure trees and solution for specific problems.
- To learn Non-linear data structure graph and solution for specific problems.

CA-303: Software Engineering

On completion of this course, students will be able to:

- Basic knowledge and understanding of the analysis and design of complex systems.
- Understand the need of software, types of Software and the main use of Software Engineering.
- Gain ability to design, develop, evaluate, test and maintain large-scale software systems and understand process models used in software Engineering.
- Understand requirements Engineering Tasks and Requirements of Engineering Process.
- Understand Designing and implement data flow analysis, Decision tree, Structure chart and diagram and data dictionary.
- Understand the Software Testing Process and different types of testing.
- Ability to do maintenance of software and understand different types of maintenance, Reverse Engineering and Restructuring and forward Engineering.

CA-304: PHP

On completion of this course, students will be able to:

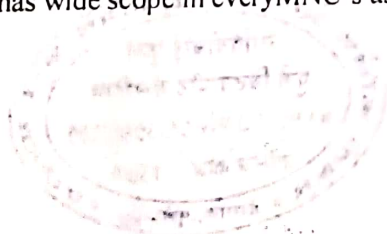
- Give students the basic understanding of how things work in the Web world from the technology point of view as well as to give the basic overview of the different technologies.
- Giving introduction about Clients- Servers and Communication & Web server and Web browser
- Introduction to develop dynamic web pages by using server side scripting language PHP.
- Understand Control Structures and Loops
- Learn different functions & string built in functions and class concept in PHP.
- Understand POST and GET in form submission
- Learn to retrieve values from form, validation of form and Email handling programming.
- Learn to receive and process form submission data using cookies and Session.
- Learn to Read and process data in a MySQL database and explain different advanced database techniques.

SEMESTER – IV

CA-401: Networking

On completion of this course, students will be able to:

- Students can get job as a Network Administrator in any organization.
- This subject has wide scope in every MNC's as Networking is required everywhere.
- Students can get job as a Network Administrator in any organization.
- This subject has wide scope in every MNC's as Networking is required everywhere.



- Understand the concept of reliable and unreliable transfer protocol of data and how TCP and UDP implement these concepts, to understand the client/server model and socket API with their implications, skills to implement a network protocol based on socket programming.
- Understand connecting LAN's, backbone networks, and virtual LAN's. Students should understand operations of
- Able to compare and contrast the data transmission modes: serial and parallel as well as synchronous, asynchronous, and isochronous with relevant examples, bridges and the spanning tree algorithm.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.
- Can effectively discuss that bandwidth utilization is goal-oriented and involves trade-offs by showing that multiplexing (TDM, FDM, WDM) efficiently use bandwidth while spread spectrum inefficiently use bandwidth to ensure privacy and anti-jamming.

CA-402: Object Oriented Concept Through CPP

On completion of this course, students will be able to:

- Students will understand the features of C++ supporting object-oriented programming, concept and application of OOP
- Understanding the basic concepts, Implementation and build models in C++.
- Understanding the implementation of user define function.
- Understanding concept of classes and objects.
- Understand to build/ produce object-oriented software using C++ through classes and object.
- To know about constructor and destructor.
- Understand to develop application using constructor.
- Understand how to apply inheritance to implement programs in C++.
- To know different types of inheritance.
- Understand how to apply polymorphism to implement programs in C++.
- To know different types of polymorphism.
- Understand how to handle files.
- To know how to perform various operations on file.

CA-403: Operating System

On completion of this course, students will be able to:

- Explain the fundamental components of a computer operating system.
- Study structure of operating system.
- Define, restate, discuss, and explain the policies for scheduling.
- Define states of process management.
- Understand various queues in process execution.
- How CPU get allocated for process execution
- Using various algorithms like fcfs, SJF, Priority, round robin.
- Understand the process management policies and scheduling of processes by CPU.
- Understand the critical section problem along with semaphore.
- To define, restate, discuss, and explain the concept of deadlocks in real life.
- To Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system.
- Calculate efficiency of different memory management.
- To define, restate, discuss, and explain the policies for file systems.
- To define, restate, discuss, and explain the policies for I/O systems.

CA-404: Advance PHP

On completion of this course, students will be able to:

- Understand OOP concept of visibility, inheritance and interface
- Study about processing form.
- Understand concept of XML.



