# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Fundamentals of Information Technology** | **Subject Code: 3021A01BT021** |
| **Total/Minimum Pass Marks (End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 4** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 3 Hours** |

## Subject: Fundamentals of Information Technology

**Course Objectives:**

1. Understanding Core IT Concepts
2. Proficiency in Software Applications
3. Network and Internet Basics
4. Awareness of Operating System
5. Awareness of IT Ethics and Security

**Course Outcomes:**

1. Hands on skill in Basic IT Concepts
2. Understanding Basic Computer Organization
3. Proficiency in Software Applications
4. Good knowledge of Operating System
5. Good knowledge of IT Ethics and Security

**Course Content:**

**UNIT I**: Introduction to Computers: Introduction, Definition, Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification of Computers, Applications of Computer, Capabilities, and limitations of computer.

**UNIT II**: Basic Computer Organization: Role of I/O devices in a computer system. Input Units: Keyboard, Terminals, and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. NonImpact Printers and its types, Plotters, Sound cards, Speakers.

**UNIT II**I: Storage Fundamentals: Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Flash Drives.

**UNIT IV**: Software: Software and its needs, Types of S/W. System Software: Operating System, Utility Programs Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word Processing, Spread Sheets Presentation, Graphics, DBMS s/w.

**UNIT V**: Operating System: Functions, Measuring System Performance, Assemblers, Compilers, and Interpreters. Batch Processing, Multiprogramming, MultiTasking, Multiprocessing, Time Sharing, DOS, Windows.

***Reference Books:***


"Fundamentals of Computers" by V. Rajaraman

"Computer Fundamentals" by P.K. Sinha and P. Sinha

"Fundamentals of Information Technology" by Alexis Leon and Mathews Leon

"Information Technology: Principles and Applications" by A. K. Sharma

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Office Automation** | **Subject Code: 3021A02BT021** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 04** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject : Office Automation

**Course Objectives:**

1. Proficiency in Core Applications
2. Data Management and Analysis
3. Effective Communication
4. Collaboration and Productivity
5. Automation and Efficiency

**Course Outcomes:**

1. Proficiency in Microsoft Word
2. Advanced Skills in Microsoft Excel
3. Effective Use of Microsoft PowerPoint
4. Efficient Management of Database using MS ACCESS
5. Integration and Collaboration Across Microsoft Office Applications

**Course Content:**

**UNIT I Introduction to MS-Office**–Applications of computer Types of Computer: Micro Computer, Mini Computer, Main Computer, Super Computer, Memory, Primary Memory, Secondary memory CPU, Components of CPU, Mother board, Hard disk, RAM, ROM, Processor, SMPS & Connecting wire Graphics Card, Sound Card, Network Card – Modem Input /Output Devices Keyboard, Mouse, Scanner, Digital Camera, Joystick, Pen drive, Monitor, Printer, Plotter, Connecting port, Serial, parallel, USB port. Operating System, Single User, Multi User, Software, System Software, Application Software, Internet, Intranet.

**UNIT II Introduction to MS-Word,** Shortcut Bars Menu bar, Taskbar, Status bar, Toolbar, Manipulating Images, Graphic elements, Charts, Collaborating on documents, Securing a document, Hyper Link, Shortcut keys, Document creation, Paragraph formatting, Header and Footer, Tables, Mail Merge Managing Document Security, Comments and Tracked changes, Spell check, File Operations, Cut, Copy and Paste, Drag and Drop, Dynamic Data exchange, Templates, Formula, Undo, Redo, Find and Replace, Autocorrect.

**UNIT III Introduction to MS-Excel:** Work sheet, Data types, Wizards, Insert, delete, Resize of the Columns and Rows, Views of Worksheets, Hiding, Usage of Formula and, Calculation, Different Charts, Functions, Tables and Formatting, Query, Macros, Simulations, Formatting Spreadsheets,

Sorting, Security, Calculator, Usage of Formula, Formatting text and Cells, Using wizards, File Management, Spell check and Error checking Working with dates and times, Sparklines, Troubleshooting worksheets.

**UNIT IV Introduction to PowerPoint,** creating a presentation, formatting a presentation, adding effects to the presentation, Reusability and Templates of the presentation, Different views of Slides, Files in power point presentation, Printing Handouts, Tables, Columns and Lists, Adding Graphics, Sounds and Movies of a Slide, Objects, Design, Effects, Animation, Multimedia in PPT, Slide show, Transition and Timings, Diagrams, Clipart and Pictures

**UNIT V Introduction to MS-Access,** Database Development, Creating Tables, Forms creation, Data selection with Queries, Reports, mySQL Vs MSAccess, Links/Connectivity, Find and Replace a Query, Tables, Features of MSAccess, Objects, Wizards, Importing and Exporting data, Data duplication, Query manipulation, Macros, DBMS Vs Access. File manipulationApplications.

***Reference Books:***


"Mastering MS Office: A Complete Guide" by Nidhi Sharma

"MS Office 2016 Step by Step" by Yogesh Patel

"Microsoft Office 2013: On Demand" by Steve Johnson and Perspection Inc.

"MS Office 2019 Training Guide" by Satish Jain

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Programming in C – Paper I** | **Subject Code: 3021A03CT021** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 4** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Programming in C – Paper I

**Course Objectives:**

1. Understanding Basic Programming Concepts
2. Developing ProblemSolving Skills
3. Mastering C Syntax and Semantics
4. Implementing Code Debugging and Testing
5. Applying Programming Best Practices

**Course Outcomes:**

1. Applying Basic Syntax and Structure
2. Control Structures and Functions
3. Data Types and Memory Management
4. ProblemSolving and Algorithm Development
5. Debugging and Code Optimization

**Course Content:**

**UNIT I** Basics of programming: Approaches to problem solving, Use of highlevel programming language for systematic development of programs, Concept of algorithm and flowchart, Concept, and role of structured programming.

**UNIT II** Basics of C: History of C, Salient features of C, Structure of C Program, Compiling C Program, Link and Run C Program, Character set, Tokens, Keywords, Identifiers, Constants, Variables, Instructions, Data types, Standard Input/Output, Operators, and expressions.

**UNIT III** Conditional Program Execution: if, ifelse, and nested ifelse statements, Switch statements, Use of break and default with switch. Loops and Iteration: for, while and dowhile loops, Multiple loop variables, Nested loops, Assignment operators, break and continue statement.

**UNIT IV** Functions: Introduction, Types, Declaration of a Function, Function calls, defining functions, Function Prototypes, passing arguments to a function return values and their types, writing multifunction program, Calling function by value, Recursive functions.

**UNIT V** Arrays: Array notation and representation, declaring one dimensional array, initializing arrays, Accessing array elements, Manipulating array elements, Arrays of unknown or varying size, Two dimensional arrays, Multidimensional arrays.

***Reference Books:***


"Let Us C", by Yashwant Kanitkar

"ANSI C" by E. Balagurusamy

"The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie

"Head First C" by David Griffiths and Dawn Griffiths

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Communication Skill** | **Subject Code: 3021A04DT046** |
| **Total / MinimumPass Marks(End Semester Exam):** | **L: 1 T: 1 P: 0 Credits: 2** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 3 Hours** |

## Subject: Communication Skill

**Course Objectives:**

1. Effective Verbal Communication
2. Active Listening Skills
3. Written Communication Proficiency
4. NonVerbal Communication
5. Interpersonal and Team Communication

**Course Outcomes:**

1. Enables in effective Communication
2. Enables Listening and understanding Skills
3. Proficiency in Nonverbal Communication
4. Enables proficient Written Communication Skills
5. Interpersonal Communication and Conflict Resolution

**Course Content:**

**UNIT I** Passage for Comprehension: Language of Science, Robotic Revolution, Designing a Car, New Wonders of camera, nonconventional sources of Energy, Our Environment, Entrepreneurship, Safety practices

**UNIT II** Short Stories: Selfish Giant Oscar Wilde, A Letter to God Gregario Lapex YFuentes An astrologer's Day –R.K. Narayan

**UNIT III** Applied Grammar: Determiners, Auxiliaries, Tenses, Passive, Prepositions, Subject verb, Agreement

**UNIT IV** Letter Writing: Application (For Job/Leave), Letter of Enquiry and replies, Letter for Order Placement, Letter of Complaints (To Editor/ Appropriate Authorities)

**UNIT V** Report Writing: Writing Progress – Report of a job, General outline for preparing A Project Report.

***Reference Books:***

"The Art of Communicating" by Thich Nhat Hanh
"Communicate with Confidence!" by Dianna Booher
"The Definitive Book of Body Language" by Allan Pease and Barbara Pease

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Foundation Course on Ancient Indian Knowledge Systems** | **Subject Code: 3021A05ET046** |
| **Total / Minimum Pass Marks(End Semester Exam):** | **L: 1 T: 1 P: 0 Credits: 02** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Foundation Course on Ancient Indian Knowledge Systems

## Course Objective:

1. To briefly introduce different areas of science, technology and Management of Indian Knowledge System and Indian perspective of modern view.
2. To give a brief overview of selected areas of IKS, ancient mathematics, astronomy, literature, arts and business.
3. To give foundation knowledge on work done by Indian Mathematicians in the fields such as Astronomy, Astrology, Geometry, Algebra, and Arithmetic etc

## Course Outcome

1. Student understand the various aspects in the Indian Knowledge System.
2. Study of Indian Mathematics will reveal to students how it is embedded in Indian art, architecture, music, and religious practices, fostering a deeper understanding and appreciation of Indian culture.
3. They have been introduced to some fields of IKS used in present Science, Technology and Management.
4. They have been introduced to some fields of IKS like Ayurved and Yoga.

**UNIT I: INTRODUCTION**

Introduction to IKS & Its importance, Introduction & importance of IKS, Various IKS Systems, Shastra –What is Shastra?, Importance of Shashtra, Classification of Shashtra – Vaidic& Avaidic (with examples of important Literature), Bhartiya Education System and its philosophy, History Domains of Education: Gurukul, Pathshala, Vidyalay, Vishvavidyalay.

**UNIT II: FOUNDATIONAL CONCEPTS**

Linguistics, Introduction to Indian Mathematics, Indian Mathematicians and their Contributions, Number systems in India - Historical evidence, and Units of Measurement, Measurements for time, distance, and weight Knowledge: Framework and Classification.

**UNIT III: SCIENCE, TECHNOLOGY AND MANAGEMENT in IKS`**

Astronomy, Science and Technology: Astronomy, Science and technology heritage of India: Metals and Metalworking, Physical structures Temples Watershed management Dyes, arts and perfume production. Arthshastra: Governance, Commerce, Economics and Political Framework basic principles as suggested by Acharya Chanakya. Evidences of AI in ancient India.

**UNIT IV: AYURVEDA IN IKS**

Health, Wellness and Psychology, Ayurveda for Life: Introduction to Ayurveda: understanding Human body and Panchamahabhuta, the communication between body & mind, health regime for wellbeing.

**UNIT V: YOGA IN IKS**

Yoga in IKS: Introduction to yoga, Health and Well-being through yoga, Significance, Types of yoga: Raja yoga, Ashtang yoga, Gyan yoga.

**Text Books: (Hindi and English language as per availability)**


1. B. Mahadevan, VinayakRajat Bhat, NagendraPavana (2022) Introduction to Indian Knowledge System: Concepts and Applications.
2. A Concise History of Science in India – Bose, Sen &Subbarayappa- INSA Publications
3. Dikshit, S. B. (1969, 1981). BharatiyaJyotish Sastra (in Marathi) Poona (1896). (Transl. RV Vaidya, Vol.1). New Delhi: Government of India Press.
4. Sen, S. N., and Shukla, K. S. (Ed.) (2000). History of Astronomy in India, 2nd Revised Edition. New Delhi: Indian National Science Academy.


