

**GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE,
RAJNANDGAON**



TEACHING PLAN

2022-2023

**DEPARTMENT OF COMPUTER
SCIENCE**

Rohinee Samsat

"Department of Computer Science"

Session "2022-23"

Core Paper -II :- Semester I

DSCII:- UBCCT102 -Programming in 'C' Language

Theory: - 60 Lectures

(Credits: 06, Theory-04, Practical - 02)

UBCCT102

Programming in C Language

UNIT-I Fundamental of C

(15 Lecture)

Overview of C :History of C,structure of "C" program, keywords ,tokens, Data types, Constants, Literals and variables, operators and expressions: Arithmetic operators,Relational operators,Logical operators ,Expressions, Operators: Operators precedence and associativity,Type casting, Console I/O formatting Unformatted I/O functions getch(), getchar(), getch(), gete(), puts(), putchar() .

September

UNIT-II- Control Structure & Looping Statement

(15 lecture)

If Statement & Switch case: Simple If, If -else, Nested If, Else if ladder, conditional operators, switch statement, Looping & branching statements: do... while ,while, for, Nested loops, break and continue, go to and label, exit function.

October

UNIT-III- Array, Function & Pointer

(15 Lecture)

Array : Array declaration, one and two Dimensional numeric and character array, multidimensional array. Functions: Definition function components, functions arguments, return value, function call statements, function prototype, Types of function. Call by value and Call by reference, Function using arrays, recursive function. Pointer: Definition of pointer, pointer declaration, using & and* operators. Types of pointers: Void pointer, pointer to pointer, pointer arithmetic.

November

Union-IV String, Structure & Union

(15 lecture)

STRING: String declaration, initialization, string manipulation with/without using library function. Structure, Union And Enum Structure: Basics, declaring structure and structure variable, typedef statement, array of structure, array within structure. Nested structure: passing structure to function, function returning structure. Union: Basics, declaring union & union variable, Enum: declaring enum and enum variable.

November
December

Reference Books:

1. Programming in Ansi C, E. Balagurusamy, Tata McGraw Hills (latest Edition)
2. Let Us C, Yashwant Kantekar, Infinity Science Press Eight Edition.
3. Mastering C: K.R.Venugopal, Tata McGraw Hill.
4. The C programming language, Brian W.kernighan, Dennis M.Ritchie, prentice Hall, Second Edition.

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Department of Computer Application
Govt. Digvijay P.G. College
Bhandgaon (C.S.)

Paper I : Mathematical Foundation of Computer Science

Max Marks:100

Min Marks:40

NOTE: - The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Course Outcome:

Student will be able to-

- Understand the concepts of Digital Electronics.
- Apply the concept of Automata Theory
- Solve the problems with Optimization Methods
- Use the hypothetical testing
- Familiar with the graph theory and its applications

UNIT - I: Mathematical Logic, Sets Relations and functions

Mathematical Logic : Notations, Algebra of Propositions & Propositional functions, logical connectives, Truth values & Truth table Tautologies & Contradictions, Normal Forms, Predicate Calculus, Quantifiers.
Set Theory: Sets, Subsets, Power sets, Complement, Union and Intersection, De-Morgan's law Cardinality, relations: Cartesian Products, relational Matrices, properties of relations equivalence relation functions: Injection, Surjection, Bijection, Composition, of Functions, Permutations, Cardinality, the characteristic functions recursive definitions, finite induction.

} September

UNIT - II: Lattices & Boolean Algebra

Lattices: Lattices as Algebraic System, Sub lattices, some special Lattices (Complement, Distributive, Modular).

Boolean Algebra: Axiomatic definitions of Boolean algebra as algebraic structures with two operations, Switching Circuits.

} October

UNIT - III: Groups Fields & Ring

Groups: Groups, axioms, permutation groups, subgroups, co-sets, normal subgroups, free subgroups, grammars, language).

Fields & Rings: Definition, Structure, Minimal Polynomials, Irreducible Polynomials, Polynomial roots & its Applications.

} October

UNIT - IV: Graphs

Graphs: Simple Graph, Multigraph & Pseudograph, Degree of a Vertex, Types of Graphs, Sub Graphs and Isomorphic Graphs, Operations of Graphs, Path, Cycles and Connectivity, Euler and Hamilton Graph, Shortest Path Problems BFS (Breadth First Search, Dijkstra's Algorithm, Representation of Graphs, Planar Graphs, Applications of Graph Theory.

} November

UNIT - V: Trees

Trees: Trees, Properties of trees, pendant vertices in a tree, center of tree, Spanning tree, Binary tree, Tree Traversal, Applications of trees in computerscience.


