# RAJJU SHROFF ROFEL UNIVERSITY, VAPI

## Bachelor of Computer Application (BCA)

## First Year Syllabus

### With Effect from 2023-24

### Semester - 1

| Subject Code | Subject Name | Credit | Description |
|---|---|---|---|
| CAM201-1C | Fundamentals of Programming | 4 | This subject introduces the programming language C. In this subject, a student learns to understand the logic of a problem and write structured C programs. |
| CAM202-1C | Computerized Documentation Tools & Internet Technology | 4 | This subject introduces basic concepts of Microsoft Office Tools like Word, Excel and PowerPoint. In this subject, a student learns -to understand the basic concepts of the Internet and WWW. |
| CAE201-1C | Fundamentals of Computer | 4 | This subject introduces the basic concepts of the functioning of a computer. It helps a student to learn the use of Boolean algebra for performing calculations in various number systems. |
| CAE201-1C | Computer Organization Architecture | 4 | The Purpose of this course is to give students a basic understanding of digital logic and its applications. It covers the fundamental concepts of digital logic, combinational circuits, such as half-adders and full-adders. |
| MDC201-1C | Advance Mathematics | 4 | Purpose of this course is to develop mathematical abilities relevant to Computer Science. |
| AEC201-1C | Communication Skills-Oral | 2 | This syllabus has been intended to give a foundation of the English Language. The literary texts are intended to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. |
| SEC201-1C | Cloud Computing | 2 | The purpose of a cloud computing course is to teach students the fundamentals of cloud computing, including its concepts, benefits, and use cases. |
| SEC201-1C | Personality Development | 2 | The purpose of this syllabus is to help individuals understand themselves better, develop positive personality traits, and improve their communication and interpersonal skills. |
| IKS201-1C | Indian Knowledge System | 2 | The purpose of an Indian Knowledge System (IKS) course is to introduce students to the rich and varied intellectual traditions of India. |

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| Paper Code: | CAM201-1C | |
| Title | **Fundamentals of programming** | |
| Credit | 4 (Theory + Practical) | |
| Purpose | To make the student aware of the programming concepts and develop the logic | |
| Course outcome | Student will develop the programming skills with implementing the logic.The students will learn the C programming language | |
| **Unit** | **Description** | **Percentage** |
| 1 | 1.1: Concept of programming:<br>1.1.1: Programming language definition<br>1.1.2: Levels of programming language<br>1.2: Understanding open source languages<br>1.3: IDE and editors<br>1.4: Translators:<br>1.4.1:Compilers and interpreters | 20% |
| 2 | 2.1: Building blocks of programming:<br>2.2: Header files<br>2.3: Preprocessor directives<br>2.4: Data types<br>2.4.1: Storage and scope of variables<br>2.5: Identifiers<br>2.5.1: Variables and constants<br>2.5.2: Operators & Expressions<br>2.5.3: Hierarchy of the operators<br>2.5.4: Type conversion | 20% |
| 3 | 3.1: Statements in programming<br>3.2: Structure of C program<br>3.3: Assignment statements<br>3.3.1: shorthand assignment expressions<br>3.4: Conditional statements<br>3.4.1: if statement<br>3.4.2: switch<br>3.4.3: goto statement<br>3.5:Looping statements<br>3.5.1: forming loop with if and goto<br>3.5.2: while loop<br>3.5.3: do…while<br>3.5.4: for loop | 20% |
| 4 | 4: Strings and derived data type : arrays<br>4.1:Handling strings<br>4.2:Builtin functions of strings<br>4.3:Concept of 1D arrays:<br>4.4: Defining and declaring arrays<br>4.4.1: Initializing the array<br>4.4.2: Accessing the array elements<br>4.4.3: Dynamic arrays<br>4.5: Handling 2D arrays:<br>4. 5.1: Declaring & handling 2D arrays | 20% |

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| | 4. 5.2: Declaring & Handling 2D string arrays<br>4.6: Concepts of Pointers<br>4.5.1:Declaring and initializing int, float, char and void pointers | |
| 5 | 5: UDF and User defined data type: structure<br>5.1: Declaring and fetching values of structure<br>5.2: Function declaration and parts of function<br>5.3: Passing arguments to function and Calling function<br>5.3.1: Call UDF from main() function<br>5.3.2: Calling UDF from other function.<br>5.4: Function types:<br>Function with No arguments and no return value, No arguments and a return value, with arguments and no return value, with arguments and a return value.<br>5.5: Recursive Function | 20% |
| | **Reference books:**<br>1. Kernighan B., Ritchie D. : The C Programming Language, Prentice Hall. Cooper H. & Mullish H : The Sprit of C, Jaico Publication House, New Delhi.<br>2. Balaguruswami : Programming in ANSI C., Tata McGraw Hill Publication.<br>3. Programming in c by Byron Gottfried, Tata McGraw Hill Publication.<br>4. Let Us C : Yashavant Kanetkar, BPB Publications | |