- Define document object model and XML extension.
- Learn Ajax basic script
- Learn how to connect with database using Ajax and PHP
- To understand core building block of webservices.
- To define, restate, discuss, and explain the concept of deadlocks in real life.
- To Understand PHP framework and MVC architecture.

T. Y. B.B.A. SEMESTER V

CA-501: Cyber Security

On completion of this course, students will be able to:

- Have a good understanding of Cyber Security and the Tools.
- Identify the different types of Cyber Crimes.
- Have a good understanding of Cyber laws.
- Have a good understanding of Cyber laws.
- To develop Cyber forensics awareness.
- Identify attacks, security policies and credit card frauds in mobile and Wireless Computing Era
- Identify attacks, security policies and credit card frauds in mobile and Wireless Computing Era

CA-502: Object Oriented Software Engineering

On completion of this course, students will be able to:

- To design with the UML dynamic and implementation diagrams.
- To understand and differentiate Unified Process from other approaches.
- Students will be able to give Design Specifications for project.
- To design with static UML diagrams.
- Students will acquire Knowledge in Basic Modeling.
- To design with the UML dynamic and implementation diagrams.
- To improve the software design with design patterns.
- To improve the software design with design patterns.
- To test the software against its requirements specification.

CA-503: Core Java

On completion of this course, students will be able to:

- Understanding the basic fundamentals and important terminologies of java.
- Understanding how to create classes and objects.
- Understanding new functionalities like Interface, Packages etc. and Get detailed knowledge of collection, map, Iterator etc.
- Understand exception and file handling in detailed.
- Understanding how to create small internet applications using applet and know how to create GUI in java using AWT and Swing.

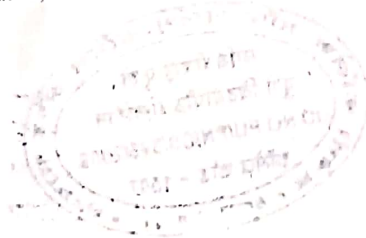
CA-504: Python

On completion of this course, students will be able to:

- Understand Python programming basics and paradigm.
- Understand python looping, control statements and string manipulations.
- Understand Python programming basics and paradigm.
- Concepts of file handling, exception handling.
- GUI application and how to handle exceptions and files.
- Students should be made familiar with the concepts of GUI controls and designing GUI applications.

CA-506: Computer Laboratory Based on 503 and 504

On completion of this course, students will be able to:



- Use the concepts of Python or Mongo DB to develop applications.
- Apply the concepts of core JAVA Programming for problem solving.
- Demonstrate his theoretical knowledge practically in computer laboratory.

SEMESTER VI

CA-601: Recent Trends in IT

On completion of this course, students will be able to:

- To introduce upcoming trends in Information technology.
- To discuss the basic concepts AI
- To provide a strong foundation of fundamental concepts in Artificial Intelligence.
- To apply basic, intermediate and advanced techniques to mine the data.
- To evaluate the performance of various data mining task.
- To provide an overview of the concept of Spark programming.

CA-602: Software Testing

On completion of this course, students will be able to:

- To provide learner with knowledge in Software Testing techniques.
- Students will be introduced to testing tools.
- To understand how testing methods can be used as an effective tool in providing quality assurance for software.
- To provide skills to design test case plan for testing software.
- Students will acquire Knowledge of Basic SQA.
- Students will be able to design basic Test Cases.

CA-603: Advanced Java

On completion of this course, students will be able to:

- Students will know the concepts of JDBC Programming
- Students will know the concepts of Multithreading and Socket Programming.
- Students will know the concepts of Spring and Hibernate.
- Students will develop the project by using JSP and JDBC.
- Students will develop applications in Spring and hibernate.

CA-604: Android Programming

On completion of this course, students will be able to:

- Demonstrate their understanding of the fundamentals of Android operating systems.
- Demonstrate their skills of using Android software development tools.
- Student will be able to write simple GUI applications, use built-in widgets and components, work with the database to store data locally, and much more.
- To understand the issues relating to Wireless applications.
- Student will be able to understand use of threads and notifications.
- Students will understand issues relating to Wireless applications.

CA-605: Computer Laboratory based on 603 and 604

On completion of this course, students will be able to:

- Apply the knowledge of Android Programming for app development.
- Use the concepts of JDBC for Database connectivity
- Apply the concepts of Adv. JAVA for distributed applications and problem solving.
- Demonstrate theoretical knowledge practically in computer laboratory.



