



Course Name: **BCA 4th Semester**

Subject Code: **CS-3210**

Subject Name: **JAVA Programming**

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### **Aim of the Subject**

The aim of this course is to understand the various concepts of Object Oriented Programming (OOP) using Java.

### **Learning Outcomes**

The students are expected to learn following after completion of the course:

- Will be able to identify classes, data members and member function for a specific problem.
  - Will be able to implement the concept of Inheritance and polymorphism.
  - Will be able to implement Packages.
  - Will be able to handle Exception, Multithreading, I/O basics and Applets.
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### **Unit 1**

Features of java: Object-Oriented programming overview: Introduction of java Technology, Installing java, java program development, java source file, compilation, execution.

Data Types, Variables, Memory concepts, Naming conventions, primitive data type, declarations, variable name, numeric, literals, character literals, String, string literals, printing to console and taking input through console (scanner class).

Expressions: Assignment operator arithmetic operators, relational operators, logical operators, increment and decrement operators, conditional operator, operator precedence.

### **Unit 2**

Statements: conditional: if, else if, switch statement. Break and Continue, type conversion and casting, command-line arguments.

Introduction to class, Objects, Methods and Instance Variable, primitive type vs reference type  
Initializing objects with constructors, access modifiers, and encapsulation.

Final instance variable, this reference, garbage collection and finalize method, overloading methods.

### **Unit 3**

Array declaring and creating array, passing array to methods, multidimensional array, variable length. Static method, static field and Math Class.

String Handling: String constructors, data and member functions, character extraction, string comparison, string buffer etc.

Inheritance: Inheritance basics, member access and inheritance, using super keyword, creating a multilevel hierarchy.

Polymorphism: Method overriding, dynamic method dispatch, final method and classes, abstract classes and methods, instances of operator, The object class.

#### **Unit 4**

Package: defining a package, understanding CLASSPATH, access protection, importing packages, creating own packages.

Interface: defining an interface, properties of interface, advantage of interface, achieving multiple inheritance through interfaces, variables in interfaces.

Exception Handling: Introduction, Keywords (try, catch, throw, throws), finally keyword, chained exception, user defined exception.

#### **Unit 5**

Multithreading: what are threads, the java thread model, thread priorities, thread life cycle, creating thread and executing thread.

Streams and Files: Introduction, files and streams, java stream class hierarchy. Executing file handling

Applets: Applet basics, applet architecture, applet life cycle method, applet HTML tag and attributes, executing applet in web browser and in the appletviewer.

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#### **Text Book(s)**

1. The complete reference by Herbert Schildt, Tata McGraw-Hill
2. JAVA how to program by Deitel & Deitel, Pearson education

#### **Reference Material(s)**

1. Head First JAVA by KathySierra & Bert Bates.

Course Name: **BCA 4th Semester**

Subject Code: **CS-2402**

Subject Name: **Introduction to DBMS**

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### **Aim of the Subject**

The student should learn database design and information retrieval concepts and apply these concepts in projects involving database.

### **Learning Outcomes**

The students are expected to learn following after completion of the course:

- Conceptual clarity on database systems and their evaluation
  - Database design issues from ER model to normalization
  - theoretical foundation of query languages through relational algebra
  - proficiency in SQL
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### **Unit 1**

Introduction: purpose of DBMS, view of data, data models: physical model, logical model, conceptual model, hierarchical model, network model. Object oriented model. database language, Database administrator, database user, overall system structure.

### **Unit 2**

Entity relationship model: basic concepts, mapping constraints, keys, E-R diagram, weak, entity features, design of an E-R database schema, reduction of E-R schema to table.

### **Unit 3**

Structured Query Language(SQL):basic structure, set operations, aggregate functions, null values, nested sub queries, data definition language(DDL), data manipulation language(DML), data control language(DCL), transaction control language(TCL).

### **Unit 4**

Relational database design: Decomposition, normalization using functional dependencies, normalization using multivalued dependencies.

### **Unit 5**

Concept of RDBMS, characteristics of RDBMS, Codd's 12 rules, introduction to oracle tools, security.

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**Text Book(s)**

1. Database System concepts –Henry F. Korth , Tata McGraw Hill 6th Edition.

**Reference Material(s)**

1. “Fundamentals of Database Systems”, Elmasri R, Navathe S, Addison Wesley 4th Ed.
2. An introduction to database system-Bipin C. Desai, Galgotia Revised Edition
3. An introduction to Database System -C.J Date, Pearson 8th Ed.

Course Name: **BCA 4th Semester**

Subject Code: **CS-2004**

Subject Name: **Introduction to Computer Architecture**

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### **Aim of the Subject**

To provide an understanding the functioning of the modern computer architecture, including mechanism of parallelism, pipelining and cache memory architecture.

### **Learning Outcomes**

The students are expected to learn following after completion of the course:

- Students will be familiar with various measuring tools and functional units of CPU.
  - They will be aware about architecture of 8085 microprocessor.
  - They will have knowledge of assembly language programming.
  - They will be aware about computer arithmetic.
  - They will have understanding about various types of instruction formats and addressing modes.
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### **Unit 1**

Technological trends, measuring performance: MIPS, CPI/IPC, Benchmark suite, Geometric and Arithmetic means, Speed up, Amdahl's law, Types of architecture.

### **Unit 2**

Introduction of 8085 Microprocessor: Architecture of 8085 processor. Register Architecture: Accumulator, Temporally Register and Flag Register. Program Counter, Stack pointer and Instruction register.