| Paper Code: | CAM202-1C | |
|---|---|---|
| Title | **Computerized Documentation Tools & Internet Technology** | |
| Credit | 4 (Theory + Practical) | |
| Purpose | Students will able to work with Office Software packages<br>Students will be able to work with the internet. | |
| Course outcome | Student will get knowledge about Office Documentation Tool and basics of internet, internet application and internet security | |
| **Unit** | **Description** | **Percentage** |
| 1 | **Word Processing Package**<br>1.1 : Different formats for saving a word document, creating, editing document and related operations<br>1.2 : formatting features and related operations, spelling and grammar checker<br>1.3 : Header and Footer, find and replace<br>1.4 : Creating and Managing tables, Smart art, pictures, shapes, page break<br>1.5 : Printing, layout and margin<br>1.6 : Macros<br>1.7 : mail merge<br>1.8 : equation editor<br>1.9 : footnote, endnote, table of content and bibliography | 20% |
| 2 | **Spreadsheet Package**<br>2.1 : Spreadsheet Basic<br>2.2 : Creating, editing, saving and printing spreadsheet<br>2.3 : Working with functions and formula<br>2.4 : Validation, data form, conditional formatting, frees pane<br>2.5 : sorting, filtering and advance filtering<br>2.6 : Graph-Plotting facilities and charts<br>2.7 : Goal seek and Solver<br>2.8 : Create and Manage PivotTables<br>2.9 : Securing and protecting worksheet | 20% |
| 3 | **Presentation Package**<br>3.1 : Opening, viewing, creating and printing slides<br>3.2 : Insert and format text, shape and images<br>3.3 : Insert tables, charts, smart art and media<br>3.4 : Apply transition and animation<br>3.5 : PowerPoint views<br>3.6 : Rehearsing timings and recording narration | 20% |
| 4 | **Basics of Internet**<br>4.1 : Introduction to Internet, intranet and extranet<br>4.2 : Advantages and disadvantages of Internet<br>4.3 : Application of Internet<br>4.3.1 : WWW<br>4.3.2 : Search Engine<br>4.3.3 : News Groups<br>4.3.4 : E-mail | 20% |

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| | 4.3.5 : IRC<br>4.3.6 : E-Commerce, E-learning , E-Banking, E-Governance<br>4.4 : Web Browser, Web pages | |
| 5 | **Internet Protocol and Security**<br>5.1 : Internet Protocols – Introduction and purpose(TCP, IP, UDP, HTTP, FTP, SMTP, TELNET)<br>5.2 : Data Encryption Concepts<br>5.3 : Data Encryption Type<br>5.2.1 : Public key encryption<br>5.2.2 : Private key encryption<br>5.4 : Digital Signature<br>5.5 : Firewall | 20% |
| | **Reference Book :**<br>1. PC Software for windows Made Simple ByR.K.Taxali<br>2. Mastering Excel By Mindy & Martin<br>3. Internet- The Complete Reference, Margaret Levine Young- McGraw-Hill2.<br>4. The Rough Guide to The Internet- Rough Guides Limited3.<br>5. Introduction to Networking Richard McMahon Tata McGraw Hill Publication<br>6. Computer Network Fundamentals and application – R S Rajesh Vikas Publication | |