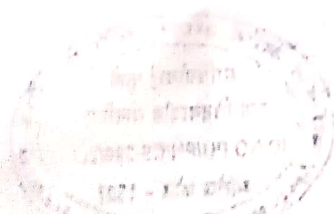
Program Outcomes & Course Outcomes

Program Outcomes

B.B.A.

After Completion of B.B.A. Programme the will be able to:

1. To learn and demonstrate various Managerial Skills.
2. Demonstrate various Marketing techniques to their future career.
3. Acquire the skills of effective communication, decision making and problem solving in day to day business.
4. Prove their ability in different competitive exams like CS, CAT and other courses.
5. To manage finance in their future.
6. Go for higher education and other advancement courses related to their specialization.
7. Work as Financial advisor, Human Resource Executive and Marketing Executive.
8. Involve in various events and activities to gain theoretical and practical knowledge.
9. Gain practical exposure through summer internship and industrial training.
10. Gain presentation skills.
11. Make product's and company's brand value through practical exposure.
12. Manage his portfolio and take decisions regarding their investment options.



Course Outcomes

B.B.A.

F.Y.B.B.A. SEMESTER I

101: Business Organisation & System

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

- Explain why information systems are so important today for business and management.
- Have the knowledge of the different forms of business systems.
- Develop the spirit of entrepreneurship.
- Have the knowledge of Domestic and Foreign Trade.

102: Business Communication Skills

On completion of the course, students will be able to:

- Improve their skills such as linguistic, non-linguistics and paralinguistic skills.
- Develop integrative approach where reading, writing, oral and speaking components are used together to enhance the ability to communicate and write effectively.
- Be aware about various methods and media of communication.

103: Business Accounting

On completion of the course, students will be able to:

- Have acquired sound knowledge of basic concepts of accounting.
- Also understood about recording of transactions and preparation of final accounts.
- Get exposure about various accounting software packages.

104: Business Economics (Micro)

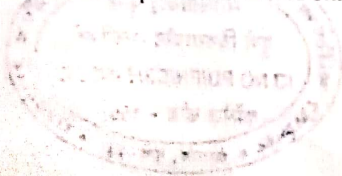
On completion of the course, students will be able to:

- Understand how households and businesses interact in various market structures to determine price and quantity of a good produced.
- Understand the links between household behaviour and economic models and demand.
- Represent demand, in graphical form, including the downward slope of the demand curve and what shifts the demand curve.
- Understand the links between production costs and the economic models of supply.
- Represent supply, in graphical form including the upward slope of the supply curve and what shifts the demand curve.
- Understand how different degrees of competition in market affect pricing and output.

105: Business Mathematics

On completion of the course, students will be able to:

- Understand application of matrices in business.
- Understand the concept and application of permutation and combination in business
- Use LPP and its applications in business.
- Understand the concept of transportation problems and its applications in business world.
- Understand the concept of shares and share market



106: Business Demography & Environmental Studies

On completion of the course, students will be able to:

- Understand distribution of population and population growth.
- Be aware regarding environment and environmental issues related to business.
- Understand the problems of urbanization.

SEMESTER II

201: Principles of Managements

On completion of the course, students will be able to:

- Demonstrate and understanding of effective management principles as outline in selected text learning objectives.
- Apply effective management strategies principles and techniques.
- Demonstrate research and analytical skills by using both human and technology resources.
- Communicate effectively.

202: Principles of Marketing

On completion of the course, students will be able to:

- Get familiar to Basic concept of marketing its general nature scope and importance.
- Receive appropriate knowledge and understanding of its primary functions and applications and its gradual evolution and development.
- Developed basic and essential skills related to marketing.
- Get a learning platform for preparing for marketing employability opportunities essential for industries.

203: Principles of Finance

- Understood the nature importance structure of inancerelated areas.
- Knowledge regarding sources of finance for a business.

204: Basics of Cost Accounting

On completion of the course, students will be able to:

- Got the knowledge of basic cost concepts elements of cost and preparation of Cost sheet.
- Basic knowledge of important methods of Costing was given.

205: Business Statistics

On completion of the course, students will be able to:

- Understand the basic of statistic concept of population and sample and to use frequency distribution to make decision.
- Understand and calculate various types of average is and variation.
- Understand correlation and use of regression analysis to estimate the relationship between two variables and its applications.
- Understand the concept time series and its application in business.
- Imbibe research and culture.
- Understand the concept index numbers and applications in business.