**Reference Books: (Hindi and English language both)**


1. Iyengar, R. N. (2016) Astronomy in Vedic texts, History of Indian Astronomy, A Handbook - Volume brought out on the occasion of IX International Conference on Oriental Astronomy November 14–18.
2. Encyclopedia of Classical Indian Sciences- Roddam Narasimha, Universities Press
3. NCERT Modules of KPTI
4. Thompson R.L. (2007) The Cosmology of the Bhāgavata Purāṇa (First Indian Edition) MLBD Publication. Delhi.
5. Altekar A.S. (1944) Education in Ancient India.
6. Agrawala V.S. (1953) India as known to Panini.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Digital Electronics** | **Subject Code: 3021A06JT028** |
| **Total / MinimumPass Marks(End Semester Exam):** | **L: 2 T: 1 P: 0 Credits: 03** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Digital Electronics

**Course Objectives:**

1. Understanding Digital Logic Fundamentals
2. Design and Analysis of Combinational Circuits
3. Design and Analysis of Sequential Circuits
4. Digital System Design Techniques
5. Integration and Application of Digital Systems

**Course Outcomes:**

1. Understanding Fundamental Concepts
2. Design and Analysis of Digital Circuits
3. Proficiency in Digital Design Tools
4. Implementation of Digital Systems
5. ProblemSolving and Application

**Course Content:**

**UNIT I** Introduction; Define digital and analog signals and systems, difference between, Need of digitization and applications of digital systems. Number Systems; Decimal, binary, octal, hexadecimal number systems, Conversion of number from one number system to another including decimal points, Binary addition, subtraction, multiplication, division 1‟s and 2‟s complement method of subtraction, BCD code numbers and their limitations, addition of BCD coded numbers, conversion of BCD to decimal and viceversa

**UNIT II** Logic Gages; Logic gates, positive and negative logic, pulse waveform, definition, symbols, truth tables, pulsed operation of NOT, OR, AND, NAND, NOR, EXOR, EXNOR gates. Logic Simplification; Rules and laws of Boolean algebra, logic expression, Demorgan's theorems, their proof,

**UNIT III** Sum of products form, Product of sum form, simplification of Boolean expressions using KMap, Arithmetic Circuits; Half adder, full adder circuits, operation, Parallel binary adder, 2bit and 4bit binary full adder, block diagram, working Multiplexer/Demultiplexer.

**UNIT IV** Encoders and Comparators; Encoder, decimal to BCD encoder, decimal to BCD priority encoder, keyboard encoder, Magnitude comparators, symbols and logic diagrams of 2bit and 4bit comparators, Latches and FlipFlops; Latch, SRlatch, Dlatch, Flipflop, difference between latch and flipflop, SR, D, flipflop their operation using waveform and truth tables, JK flipflop, master slave, using waveform and truth tables

**UNIT V** Counters; Asynchronous counter, 4bit Asynchronous, counter Asynchronous decode counter, Asynchronous counter, 4bit synchronous binary counter, Asynchronous decode counter, Ring counter, cascaded counter, counter applications, Shift Registers; Shift registers functions, serialinserial out, serialinparallelout, parallelin serialout, parallelinparallel out

***Reference Books:***

"Digital Design" by M. Morris Mano
"Digital Design and Computer Architecture" by David Money Harris and Sarah L. Harris
"Digital Electronics: Principles and Applications" by Roger L. Tokheim
"Fundamentals of Digital Logic with Verilog Design" by Stephen Brown and Zvonko Vranesic

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Environmental Science** | **Subject Code: 3021A07FT020** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 2 T: 0 P: 0 Credits: 0** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Environmental Science

**Course Objectives:**

1. Understanding Ecosystems and Biodiversity
2. Analyzing Environmental Problems and Solutions
3. Learning About Environmental Policies and Ethics
4. Studying Human Impact on the Environment
5. Applying Scientific Methods and Research

**Course Outcomes:**

1. Understanding Ecological Principles
2. Analyzing Human Impact on the Environment
3. Developing Sustainable Solutions
4. Applying Environmental Laws and Policies
5. Conducting Environmental Research

**Course Content:**

**UNIT – I** General: Environmental segments, environmental degradation, environmental impact assessment.

**UNIT – II** Concept of Ecosystem: Fundamental of Ecology and Ecosystem, components of ecosystem, food chain, food web, trophic levels, energy flow, cycling of nutrients, major ecosystem types (forest, grass land and aquatic ecosystem).

**UNIT – III** Air Pollution: Atmospheric composition, energy balance, classification of air pollutants, source and effect of pollutants. Water Pollution: Hydrosphere, natural water, classification of water pollutants, trace element contamination of water, sources and effect of water pollution, types of pollutants,

**UNIT – IV** Land Pollution & Noise Pollution: Lithosphere, pollutants (agricultural, industrial, urban waste, hazardous waste), their origin and effect, collection of solid waste, solid waste

management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting).

**UNIT – V** Environmental Biotechnology: Definition, current status of biotechnology in environmental protection, biofuels, biofertilize, biosurfactants, biosensor, biochips, bioreactors.

***Reference Books:***


"Living in the Environment" by G. Tyler Miller and Scott Spoolman

"Environmental Studies" by Benny Joseph

"Environmental Studies: From Crisis to Cure" by R. Rajagopalan

"Fundamentals of Ecology and Environmental Biology" by S.C. Santra

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Digital Electronics (Lab)** | **Subject Code: 3021A01JL028** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Digital Electronics (Lab)

1. Basic Logic Gates
   Verify the truth tables of basic logic gates: AND, OR, NOT.
2. Universal Gates
   Implement basic logic gates using NAND and NOR gates.
3. Combinational Logic Circuits
   Design and implement a 4bit binary adder and subtractor.
4. Multiplexers
   Design and implement a 4to1 multiplexer.
5. Demultiplexers
   Design and implement a 1to4 demultiplexer.
6. Encoders
   Design and implement an 8to3 encoder.
7. Decoders
   Design and implement a 3to8 decoder.
8. Seven Segment Display
   Interface and program a sevensegment display.
9. Binary Adders
   Design and implement a full adder circuit.
10. Binary Subtractors
    Design and implement a full subtractor circuit.
11. Arithmetic Logic Unit (ALU)
    Design a simple 4bit ALU.
12. FlipFlops
    Implement SR, JK, D, and T flipflops and verify their truth tables.
13. Shift Registers
    Design and implement a 4bit shift register.
14. Synchronous Counters

Design and implement a 4bit synchronous counter.

15. Asynchronous Counters

Design and implement a 4bit asynchronous counter.

16. Up/Down Counters

Design and implement a 4bit up/down counter.

17. Ring Counters

Design and implement a ring counter.

18. Johnson Counters

Design and implement a Johnson counter.

19. Analog to Digital Converter (ADC)

Interface and verify the operation of an ADC.

20. Digital to Analog Converter (DAC)

Interface and verify the operation of a DAC.

21. 555 Timer as Astable Multivibrator

Design and verify the operation of a 555 timer in astable mode.

22. 555 Timer as Monostable Multivibrator

Design and verify the operation of a 555 timer in monostable mode.

23. Memory Devices

Study and interface with ROM and RAM modules.

24. Programmable Logic Devices (PLD)

Implement logic functions using a PLA or PAL.

25. Field Programmable Gate Arrays (FPGA)

Design and implement a simple digital circuit using an FPGA.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Office Automation (Lab)** | **Subject Code: 3021A02BL021** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Office Automation (Lab)

**Microsoft Word**

1. Creating and Formatting Documents
   Task: Create a professional document with headings, subheadings, and body text.
   Task: Apply different font styles, sizes, and colors to text.
2. Inserting and Formatting Tables
   Task: Insert a table and format it using table styles.
   Task: Merge cells and adjust column widths and row heights.
3. Using Styles and Templates
   Task: Apply and modify built-in styles.
   Task: Create and use a custom template.
4. Inserting Graphics and Charts
   Task: Insert and format images.
   Task: Create and customize a chart within a Word document.
5. Working with Headers, Footers, and Page Numbers
   Task: Insert and customize headers and footers.
   Task: Add page numbers and adjust their format.

**Microsoft Excel**

6. Creating and Formatting Spreadsheets
   Task: Create a spreadsheet with data entries and apply cell formatting.
   Task: Use conditional formatting to highlight specific data.
7. Using Formulas and Functions
   Task: Apply basic formulas (SUM, AVERAGE, COUNT).
   Task: Use advanced functions (VLOOKUP, IF, CONCATENATE).
8. Creating and Formatting Charts
   Task: Create a bar chart and customize its appearance.

Task: Create a pie chart with data labels and a legend.

9. Data Sorting and Filtering
   Task: Sort data by multiple criteria.
   Task: Apply filters to display specific data.
10. PivotTables and Pivot-Charts
    Task: Create a PivotTable to summarize data.
    Task: Generate a PivotChart from the PivotTable.

**Microsoft PowerPoint**

11. Creating and Designing Presentations
    Task: Create a presentation with multiple slides.
    Task: Apply themes and slide layouts.
12. Inserting and Formatting Images and Media
    Task: Insert images, audio, and video clips.
    Task: Customize the media properties and playback settings.
13. Using Animations and Transitions
    Task: Apply slide transitions.
    Task: Add and customize animations for slide elements.
14. Creating SmartArt and Charts
    Task: Insert and format SmartArt graphics.
    Task: Create and customize charts within PowerPoint.
15. Working with Slide Masters and Layouts
    Task: Customize the Slide Master.
    Task: Create and apply custom slide layouts.

**Microsoft Access**

16. Creating and Managing Databases
    Task: Create a new database and add tables.
    Task: Define primary keys and set relationships between tables.
17. Designing and Using Queries
    Task: Create select queries to retrieve data.
    Task: Create parameter queries to filter data based on user input.
18. Designing and Using Forms
    Task: Create forms for data entry.
    Task: Customize form layout and design.
19. Generating and Customizing Reports
    Task: Create a report based on a table or query.
    Task: Customize the report layout and format.
20. Using Macros and Modules
    Task: Create and run simple macros.

Task: Write basic VBA code to automate tasks.

**Microsoft Office Integration**

21. Mail Merge with Word and Excel
    Task: Use Word and Excel to create a mail merge document.
    Task: Customize the mail merge fields and output.
22. Linking Data between Excel and Access
    Task: Import data from Excel into Access.
    Task: Link an Excel worksheet to an Access table.
23. Embedding and Linking Objects
    Task: Embed an Excel chart into a Word document.
    Task: Link an Excel worksheet to a PowerPoint presentation.
24. Creating Interactive Presentations with Excel Data
    Task: Insert and update Excel data in PowerPoint slides.
    Task: Use PowerPoint to present data interactively.
25. Collaborative Features and Cloud Integration
    Task: Use OneDrive to save and share Office documents.
    Task: Collaborate on a document using real time coauthoring.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (I$^{st}$ Sem)** | **Branch: Computer Application** |
| **Subject: Programming in C Paper I (Lab)** | **Subject Code: 3021A03CL021** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Programming in C Paper-I (Lab)

1. Write a program to enter radius of a circle, compute area and circumference.
2. Write a program to enter radius of a sphere, compute its volume.
3. Write a program to enter temperature in Fahrenheit and compute equivalent Celsius temperature. i.e. [cel = (fah – 32) * 5/9]
4. Write a program to enter values of all three co-efficient of a quadratic equation(a,b,c) find its discriminate and values of both the roots.
5. Write a program to enter length of three sides of a triangle, compute area using Hero's formulae.
6. Write a program to enter values of all three co-efficient of a quadratic equation (i.e. a,b,c), find its discriminate D = b2 – 4ac, and determine whether the roots of equation are Real, Equal, or Imaginary.
7. Write a program to enter an angle in degree, determine whether it is Acute, Obtuse or Right angle.
8. Write a program to enter length of three sides of a triangle, determine whether it is Equilateral, Isosceles or Scalene.
9. Generate the series – 1 4 9 16 25……100
10. Generate the series – 1 3 7 15 31 63……..<500
11. Generate the series – 1 2 4 7 11 16 22……<100
12. Generate the series – 1 2 4 8 16 32…….1024
13. Generate the series – 1 3 7 13 21 31 …….. <100
14. Write a program to enter any number and determine whether it is Even or Odd.
15. Write a program to enter any year of the century and check whether it is a Leap year or Non-Leap year.
16. Write a program to enter any number and compute sum of each digit of the number.
17. Write a program to enter any number and find reverse of the number. (mirror image)

18. Write a program to enter any number and determine whether it is an Armstrong number or not. e.g. 1, 153, 370, 371, 407 (sum of cube of each digit of the number will equal to the number itself.)
19. Write a program to enter any number and determine whether it is a Palindrome or not. e.g. 2332: as reverse of the number is equal to the number itself.)
20. Write a program to enter any number and determine whether it is a Buzz number or not. e.g. 4862; as the sum of each digit of the number is 20 which is divisible by unit digit of the number 4862 i.e. 2 => 20 % 2 == 0
21. Write a program to enter any number and determine whether it is a Prime or Composite. e.g. 2, 3, 5, 7, 11, 13, 17… (The number divisible by one or itself only.)
22. Write a program to enter any number and determine whether it is an Automorphic number or not. e.g. 25, 36, 100, 121, 225, 625 etc. here unit digit of these number are equal to the unit digit of their square roots.
23. Write a program to enter length of two objects in meter and centimeter and find their consolidated length. e.g. 5m and 90cm + 3m and 45cm = 9m and 35cm
24. Write a program to declare two arrays M[5] and N[5], store five elements in first array M, and shift squared value of M into N.
25. Write a program to enter ten elements in an array, arrange the list in ascending order of the values using Bubble sort method.
26. Write a program to enter twenty elements in an array, arrange the list in descending order of the values using Bubble sort method.
27. Write a program to enter ten elements in an array, arrange first five elements of the list in descending order and rest five in ascending order.
28. Write a program to enter two matrices M and N of order 3 x 3 and find out (M+N).
29. Write a program to enter two matrices ‘mat1’ and ‘mat2’ of order m x n and n x r, find out their product.
30. Write a program to enter two matrices M of order 4 x 3 and N of order 3 x 4, find out their product (M x N).

