**Session 2024-25 Semester I (Odd)**

**Lesson Plan for Arts/ Physical Sciences/ Life Sciences/**

**Name of Program:UG Multi/ Interdisciplinary Program in Computer Science**

**Name of Course: Minor Course (MIC)**

**Nomenclature of Course: Fundamentals of Computing and Problem Solving using C**

**Course Code: 24CSC401MI01**

**Credits (L+T+P): 2:0:2 Marks: 35+15+35+15=100**

| **MONTH** | **WEEK** | **SYLLABUS** |
| --- | --- | --- |
| **July** | 4th week | **Computing Fundamentals:** Overview of computing principles and history, Generations of Computers, |
|  | 5th week | Block Diagram along with its components, Classification of computers, Applications of computers in various fields. |
| **August** | 1st week | Input/Output Devices, Memory: Concept of primary & secondary memory, Cache Memory, Secondary storage devices. |
|  | 2nd week | **Basics of Networking & Operating System:** Introduction to computer networking, Network types, Network topologies,. |
|  | 3rd week | Internet and its applications; Operating system and its functions |
|  | 4th  week | **Introduction to software development methodologies:** Basics of algorithmic thinking and problem-solving strategies. Planning the |
|  | 5th week | Computer Program: Problem definition, Program design, Debugging, Types of errors in programming, Techniques of Problem Solving-Flowcharting, Algorithms  Test and Revision |
| **September** | 1st week | **Introduction to the C programming language:** History of C, Importance of C, Elements of C: C character set, identifiers and keywords, |
|  | 2nd week | Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(),scanf()Functions |
|  | 3rd week | Operators &Expression, type casting and conversion,operator hierarchy &associativity.. |
|  | 4th week | **Decision making & Branching:** Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, go to statement. |
|  | 5th week | Decision making &Looping: while,do-whileandforloop,jumpsinloops,break,continuestatement,Nestedloops.  Test and Revision |
| **October** | 1st week | **Functions and modular programming concepts:** StandardMathematicalfunctions,Input/output:Unformatted&formattedI/OfunctioninC,Input functions ,output functions, string manipulation functions. |
|  | 2nd week | User defined functions: Introduction/Definition, function prototype, Local and global variables ,passing parameters, recursion. |
|  | 3rd week | **Arrays & Pointers:** Definition ,types, initialization, processing an array, passing arrays to functions declaration and initialization of string, Input/output of string data, Introduction to pointers. |
|  | 4th week | **Advance Concepts of C Programming:** Pointers and memory management in C; File input/output operations in C; Dynamic memory allocation and deallocation; Advanced control structures: switch, break, and continue statements.  Test and Revision |
| **November** | 2nd week | **Practical applications of C programming in software development:** Algorithmic problem-solving using C programming constructs; |
|  | 3rd week | Design and implementation of C programs; Debugging and testing techniques for C programs; Best practices and coding standards in C programming. |
|  | 4th week | Test and Revision |

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**Session 2024-25 Semester I (Odd)**