206: Business Informatics

On completion of the course, students will be able to:

- Know the basic of computer.
- Understand the basic of networking.
- Understand basic of internet.
- Understand the basic of data bases.



S. Y. B.B.A. SEMESTER III

301: personality development

On completion of the course, students will be able to:

- Get aware about various dynamics of personality development impersonality development
- Be aware about the dimensions and importance of effective personality development.
- Understand personality traits and formation and vital contribution in the world of business.

302: Business Ethics

On completion of the course, students will be able to:

- Get knowledge of Business Ethics.
- Witness promotions of ethical practices in the business.
- Develop ethical and value based thought process among the future managers entrepreneurs

303: Human Resource Management & Organisation Behaviours

On completion of the course, students will be able to:

- Studying HRM/OB acquired the knowledge ,critical thinking critical thinking and practical skills that will enable them to create organisational effectiveness, organisational effectiveness lead human resources management Strategies, and announce the human condition at work.
- HRM/OB learn to think critically about the challenges involved in creating high performance work places where innovation diversity and ethical behaviour are valued are rewarded.
- HRM/OB majors are educated in human resources management organisational behaviour OB and Industrial Relations IR

304: Management Accounting

On completion of the course, students will be able to:

- Got the basic knowledge of Management Accounting.
- To know the implications of various financial ratios in decision making.
- Significance of working capital in business.
- Got the concept of budgetary controls and its application in business.
- Got calculating ability of various techniques of Management Accounting.

305: Business Economic (Macro)

On completion of the course, students will be able to:

- On completion of the course, students will be able to:
- And study the behaviour of working of the economy as a whole.
- Developed and analytical framework to understand the interlink ages among the crucial macroeconomics variables.
- Apply economic reasoning to problems of business and public policy.

306: I.T.in Management

On completion of the course, students will be able to:

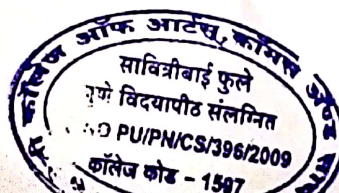
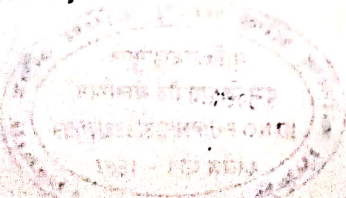
- The study describes the role of information systems in business.
- It studies the current issues of Information Technology and relates those issues to the firm.

SEMESTER – IV

401: Production & Operations Management

On completion of the course, students will be able to:

- Identify and articulate how operations management contributes to the achievement of organisations strategic objectives.
- Critically evaluate the operations functions in manufacturing and service production settings.



- Apprise and apply forecasting methods as the basis of management planning and control activity.
- SS and formula decision making strategies to address operating issues that have short, intermediate or long lead times.
- Evaluate approaches to problem solving and process improvement in production settings.

402: Industrial Relations & Labour laws

On completion of the course, students will be able to:

- Understood relationship between labour and Management.
- Resolving of industrial disputes and grievances.
- Understood the laws which affect the industry and labour.

403: Business Taxation

On completion of the course, students will be able to:

- Got to understand the basic concept and definitions under the Income Tax Act 1961, where given latest development in the subject of taxation.
- Acquired knowledge about competition of income under different heads of income of Income Tax Act 1961.
- Acquired knowledge about the submission of income tax return, advance tax, tax detected at source tax collection authorities.
- Became competent enough to take up to employment in tax planner.
- To develop ability to calculate taxable income of forms, co-operative societies and charitable trust.

404: International Business

On completion of the course, students will be able to:

- Get acquainted with emerging is used in international business.
- Child studies the impact of international business environment on foreign market operations.
- Understand the importance of foreign trade for Indian economy.

405: Management Information System

On completion of the course, students will be able to:

- Became competent enough to understand the concept of information system.
- Understood the concept of system analysis and design.
- Understood the issues in MIS.

406: Business Exposure (Field Visits)

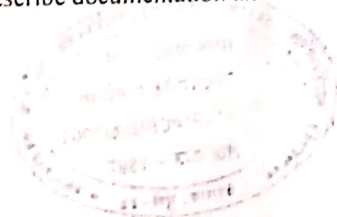
On completion of the course, students will be able to:

- Develop their understanding with a realistic and practical perception of industry its layout, procedures process is organisation structure.
- Gain first-hand information regarding the functioning of industry which present the with opportunities to plan, organise and engage inactive learning expenses both inside and outside the classroom.