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Computer System Architecture** | **Subject Code**: **3021B01BT021** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 04** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Computer System Architecture

**Course Objectives:**

1. Understanding Computer Organization
2. Comprehending Data Representation and Manipulation
3. Exploring CPU Design and Functionality
4. Analyzing Memory Hierarchy and Management

**Course Outcomes:**

1. Grasp the fundamental structure and organization of computer systems
2. Explore different number systems and arithmetic operations performed by the computer hardware.
3. Investigate the design and functionality of the central processing unit (CPU), including its control unit, arithmetic logic unit (ALU), and registers.
4. Study the memory hierarchy, including cache, primary memory, and secondary storage.

**Course Content:**

**UNIT I:** Introduction to Computer Systems, Overview of Computer Systems, Definition and Components, Types of Computer Systems, Basic Structure of Computers; Functional Units, Basic Operational Concepts, Bus Structures

**UNIT II:** Arithmetic and Logic Unit (ALU); Basic Arithmetic Operations, Addition and Subtraction, Multiplication and Division Algorithms, Signed Numbers and Arithmetic, Logic Operations; Boolean Algebra; Logic Gates and Circuits, Binary Decision Diagrams, ALU Design; Combinational ALUs, Sequential ALUs

**UNIT III:** Central Processing Unit (CPU); Processor Organization, CPU Structure and Function, Register Transfer Language, Instruction Set Architecture (ISA); Types of Instructions, Addressing Modes, Control Unit Design; Hardwired Control, Microprogrammed Control

**UNIT IV:** Memory System; Memory Hierarchy, Cache Memory, Main Memory, Secondary Storage, Cache Organization, Mapping Functions, Replacement Algorithms, Write Policies, Virtual Memory; Paging and Segmentation, Page Replacement Algorithms

**UNIT V:** Input/Output System, I/O Fundamentals; I/O Methods (Programmed, InterruptDriven, Direct Memory Access), I/O Interface, Peripheral Devices; Storage Devices (HDD, SSD), Input Devices (Keyboard, Mouse), Output Devices (Monitor, Printer)

***Reference Books:***

"Computer System Architecture" by M. Morris Mano
"Computer Architecture and Organization" by John P. Hayes
"Computer System Architecture" by V. Rajaraman and T. Radhakrishnan

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Programming in C – Paper II** | **Subject Code: 3021B02CT021** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 04** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Programming in C – Paper II

**Course Objectives:**

1. Understanding C Syntax and Structure
2. Memory Management and Pointers
3. Modular Programming and Code Reusability
4. Data Structures and Algorithms
5. Debugging and Testing

**Course Outcomes:**

1. Advanced Data Structures and Algorithms
2. Hands on programming in Pointers & String
3. Systemlevel Programming and Interfacing
4. Code Optimization and Debugging Techniques
5. Mastery of Dynamic Memory Management

**Course Content:**

**UNIT I** Pointers: Introduction, * and & operators, Pointer arithmetic, call by value, call by reference, Pointers to functions, Pointer to pointer.

**UNIT II** Strings: Introduction, initializing strings, Accessing string elements, Array of strings, Passing strings to functions, String functions.

**UNIT III** Structure: Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on structures, Structure within structure

**UNIT IV** Union: Introduction, Declaring union, Usage of unions, Operations on union. Enumerated data types, Storage classes: Introduction, Types automatic, register, static and external.

**UNIT V** Dynamic Memory Allocation: Introduction, Library functions – malloc, calloc, realloc and free. File Handling: Basics, File types, File operations, File pointer, File opening modes, File handling functions.

***Reference Books:***


"Let Us C", by Yashwant Kanitkar

"ANSI C" by E. Balagurusamy

"The C Programming Language" by Brian W. Kernighan and Dennis M. Ritchie

"Head First C" by David Griffiths and Dawn Griffiths

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Web Technology** | **Subject Code: 3021B03CT021** |
| **Total / MinimumPass Marks(End Semester Exam):** | **L: 3 T: 1 P: 0 Credits: 04** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Web Technology

**Course Objectives:**

1. Understanding Web Development Fundamentals
2. Proficiency in HTML, CSS, and JavaScript
3. Back End Development Skills
4. Web Application Security
5. Responsive and Adaptive Web Design

**Course Outcomes:**

1. Understanding Web Development Fundamentals
2. Client Side and Server Side Scripting
3. Web Standards and Best Practices
4. Database Integration and Management
5. Security and Web Services

**Course Content:**

**UNIT I** Internet Basics; Concept of internet and its evolution, Application and use of internet in various fields of Science and Technology, Specification and technical details for establishing Internet. Types and functions of modems, IP addressing, internet domains, domain name server, TCP/IP protocols, Internet service providers, Intranets, Internet Connectivity:

**UNIT II** World Wide Web (WWW): World Wide Web and its evolution, web page, web server, HTTP protocol. Examples of web servers. Navigation Tools: Netscape and Internet Explorer to surf Internet, Uniform Resource Locator (URL), Hypertext, hyperlinks and hypermedia, URL, its registration, browsers, search engines, proxy servers

**UNIT III** Internet Applications: Email, Telnet, FTP, IRC, NNTP, Video conferencing, ecommerce Developing Portals Using HTML, Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments. Formatting text, title, headings, colors, fonts, sizes, simple tables and forms. HTML tags, hyperlinks. Adding graphics and images, image maps, image files.

**UNIT IV** Using Front Page: Front page editor, Front page explorer, Client-side Scripting: VB Scripting Vs Java Script, Introduction to Java Scripts, event handling, verifying forms, working with browser windows, cookies, embedding with HTML

**UNIT V** Server-side Scripting: Scripting methods, Java Server Pages (JSP), Active Server Pages (ASP), Text processing using ASP, Handling server/Client requests, Accessing databases, using IIS web server; ASP Objects, Developing Interactive Web Pages using Java scripts/VB Scripts

***Reference Books:***

"Web Technologies: A Computer Science Perspective" by Jeffrey C. Jackson
"JavaScript and JQuery: Interactive Front End Web Development" by Jon Duckett
"CSS: The Definitive Guide" by Eric A. Meyer and Estelle Weyl
"Responsive Web Design with HTML5 and CSS3" by Ben Frain

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Digital Marketing & Ecommerce** | **Subject Code: 3021B04JT021** |
| **Total / MinimumPass Marks (End Semester Exam):** | **L: 1 T: 1 P: 0 Credits: 02** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Digital Marketing & ECommerce

**Course Objectives:**

1. Understanding Digital Marketing Strategies
2. Mastering ECommerce Platforms and Tools
3. Data Analysis and Optimization
4. Customer Relationship Management (CRM)
5. Legal and Ethical Considerations

**Course Outcomes:**

1. Comprehensive Understanding of Digital Marketing Strategies
2. Proficiency in Data Analytics and Performance Measurement
3. Mastery of ECommerce Platforms and Technologies
4. Skills in Consumer Behavior and Market Research
5. Expertise in Legal and Ethical Considerations

**Course Content:**

**UNIT I** Fundamentals of digital marketing; Understanding digital marketing, how it differs from traditional marketing, and how it helps businesses grow, Email marketing; Using copywriting and visuals to send targeted suggestions, promotions, and product announcements to an audience interested in a product

**UNIT II** Social media marketing; Using social media platforms to promote a business and grow a network of potential customers, Content marketing; Planning, writing, and publishing content

**UNIT III** Search engine marketing; Paid search advertising, which are text based ads that appear at the top of search results, Web analytics; Measuring and analyzing website data to improve performance, understand user behavior, and optimize digital marketing campaigns

**UNIT IV** Affiliate marketing; A performance based marketing channel where an advertiser pays a commission to an affiliate for promoting their products or services, Marketing analytics; A skill that employers are looking for

**UNIT V** Ecommerce marketing; Inventory management, keyword research, supply chain management, packaging and shipping, selling online, uploading product details, and monitoring customer experiences

***Reference Books:***

"Digital Marketing: A Practical Approach" by Alan Charlesworth
"Ecommerce 2020: Business, Technology, Society" by Kenneth C. Laudon and Carol Guercio Traver
"Digital Marketing: Strategy, Implementation and Practice" by S. Rajaram and G. Gayathri
"Ecommerce: An Indian Perspective" by P. T. Joseph
"Digital Marketing: Concepts and Strategies" by Abhijit Dasgupta

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program/Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Indian Culture and Constitution** | **Subject Code: 3021B05ET046** |
| **Total/Minimum Pass Marks (End Semester Exam)** | **L: 1 T:1 P:0 Credits: 2** |
| **Minimum no. of Class Test: 2** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Indian Culture and Constitution

**Course Objectives:** The objective of the course is to impart understanding of legal environment of business and familiarize with legal agreements to understand the process of establishing legal relationships

**Course Outcome:**

- **CO 1:** Outline different types of Contracts
- **CO 2:** Explain the essentials of sales of goods
- **CO 3:** Classify different types of companies under companies Act 2013
- **CO 4:** Outline machinery for consumer protection
- **CO 5:** Summarize the salient features of Right to information Act 2005

**Course contents:**

**Unit I: Background to the study of Indian Constitution:** Meaning of Dharma and Danda. Nationalistic perspectives of Raja Rammohun Roy, Swamy Vivekananda and Sri Aurobindo

**Unit II: Philosophy and features of Indian Constitution:** Preamble*, Salient features** Dr B.R. Ambedkar and Nehru's contribution in making of the Constitution.

**Unit III: Parliamentary and Constitutional Institutions:** Legislature: * Lok Sabha Rajya Sabha- Composition and powers Executive: President, Prime minister composition and powers, Judiciary: Supreme court, High court composition and jurisdiction, Comptroller and Auditor General, Election Commission. Powers

**Unit IV: Role and Responsibilities of Citizens under Indian Constitution:** Concept of Citizenship, Person of Indian Origin PIO Overseas Citizen of India OCI, Fundamental Duties,

**Unit V: Goals and Policies of National Development enshrined in the Constitution:** NITI Ayoga, National Development Council, Goals of National Educational Policy 2020*

**Text Books:**


1. Aiyangar K.R. 1941. ―Ancient Indian Polity". Oriental Bokks Agency. Poona.
2. Altekar A.S. 1949. ―State and Government in Ancient India. Motilal Banarsidass Chowk,Banaras.