} November
December

BOOKS RECOMMENDED:

1. A text book of Discrete Mathematics - By Swapan Kumar Sarkar. (S.Chand & company Ltd.).
2. Discrete Mathematical structure with - By J.P Trembly & R.P. Manohar.
Applications to computerscience
3. Discrete Mathematics - By K.A Ross and C.R. Bwrith.
4. Discrete Mathematics Structures for computerscience - By Bernard Kohman & Robert C. Bushy.
5. Discrete Mathematics - By Seymour Lipschutz Mare Lipson. Tata McGraw-Hill Edition.

Suggested Digital Platforms Web Links:

- https://onlinecourses.nptel.ac.in/noc22_cs123/preview
- https://onlinecourses.nptel.ac.in/noc22_cs85/preview


H.O.D
Department of Computer Science
Govt. Durgavati College, Jabalpur

M.SC. COMPUTER SCIENCE 2022-23
THIRD SEMESTER
Paper V: Object Oriented Analysis And Design
(PC SCT 305)

Max Marks : 100

Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Course Outcome:

Students will be able to:

- be able to use an object-oriented method for analysis and design
- be able to analyze information systems in real-world settings and to conduct methods such as interviews and observations
- have a general understanding of a variety of approaches and perspectives of systems development, and to evaluate other IS development methods and techniques
- know techniques aimed to achieve the objective and expected results of a systems development process
- know different types of prototyping
- know how to use UML for notation.

Unit-I

Introduction: Two views of software Developments: SSAD and OOAD, Why Object –Orientation? Object and classes, Abstraction and encapsulation, Methods and Message, Interfaces, Inheritance and Polymorphism, Access Control, The Business case for OO Developments.

Object Oriented Methodologies: Object Oriented Design –Booch, Object Modeling Techniques- Rumbaugh, Object – Oriented Analysis – Coad-Yourdan, Object – Oriented Software Engineering – Ivar Jacobson.

September

Unit-II

Unified Approach: Diagramming and Notational Techniques using the UML, UML Notation, {Analysis Diagramming Techniques.} = Introduction to all (ten) Diagram, {Design Diagramming Techniques}, Generalization/Specialization, Aggregation and composition, Association, Cardinality, Navigability, Icons, relationships and adornments.

Object-Oriented Systems Development Process:

Rational Unified Process, Four Major phases: Inception, Elaboration, Construction, Transition, Requirements Engineering:

Problem analysis, Understanding Stockholders need, Type of requirements, Use-case Model: Writing Requirements

October

Unit-III

Analysis: Behavioral Analysis, Domain Analysis or Business Object Analysis, Use-case Driven Object Oriented analysis : The UML approach., Develop use-case Model, Use-case Description, Documentation, Activity Diagram, Identify the classes.,

Introduction to different approaches for identifying classes, "Noun Phrase" approach OR , "Conman Class Pattern" approach Or , "CRC" approach Or, Use case Driven Approach. Containment and Composition, Aggregation, Inheritance, SubTypes and IS-A Hierarchies, Association and Link Relationships, Diagramming System Events.

October
November

Unit IV

Design Phases: Translating Analysis Concept into Design, Optimizing classes and Objects: The Multi- tiered Architecture View, Mapping System functions to objects., Object to Object Visibility, Collaboration Diagram, Sequential Diagram, Specification Class Diagram, Specifying Object Interfaces, Designing the Data Access layer, Design User Interface layer, Designing System Interfaces, Controls and Security.

November

Unit V

Design Refinement :Designing for Extensibility, Design for reusability, Portioning class space, Checking Completeness and correctness.

November

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Department of Computer Science
M.A.U. Bikaner College Hamirwa

Persistent Object and Database Issues: The Cood Data Management Domain, Object Persistence, Object-oriented Database Management System, Object-Oriented versus Relational Database, Mapping object to Relational Data structure. Testing: Introduction to Testing Strategies, Impact of Object Orientation on Testing. Testing Business Process, Design Matrix, Discovering reusable pattern.

December

RECOMMENDED BOOKS

1. Object Oriented Analysis and Design with Applications - Grady Booch, Benjamin/Cummings.
2. Object Oriented Modeling and Design. - J Rumbaugh, M Blaha, W .Premerlani 3.Principles of Object-Oriented Software Development - Anton Eliens, Addison Wesley.
4. Object Oriented System Development - Ali Bahrami McGRAW-HILL.
5. Object Oriented Software Engineering - Ivar Jacobson Pearson Education INC
6. Design Object-Oriented Software - Rebecca Wrifs-Brock. Brian Wilkerson, Lauren Wiener.