T. Y. B.B.A. SEMESTER V

501: Supply & Chain logistics

- Upon successful completion of program able to describe major Logistic functions and activities.
- Differentiate Logistic and supply chain management.
- Describe methods of inventory planning.
- Explain how Technology has and continuous to change Logistic and supply chain management.
- Compare modes of transportation.
- Describe warehouse processes, systems and performance measures.
- Describe documentation and terms of sale for international shipments.



503: Entrepreneurship Development

On completion of the course, students will be able to:

- Evaluate entrepreneurship will be able to demonstrate a fundamental comprehension of business opportunity evaluation from the perspective of a prospective investor.
- Identify the most recognizable sources of potential funding and financing for business starts up and/ or expansion.
- Demonstrate extemporaneous speaking skills developed through in class discussion of text materials case study analysis and current entrepreneurship related issues.
- Assess their own personal work products creativity and how those could apply to their own real life future business Ventures.

504: Business Ethics

- Understand basic legal terms and concept used in law pertaining to business.
- Applicability of legal principles to situations in business world.

505: research methodology (tools & analysis)

On completion of the course, students will be able to:

- Gain basic understanding of research process and tools for the same.
- Gain understanding of the tools and techniques necessary for research and report writing.

506: Specialisation –I (Financial Services)

On completion of the course, students will be able to:

- Aware of various financial services and financial markets in India.

506: Specialisation –II (Advertising and sales promotion)

On completion of the course, students will be able to:

- Develop knowledge and understanding of importance of functions of advertising.

SEMESTER VI

601: Business Planning & Project Management

On completion of the course, students will be able to:

- Learn to manage the scope, cost timing and quality of the project at all times focused on project.
- Align the project to the organisation strategic plans and business justification throughout its life cycle.
- Identify project goals, constraints, deliverables, performance criteria, control needs.
- Implement project management knowledge, processes, life cycle and the embodies concept, tools and techniques in order to achieve project success.

602: Event Management

On completion of the course, students will be able to:

- Get acquainted with concepts issues and various aspects of event management

603: Management Control System

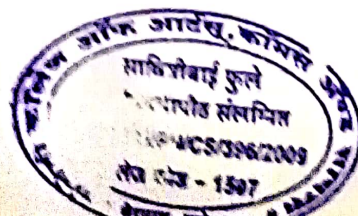
On completion of the course, students will be able to:

- Understand the function of management control, its nature, functional areas and techniques.

604: E- Commerce

On completion of the course, students will be able to:

- Understand the basic concepts and technology is used in the field of management information systems.
- Be aware of the ethical social and security is use of information system.
- Assess the impact of the internet and internet technology on business Electronic Commerce and electronic business.



- Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to the challenges.

605: Specialisation –III (Cases in Marketing)

On completion of the course, students will be able to:

- Get hands on application of theory by practicing via projects and cases.

606: Specialisation – IV (Cases in HRM)

On completion of the course, students will be able to:

- Understand the actual application of theoretical aspects and laws by the means of live project.



Course Outcomes

B. Sc. (Computer Science)

F.Y.B.Sc. SEMESTER I

CS101: Problem Solving Using Computer and 'C' Programming – I

On completion of this course, students will be able to:

- Explore algorithmic approaches to problem solving.
- Develop modular programs using control structures and arrays in 'C'.

CS102: Database Management Systems

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

- Solve real world problems using appropriate set, function, and relational models.
- Design E-R Model for given requirements and convert the same into database tables.
- Use SQL.

CS103: Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems

On completion of this course, students will be able to:

- Devise pseudo codes and flowchart for computational problems.
- Write, debug and execute simple programs in 'C'.
- Create database tables in postgresSQL.
- Write and execute simple, nested queries.

MTC-111: Matrix Algebra

On completion of this course, students will be able to:

- Perform basic Matrix operation.
- Define special matrices: diagonal, triangular, and symmetric.
- Basics of solving systems of linear equations.
- Understand determinants and their properties.
- Logic behind writing programs using computer language.
- Factorization of any square matrix in simpler LU-form.