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| Paper Code: | CAE201-1C | |
| Title | **Fundamentals of Computer** | |
| Credit | 4 (4 hrs per week teaching) | |
| Purpose | This syllabus has been intended to give a basic knowledge about the computers, this includes computer concepts, including fundamental functions and operations of the computer. | |
| Course outcome | After studying this course, students will be able to develop the skill of using computer application software for problem-solving and performing the variant operations. | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1. Introduction to computers**<br>1.1 History and types of computers.<br>1.2 Hardware and Software.<br>1.3 Microcomputers, PDA, Palmtops<br>1.4 Block Diagram of Personal Computer | 20% |
| 2 | **2. Processors, Memory**<br>2.1 CPU organization<br>2.2 ALU design<br>2.3 Universal Serial Bus (USB)<br>2.4 Memory types: RAM, ROM, FLASH, PROM, EPROM, EEPROM<br>2.5 Concepts of virtual memory, Cache memory | 20% |
| 3 | **3. Number System**<br>3.1 Various Numbers systems (Decimal, Binary, Octal, Hex)<br>3.2 Character Code- ASCII, ISCII, UNICODE<br>3.3 Binary to decimal and Decimal to binary Conversions.<br>3.4 Operations on binary number system (Addition, subtraction) | 20% |
| 4 | **4. Secondary Storage Devices**<br>4.1 Introduction to secondary storage devices<br>4.2 Types of storage devices<br>4.2.1 Hard disk<br>4.2.2 CD<br>4.2.3 DVD<br>4.3 Concepts of flash memory | 20% |
| 5 | **5. Working with Input and Output Devices**<br>5.1 Introduction of Input Devices<br>5.1.1 Keyboard, Mouse, Joystick, Track ball, Touch screen, Light pen<br>5.2 Introduction of Output Devices<br>5.2.1 Monitors – CRT, LCD, TFT<br>5.2.2 Printers and its types<br>5.2.3 Scanners | 20% |

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| | **Reference Books :**<br>1. How computers work : Ron white - Tech Media<br>2. Introduction to computers : 4th Edition – Peter Norton<br>3. Computer Organization and Design, Prentice-Hall of India Pvt. Ltd.programming In C (Hutchison R-MGH ) by Pal Chaudhuri<br>4. Digital Computer Elect., Tata McGraw, Hill Pub. Co. Ltd. By Malvino A. P. | |

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| Paper Code: | CAE201-1C | |
| Title | **Computer Organization Architecture** | |
| Credit | 4 (4 hrs per week teaching) | |
| Purpose | The course is designed to give students a basic understanding of digital logic and its applications. It covers the fundamental concepts of digital logic, such as logic gates, truth tables, and Boolean algebra. The course also covers the design of combinational circuits, such as half-adders and full-adders. Finally, the course introduces students to digital components and flip-flops, which are the basic building blocks of digital circuits. | |
| Course outcome | After studying this course, students will be able to understand the basic concepts of digital logic, be able to use truth tables to analyse logic circuits, be able to use Boolean algebra to simplify logic circuits and be able to understand digital components and flip-flops. | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1. Understanding Computers and its Units**<br>1.1 Evolution of computers-<br>1.2 Definitions of the terms : hardware, software<br>1.3 functional units- - Applications of computers<br>1.4 Block diagram of a simple computer and significance of different Units | 20% |
| 2 | **2. Number Representation**<br>2.1 Positional representation of numbers (decimal, binary, octal, Hexa)<br>2.2 Number conversions<br>2.3 Addition and subtraction<br>2.4 Character Code- ASCII, ISCII, UNICODE | 20% |
| 3 | **3. Introduction to logic Circuits**<br>3.1 Introduction to logic circuits-variables and functions<br>3.2 Logic gates.<br>3.3 Truth tables<br>3.4 Definition : Boolean algebra | 20% |
| 4 | **4. Boolean Algebra and Combination Circuits**<br>4.1 Laws of Boolean Algebra<br>4.2 Simplification using Boolean algebra<br>4.3 Combination Circuits<br>4.3.1 Half – Adder<br>4.3.2 Full – Adder | 20% |
| 5 | **5. Digital Components and Flip-Flops**<br>5.1 Integrated Circuits<br>5.2 Decoder<br>5.3 Encoder<br>5.4 Multiplexer<br>5.5 De – multiplexer<br>5.6 Introduction to Flip-Flops ( S-R Flip Flop, D Flip Flop, JK Flip Flop, T Flip Flop) | 20% |

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|---|---|---|
| | **Reference Books :**<br>1. How computers work : Ron white - Tech Media<br>2. Introduction to computers : 4th Edition – Peter Norton<br>3. Computer System Architecture, M. Morris Mano, Third edition, Pearson Eduction.<br>4. Computer Organization and Architecture, W. Stallings, Pearson Education. Malvino A. P.<br>5. Fundamental of digital logic with Verilog Design by Stephen Brown & ZVONKO VRANESIC, Tata McGrawHill. | |