Suggested Digital Platforms Web Links:

https://onlinecourses.nptel.ac.in/noc22_cs99/preview

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AK
H.O.D
Department of Computer Science
New Niyilav College Kaimarama

M.SC. COMPUTER SCIENCE 2022-23
FIRST SEMESTER
Paper V: Computer System Architecture
(PCSC T105)

MaxMarks:100

Min Marks:40

NOTE:- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Course Outcome:

Students will be able to:

- Get concepts of the basics organizational and architectural issues of a digital computer.
- Analyze performance issues in processor and memory design of a digital computer.
- Understand various data transfer techniques in digital computer.
- Explain block diagram of CPU, Memory and types of I/O transfers

UNIT - I : Representation of Information

Number system, Integer & Floating point representation Character code (ASCII, EBCDIC), Error Detect and Correct code, Basic Building Blocks, Boolean Algebra, MAP Simplification, Combination Blocks, Gates, Multiplexers, Decoders, etc Sequential building block, flip-flop, registers, counters, ALU, RAM etc.

} September

UNIT - II : Register transfer language and micro operations

Concepts of bus, data movement along registers, a language to represent conditional data transfer, data movement from its memory, arithmetic and logical operations along with register transfer timing in register transfer

} October

UNIT - III : Basic Computer Organization and Design

Instruction code, Computer Instructions, Timing and Control, Execution of Instruction, Input and Output Interrupt, Design of Computer.

} October

UNIT - IV : Computer Software

Programming Language, Assembly Language, Assembler, Program Loops, Input /Output Programming, System Software. Central Processor Organization: - Processor Bus Organization, Arithmetic Logic Unit, Stack Organization, Instruction Formats, Addressing modes, Data transfer and Manipulation, Program Control, Microprocessor Organization, Parallel Processing..

} November

UNIT - V : Input-Output & Memory Organization

Input-Output Organization : Peripheral Devices, Input/Output Interface, Asynchronous Data Transfer, Direct Memory Access (DMA), Priority Interrupt, Input-Output Processor, Multiprocessor System Organization, and Data Communication Processor.
Memory Organization : Auxiliary Memory, Micro Computer Memory, Memory Hierarchy, Associative Memory, Virtual Memory, Cache Memory, Memory Management Hardware.

} November
December

BOOKS RECOMMENDED:

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|---------------------------------------|-----------------------------|
| 1. Computer System Architecture | - M. Morris Mano(PHI). |
| 2. Digital Computer Electronics | -Malvino. |
| 3. Digital Computers and Logic Design | - M.Morris Mano(PHI). |
| 4. Structured Computer Organization | - Andrew M. Tanenbanm(PHI). |

Suggested Digital Platforms Web Links:

https://onlinecourses.nptel.ac.in/noc22_cs88/preview
https://onlinecourses.nptel.ac.in/noc22_cs110/preview

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Department of Computer Science
K. J. Somaiya Institute of Engineering & Information Technology

Core Paper -VI :- Semester II

DSC VI:- UBCCT203- Digital Electronics

Theory: - 60 Lectures

(Credits: 06, Theory-05+01)

UBCCT-203
Digital Electronics

Unit - I

Number systems : Binary number system, Octal & Hexa-decimal number system.
Conversion of Number System, r's & (r-1)'s, Binary arithmetic Operations, complement
weighted & unweighted codes (BCD, Excess-3, Gray code).

} January

Unit - II

Logic Gates: AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates
Boolean algebra: AND, OR, Inversion, Basic Boolean Law's, Demorgan's theorem.
Minimization techniques: K -Map, Sum of Product & Product of Sum.

} February

Unit III

Combinational circuits: Multiplexers, Demultiplexers, Decoders & Encoders, Half
Adder, Full Adder, Half Subtractor, Full Subtractor.

} March

Unit -IV

Sequential Circuits: Flip Flop, Types of Flip Flop: R-S, D, J-K, T, Master Slave, and
State Realization of one Flip Flop Using Other Flip Flop, Registers, Counters.

} March

Reference Books:

2. Taub & Schelling, *Digital Integrated Electronics*, McGraw-Hill International Edition
3. Charles H. Roth, Jr. *Fundamentals of Logic Design*, Jaico Publishing House, 2000.
4. Donald D. Givone, *Digital Principles and Design*, Tata McGraw-Hill, 2003.
5. Bartee, *Digital Computer Fundamentals*.