MTC 112: Discrete Mathematics

On completion of this course, students will be able to:

- Understanding the concepts of discrete mathematics.
- Learning applications of discrete structures in Computer Science.
- Express a logic sentence in terms of predicates, quantifiers, and logical connectives.
- Apply the operations of sets and use Venn diagrams to solve applied problems; solve problems using the principle of inclusion-exclusion.
- Demonstrate different traversal methods for trees and graphs.
- Model problems in Computer Science using graphs and trees.



MTC 113: Mathematics Practical

On completion of this course, students will be able to:

- Students will be able to compute matrix calculation using Maxima software.
- Use appropriate modern technology to explore calculus concepts.
- Solve applied problems using matrices.
- Solve systems of linear equations by use of the matrix.
- Students will be able to formulate problems in the language of sets and perform set operations, and will be able apply the Fundamental Principle of Counting, Multiplication Principle.

ELC-111: Semiconductor Devices and Basic Electronic Systems

On completion of this course, students will be able to:

- Semiconductor Devices and Basic Electronic Systems
- To study various types of semiconductor devices, elementary electronic circuits and systems.
- To bridge the gap between Theoretical and practical knowledge.

ELC 112: Principles of Digital Electronics

On completion of this course, students will be able to:

- To get familiar with concepts of digital electronics.
- To study arithmetic circuits, combinational circuits and sequential circuits.

ELC-113: Practical Course

On completion of this course, students will be able to:

- To use basic concepts for building various applications in electronics.
- To understand design procedures of different electronic circuits as per requirement.
- To build experimental setup and test the circuits.
- To develop skills of analysing test results of given experiments.

CSST 111: Descriptive Statistics

On completion of this course, students will be able to:

- The main purpose of descriptive statistics is to provide a brief summary of the samples and the measures done on a particular study.
- To provide basic information about variables in a dataset.

CSST 112: Mathematical Statistics

On completion of this course, students will be able to:

- It will help students develop skills in thinking and analysing problems from a probabilistic and statistical point of view.
- It will provide difference between Discrete and continuous distributions.

CSST113: Statistics Practical

On completion of this course, students will be able to:

- To Study free statistical software's and use them for data analysis in project
- To use of Statistical tools in Ms-Excel

SEMESTER II

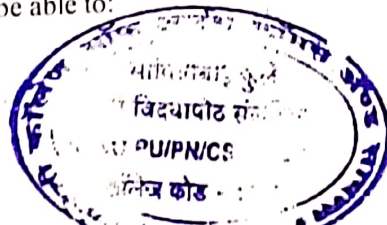
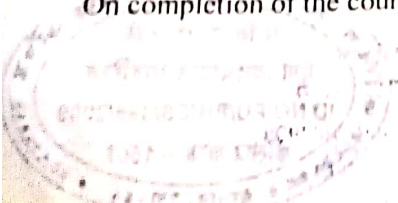
CS201: Advanced 'C' Programming

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

- Develop modular programs using control structures, pointers, arrays, strings and structures
- Design and develop solutions to real world problems using C.

CS202: Relational Database Management Systems

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



- Design E-R Model for given requirements and convert the same into database tables.
- Use database techniques such as SQL & PL/SQL.
- Explain transaction Management in relational database System.
- Use advanced database Programming concepts.

CS203: Practical Course on Advanced 'C' Programming and Relational Database Management Systems

On completion of this course, students will be able to:

- Write, debug and execute programs using advanced features in 'C'.
- To use SQL & PL/SQL.
- To perform advanced database operations.

MTC-121: Linear Algebra

On completion of this course, students will be able to:

- Solve systems of linear equations using various methods including Gaussian and Gauss Jordan elimination and inverse matrices.
- Perform matrix algebra, invertibility, and the transpose and understand vector algebra in R^n .
- Compute linear transformations, kernel and range, and inverse linear transformations, and find matrices of general linear transformations.
- Compute inner products on a real vector space and compute angle and orthogonality in inner product spaces.
- Prove basic results in linear algebra using appropriate proof-writing techniques such as linear independence of vectors; properties of subspaces; linearity, injectivity and surjectivity of functions; and properties of eigenvectors and eigenvalues.