**Reference Books:**


1. Andre Beteille, 1965. Caste,class, and Power. University of California Press, Berkley.
2. Arora & Mukherji, 1992. Federalism in India, Origin and Developments, Vikas Publishing
3. House, New Delhi.
4. Bakshi, 1999. P.M Constitution of India, Universal Law Publishing House, New Delhi,
5. Balagangadhar, S.N. 2021, ―What Does it mean to be _Indian' Notion Press, Indica Academy,Chennai.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Mathematical Foundation to Computer Science** | **Subject Code: 3021B06BT014** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 2 T: 1 P: 0 Credits: 03** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Mathematical Foundation to Computer Science

**Course Objective:** The objective of the "Mathematical Foundations of Computer Science" course is to introduce students to the mathematical concepts and techniques that underpin various areas of computer science. The course aims to help students develop a strong foundation in mathematical reasoning and problem-solving skills that are essential for understanding algorithms, data structures, and theoretical aspects of computer science.

**Course Outcome:** By the end of this course, students should be able to:

1. Understand fundamental mathematical concepts and their applications in computer science.
2. Analyze algorithms and data structures using mathematical techniques.
3. Formulate and solve problems in computer science using mathematical modeling.
4. Apply mathematical reasoning to analyze the efficiency and correctness of algorithms.

**Course Content:**

**UNIT I Mathematical Logic** Propositional Calculus: Statements and Notations, Connectives, Well Formed Formulas, Truth Tables, Tautologies, Equivalence of Formulas, Duality Law, Tautological Implications, Normal Forms, Predicates, Predicative Logic, Statement Functions, Variables and Quantifiers

**UNIT II Set Theory** Sets: Operations on Sets, Principle of Inclusion Exclusion, Relations: Properties, Operations, Partition and Covering, Transitive Closure, Equivalence, Compatibility and Partial Ordering, Hasse Diagrams

**UNIT III Functions** Bijective, Composition, Inverse, Permutation, and Recursive Functions, Lattice and its Properties, Algebraic Structures: Algebraic Systems, Properties, Semi Groups and Monoids, Group, Subgroup and Abelian Group, Homomorphism, Isomorphism.

**UNIT IV Combinatorics** Basis of Counting, Permutations, Permutations with Repetitions, Circular

and Restricted Permutations, Combinations, Restricted Combinations, Binomial and Multinomial Coefficients and Theorems

**UNIT V Number Theory** Properties of Integers, Division Theorem, Greatest Common Divisor, Euclidean Algorithm, Least Common Multiple, Testing for Prime Numbers, The Fundamental Theorem of Arithmetic, Modular Arithmetic, Fermat's and Euler's Theorems

**Recommended Books:**


1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete MathematicsA Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Programming in C Paper II (Lab)** | **Subject Code: 3021B02CL021** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Programming in C Paper-II (Lab)

1. Write a program to enter any sentence and count frequency of vowel, consonant, alphabets, blank spaces and number of words.
2. Write a program to enter any sentence and count frequency of lower-case letters, upper case letters, digits and special characters.
3. Write a program to enter any word and check whether it is a palindrome or not. e.g. (MADAM, MALAYALAM, ARORA etc)
4. Write a program to enter any string and compute its length without using any built-in-type function.
5. Write a program to enter two word, and compare both without using any built-in-type function.
6. Write a program to enter name of any person and abbreviate the name as follows. (e.g. if Input – Vimal Kumar Sharma – then output V. K. Sharma)
7. Write a program to enter name of twenty students, of a class, in an array of string, and get the list of names arranged alphabetically ascending. (A to Z)
8. Write a program to define a function named AREA(), which takes length of three sides of a triangle and compute area of the triangle using Hero's formulae.
   Area = √s x (x-a) x (s-b) x (s-c), where s = (a+b+c)/2
9. Write a program to define a function named PALIN (char N[20]), which accepts a word as argument and checks whether it is a palindrome or not.
10. Write a program to define a function named 'int FACT (int)' which accepts a value as argument and returns its factorial.
11. Write a program to define a function named 'int Prime (int )' which accepts a value as argument and returns 1 if it is prime else it will return 0.
12. Write a program to demonstrate the concept of a pointer to an array.
13. Show how to pass an array to a function using a pointer.
14. Implement a program to pass arrays to functions and modify them using pointers.

15. Write functions to calculate the sum, average, and other statistics of an array using pointers.
16. Write a program to perform string manipulation operations (e.g., concatenation, comparison, length calculation) using pointers.
17. Implement custom functions for string copy, reverse, and palindrome check using pointers.
18. Write a program to dynamically allocate memory for an array using malloc and free.
19. Demonstrate how to use pointers to access and deallocate memory.
20. Write a C program that performs the following operations:

    a. Create and open a text file named `data.txt`.
    b. Write a series of numbers (1 to 10) to `data.txt`.
    c. Close the file.
    d. Reopen the file for reading.
    e. Read the numbers from the file and calculate their sum.
    f. Display the numbers and their sum on the screen.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Web Technology (Lab)** | **Course Code: 3021B03CL021** |
| **Total/MinimumPass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Web Technology (Lab)

**HTML and CSS**

1. HTML Basics: Create a basic HTML page with a header, footer, navigation bar, and a few sections.
2. HTML Forms: Design a registration form using HTML and style it using CSS.
3. Responsive Design: Create a responsive webpage that adjusts its layout on different screen sizes using CSS media queries.
4. CSS Flexbox: Build a layout using CSS Flexbox to create a navigation bar, main content area, and footer.
5. CSS Grid: Design a webpage layout using CSS Grid to organize content into rows and columns.

**JavaScript**

6. JavaScript DOM Manipulation: Create a webpage where clicking a button changes the text content of a paragraph.
7. JavaScript Events: Develop a webpage with a form that validates user input using JavaScript events.
8. JavaScript Arrays and Objects: Create a webpage that displays a list of items from a JavaScript array and allows the user to add new items.
9. JavaScript Fetch API: Build a webpage that fetches and displays data from an external API using the Fetch API.
10. JavaScript Local Storage: Create a simple to-do list application that saves tasks to local storage.

**Web Development Frameworks**

11. Bootstrap: Design a responsive webpage using Bootstrap components like navigation bars, cards, and forms.
12. React Basics: Create a simple React application that displays a list of items and allows users to add new items.

13. React State Management: Develop a React application with state management using hooks (useState and useEffect).

**Backend Technologies**

14. Node.js Basics: Set up a basic Node.js server that serves static HTML files.
15. Express.js: Create a RESTful API using Express.js that allows CRUD operations on a collection of items.
16. MongoDB Integration: Develop a Node.js application that connects to MongoDB database and performs CRUD operations.

**Advanced Topics**

17. User Authentication: Implement user authentication in a web application using JWT (JSON Web Tokens).
18. Socket.io: Create a real-time chat application using Node.js and Socket.io.
19. RESTful API: Build a RESTful API that provides endpoints for managing a collection of resources (e.g., books, movies).
20. Deployment: Deploy a web application to a cloud service provider (e.g., Heroku, AWS) and make it publicly accessible.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

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|---|---|
| **Program / Semester: BCA (II$^{nd}$ Sem)** | **Branch: Computer Application** |
| **Subject: Linux (Lab)** | **Subject Code: 3021B04BL021** |
| **Total/Minimum Pass Marks (End Semester Exam):** | **L: 0 T: 0 P: 2 Credits: 01** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## Subject: Linux (Lab)

List of Experiments to be performed

1. Install and configure Linux Operating System.
2. Execute Linux command
    a. Who, who am I, tty, pwd, cd , mkdir, rmdir, ls , cat , cp, rm, mv, cw , split, cmp, comm, diff, head, tail, grep, sort, In, chmod, chown, chgrp, pr, Ip, expr, man, help, pipes, I/O redirectors, tee, ps.
3. Prepare a document using 'vi' editor.
4. Execute ps command with all options
5. Execute apt-get install and apt-get remove commands.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find sum, product, difference and division to two numbers entered by the user.
8. Write a shell script to check whether a number is even or odd.
9. Write a shell script to display the largest of three numbers.
10. Write a shell script to print the multiplication table of a number.
11. Write a shell script to find factorial of a given integer.
12. Write a shell script to check whether a given string is a palindrome.
13. Write a shell script to reverse the digits of a given 4-digit number.
14. Write a shell script to reverse a given string and display it.
15. Write a shell script to accept a string in lower case and change it to upper case.

# Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

| | |
|---|---|
| **Program / Semester: BCA** | **Branch: Computer Application** |
| **Subject: Algebra** | **Subject Code: 3021A08AT014** |
| **Total/Minimum Pass Marks (End Semester Exam):** | **L: 2 T: 1 P: 0 Credits: 0** |
| **Class Tests & Assignments to be conducted: 2 each** | **Duration (End Semester Exam): 03 Hours** |

## BRIDGE COURSE

**Course Objective:** The main objective of the course is to bridge the gap between subjects studied at School/ Jr college level and subjects they would be studying in Graduation. To improve confidence of the slow learners to meet the knowledge requirements. To prepare the new entrants for the intellectual challenges of a university education.

**Course Outcome:** By the end of this course, students should be able to:

1. It would enable the students to grasp the concepts of mathematics quickly and efficiently.
2. Strengthened Foundational Knowledge
3. Improved Mathematical Communication
4. Preparation for Advanced Courses

**Course Content:**

**UNIT–I: Matrices;** Introduction of matrices Types of matrices Operations on matrices, Properties of matrices, Eigen value and eigen vector, Cayley Hamilton theorem.

**UNIT-II: Set theory;** set, subset, operation of set, type of set- null set, singleton set, finite set infinite set, relation and inverse relation composition relation, function, inverse function composition function.

**UNIT-III: Graph;** definition, examples type of graph null graph, multigraph, finite graph infinite graph, countable graph, uncountable graph bipartite graph, isomorphism graph, weighted graph in shortest path in Dijkstras method.

**UNIT-IV: Statistical analysis;** frequency distribution, histogram, frequency polygon & frequency curve, mean, median and mode, standard deviation.

**Recommended Books:**


1. Discrete Mathematical Structures with Applications to Computer Science, H. K. Pathak, Shiksha Sahitya Prakashan.
2. Elements of Discrete Mathematics A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.


***Note: All (10+2) Biology, Commerce, Arts, Home Science or Agriculture student on the other hand (10+2) no mathematics students must clear the Bridge Course examination during 3 years (6 semesters) tenure of BCA Program. The end semester examination of Bridge Course will be conducted with all semester examination.***

# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Probability and Statistics | Semester: III Sem |
| Subject Code: 3021C01AT014 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives**

1. To introduce fundamental concepts of statistics and data analysis.
2. To develop understanding of measures of central tendency and dispersion.
3. To familiarize students with basic probability concepts and rules.
4. To enable interpretation of data using graphs and simple statistical tools.
5. To build analytical skills for solving real-life problems using statistics.

**Course Outcomes**

1. Students will be able to organize, present, and interpret data effectively.
2. Students will be able to compute and analyze mean, median, mode, and dispersion measures.
3. Students will be able to apply basic probability rules to simple problems.
4. Students will be able to analyze relationships using basic correlation concepts.
5. Students will be able to use statistical thinking for decision-making in real-life situations.

**Unit I: Basics of Statistics -** Meaning and importance of Statistics, Types of data (primary and secondary), Methods of data collection, Classification and tabulation of data, Graphical representation (bar graph, pie chart, histogram)

**Unit II: Measures of Central Tendency -** Mean (Arithmetic Mean), Median, Mode, Simple numerical problems, Comparison of mean, median, and mode

**Unit III: Measures of Dispersion –** Range, Mean Deviation, Variance and Standard Deviation, Simple problems on dispersion, Importance of variability

**Unit IV: Basic Probability -** Concept of probability, Sample space and events, Types of events (simple, compound), Addition theorem of probability, Simple probability problems

**Unit V: Correlation and Basic Distributions -** Meaning of correlation, Types of correlation (positive, negative), Introduction to probability distributions, Binomial distribution (basic idea), Real-life applications of statistics.

**Text Books:**

Probability and Statistics by E. Rukmangadachari & E. Keshava Reddy
Probability and Statistics by M. Ray, H.S. Sharma & U.N. Singh
Probability and Statistics by Dr. Deo Datta Aarya, Dr. Yogendra Kumar Rajoria

**Reference Books**

Fundamentals of Mathematical Statistics by S.C. Gupta & V.K. Kapoor
Statistics by S.P. Gupta
A First Course in Probability and Statistics by B. L. S. Prakasa Rao

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Operating System | Semester: III Sem |
| Subject Code: 3021C02BT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. To introduce the fundamental concepts and functions of operating systems.
2. To understand process management and CPU scheduling techniques.
3. To learn memory management and file system organization.
4. To explore concepts of deadlocks and their handling methods.
5. To familiarize students with basic security and protection mechanisms in OS.

