First Semester

COMPUTER FUNDAMENTALS AND APPLICATIONS

COURSE CODE: BCA 101

YEAR/SEMESTER: I/I **CREDIT HOURS: 3**

WORKLOAD: 6 Hrs./WEEK (THEORY: 3 Hrs., PRACTICAL: 3Hrs)

Course description:

This course covers the concepts of basic computer fundamental knowledge and its application to solve real life problems. This course including basic introduction, its types and Application various types in various fields, computer software and hardware, operating system, database management system and computer networks and recent trends technology developed and used in computer and ICT. It also aims at helping students convert theoretical concept into practical skill through the use of different application packages including word processor, spreadsheet package, presentation package and photo editing graphical package and others tools and application use in computer.

Course objectives:

The main aims of this course are to provide fundamental concepts of information and communication technology and to make students capable of using different application packages in their personal as well as professional life.

The general course objectives of this course are outlined as:

- To familiarize students with fundamental knowledge about computer system
- To make students understand software, hardware and their working procedure.
- To enhance student's knowledge about various software and its types.
- To provides the knowledge about database management system and nature of data use in computer.
- To provide knowledge about computer networking knowledge and internet use.
- To enhance students' knowledge about computer security and computer threat.
- To provide the knowledge about the recent trends and technologies use in ICT.

Course contents

Unit 1: Introduction to computer **5 hrs.**

1.1 Definition, characteristics of computer.

1.2 Anatomy of computer

1.3 Types of computers (size, principle, brand and purpose).

1.4 History of computer and generation

1.5 Application of computer

Unit 2. Computer Hardware **10 hrs.**

2.1. Basic computer Organization and Architecture

2.2. Component of computer (hardware, software, user, data and procedure).

2.3. Component of CPU (ALU, CU and RA).

2.4. Computer memory, Memory Hierarchy, Primary and Secondary memory.

2.5. Motherboard and its parts, slots, ports, interface, processor, memory chips.

2.6. BIOS, SMPS, CMOS, and Microprocessor chips.

Unit 3 Computer software **10 hrs.**

3.1. Introduction to Software, program

3.2 Types of Software (System and Application)

3.3. Operating System (Function and types).

3.4. Utility Software, Virus and Antivirus Software.

3.5. Programming language and Types of language Translator.

Unit 4. Database management System. **5 hrs.**

4.1. Introductions to data, database and DBMS

4.2. Database system Architecture.

4.3. Database Model, database Application.

4.2. SQL and No SQL concepts

4.4. Introduction to data warehousing

4.5. Data mining and concept of big data.

Unit 5: Computer Network and Internet. **5 hrs**

5.1 Introductions to Network. Intranet, Internet

5.2. Types of networks, LAN Topologies

5.3. Transmission media, Network devices

5.4. Data Communication, Transmission Mode

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5.5. OSI reference model, Network Protocol.

5.6. Concept of web, and www, URL, DNS, client server

Unit 6: Computer Security **8 Hrs**

6.1. Introduction: security Threat and security attacks

6.2. Malicious Software and types of viruses.

6.3. Security Mechanisms (Cryptography, Digital Signature)

6.4. Firewall, users Authentication, intrusion Detection System

6.5. Security Awareness and Security Policy.

Unit 7: Contemporary Technology **5 hrs**

7.1. Introduction to AI, AI and Its applications.

7.2. Machine Learning, Neural network (basic concepts).

7.3. Blockchain Technology and bitcoin

7.4. IoT, cloud computing and its use

7.5. Virtual and Augmented Reality

Laboratory works **48 hrs.**

a. Office automation

b. Word-processor

- Basics options of word-processing for typing, editing, formatting margin setting viewing, designing, printing a document.
- Crating, inserting, formatting table and working with large documents in word-processing

c. Spreadsheet

- Basic sheet concepts and its shell address and other features.
- Preparing sheet for data processing like arithmetic, logical and other types of functional operation, prepared bills and invoices.
- Prepared data table for calculation, analysis and creating various charts for presentation and using different formulae for calculation and logical test.

d. Presentation

- Create the various types of slides with master slides for presentation.
- Setting slide into the required format.

1. Basic DOS commands

- Comparison of DOS and window, Switching between DOS and window
- Various Internal and external command

2. Basics of window and user interface
    - Various features of GUI base Operating System
    - Explore different files and folders
    - Control panel setting
3. Computer commination and Internet
    - Basics of computer network, WWW and websites
    - Web browsing, net surfing and search engine
    - Use of various AI tool with their purposed

Required readings:

Goel, A. (2010). *Computer fundamental,* Pearson Education India.

Leon, A. & Leon (2010). *Fundamental of information technology*. Leon Techworld

Norton, P. (2017). *Introduction to computer*, 7th Edition, McGraw Hill Education.

Sinha, P.K. (2003). *Computer Fundamentals*, BPB Publication

C PROGRAMMING

COURSE CODE: BCA-102

YEAR/SEMESTER: I/I **CREDIT: 3**

WORKLOAD: 6 Hrs/ WEEK (THEORY: 3 Hrs, PRACTICAL: 3 Hrs)

Course description:

This course provides a comprehensive introduction to the C programming language, a foundational tool in computer science and software development. Emphasizing structured and procedural programming techniques, the course covers the core concepts of C including variables, data types, operators, control structures, arrays, functions, pointers, structures, unions, and file handling. Students will gain practical skills in writing efficient, modular, and error-free code, reinforced through hands-on lab sessions. The course is designed to develop algorithmic thinking, problem-solving ability, and a strong understanding of how memory and low-level operations work in modern computing environments. This course provides the essential groundwork for more advanced in programming for software development, algorithms, and systems programming.

Course objectives:

The main objective of this course to provide students both the theoretical foundation and practical knowledge of programming using C programming language. After the completion of the course, students will be able to:

- Understand the basic structure and syntax of the C programming language, including data types, operators, and control statements.
- Develop algorithmic thinking and structured programming techniques to solve computational problems.
- Apply modular programming concepts using functions to enhance code reusability and clarity.
- Manipulate arrays, strings, and pointers effectively for data processing and memory management.
- Use structures and unions to model and organize complex data in C.
- Perform basic file input and output operations to read, write, and manage data in text and binary files.