MTC-122: Graph Theory

On completion of this course, students will be able to:

- Explain basic concepts in graph theory.
- Define how graphs serve as models for many standard problems.
- Account for the theory of paths and degree of connectedness of graph.
- Learn the use of spanning tree.
- Discuss the concept of graph, tree, and Euler graph.
- See the applications of graphs in science, business and industry.
- To present a survey of essential topics for computer science students who will encounter some of them again in more advanced courses.

MTC 123: Mathematics Practical

On completion of this course, students will be able to:

- Students will be able to find Eigen values and Eigen vectors using Maxima software.
- Students will be able to perform operations on orthogonally and quadratic forms.
- Use appropriate modern technology to explore calculus concepts.

ELC 121: Instrumentation System

On completion of this course, students will be able to:

- To study various kind of Instrument of different Instrumentation System
- To control the parameter in process or a particular system.
- To study smart sensors for smart Electronics Applications.

ELC 122: Basics of Computer Organisation

On completion of this course, students will be able to:

- To study and design different counters.
- To study basics of computer system.
- To study Memory Organization.



ELC-123: Practical Course

On completion of this course, students will be able to:

- To use basic concepts for building various applications in electronics.
- To understand design procedures of different electronic circuits as per requirement.
- To build experimental setup and test the circuits.
- To develop skills of analysing test results of given experiments.

CSST121: Methods of Applied Statistics

On completion of this course, students will be able to:

- To create a mathematical model that can be used to predict the values
- To Handle large data and analyse it by statistical tools

CSST122: Continuous Probability Distributions and Testing of Hypotheses

On completion of this course, students will be able to:

- To study distribution of various data
- Student should use these techniques for their project.

CSST 123: Statistics Practical

On completion of this course, students will be able to:

- How to use statistical tools in real life situation.
- Handling data for research purpose

S. Y. B.Sc. SEMESTER III

CS 231: Data Structures and Algorithms – I

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

- To use well-organized data structures in solving various problems.
- To differentiate the usage of various structures in problem solution.
- Implementing algorithms to solve problems using appropriate data structures.

CS 232: Software Engineering

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

- Compare and chose a process model for a software project development.
- Identify requirements analyse and prepare models.
- Prepare the SRS, Design document, Project plan of a given software system.

CS 233: Practical course Data Structures and Algorithms and Software Engineering

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

- Implement the Tree using C language
- Implement the Stack using C language
- Implement the Queues using C language
- Implement the Sorting algorithm using C language

MTC 231: Groups and Coding Theory

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

- Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.

MTC 232: Numerical Techniques

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

- Give the students a sufficient knowledge of fundamental principles, methods and a clear perception of in numerous powers of mathematical ideas and tools and know how to use them by modelling, solving and interpreting.



ELC 231: Micro controller Architecture & Programming

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

- I/O peripherals to 8051 microcontroller
- To write programs for 8051 microcontroller.
- To interface o design small microcontroller-based projects

ELC 232: Digital Communication and Networking

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

- Define and explain terminologies of data communication.
- Understand the impact and limitations of various digital modulation techniques.
- To acknowledge the need of spread spectrum schemes.
- Identify functions of data link layer and network layer while accessing communication link.
- To choose appropriate and advanced techniques to build the computer network.

SEMESTER IV

CS 241: Data Structures and Algorithms – II

On completion of the course, student 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.

CS 242: Computer Network

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

- Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers.
- Understand the working of various protocols.
- Analyse the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.

MTC 241: Computational Geometry

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

- Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.

MTC 242: Operations Research

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

- Enhancing students' overall development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

ELC 241: Embedded System Design

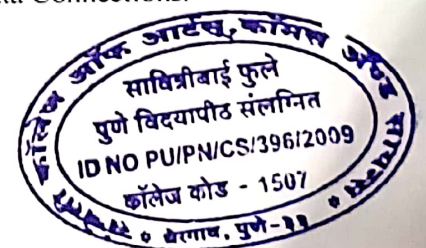
On completion of the course, student will be able to:

- To understand the concept of Embedded Systems.
- To study the design flow and available tools for an Embedded system.
- To understand the implementation of Embedded System using firmware and hardware components.
- To acquire programming skills for the development of embedded system design.

ELC 242: Wireless Communication and Internet of Things

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

- Know working principal of wireless technologies such as Mobile communication, GSM, GPRS
- Become familiar with 3G and 4G Cellular Network Technologies for Data Connections.