**Course Outcomes:**

1. Students will be able to explain the basic structure and functions of an operating system.
2. Students will analyze and apply different CPU scheduling algorithms.
3. Students will understand memory management techniques such as paging and segmentation.
4. Students will identify and handle deadlock situations in operating systems.
5. Students will demonstrate knowledge of file systems, security, and protection concepts.

**Course Content:**

**UNIT I Introduction to Operating System**– Definition and Functions of Operating System, Types of Operating Systems (Batch, Time-sharing, Distributed, Real-time), Structure of Operating System, System Calls and Services, Operating System as Resource Manager

**UNIT II Process Management -** Process concept and states, Process scheduling (FCFS, SJF, Round Robin), CPU scheduling criteria, Inter-process communication (IPC), Introduction to threads

**UNIT III Memory Management -** Memory management concepts, Paging and segmentation, Virtual memory, Swapping, Page replacement algorithms (FIFO, LRU)

**UNIT IV Deadlocks -** Deadlock concept, Necessary conditions of deadlock, Deadlock prevention and avoidance, Deadlock detection and recovery, Banker's Algorithm (basic idea)

**UNIT V File System & Security -** File system concepts, File organization and access methods, Directory structure, Disk management basics, Security and protection in OS

***Text Books:***

*Peter Baer Galvin, Greg Gagne, "Operating System Concepts" - Abraham Silberschatz, edition, Wiley-India, 2009*

Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, PHI

***Reference Books:***

Elmasri, Carrick, Levine, Operating Systems: A Spiral Approach - TMH Edition

Akshay Singh, Operating System, RGCSM Publications

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Data Structure using C | Semester: III Sem |
| Subject Code: 3021C03BT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. To understand the fundamental concepts of data structures and their importance in problem-solving.
2. To learn the implementation of various data structures using the C programming language.
3. To develop skills in analyzing algorithm efficiency (time and space complexity).
4. To gain knowledge of linear and non-linear data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
5. To apply data structures in designing efficient and optimized solutions for real-world problems.

**Course Outcomes:**

1. Students will be able to implement different data structures using C.
2. Students will analyze and evaluate the performance of algorithms using complexity analysis.
3. Students will apply appropriate data structures to solve computational problems efficiently.
4. Students will demonstrate understanding of operations on linear and non-linear data structures.
5. Students will develop optimized programs using suitable data structures for real-life applications.

**Course Content:**

**UNIT I**: **Introduction to Data Structures** - Basic concepts of data and data structures, Types of data structures (Linear and Non-linear), Introduction to algorithms, Basics of C programming (variables, operators, control statements)

**UNIT II: Arrays and Strings -** Introduction to arrays (1D and 2D), Basic operations on arrays (insertion, deletion, traversal), Introduction to strings and basic string operations

**UNIT III**: **Linked Lists -** Concept of pointers in C, Introduction to linked list, Types: singly linked list, Basic operations (insertion, deletion, traversal)

**UNIT IV**: **Stacks and Queues -** Introduction to stack (LIFO concept), Basic operations on stack (push, pop), Introduction to queue (FIFO concept), Basic operations on queue (enqueue, dequeue)

*UNIT V: Introduction to Trees and Sorting* - ***Basic concept of tree and binary tree, Introduction to searching (linear search), Introduction to sorting (bubble sort, selection sort)***

***Text Books:***

"Data Structure through C" by Yashwant Kanitkar

"Data Structures Through C (A Practical Approach)" by G. S. Baluja

***Reference Books:***

“Schaum’s Outline of Data Structures with C” by Seymour Lipschutz.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Database Management System | Semester: III Sem |
| Subject Code: 3021C04CT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. To understand the fundamental concepts of database systems and data models.
2. To learn database design techniques using Entity-Relationship (ER) modeling.
3. To develop skills in Structured Query Language (SQL) for data manipulation and retrieval.
4. To gain knowledge of database normalization, transactions, and concurrency control.

**Course Outcomes:**

1. Students will be able to design and model databases using ER diagrams.
2. Students will be able to write SQL queries for creating, updating, and retrieving data.
3. Students will be able to apply normalization techniques to reduce data redundancy.
4. Students will be able to understand transaction management and ensure database consistency.

**Course Content:**

**UNIT I Introduction to Database Systems -** Basic concepts: Data, Information, Database, DBMS, Advantages and applications of DBMS, Database users and architecture (Three-level architecture), Data models: Hierarchical, Network, Relational

**UNIT II Data Modeling and Design -** Entity-Relationship (ER) Model: Entities, Attributes, Relationships, ER Diagrams and notation, Mapping ER model to Relational model, Keys: Primary, Foreign, Candidate, Composite, Constraints and integrity rules

**UNIT III Structured Query Language (SQL) -** Basics of SQL and data types, DDL commands: CREATE, ALTER, DROP, DML commands: INSERT, UPDATE, DELETE, Querying data using SELECT, WHERE, ORDER BY, Joins, Aggregate functions, GROUP BY, HAVING

**UNIT IV Normalization and Database Design -** Functional Dependency, Normalization: 1NF, 2NF, 3NF, Boyce-Codd Normal Form (BCNF), Denormalization concepts, Design of relational schema

**UNIT V Transaction Management and Advanced Concepts -** Transaction concepts and properties, Concurrency control and locking techniques, Deadlock handling, Database security and authorization, Backup and recovery basics

***Text Books:***

Database system concept, H. Korth and A. Silberschatz, TMH Publications.
Data Base Management System, Alexies & Mathews, Vikash publication.
Data Base Management System By James Martin

***Reference Books:***

Principles of Database System By Ullman. Program Design, Peter Juliff, PHI Publications.
The Complete Reference, Kevin Loney, Oracle Press. SQL, PL/SQL
The Programming Language of Oracle, Ivan Bayross, PustakKosh Publication

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Object Oriented Programming with C++ | Semester: III Sem |
| Subject Code: 3021C05CT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. To understand the fundamental concepts of Object-Oriented Programming such as classes, objects, inheritance, polymorphism, abstraction, and encapsulation.
2. To develop programming skills using C++ for solving real-world problems through object-oriented approaches.
3. To learn the use of functions, constructors, destructors, and operator overloading in C++.
4. To familiarize students with advanced concepts like file handling and exception handling in C++.

**Course Outcomes:**

1. Students will be able to design and implement programs using object-oriented principles in C++.
2. Students will be able to apply inheritance and polymorphism to create reusable and efficient code.
3. Students will be able to develop modular programs using classes, objects, and functions.
4. Students will be able to handle files and exceptions effectively in C++ applications.

**Course Content:**

**UNIT I Introduction and Programming Concepts -** Definition of Program, Source file, Object file, Executable file, Header file, Language Translator- Assembler, Interpreter, Compiler, Testing, Debugging, Operators, Data Types, Control structure: Conditional and looping statements, Operator Precedence and Associativity,

**UNIT II Arrays -** Array and its types, Pointer, Functions: Standard Library and User-defined functions, function prototype, Call by value and Call by reference, recursive functions, String functions.

**UNIT III Introduction to Object Oriented Programming -** Concept of object oriented programming, Features of C++, Structure of C++ program, Data types, structure, class and objects, Access Specifiers: Private, Public, Protected, inline functions, static data and static functions. Constructor: Default constructor, Copy constructor, Parameterized constructor, Destructor.

**UNIT IV Inheritance and Polymorphism -** Definition, Concept of base and derived class, Types of Inheritance: Single, Multilevel, Multiple, Hierarchical and Hybrid Inheritance. Polymorphism: Definition, Compile-time polymorphism: Function overloading, Operator overloading, constructor overloading, Runtime polymorphism: Virtual Function, pure virtual function. Inline function, friend function, friend class

**UNIT V Input-Output and File Handling -** I/O classes, File and Stream classes, Char I/O, String I/O, Object I/O, File Pointer, Opening and Closing file, Exception Handling and Standard Template Library: Definition, Exception basics, try, catch and throws keywords, Template

***Text Books:***

Y. Kanetkar, Let us C++, B.P.B Publication.
E. Balaguruswamy, Programming in C++, Tata McGraw Hill.

***Reference Books:***

Peter Juliff, Program Design, PHI Publications
R. Kumar, Object Oriented Programming with C++, Prakhar Publication

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: Life Concept by Bhagwat Gita | Semester: III Sem |
| Subject Code: 3021C06ET046 | ESE Duration: **Three Hours** |
| Credits: **02** | Minimum L:**02** T:**00** P:**00** |
| Maximum Marks: **50** | Minimum Marks**: 18** |
| CT Marks: **10** | TA Marks: **10** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. To learn the scientific aspects of the Bhagavad Gita.

2. To explore how the timeless wisdom of the Gita can be integrated into modern life to foster holistic well-being.

3. To discover practical methods from the Gita to manage and reduce stress, anxiety, and overwhelm in personal and professional life.

4. To gain insights from the Gita on building meaningful and harmonious relationships, enhancing effective communication, and critical thinking.

5. To develop mindfulness and meditation practices based on Gita teachings to enhance self-awareness, inner peace, and bhakti for achieving the ultimate goal of life.

**Course Outcome:**

1. Student understands the basic concepts of Bhagwd-Gita and its need for students.
2. They have been introduced to some concepts of Science of SOULS
3. They have been introduced to some concepts Supreme Lord (Ishwara).
4. They have been introduced to concepts of Yoga – Dhyana, Karma, Jnana, Bhakti

**UNIT-I: BASIC CONCEPTS OF BHAGWAD GITA:**

Introduction to Bhagavad Gita, How to learn Bhagavad-Gita, Five topics in the Bhagavad Gita: Isvara, Jiva, Kala, Karma and Prakriti.

Dilemma in the material world: Arjuna's dilemmas and doubts; perplexities of life in this world: birth, death, disease and old age, three-fold miseries; material relationships: temporary, cause misery; the only solution: spiritual, relationship.

Absolute necessity of spiritual relationship with a bonafide spiritual master/teacher; qualifications of a spiritual master; check and balance through Guru, sadhu and sastra, Qualifications of a disciple/student

**UNIT-II: SCIENCE OF SOUL (JIVA):**

What is soul? Proof of existence of soul, its nature and individuality; the doctrine of life comes from life; activities in knowledge of science of soul. Cause of suffering in this world; constitutional position of living entity.

**UNIT-III: SUPREME LORD (ISHWARA):**

Knowing Krishna, the Supreme personality of Godhead; Krishna as the source of both material and spiritual energies, and the supreme controller; understanding the position of God, His expansions and living entities. Lord's descent: His love, purpose and mission; Paramatma: our ever well-wishing best friend. Inconceivable nature of the Supreme Personality of Godhead, His qualities and pastimes;

cultivating spiritual relationship: the only way to understand Him. Is God personal or impersonal? Three aspects of the Absolute Truth; path of personalism vs. path of impersonalism. Demigod worship: universal administration; demigods and their relationship with Krishna; right way to approach demigods

**UNIT-IV: YOGA (CONNECTING WITH SUPREME LORD):**

**What is yoga?** Types of yoga – Dhyana, Karma, Jnana, Bhakti; limitation of asthanga yoga in kali yuga; gradual and direct method - bhakti yoga; pure devotional service; the topmost yoga system. Different platforms of worship: fear, desire, duty,

**Karm Yoga (कर्म योग) :** Why bad things happen to good people? Law of karma: good karma, bad karma and akarma; how to become free from karma and reincarnation; karma yoga and its importance; contemporary relevance of karma yoga; sakama and nishkama karma yoga

**Jnana Yoga (ज्ञान योग):** Relation between Karma Yoga and Jñāna yoga, Distinction between Jnana and Vijñāna. Criteria of True Knowledge (Buddhi Yoga & JñānaYoga).

**Bhakti Yoga भक्ति योग :** Four kinds of devotees, Characteristics of Ideal Bhakti- Saraṇāgati & Prapattikrupa (grace); Relation between Bhakti Yoga & Jñāna Yoga

**Text Books:**

1. Srimad Bhagavad Gita: The ultimate manual of life (1st ed.) Das, M., & Das, T. K. (n.d.) CHOICE (Centre for Heritage of Indian Culture and Education).

