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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Program** | Bachelor of Computer Applications (DS & AI) | | | | | | |
| **Year** | I | **Semester** | | I | | | |
| **Course Name** | Fundamentals of Computer & Programming in ‘C’ | | | | | | |
| **Code** | BCADSN11102 | | | | | | |
| **Course Type** | DSC | **L** | **T** | **P** | | **Credit** | |
| **Pre-Requisite** |  | 3 | 1 | 0 | | 4 | |
| **Course Objectives** | The subject focuses on the fundamentals of Computer and its peripherals with modern technology along with methodology of programming with concepts of C  Programming. | | | | | | |
| **Course Outcomes** | | | | | | | |
| **CO1** | Demonstrate the knowledge of the basic structure of computers, History of Computer, Hardware, Software, Input / Output devices, Computer languages,  Language Translators. | | | | | | |
| **CO2** | Describe the concept of data communication and networks along with the few  concepts of modern technology. | | | | | | |
| **CO3** | Learn various constructs of C Language along with programming constructs. | | | | | | |
| **CO4** | Understand the concept of array, structure, functions, and pointers. | | | | | | |
| **Module** | **Course Contents** | | | | **Contact**  **Hrs.** | | **Mapped**  **CO** |
| 1 | **Introduction to Computers:** Introduction to computer, Basics of computers and its operation, History of computer, Capabilities and limitations of computers, Types of computers; **Hardware:** CPU(Architecture & Related Technology); **Storage Devices:** Primary & Secondary; Auxiliary Storage Devices; Cache Memory; Memory Hierarchy; Buffering and Spooling; **Software:** Types of software : Application Software and System Software; Input devices; Output Devices; **Operating System:** Functions, Types, Need of Operating System; DOS; Translator: Compiler, Interpreter & Assembler; **Types of Languages:** Machine Language, Assembly Languages, High level Languages; Loader, Linker, Flowchart; **Algorithms:** Introduction, Definition,  Characteristics, Limitations. | | | | 15 Hrs. | | CO1 |
| 2 | **Computer Networks & Internet:** Data communication: Signaling & Transmission; Network Devices: HUB, Switches, Router, Gateways; Types of Networks; Topology; Transmission Mode & Media; Switching Techniques, Internet and protocol, Internet services, OSI reference model; TCP/IP  Reference Model. | | | | 15 Hrs. | | CO2 |
| 3 | **Introduction to C:** Introduction; Structure of C Program; Writing the first C Program; File used in C Program; Compiling and Executing C Programs; Comments; Data Types, **Tokens:** Keywords, Literals, Identifiers, Variables, Constants; I/O Statements; **Operators:** Types of operators, Precedence and Associativity of operators; Programming Examples; Type Conversion and Type Casting. **Decision Control Statements:** If, If-Else, Nested If, If-Else Ladder, Switch-Case; **Iterative Statements:** For Loop, While Loop, Do-While Loop; **Jump**  **Statement:** Break, Goto and Continue. | | | | 15 Hrs. | | CO3 |
| 4 | **Introduction to Array, Structures, Union: Array :** Types of Array: Single Dimension Array, Two-Dimensional Array; Address Calculation of an Element in Array; Insertion and Deletion in an Array; **Functions:** User-Defined Functions; | | | | 15 Hrs. | | CO4 |

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|  | Function Declaration; Types of Arguments: Actual Arguments, Formal Arguments; Function Definition; Methods to Call a Function: Call by Value, Call by Reference; Passing Arrays as Parameters; Storage Classes; **Pointers:** Declaration of Pointer Variables; Pointer Arithmetic; Pointers and Arrays, Pointer and Character Strings, Array of Pointers, Pointers as Function  Arguments; Structure, Union & Enumeration. |  |  |

## Suggested Readings

1. E. Balagurusamy, “Fundamentals of Computers”, McGraw Hill Education.
2. Thareja R., “Fundamentals of Computers”, Oxford University Press.
3. Peter Norton’s, “Introduction to Computers”, TMH Publications
4. E. Balagurusamy, “Programming in ANSI C”, TMH Publications.
5. Reema Thareja, “Programming in C”, OXFORD University Press.
6. Raja Raman. V, “Fundamentals of Computers”, PHI Publications, 3rd Edition, 2004.

## Online Resources

1. https://nptel.ac.in/courses/106104128
2. https://archive.nptel.ac.in/courses/106/104/106104128/

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| **Course Articulation Matrix** | | | | | | | | | | | | | | |
| **PO-PSO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** |
| **CO1** | 3 | 2 |  |  | 1 | 2 | 2 |  | 2 | 1 |  | 1 | 2 | 1 |
| **CO2** | 1 | 3 | 1 |  | 2 | 3 | 2 |  | 2 | 1 |  | 1 | 3 | 1 |
| **CO3** | 3 | 2 | 2 | 3 | 2 | 3 | 2 |  | 2 | 2 |  | 3 | 2 | 3 |
| **CO4** | 2 | 3 | 3 | 3 | 3 | 3 | 2 |  | 2 | 3 |  | 3 | 3 | 3 |