- Understand working principles of short-range communication application
- Get introduced to upcoming technology of Internet of Things
- Explore themselves and develop new IoT based applications

T. Y. B.Sc. SEMESTER V

CS 351: Operating Systems – I

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

- Processes and Thread Scheduling by operating system.
- Synchronization in process and threads by operating system.
- Memory management by operating system using with the help of various schemes.

CS 352: Computer Networks – II

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

- Student will understand the different protocols of Application layer.
- Develop understanding of technical aspect of Multimedia Systems
- Develop various Multimedia Systems applicable in real time.
- Identify information security goals.
- Understand, compare and apply cryptographic techniques for data security.

CS 353: Web Technologies – I

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

- Understand how to develop dynamic and interactive Web Page.

CS 354: Foundations of Data Science

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

- Perform Exploratory Data Analysis
- Obtain, clean/process, and transform data.
- Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization.
- Demonstrate proficiency with statistical analysis of data.
- Present results using data visualization techniques.
- 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.

CS 355: Object Oriented Programming using Java – I

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

- Understand the concept of classes, object, packages and Collections.
- To develop GUI based application

CS 356: Theoretical Computer Science

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

- Understand the use of automata during language design.
- Relate various automata and Languages.

CS357: Practical Course based on 351

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

- Process synchronization
- Processes and Thread Scheduling by operating system.
- Memory management by operating system using with the help of various schemes.



CS 358: Practical Course based on C++, JSP and PHP – III

- On completion of the course, student will be able to:
- Understand how to develop dynamic and interactive Web Page
 - Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions.
 - Perform exploratory data analysis

CS 359: Practical Course based on C++, JSP

- On completion of the course, student will be able to:
- Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
 - Read and make elementary modifications to Java programs that solve real-world problems.
 - Validate input in a Java program

CS 3510: Python Programming

- On completion of the course, student will be able to:
- Develop logic for problem solving. SEMESTER – VI
 - Examine the methods to create and develop Python programs by utilizing the data.
 - Structures like lists, dictionaries, tuples and sets.
 - To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
 - To write python programs and develop a small application project.

CS 3511: Block chain Technology

- On completion of the course, student will be able to:
- Learn the fundamentals of Block chain Technology.
 - Learn Block chain programming
 - Basic knowledge of Smart Contracts and how they function.

SEMESTER VI

CS 361: Operating Systems II

- On completion of the course, student will be able to:
- Management of deadlocks and File System by operating system
 - Scheduling storage or disk for processes
 - Distributed Operating System and its architecture and the extended features in mobile OS.

CS 362: Software Testing

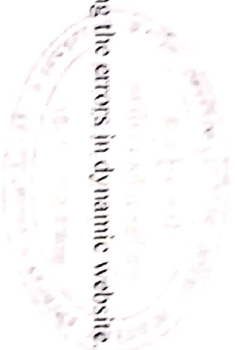
- On completion of the course, student will be able to:
- To understand various software testing methods and strategies.
 - To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
 - To design test cases and test plans, review reports of testing for qualitative software.
 - To understand latest testing methods used in the software industries.

CS 363: Web Technologies – II

- On completion of the course, student will be able to:
- Build dynamic website.
 - Using MVC based framework easy to design and handling the errors in dynamic website.

CS364: Data Analytics

- On completion of the course, student will be able to:



- Use appropriate models of analysis, assess the quality of input, and derive insight from results.
- Analyse data, choose relevant models and algorithms for respective applications
- Understand different data mining techniques like classification, prediction, clustering and association rule mining
- Apply modelling and data analysis techniques to the solution of real-world business problems.

CS 365: Object Oriented Programming using

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

- To access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application.
- Understand and create dynamic web pages, using Servlets and JSP.
- Work with basics of framework to develop secure web applications

CS 366: Compiler Construction

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

- Understand the process of scanning and parsing of source code.
- Learn the conversion code written in source language to machine language.
- Understand tools like LEX and YACC.

CS 367: Practical Course based on CS – 361

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

- Management of deadlocks by operating system
- File System management
- Disk space management and scheduling for processes.

CS 369: Practical Course based on CS – 365

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

- To Learn database Programming using Java
- Understand and create dynamic web pages using Servlets and JSP.
- Work with basics of framework to develop secure web applications.

CS 3610: Software Testing Tools

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

- To understand various software testing methods and strategies.
- To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.
- To design test cases and test plans, review reports of testing for qualitative software.
- To understand latest testing tools used in the software industries.