2. Introduction to Bhagavad Gita by A.C.Bhaktivedanta Swami Prabhupada.

2. Srimad Bhagavad Gita As It Is. Mumbai: Bhaktivedanta Book Trust, 2009.

3. The Bhagavad Gita. Gorakhpur: Gita Press, 2007.

4. Krishna consciousness - The Topmost Yoga System by A.C.Bhaktivedanta Swami Prabhupada.

**Reference Books:**

**1.** Prabhupada, His Divine Grace A.C. Bhaktivedanta. Isopanishad. Mumbai: Bhaktivedanta, Book Trust, 2002.

2. Dasa, Bhurijana. Surrender Unto Me. Vrindavan: Vrindavan Institute of Higher Education, 1997.

3. Prabhupada, His Divine Grace A.C. Bhaktivedanta. The Science of Self-Realization. Mumbai: Bhaktivedanta Book Trust, 2002.

**E- Recourses**

1. https://youtu.be/bedsn7xIn0w?si=VW5iQdLgDu5UDhA6
2. https://anubooks.com/uploads/session_pdf/16623612876.pdf
3. https://ijcrt.org/papers/IJCRT2101218.pdf
4. https://youtu.be/HHIv6qJlRjI?si=MML5aslZRwUvE1Rl
5. https://en.wikipedia.org/wiki/Jnana-Vijnana_Yoga
6. https://en.wikipedia.org/wiki/Bhakti_yoga

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: **Data Structure using C Lab** | Semester: III Sem |
| Subject Code: 3021C01BL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

**Basic Programs (Arrays & Strings)**

1. Write a C program to create an array and perform insertion and deletion operations.
2. Write a program to search an element in an array using **linear search**.
3. Write a program to search an element using **binary search**.
4. Write a program to sort an array using **bubble sort**.
5. Write a program to sort an array using **selection sort**.
6. Write a program to perform matrix addition and multiplication.
7. Write a program to reverse a string without using built-in functions.

**Stack (Using Array & Linked List)**

8. Implement a stack using an array with push, pop, and display operations.
9. Implement a stack using a linked list.
10. Write a program to evaluate a postfix expression using stack.
11. Write a program to convert infix expression to postfix using stack.

**Queue (Using Array & Linked List)**

12. Implement a queue using an array.
13. Implement a circular queue using an array.
14. Implement a queue using a linked list.
15. Write a program to simulate a **priority queue**.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: **Database Management System Lab** | Semester: III Sem |
| Subject Code: 3021C02BL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

1. Create a database for a **College Management System** and define tables for Student, Course, and Faculty with appropriate attributes and constraints.
2. Write SQL queries to perform **DDL operations** (CREATE, ALTER, DROP) on a table named *Employee*.
3. Insert, update, and delete records in a table using **DML commands**.
4. Apply **constraints** (PRIMARY KEY, FOREIGN KEY, UNIQUE, NOT NULL, CHECK) on tables and demonstrate their usage.
5. Write SQL queries using **SELECT** with WHERE, ORDER BY, GROUP BY, and HAVING clauses.
6. Implement different types of **joins** (INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN) using sample tables.
7. Write SQL queries using **aggregate functions** (COUNT, SUM, AVG, MAX, MIN).
8. Create and use **views** for data abstraction and security.
9. Write SQL queries using **subqueries** (nested queries) in SELECT, WHERE, and FROM clauses.
10. Implement **indexes** on a table and analyze their effect on query performance.
11. Create and execute **stored procedures** for performing database operations.
12. Write **triggers** for INSERT, UPDATE, and DELETE operations.
13. Design an **ER diagram** for a Library Management System and convert it into relational schema.
14. Perform **normalization** (up to 3NF) on a given unnormalized table.
15. Implement **transaction control commands** (COMMIT, ROLLBACK, SAVEPOINT) with suitable examples.
16. Write SQL queries to demonstrate the use of **set operations**: UNION, UNION ALL, INTERSECT, and EXCEPT.
17. Create a **cursor** in SQL and demonstrate its use for row-by-row processing of records.
18. Implement **role-based access control** by creating users and assigning different privileges using GRANT and REVOKE commands.
19. Design and implement a **backup and recovery strategy** for a database, showing steps for taking backup and restoring data.
20. Develop a **mini project** (e.g., Hospital Management System or Online Shopping System) including database design, table creation, and sample queries.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: **Object Oriented Programming with C++ Lab** | Semester: III Sem |
| Subject Code: 3021C03CL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

**Basic Programs**

1. Write a C++ program to display student details using class and object.
2. Create a class Rectangle to calculate area and perimeter.
3. Write a program to demonstrate use of member functions inside a class.
4. Define a class Employee and display employee salary details.
5. Write a program to demonstrate inline functions in C++.

**Constructors & Destructors**

6. Create a class with default and parameterized constructors.
7. Write a program to demonstrate constructor overloading.
8. Implement a copy constructor in a class.
9. Create a class to demonstrate destructor invocation.

**Function & Operator Overloading**

10. Write a program to overload a function to calculate area of circle, rectangle, and triangle.
11. Implement operator overloading for addition of two complex numbers.
12. Overload unary operator (-) to negate a number.
13. Overload binary operator (+) for adding two objects of a class.

**Inheritance**

14. Write a program to demonstrate single inheritance.
15. Implement multilevel inheritance using a class hierarchy.
16. Demonstrate multiple inheritance in C++.
17. Write a program to show hierarchical inheritance.

**Polymorphism**

18. Write a program to demonstrate function overriding.
19. Implement runtime polymorphism using virtual functions.
20. Create a base class pointer to access derived class objects.

**File Handling**

21. Write a program to create and write data into a file.
22. Write a program to read data from a file.
23. Implement a program to append data into an existing file.

**Exception Handling & Advanced Concepts**

24. Write a program to demonstrate exception handling using try, catch, and throw.
25. Create a program to handle division by zero using exception handling.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: **Idea Innovation Lab** | Semester: III Sem |
| Subject Code: 3021C04FL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

1. Smart Attendance System using QR Code
2. College Event Management System
3. Digital Notice Board (Web/App based)
4. Student Feedback Analysis System
5. Blood Donation Finder System
6. Women Safety Alert Application
7. Online Complaint Registration System for Local Issues
8. Expense Tracker Application
9. To-Do List with Reminder System
10. Online Appointment Booking System
11. Food Donation & Distribution Platform
12. Smart Parking System (Simulation-based)
13. Virtual Study Group Platform
14. Skill Exchange Platform (Students teaching each other)
15. AI-based Career Guidance System

*Note: Students have to prepare and submit three mini project works from the above-listed titles.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (III Sem) | Branch: Computer Application |
| Subject: **Personality Development** | Semester: III Sem |
| Subject Code: 3021C07DT076 | ESE Duration: **Three Hours** |
| Credits: **Non Credit** | Minimum L:**01** T:**00** P:**02** |
| Maximum Marks: - | Minimum Marks: -- |
| TA Marks: **20** | |

**Course Objectives:** This course aims to develop self-awareness, self-management, communication, interpersonal, and professional skills in students to enhance their personality and prepare them for career and workplace readiness.

**Course Contents:**

Unit I: Personality & Self-Awareness – Concept and determinants of personality, Self-awareness and SWOT analysis, Attitude and confidence building.

Unit II: Self-Management– Stress management techniques, Time management and goal setting, Body language.

Unit III: Interpersonal Skills – Interpersonal transactions and Transactional Analysis (TA) basics; Conflict – Types and resolution, Digital communication etiquette: email writing, netiquette, and professional social media presence.

Unit IV: Teamwork – Group dynamics and team building, Leadership skills, Collaboration and coordination, Problem-solving in teams.

Unit V: Professional Skills – Public speaking and presentation skills: overcoming stage fear, structuring a talk, use of visuals; Workplace etiquette: professional appearance, meeting conduct, and workplace relationship.

**Course Outcomes:**

| CO No. | Course Outcome | Bloom's Level |
|---|---|---|
| CO1 | Identify personality traits and perform self-assessment analysis. | Remember (L1) / Understand (L2) |
| CO2 | Apply self-management techniques for personal and career goals. | Apply (L3) |
| CO3 | Demonstrate effective interpersonal skills in various contexts. | Apply (L3) |
| CO4 | Analyze group dynamics and exhibit teamwork abilities. | Analyze (L4) |
| CO5 | Develop professional competencies and workplace etiquettes. | Create (L6) |

**Text Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Personality Development and Soft Skills | Barun K. Mitra | - | Oxford University Press |
| 2 | Communication Skills and Personality Development | J.R. Kadam et al. | - | Scientific Publishers |

**Reference Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Communication Skills and Personality Development | M. Jegadeesan et al. | - | - |
| 3 | How to Win Friends and Influence People | Dale Carnegie | - | - |

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Artificial Intelligence | Semester: IV Sem |
| Subject Code: 3021D01BT021 | ESE Duration: **Three Hours** |
| Credits: **04** | Minimum L:**03** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives**

- To introduce the basic concepts, scope, and applications of Artificial Intelligence.
- To understand fundamental problem-solving and search techniques used in AI.
- To familiarize students with basic knowledge representation and machine learning concepts.
- To create awareness about real-world AI applications and ethical considerations.

**Course Outcomes**

- Students will be able to explain fundamental concepts and applications of Artificial Intelligence.
- Students will be able to apply basic search techniques to solve simple problems.
- Students will be able to understand introductory machine learning and knowledge representation methods.
- Students will be able to analyze the impact of AI technologies and related ethical issues.

**Unit I: Introduction to Artificial Intelligence -** Meaning, definition, and scope of Artificial Intelligence, History and evolution of AI, Applications of AI in daily life (education, healthcare, business), Types of AI (Narrow AI, General AI), Basics of intelligent agents

**Unit II: Problem Solving and Search Techniques -** AI problem formulation, State space representation, Uninformed search techniques (BFS, DFS), Informed search techniques (Greedy, A*), Simple problem-solving examples

**Unit III: Knowledge Representation -** Introduction to knowledge representation, Types of knowledge (declarative, procedural), Logic-based representation (propositional logic – basics), Semantic networks and frames (basic idea), Applications of knowledge representation

**Unit IV: Machine Learning Basics -** Introduction to Machine Learning, Types of learning (supervised, unsupervised), Simple examples (classification and clustering), Basic algorithms overview (decision trees, K-means – concept only), Applications of machine learning

**Unit V: AI Applications and Ethics -** Natural Language Processing (basic idea), Expert systems (concept and examples), Robotics (introductory concepts), AI in real-world applications, Ethical issues in AI (bias, privacy, security)

**Text Books:**


Goswami, S., Das, A. K., & Chakrabarti, A. (2024). *AI for Everyone: A Beginner's Handbook for Artificial Intelligence*. Pearson India.

Verma, R. K., Vishwakarma, H., Purohit, J., & Pradeep, J. (2025). *Artificial Intelligence: Concepts, Techniques, and Applications*. AG Publishing House.

Banerjee, S. (2025). *Artificial Intelligence: Foundations and Frontiers*. Sultan Chand & Sons.


**Reference Books:**


Aggarwal, C. C. (2021). *Artificial Intelligence: A Textbook*. Springer Nature, Switzerland.

Russell, S. J., & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach* (4th ed.). Pearson Education.


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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Software Engineering | Semester: IV Sem |
| Subject Code: 3021D02BT021 | ESE Duration: **Three Hours** |
| Credits: **04** | Minimum L:**03** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives**

- To introduce fundamental concepts, principles, and the importance of Software engineering.
- To understand various software development life cycle (SDLC) models.
- To familiarize students with basic requirement analysis, design, and testing techniques.
- To develop awareness of project management practices and ethical issues in software development.