**Lesson Plan for Arts/ Physical Sciences/ Life Sciences/**

**Name of Program:UG Multi/ Interdisciplinary Program in Computer Science**

**Name of Course: Multi/Interdisciplinary Course (MDC)**

**Nomenclature of Course: MDC1 Computer Fundamentals**

**Course Code: 24CSCX01MD01**

**Credits (L+T+P): 3:0:0 Marks: 50+25=75**

| **MONTH** | **WEEK** | **SYLLABUS** |
| --- | --- | --- |
| **July** | 4th week | **Computer Fundamentals:** Generations of Computers, Definition, Block Diagram along with its components, characteristics & classification of computers, Applications of computers in various fields. |
|  | 5th week | Block Diagram along with its components, Classification of computers, Applications of computers in various fields. |
| **August** | 1st week | **Memory:** Concept of primary & secondary memory, RAM, ROM, types of ROM, Cache Memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk |
|  | 2nd week | **Computer hardware & software:** I/O devices, definition of software, relationship between hardware and software, types of software. |
|  | 3rd week | **Overview of operating system:** Definition, functions of operating system, concept of Multiprogramming, multitasking, Multithreading, Multiprocessing, time-sharing, real time, single-user & multi-user operating system. |
|  | 4th  week | **Computer Languages:** Analogy with natural language, machine language, assembly language, high-level languages, forth generation languages, compiler, interpreter, assembler, Linker, Loader , characteristics of a good programming language, |
|  | 5th week | Test and Review |
| **September** | 1st week | **Planning the Computer Program:** Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, |
|  | 2nd week | Techniques of Problem Solving-Flowcharting, Algorithms |
|  | 3rd week | **Overview of Networking:** An introduction to computer networking, Network types (LAN, WAN, MAN), |
|  | 4th week | Network topologies |
|  | 5th week | Test And Revision |
| **October** | 1st week | Modes of data transmission, Forms of data transmission, Transmission channels(media) |
|  | 2nd week | Introduction to internet and its uses, Applications of internet |
|  | 3rd week | Revision |
|  | 4th week | Test and Revision |
| **November** | 2nd week | Practical and revision |
|  | 3rd week | Practical and revision |
|  | 4th week | Test and Revision |

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**Session 2024-25 Semester 3 (Odd)**

**Lesson Plan for Physical Sciences**

**Name of Program:UG Multi/ Interdisciplinary Program in Computer Science**

**Name of Course: BSC(2nd Year)**

**Nomenclature of Course:** Data Communication and Networking and Object-Oriented Design and C++

**Course Code: Paper 3.1 and 3.2**

**Credits (L+T+P): 4:0:2 Marks: 100**

| **MONTH** | **WEEK** | **SYLLABUS** |
| --- | --- | --- |
| **July** | 4th week | Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; |
|  | 5th week | Types of Computer Networks and their Topologies; Network Architecture and the OSI Reference Model, TCP/IP reference model. |
| **August** | 1st week | Analog and Digital Communications: Concept of data, signal, channel, bid-rate , maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals,  Object oriented concepts: Class, Object, Methods, Message Passing, Abstraction, Inheritance, Polymorphism, Generosity, Overriding, Abstract Class & methods. |
|  | 2nd week | Data Rate and Bandwidth, Capacity, Baud Rate; Asynchronous and synchronous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems;  Generalization, Aggregation, Associations. Object modelling techniques: Introduction to object model, Dynamic model, Functional Model. Strengths & Weakness of all models |
|  | 3rd week | Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts  Introduction to Programming C++: Object-Oriented Features of C++, data types in C++, variables, |
|  | 4th  week | Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction;  operators, flow control, recursion, array, Pointers and their manipulation, strings, structures |
|  | 5th week | Test and Review |
| **September** | 1st week | Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to Ethernet, FDDI, Wireless LANs. Network Layer and Routing Concepts: Virtual Circuits and Datagram’s; |
|  | 2nd week | Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; InternetworkingInline Functions, Static Data Members and Member Functions, Friend Functions |
|  | 3rd week | Class and Objects, Data Hiding & Encapsulation, Data members and Member functions,  Preprocessor Directives, Namespace, Comparing C with C++. |
|  | 4th week | Constructors & Destructors: Roles and types of Constructors, Constructor Overloading, Roles of Destructors. |
|  | 5th week | Test And Revision |
| **October** | 1st week | Transport layer: Elements of Transport protocol: Addressing, Connection Establishment  Dynamic Memory Allocation: Pointers and their Manipulation, new and delete Operators ‘this’ Pointer |
|  | 2nd week | Flow Control, Buffering, Crash recovery. Internet Transport protocol: UDP:  Console I/O: Formatted and Unformatted I/O, Manipulators |
|  | 3rd week | Introduction, Real time Transport protocol, Remote Procedure Call. |
|  | 4th week | Application Layer: Domain Name System, Electronic Mail, World Wide Web.  Compile-Time Polymorphism: Unary and Binary Operators overloading through Member Functions and Friend Functions, |
| **November** | 2nd week | Function Overloading, virtual functions, abstract class, virtual class Inheritance: Types of Derivations, Forms of Inheritance, Roles of Constructors and Destructors in Inheritance  Practical and revision |
|  | 3rd week | Practical and revision |
|  | 4th week | Test and Revision |

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