| Paper Code: | MDC201-1C | |
|---|---|---|
| Title | **Advance Mathematics** | |
| Credit | 4 (4 hrs per week teaching) | |
| Purpose | Purpose of this course is to develop mathematical abilities relevant to Computer Science. | |
| Course outcome | After studying this subject, students will be able to develop Mathematical Abilities relevant to Computer Science. | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1. Set Theory**<br>1.1.Introduction<br>1.2.Representation<br>1.3.Operation and its properties<br>1.4.Venn Diagram<br>1.5.Cartesian product | **20%** |
| 2 | **2. Functions**<br>2.1.Definition<br>2.2.Types – Domain and Range<br>2.3.Construction and functions | **20%** |
| 3 | **3. Mathematical Logic**<br>3.1.Introduction to logic<br>3.2.Truth Table | **20%** |
| 4 | **4. Boolean Algebra**<br>4.1Definition & Examples of Boolean Algebra<br>4.2Boolean Functions<br>4.3Design example using Boolean algebra | **15%** |
| 5 | **5.Matrices and Determinants**<br>5.1 Matricies of order M×N<br>5.2 Row and Column transformation<br>5.3 Addition, Subtraction and Multiplication of Matricies<br>5.4 Computation of Inverese<br>5.5 Cramer's Rule<br>5.6 Business Application of Matricies | **25%** |
| | **Reference books:**<br>1. Coordinate Geometry – Shanti Narayan<br>2. Linear Algebra – Sushoma Verma<br>3. Advanced Mathematics – B.S. Shah & Co.<br>4. Schaum's Outline of Boolean algebra and switching circuits – Elliot Mendelson<br>5. Digital Computer Fundamentals - Tata McGraw Hill, 6th Edition, Thomas C. Bartee<br>6. Business Mathematics - Qazi Zameeruddin, V. K. Khanna and S. K. Bhambri, Vikas Publishing House Pvt. Ltd. | |

| Paper Code: | AEC201-1C | |
|---|---|---|
| Title | **Communication Skills-Oral** | |
| Credit | 2 (2 hrs per week teaching) | |
| Purpose | To develop competencies to form verbal communication strategies necessary in the workplace, and to execute them for effective communication. | |
| Course outcome | After studying this course, students will be able to understand the basic skills in communication as well as understanding of the fundamentals of communication, and to improve written communication skills by appreciating the importance of writing and learning essential techniques to improve the same. | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1: Communication: An Introduction**<br>1.1 Definition, Nature and Scope of Communication<br>1.2 Importance and Purpose of Communication<br>1.3 Process of Communication<br>1.4 Types of Communication | **25%** |
| 2 | **2: Non-Verbal Communication**<br>2.1 Personal Appearance<br>2.2 Gestures<br>2.3 Postures<br>2.4Facial Expression<br>2.5 Eye Contacts<br>2.6 Body Language (Kinesics)<br>2.7 Time language<br>2.8 Silence | **25%** |
| 3 | **3: English Grammar**<br>3.1 Tenses<br>3.2 Conjunction<br>3.3 Prepositions<br>3.4 Active and Passive Voice<br>3.5 Punctuations<br>3.6 Degrees of Comparisons<br>3.7 Adjective clauses and Noun Clauses.<br>3.8 Modal Auxiliaries | **25%** |
| 4 | **4: Effective Communication**<br>4.1 Essentials of Effective Communication<br>4.2 Communication Techniques<br>4.3 Barriers to Communication | **25%** |
| | **Reference Book** :<br>1. Business Communication, Raman –Prakash, Oxford<br>2. Creative English for Communication, Krishnaswamy N, Macmillan<br>3. Working in English, Jones, Cambridge<br>4. A Writer's Workbook Fourth edition, Smoke, Cambridge<br>5. Writing Skills, Coe/Rycroft/Ernest, Cambridge<br>6. Anjanee Sethi & BhavanaAdhikari, Business Communication, Tata McGraw Hill | |

| Paper Code: | SEC201-1C | |
|---|---|---|
| Title | **Cloud Computing** | |
| Credit | 2 (2 hrs per week teaching) | |
| Purpose | To make the students aware of the Cloud Computing | |
| Course outcome | Student will develop the cloud model | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1: Cloud Computing Foundation**<br>1.1 Introduction to Cloud Computing- Basics and History<br>1.2 Characteristics<br>1.3 Advantages/ Disadvantages<br>1.4 Technologies in Cloud Computing<br>1.5 Migrating into Cloud<br>1.6 Challenges in Cloud Computing<br>1.7 Types of Cloud<br>1.8 Working of Cloud Computing- Trends, Cloud Service Models | **25%** |
| 2 | **2: Cloud Computing Architecture**<br>2.1 Cloud Computing Technology – Lifecycle<br>2.2 Reference Model for Cloud Computing<br>2.3 Industry Standards<br>2.4 Cloud Architecture<br>2.5 Cloud Modelling and Design<br>2.6 Cloud Ecosystem<br>2.7 Cloud Governance- - Monitoring Business Processes | **25%** |
| 3 | **3: Data Storage and Cloud Computing**<br>3.1 Enterprise Data Storage<br>3.2 Data Storage Management<br>3.3 File System<br>3.4 Cloud Data Stores<br>3.5 Grids For Data Storage | **25%** |
| 4 | **4: Cloud Computing Services**<br>4.1 Web Based Application<br>4.2 Web Based Services<br>4.3 Infrastructure Services<br>4.4 On Demand Computing | **25%** |
| | **Reference Book :**<br>1. Cloud Computing : A practical, A Srinivasan , J Suresh, Pearson, Latest Edition<br>2. Cloud Computing a practical approach, Anthony T Velte, Toby J Velte, Robert Elsenpeter, McGraw- Hill<br>3. Mastering Cloud Computing, Rajkumar Buyya, Christian Vecchiola,S.Thamarai Selvi, McGraw-Hill<br>4. Cloud Computing - Web Based application, Michael Miller, Pearson | |