**Course Outcomes**

- Students will be able to explain basic concepts and phases of Software Engineering.
- Students will be able to apply suitable SDLC models for simple software projects.
- Students will be able to identify requirements and perform basic design and testing activities.
- Students will be able to understand project management concepts and ethical responsibilities in software development**.**

**Unit I: Introduction to Software Engineering -** Definition and importance of Software Engineering, Characteristics of software, Software development challenges, Software Development Life Cycle (SDLC) – overview, Role of a software engineer

**Unit II: Software Development Models -** Introduction to process models, Waterfall model (basic concept), Incremental and Iterative models, Agile model (basic idea), Comparison of different models

**Unit III: Requirement Analysis and Design -** Requirement engineering (basic concepts), Types of requirements (functional & non-functional), Feasibility study, Introduction to system design, Basic UML diagrams (use case, class diagram – overview)

**Unit IV: Software Testing and Maintenance -** Importance of software testing, Types of testing (unit, integration, system), Debugging basics, Software maintenance (types and importance), Introduction to software quality

**Unit V: Project Management and Emerging Trends -** Basics of software project management, Project planning and scheduling, Risk management (basic idea), Introduction to modern trends (DevOps, cloud-based development), Ethics in software engineering

**Text Books**


Software Engineering: A Practitioner's Approach, Pressman, R. S., & Maxim, B. R.
*Software Engineering: A Practitioner's Approach* (8th ed.). McGraw-Hill Education.
Software Engineering: Sommerville, I.(10th ed.). Pearson Education.
Software Engineering: Aggarwal, K. K., & Singh, Y. New Age International Publishers.


**Reference Books**


Fundamentals of Software Engineering, Mall, R. PHI Learning Pvt. Ltd.
An Integrated Approach to Software Engineering, Jalote, P. Springer.
Software Engineering, Aggarwal, K. K. New Age International Publishers.


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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Computer Networks | Semester: IV Sem |
| Subject Code: 3021D03BT021 | ESE Duration: **Three Hours** |
| Credits: **04** | Minimum L:**03** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives**

- To introduce the basic concepts, types, and components of computer networks.
- To understand network models such as the OSI Model and TCP/IP Model.
- To familiarize students with transmission media, networking devices, and data communication basics.
- To create awareness about Internet services and basic network security concepts.

**Course Outcomes**

- Students will be able to explain fundamental networking concepts, types, and topologies.
- Students will be able to describe the working of OSI and TCP/IP models and their layers.
- Students will be able to identify networking devices, transmission media, and basic communication techniques.
- Students will be able to understand Internet services and apply basic security practices in networking environments.

**Unit I: Introduction to Computer Networks -** Definition and need of computer networks, Types of networks (LAN, MAN, WAN), Network components (nodes, links, devices), Network topologies (bus, star, ring, mesh), Advantages and applications of networks

**Unit II: Network Models -** Concept of layered architecture, OSI Model (basic idea of 7 layers), TCP/IP Model (basic structure), Comparison between OSI and TCP/IP models, Functions of each layer (overview only)

**Unit III: Transmission Media & Devices -** Guided media (twisted pair, coaxial, optical fiber), Unguided media (radio waves, microwave, satellite), Networking devices (hub, switch, router, modem), Basic working of network devices

**Unit IV: Data Communication Basics -** Concept of data transmission, Analog and digital communication, Transmission modes (simplex, half duplex, full duplex), Introduction to IP addressing (basic idea), Basics of data switching (circuit and packet switching)

**Unit V: Internet & Network Security -** Introduction to Internet and its services, Basics of protocols (HTTP, FTP, SMTP), Network security basics (firewall, antivirus), Common network threats (virus, malware, phishing), Safe internet practices

**Text Books**


Computer Networks, Tanenbaum, A. S., & Wetherall, D. J. Pearson Education.
Computer Networking: A Top-Down Approach, Kurose, J. F., & Ross, K. W. Pearson Education.
Data Communications and Networking, Forouzan, B. A. McGraw-Hill Education.


**Reference Books**


Computer Networks and Internets, Comer, D. E. (2015). Pearson Education.
Computer Networks: A Systems Approach, Peterson, L. L., & Davie, B. S. Morgan Kaufmann.
Data and Computer Communications, Stallings, W. Pearson Education.


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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Python Programming | Semester: IV Sem |
| Subject Code: 3021D04CT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives**

- To introduce the basic concepts and features of Python.
- To develop problem-solving skills using basic programming constructs like variables, operators, and control structures.
- To familiarize students with functions and fundamental data structures in Python.
- To provide knowledge of file handling and basic use of Python libraries.

**Course Outcomes**

- Students will be able to understand and write simple Python programs using correct syntax.
- Students will be able to apply control structures and functions to solve basic problems.
- Students will be able to use data structures like lists, tuples, and dictionaries effectively.
- Students will be able to perform basic file operations and utilize standard Python libraries.

**Unit I: Introduction to Python -** Introduction to programming and Python, Features and applications of Python, Installation and working with Python (IDLE/Jupyter basics), Basic syntax, keywords, and identifiers, Input and output statements

**Unit II: Data Types and Operators -** Built-in data types (int, float, string, boolean), Type conversion, Operators (arithmetic, relational, logical), Expressions and precedence, Simple programs using variables and operators

**Unit III: Control Structures -** Conditional statements (if, if-else, nested if), Looping statements (for, while), Break, continue, and pass statements, Simple problem-solving using control structures

**Unit IV: Functions and Data Structures -** Functions (definition, parameters, return values), Built-in functions, Lists, tuples, and dictionaries, Basic operations on data structures, Introduction to string handling

**Unit V: Applications in Data Analysis -** Installing and Importing NumPy, Creating Arrays, Basic Array Operations, Installing and Importing Pandas, Creating Series and DataFrames, Reading and Displaying Data from CSV Files

**Text Books**


Programming in Python 3: A Complete Introduction to the Python Language. Addison-Wesley Professional.

Eric Matthes. Python Crash Course (2nd ed.). No Starch Press.

R. Nageswara Rao. Core Python Programming (2nd ed.). Dreamtech Press.


**Reference Books**


Mark Lutz, Learning Python (5th ed.). O'Reilly Media.

Ljubomir Perkovic (2015). Introduction to Computing Using Python. Wiley. Python Cookbook

David Beazley & Brian K. Jones (2013). Python Cookbook (3rd ed.). O'Reilly Media.


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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Fundamentals of Data Science | Semester: IV Sem |
| Subject Code: 3021D05BT021 | ESE Duration: **Three Hours** |
| Credits: **03** | Minimum L:**02** T:**01** P:**00** |
| Maximum Marks: **100** | Minimum Marks**: 35** |
| CT Marks: **20** | TA Marks: **20** |

**Course Objectives**

- To introduce the basic concept of data and its importance in everyday life.
- To develop understanding of simple data collection and organization methods.
- To familiarize students with basic data analysis and representation techniques.
- To create awareness about data science applications and ethical use of data.

**Course Outcomes**

- Students will be able to identify different types of data and their uses.
- Students will be able to collect, organize, and present data in simple formats.
- Students will be able to perform basic analysis using simple statistical measures.
- Students will be able to understand basic data science applications and data ethics.

**Unit I: Introduction to Data -** What is data? (daily life examples), Types of data (numbers, text, images – simple idea), Importance of data in decision making, Examples of data usage (banking, shopping, education), Introduction to Data Science (very basic idea)

**Unit II: Data Collection -** Sources of data (online, surveys, records), Methods of collecting data (forms, observation), Difference between good and bad data, Basic idea of organizing data, Simple examples of data collection

**Unit III: Understanding Data -** Arranging data in tables, Basic calculations (sum, average), Introduction to mean, median, and mode, Identifying patterns in data, Simple examples using small datasets

**Unit IV: Data Presentation -** Representing data using charts, Bar chart, pie chart, and line graph, Introduction to tools like Microsoft Excel, Simple visualisation examples, Interpreting graphs

**Unit V: Introduction to Tools and Applications -** Basic idea of Python (no coding depth), Real-life applications of Data Science, Introduction to Machine Learning (very basic idea), Importance of data privacy and ethics, Future scope of Data Science

**Text Books**

Sanjeev J. Wagh, Manisha S. Bhende, & Anuradha D. Thakare, Fundamentals of Data Science. CRC Press.

Gypsy Nandi & Rupam Kumar Sharma, Data Science Fundamentals and Practical Approaches. BPB Publications.

**Reference Books**

Avrim Blum, John Hopcroft, & Ravi Kannan, Foundations of Data Science. Cambridge University Press (Indian Edition).

Peter Bruce, Andrew Bruce, & Peter Gedeck, Practical Statistics for Data Scientists (2nd ed.). O'Reilly Media.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: Indian Traditional Knowledge: Science and Practices | Semester: IV Sem |
| Subject Code: 3021D06ET046 | ESE Duration: **Three Hours** |
| Credits: **02** | Minimum L:**02** T:**00** P:**00** |
| Maximum Marks: **50** | Minimum Marks**: 18** |
| CT Marks: **10** | TA Marks: **10** |
| Class Tests: **Two (Minimum)** | Assignments: **Two (Minimum)** |

**Course Objectives:**

1. Creating awareness amongst the youths about the true history and rich culture of the country;
2. Understanding the scientific value of the traditional knowledge of Bhārata;
3. To familiarize learners with major sequential development in Indian science, engineering and technology.
4. To review & strengthen the ancient discovery and research in physics, chemistry, maths, metallurgy, astronomy, architecture, textile, transport, agriculture and Ayurveda etc.

**Course Outcomes:**

1. Student understands the various traditional practices of ancient India.
2. They have been introduced to some concepts of Ancient Indian Physics and Chemistry.
3. They have been introduced to some concepts of Ancient Indian Science (Metallurgy, Astronomy & Astrology.
4. They have been introduced to some fields of IKS like Ancient Architecture and Engineering.

**UNIT I: Bhāratīya Civilization and Development of Knowledge System**

Genesis of the land, Antiquity of civilization, On the Trail of the Lost River, Discovery of the Saraswatī River, the Saraswatī-Sindhu Civilization, Traditional Knowledge System, Introduction to Vedas, A synopsis of the four Vedas, Sub-classification of Vedas, Vedic Life: A Distinctive Features, Ancient Education System, the Takṣaśilā University, the Nālandā University, Knowledge Export from Bhārata.

**UNIT II: ANCIENT INDIAN SCIENCE**

Physics in India: Vaisheshika darshan Atomic theory & law of motion, theory of panchmahabhoota, Brihath Shathaka (divisions of the time, unit of distance), bhaskarachaya (Theory of gravity, surya siddhanta & sidhanta shriomani ), Lilavati (gurutvakashan Shakti).

Chemistry in India: Vatsyayana, Nagarjuna,Khanda, Al-Biruni, Vagbhaṭa –building of the ras-shala (laboratory), working arrangements of ras-shala, material and equipment, Yaśodhara Bhaṭṭa-process of distillation, apparatus, saranasamskara, saranataila

**UNIT III: ANCIENT INDIAN TECHNOLOGY**

**Metallurgy in India:** Engineering Science and Technology in the Vedic Age and Post-Vedic Records, Mining and ore extraction, Survarṇa (gold), Rajata (silver), Tamra (copper), Loha (iron), Vanga (tin), Naga / sisa (lead), Pittala (brass), and steel in ancient India, Apparatuses used for extraction of metallic components, Iron Pillar of Delhi.

**Astronomy and Astrology:** The Beginnings of Indian Astronomy - The Early Historical Period-The Siddhāntic Era., Ancient Indian Observational astronomy. Foundation concepts - nakṣatra, graha, time units, phenomena like meteors, eclipses., Brief notes on Astronomical instruments like sundials, water clock, time measurement. Aryabhatta - Varahamihira- Bhaskara I – Brahamagupta- Bhaskara II

**UNIT IV: ARCHITECTURE AND CIVIL ENGINEERING**

Perspective of Arthaśāstra on town planning, Vāstu-śāstra – The science of architecture, Eight limbs of Vāstu, Town planning, Temple architecture in India, Iconography, Architecture in India: Nagara (northern style), Vesara (mixed style), and Dravida (southern style), Indian vernacular architecture, Temple sytle, cave architecture, rock cut architecture, kalinga architecture, chandels architecture, rajput architecture, jain architecture, sikh architecture, Maratha architecture.