Addressing Modes: Directaddressing mode and Register direct Addressing Mode. Register Indirect Addressing Mode, Immediate Addressing Mode and Implicit or Implied Addressing Mode.

### **Unit 3**

Introduction to Assembly Language Programming: Various Instructions Classifications: Instruction Format, Opcode, Operand and Hex code. Instruction Operation Status, Various Instruction Sets: Data Transfer Group Instructions, Arithmetic Group Instructions, Logical Group Instruction, Branch Group Instructions: Conditional and Unconditional and Machine control Instructions.

### **Unit 4**

Concept of Parallelism and their hazards.

Cache Memory: Data caches, instruction caches and unified caches, cache implementations, fully associative and direct mapped caches, write back versus write through caches, Cache coherence

### **Unit 5**

Multiprocessor Architectures: Introduction, architectures, Performance characteristics.  
Multicore architectures: single chip Multiprocessors, Flynn classification.

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#### **Text Book(s)**

Computer Architecture: Sachem's outlines by Dr. Rajkamal.

#### **Reference Material(s)**

Computer Architecture and organization By William Stalling, Seventh edition Reference Material(s)

Computer Architecture & Parallel Processing, Hwang & Briggs, McGraw Hill

Computer Architecture and Organization by D. A. Patterson

Course Name: **BCA 4th Semester**

Subject Code: **IC-2504**

Subject Name: **Advanced ICT Tools**

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### **Aim of the Subject**

### **Learning Outcomes**

The students are expected to learn following after completion of the course:

- To provides learners with the ability to use of ICT tools and encourages knowledge and understanding of advance ICT tools.
  - Understands different ICT tools.
  - Creating Fill able Forms with Google forms and able to analyze the information.
  - Perform operations on data using MS access features.
  - Perform operations on data processing in MS Excel functions.
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### **Unit 1**

### **Unit 2**

ICT's definition and meaning, different ICT approaches, ICT's components and characteristics, its applications, the numerous types of interactive ICT tools, the benefits and drawbacks of ICT, Models of Access to ICT, significance of ICT in education.

### **Unit 3**

Different ICT tools used for different purpose like, developing Literacy, Quizzing/testing/Gaming, Presentation, Creative Creations, online collaboration etc. Creating Google forms and analysing it.

### **Unit 4**

Adv use of MS Access

Key features, parts or objects, file formats, security features, creating tables, types of database creating queries and relationships between tables in Access Database. Creating a forms, report, report wizard, different sections of report, filter records, creating Pivot table view, sum up a column in a table.

### **Unit 5**



Adv use of MS Excel

Absolute and relative addressing, creating absolute reference, working with graph, function and its syntax, data sort, data filter, access macros in excel, recording and executing a Macros, Pivot table- creating, adding fields and grouping. VLOOKUP function and use of VLOOKUP function.

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#### **Text Book(s)**

Web 2.0 tools, Comparison between web1.0, web2.0, web3.0 and major features of web 2.0 and web3.0

#### **Reference Material(s)**

Linda Foulkes, Learn Microsoft Office 2019, Packt Publishing Limited; Illustrated edition (29 May 2020)

Course Name: **BCA 4th Semester**

Subject Code: **IC-2911**

Subject Name: **Communication Skills**

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### **Aim of the Subject**

The aim of this course is to provide students with the skill and knowledge of communication in the business environment. There is a strong focus on understanding the theory of communication in business context and its applications in real world.

### **Learning Outcomes**

The students are expected to learn following after completion of the course:

- Nurture students into well-balanced and positive thinking human beings. Developing students into professionals, who are capable of facing new challenges and becoming the winners in Life.
  - Enhancing Communication skills by practicing functions, processes and models.
  - Understanding of Effective Communication, Barriers to Effective Communication, order, advice, suggestions, motivation, persuasion, warning, education, raising morale, conflicts and negotiation, group decision making.
  - Practicing of various activities using dimensions of Communication- Upward, Downward, Lateral/Horizontal, Diagonal, grapevine, consensus, Channels of Communication- Formal, Informal; Patterns of Communication; Media of Communication-Verbal, Nonverbal.
  - Developing and delivering effective presentation, effective interpersonal communication, skills that maximize team effectiveness, good time management and effective problem solving.
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### **Unit 1**

Communication : An Overview

Definitions, Nature and Attributes, Purpose, Directions, Types, Kinds of communication network- Internal and External Communication, Channels of communication, Methods of communication- verbal and non-verbal.

### **Unit 2**

The Process of Communication

Basics elements of communication process, Effective Communication - 7Cs of communication, Barriers to communication-Physical and external barriers, semantic and language barriers, socio-psychological barriers and corporate communication barriers; Methods of overcoming communication barriers.

**Unit 3**

## Listening Skills

Introduction, Definitions of listening, Importance of listening, Difference between hearing and listening, Principles of good listening, Types of listening, Barriers to effective listening, Strategies to improve listening skills, Ten commandments of listening.

**Unit 4**

## Interview

Meaning and definition, purpose, methods, types of interviews, Preparation of candidate for the interview, Interview Do's and Don'ts, Possible job interview questions, job interview mistakes, Handling job interview questions conclusion.

**Unit 5**

## Written Communication

Business Letters, Types of business letters, Meetings documentation and minutes, Writing Memorandum, E-Mail writing, Paragraph writing, Job application and resume writing, Report Writing.

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**Text Book(s)**

Business Communication by Bhagaban Das (Sathya Swaroop Debashish)

**Reference Material(s)**

Business Communication by K.K. Sinha