| Paper Code: | SEC201-1C | |
|---|---|---|
| Title | **Personality Development** | |
| Credit | 2 (2 hrs per week teaching) | |
| Purpose | To make the students understand about personality and its principles. To enrich students' knowledge to enhance their employability skills. | |
| Course outcome | Students will be able to understand the concept of personality and also groom their personality skills. | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1. Introduction to Personality**<br>1.1 Basis of Personality<br>1.2 Motivation: Definition, Maslow theory of Motivation | **25%** |
| 2 | **2. Techniques in Personality Development**<br>2.1 Goal Setting: Concept, Goal commitment,<br>2.2 Goal setting in business and personal life, Limitations<br>2.3 Self Esteem: Characteristics – Causes of low self-esteem, Steps to build positive self esteem | **25%** |
| 3 | **3. Traits & Functions of Personality**<br>3.1 Functions of personality: Sensation, Intuition, Thinking and Felling<br>3.2 Basic personality Traits: The Big five dimensions, Values | **25%** |
| 4 | **4. Soft Skills**<br>4.1 Introduction of Soft skills and Hard skills<br>4.2 Self – Development<br>4.3 Resume building | **25%** |
| | **Reference Book :**<br>1. Deniel Coleman, emotional intelligence, Bentam Book capital, 2006<br>2. Personality Development by Rajiv Mishra, Rupa & co.<br>3. Soft skills.2015 Career development centre, green pearl publications<br>4. You can Win by Shiv Khera Mc Millan Publications, New Delhi | |

| Paper Code: | IKS201-1C | |
|---|---|---|
| Title | **Indian Knowledge System** | |
| Credit | 2 (2 hrs per week teaching) | |
| Purpose | To create awareness among youth about the true story and rich culture of the country<br>To understand the scientific and true value of traditional knowledge of Bharata | |
| Course outcome | Students will be able to understand and appreciate the rich heritage of our country<br>Students will be able to sensitize to the contribution made by ancient Indians in various fields | |
| **Unit** | **Description** | **Percentage** |
| 1 | **1. Indian Knowledge System – An Overview**<br>1.1 IKS – Meaning & Definition<br>1.2 Importance of Ancient Knowledge<br>1.3 Classification Framework of IKS<br>1.4 Historicity of IKS<br>1.5 Unique Aspects of IKS | **25%** |
| 2 | **2. The Vedic Corpus**<br>2.1 Introduction to Vedas<br>2.2 The Four Vedas (Brief Introduction)<br>2.3 Sub - Classification of Vedas<br>2.4 Overview of Six Vedangas (Siksa, Vyakarana, Nirukta, Chandas, Kalpa, Jyotisa) | **25%** |
| 3 | **3. Philosophical System**<br>3.1 Indian Philosophical System – Development & Unique Features<br>3.2 Classification of the Indian Philosophical Systems:<br>3.2.1 Vedic School<br>3.2.2 Non – Vedic School of Philosophy<br>3.3 Vedic School of Philosophy<br>3.3.1 Samkhya and Yoga School of Philosophy<br>3.3.2 Nyaya and Vaisesika School of Philosophy<br>3.3.3 Purva – Mimamsa and Vedanta School of Philosophy<br>3.4 Non - Vedic School of Philosophy<br>3.4.1 Jain School of Philosophy<br>3.4.2 Bauddha School of Philosophy<br>3.4.3 Carvaka School | **50%** |
| | **Reference Book :**<br>1. Introduction to Indian Knowledge System – Concepts and Applications, B. Mahadevan, Vinayak Rajat Bhat and Nagendra Pavana R. N., PHI Learning Private Limited, 2023. | |