**Text Books: (Hindi and English language as per availability)**


1. Textbook on "The Knowledge System of Bhārata by Bhag Chand Chauhan.
2. वास्तविक आईना सनातन विज्ञानं का, परम कुमार, वैभव प्रकाशन रायपुर

3. SCIENTIFIC BASIS OF INDIAN KNOWLEDGE SYSTEM Saroj Sharma, Bal Krishna Rai, Sunita Joshi Kathuria, SHIPRA PUBLICATIONS
4. R P Kulkarni, Glimpese of Indian Engineering and Technology (Ancient & Medieval period, Munshiram Manoharlal Publishers Pvt. Ltd. 2018.
5. Sen, S. N., and Shukla, K. S. (Ed.) (2000). History of Astronomy in India, 2nd Revised Edition. New Delhi: Indian National Science Academy.
6. D N Shukla Civil Architecture in Ancient India (Part-I) Meharchand lakshmidas publication, 2016.

**Reference Books: (Hindi and English language both)**

1. Iyengar, R. N. (2016) Astronomy in Vedic texts, History of Indian Astronomy, A Handbook - Volume brought out on the occasion of IX International Conference on Oriental Astronomy November 14–18.
2. Pride of India- A Glimpse of India's Scientific Heritage edited by Pradeep Kohle et al. Samskrit Bharati (2006).
3. Vedic Physics by Keshav Dev Verma, Motilal Banarsidass Publishers (2012). 3. India's Glorious Scientific Tradition by Suresh Soni, Ocean Books Pvt. Ltd. (2010).
4. AK Pathak, Science and Technology in India, Anshika prakashan pratapgarh, 2016.
5. AR vasudev Murty, Science and Technology in Ancient India as Reflected in the Mahabharata, Sanskrit bharati, 2019.
6. B Dagens, Mayamata: An Indian Treatise on Housing Architecture and Iconography (An Updated Edition with revised Glossary), Motilal banrsidas, 2017.
7. Dr. V. Ganapati Sthapati, Building Architecture of Sthapatya Veda.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: **Artificial Intelligence Lab** | Semester: IV Sem |
| Subject Code: 3021D01BL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

**Section A: Data Collection & Organization**

1. Create a small dataset (student details) in tabular form.
2. Collect data using a simple survey (class-based) and record it.
3. Organize collected data into rows and columns using Excel.
4. Identify and correct missing or incorrect values in a dataset.

**Section B: Basic Data Analysis**

5. Calculate sum and average using Excel formulas.
6. Find mean, median, and mode for a dataset.
7. Compare two datasets and identify differences.
8. Identify patterns or trends in given data.

**Section C: Data Visualization**

9. Create a bar chart using Excel.
10. Create a pie chart to show percentage distribution.
11. Draw a line graph for time-based data.
12. Interpret charts and write simple observations.

**Section D: Basic Python Activities**

13. Write a Python program to create and display a list.
14. Find sum and average of list elements in Python.
15. Find maximum and minimum values using Python functions.
16. Perform simple list operations (append, sort).

**Section E: Mini Activity / Case Study**

17. Collect real-life data (e.g., daily expenses or attendance).
18. Analyze and present the data using charts.
19. Prepare a short report on findings.
20. Present the results in class (basic presentation).

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: **Computer Networks Lab** | Semester: IV Sem |
| Subject Code: 3021D02BL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

1. Introduction to Local Area Network with its cables, connectors and topologies.
2. Installation of UTP, coaxial cable, Cross cable, parallel cable NIC and LAN card.
3. To connect two personal computers with UTP cable.
4. Installation of Switch. their cascading and network mapping.
5. Case Study of Ethernet (10 base 5,10 base 2,10 base T)
6. Installation and working with Telnet (Terminal Network).
7. Installation and working with FTP (File Transfer Protocol).
8. Installation and basic operation of a packet sniffer Wireshark.
9. Installation of Modem and Proxy Server.
10. Simulation of LAN protocol using NETSIM/Packet Tracer/Lan Trainer Kit.
11. Introduction to Server Administration.
12. Installation of Windows 2003 server/ Windows 2000 server.
13. Configuration of DHCP.
14. Configuring Switch/Router.
15. Installation and working of NetMeeting and Remote Desktop.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

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|---|---|
| Name of Program: BCA-IV Sem | Branch: Computer Application |
| Subject: **Python Programming Lab** | Semester: IV Sem |
| Subject Code: 3021D03BL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

1. Write a program to print “Hello World”.
2. Write a program to take user input and display it.
3. Write a program to add two numbers.
4. Write a program to find the square of a number.
5. Write a program to swap two numbers.
6. Write a program to check the data type of a variable.
7. Write a program to perform arithmetic operations (+, -, *, /).
8. Write a program to convert temperature from Celsius to Fahrenheit.
9. Write a program to find the largest of two numbers.
10. Write a program to check whether a number is even or odd.
11. Write a program to check whether a number is positive, negative, or zero.
12. Write a program to find the largest of three numbers.
13. Write a program to print numbers from 1 to 10 using a loop.
14. Write a program to find the sum of first N natural numbers.
15. Write a program to print multiplication table of a number.
16. Write a program to find factorial of a number.
17. Write a program to print all even numbers between 1 to 20.
18. Write a program to count the number of characters in a string.
19. Write a program to reverse a string.
20. Write a program to create a list and display its elements.
21. Write a program to find the maximum number in a list.
22. Write a program to sort a list.
23. Write a function to add two numbers.
24. Write a program to write data into a file.
25. Write a program to read data from a file.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: **Photoshop Lab** | Semester: IV Sem |
| Subject Code: 3021D04CL021 | ESE Duration: **Three Hours** |
| Credits: **1** | Minimum L:**00** T:**00** P:**02** |
| Maximum Marks: **40** | Minimum Marks: **20** |
| TA Marks: **20** | |

**Basic Interface & Tools**

1. Open Adobe Photoshop and identify different parts of the interface (toolbar, menu bar, panels).
2. Create a new file and save it in different formats (JPEG, PNG).
3. Open an image and resize it.
4. Crop an image using the crop tool.

**Selection Tools**

5. Use the rectangular marquee tool to select a part of an image.
6. Use the lasso tool to make a freehand selection.
7. Use the magic wand tool to select a specific colour area.
8. Copy and paste a selected portion into a new image.

**Layers**

9. Create a new layer and draw something on it.
10. Add multiple layers and arrange them.
11. Change the opacity of a layer.
12. Merge two layers.

**Text & Drawing**

13. Add text to an image and change its font and size.
14. Draw basic shapes (rectangle, circle) using shape tools.
15. Apply colour fill to shapes.

**Image Editing**

16. Adjust the brightness and contrast of an image.
17. Change the colour of an image (grayscale/color adjustment).
18. Apply a simple filter (blur/sharpen).

**Simple Design Tasks**

19. Create a simple poster with text and image.
20. Design a basic visiting card layout.

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: **Entrepreneurship Development and Startups** | Semester: IV Sem |
| Subject Code: 3021D07DT076 | ESE Duration: **Three Hours** |
| Credits: **Non Credit** | Minimum L:**02** T:**00** P:**00** |
| Maximum Marks: **-** | Minimum Marks: **--** |
| TA Marks: **30** | |

**Objectives:** This course develops entrepreneurial thinking by covering core concepts of entrepreneurship, innovation, startup ecosystems, venture creation, and growth management.

**Course Contents:**

**Unit I:** Introduction to Entrepreneurship – Concept and importance of entrepreneurship. Characteristics of successful entrepreneurs. Types: Innovative, Social, Women and Rural. Entrepreneur vs Manager.

**Unit II:** Creativity, Innovation, and Business Ideas – Creativity and innovation: concepts and process. Idea generation techniques. Opportunity recognition and evaluation. Problem-solution fit and product-market fit.

**Unit III:** Startup Ecosystem and Business Models – Startup ecosystem: concept and components. Government initiatives – Startup India, Make in India. Business model canvas and value proposition. Lean startup methodology. IPR basics.

**Unit IV:** Venture Creation and Financing – Steps in starting a new venture. Business Plan preparation. Sources of finance: Bootstrapping, Angel investors, Venture capital, Crowdfunding. Legal registration of startups in India.

**Unit V:** Growth, Scaling, and Entrepreneurial Management – Growth and scaling strategies. Digital marketing and branding for startups. Leadership and team building. Key challenges faced by startups. Case studies of Indian startups.

**Course Outcomes:**

| CO No. | Course Outcome | Bloom's Level |
|---|---|---|
| CO1 | Understand the concept, importance, and characteristics of entrepreneurship. | Understand (L2) |
| CO2 | Apply creativity and innovation techniques to generate and evaluate business ideas. | Apply (L3) |
| CO3 | Analyze the startup ecosystem, government initiatives, and business model frameworks. | Analyze (L4) |
| CO4 | Develop business plan covering venture creation steps, funding sources, and legal formalities. | Create (L6) |
| CO5 | Evaluate growth strategies, marketing approaches, and leadership practices for startup success. | Evaluate (L5) |

**Text Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Entrepreneurial Development | S.S. Khanka | 4th, 2018 | S. Chand Publishing |
| 2 | Dynamics of Entrepreneurial Development and Management | Vasant Desai | Revised, 2020 | Himalaya Publishing House |

**Reference Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Small Scale Industries and Entrepreneurship | Vasant Desai | 2019 | Himalaya Publishing House |
| 2 | Innovation and Entrepreneurship | Peter F. Drucker | Revised, 2006 | Harper Business |
| 3 | The Lean Startup | Eric Ries | 1st, 2011 | Crown Business |

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# Chhattisgarh Swami Vivekanand Technical University, Bhilai

| | |
|---|---|
| Name of Program: BCA (IV Sem) | Branch: Computer Application |
| Subject: **Emotional Intelligence and Social Learning** | Semester: IV Sem |
| Subject Code: 3021D08FT046 | ESE Duration: **Three Hours** |
| Credits: **Non Credit** | Minimum L:**01** T:**00** P:**00** |
| Maximum Marks: **-** | Minimum Marks: **--** |
| TA Marks: **30** | |

**Course Objectives:** This course aims to develop social and emotional awareness in students and initiate them towards better personal and social well-being.

**Course Contents:**

**Unit I:** Fundamentals of Emotional Intelligence – Nature and Significance, Building blocks of emotional intelligence.

**Unit II:** Models of Emotional Intelligence – Ability, Trait and Mixed models of emotional intelligence.

**Unit III:** Personal Competence –Self-Awareness: Observing and recognizing one's own feelings, Knowing one's strengths and areas of development.

Self-Management: Managing emotions, anxiety, fear, and anger**.**

**Unit IV**: Social Competence – Social Awareness: Others' Perspectives, Empathy and Compassion.

Relationship Management: Effective communication, Collaboration, Teamwork, and Conflict management.

**Unit V:** Social Relationships and Mindfulness – Sharing vs Power: Peers, Family and Society, The Value of Silence and Reflection, Practice of Mindfulness.

**Course Outcomes:**

| CO No. | Course Outcome | Bloom's Level |
|---|---|---|
| CO1 | Recognize and understand their own emotions, strengths, weaknesses, and potential triggers. | Remember (L1) / Understand (L2) |
| CO2 | Acquire skills for effective communication, collaboration, teamwork, and conflict management. | Apply (L3) |
| CO3 | Apply techniques to regulate emotions, anxiety, fear, and anger to manage stress and improve performance. | Apply (L3) |
| CO4 | Develop empathy and compassion by understanding perspectives, emotions, and needs of others. | Analyze (L4) |
| CO5 | Implement techniques to enhance personal and professional relationships. | Evaluate (L5) |

**Text Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Emotional Intelligence – Managing emotions to win life | S K Mangal & Shubhra Mangal | 2015 | PHI/EEE |
| 2 | Essentials of Social and Emotional Learning (SEL) | Black, Donna Lord | 2022 | Wiley |

**Reference Books:**

| S.No. | Title | Authors | Edition | Publisher |
|---|---|---|---|---|
| 1 | Mastering Emotional Intelligence | Dr Pratik Surana | 1st | TMH / Notion Press |

**Hindi Books: डैनियल गोलेमान की "इमोशनल इंटेलिजेंस", थिएबॉल्ट मूरिस की "मास्टर योर इमोशंस"**

**E-resources / Web Sources:**

https://books.google.co.in/books?id=WcSzCwAAQBAJ&printsec=copyright&redir_esc=y#v=onepage&q&f=false

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