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Head
Department of Computer Applications
Govt. Digvijay P.G. College
Rajnandgaon (C.G.)

M.SC. COMPUTER SCIENCE 2022-23
SECOND SEMESTER
Paper II: Advanced Computer Networks
(PC SCT 202)

Max Marks: 100

Min Marks: 40

NOTE:- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Course Outcome

Students will be able to:

- Understand basic computer network technology.
- Understand Data Communications System and its components.
- Enumerate the layers of the OSI model and TCP/IP reference model.
- Able to identify the different types of network devices, their functions within a network and their applications.

UNIT - I

Introduction to Computer Networking : The Concept of Networking, Data Communication, Required network Elements, The role of Standards Organization. Line Configuration, Various Topologies, Transmission Mode. Categories of Networks- LAN, MAN, WAN. The benefits of a Computer Networks.

The OSI and TCP/IP Reference Model : The Concept of Layered Architecture, Design Issues for the Layers. Interfaces and services, Detailed Functions of the Layers. Comparison between OSI and TCP/IP Reference model.

January

UNIT - II

Transmission of Digital Data : Shannon's and Nyquist theorems for maximum data rate of a channel. Transmission media- Co-axial, UTP, Fiber optic and wireless. Analog and digital data Transmission- parallel and serial transmission. DTE-DCE interface using RS-232C. Study of modems- 56k and Cable Modem-**M.S.C.**

Multiplexing and Switching : The Concept of Multiplexing- FDM, TDM, WDM. The Concept of Switching- Circuiting, Message switching, Packet switching.

February

UNIT - III

Data Link Layer and Routing Algorithms : Line Discipline, Flow Control- stop and wait, sliding window, Go back N. Error Control- ARQ stop and wait, sliding window ARQ. HDLC, SLIP, PPP. Multiple access protocols- ALOHA, Slotted ALOHA, CSMA/CD. IEEE standards for LAN's and MAN's. The IP protocol, and its header. IP address classes and subnetmask.

The concept of ICMP, ARP, RARP, RSVP, CIDR and Ipv6. : Routing algorithms- shortest path first, Distance Vector, Link State. Congestion Control-The leaky bucket and Token bucket Algorithms.

March

UNIT - IV

Transport Layer : The Concept of client and Server in terms of Socket addressing in Transport layer. Two way and three-way handshaking. TCP header. Network Performance Issues. The Concept of Domain Name System, Various Resource Records. Architecture and services of E-mail (RFC-822 and MIME). The Concept of World Wide Web- server side and client side.

ATM : The concept of ATM, ATM Adoption layers- AAL1, AAL2, AAL3/4, AAL5, Comparison of AAL protocols. Cell formats for UNI and NNI. Service Categories, Quality of service, Congestion Control in ATM.

March
April

UNIT - V

Comparative study of Networking Technologies : X.25, Frame Relay, ATM, SONET, SMDS, ISDN. Network Security : The importance of Security in Networking, traditional cryptography, Data Encryption

M. S. D. Shukla

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*Department of Computer Science
 P.V.V. College Hanamantur*

M.Sc. COMPUTER SCIENCE 2022-23
Artificial Intelligence And Expert Systems

Paper 2
(PCSC402)

Max Marks : 100

Min Marks : 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Objectives -

1. To introduce the concept of AI, characteristics and its applications.
2. To introduce the concepts of Expert Systems and knowledge representation, search techniques, etc.

UNIT - I:

General Issues and overview of AI: The AI problems; what is an AI technique; Characteristics of AI applications

Problem solving, search and control strategies: General problem solving; production systems; control strategies: forward and backward and backward chaining Exhaustive searches: Depth first Breadth first search.

January

UNIT - II:

Heuristic Search techniques: Hill climbing; Branch and Bound technique; Best first search and A* algorithm; AND /Or Graphs; problem reduction and AO* algorithm; constraint satisfaction problems

Game playing: Min-max search procedure; Alpha-Beta cutoffs; Additional Refinements

January

UNIT - III:

Knowledge Representation: First order predicate calculus; Skolemization Resolution principle and unification; Inference Mechanisms; Horn's clauses; semantic Networks; frame systems and value inheritance. Scripts; conceptual dependency.

AI Programming Languages: Introduction to Lisp, Syntax and Numeric functions; List manipulation functions; Iteration and Recursion; Property list and Arrays, Introduction to PROLOG.

February

UNIT - IV:

Natural language processing: Parsing technique; context—context- free grammar; Recursive Transition Nets (RTN); Augmented Transition Nets ((ATN); case and logic grammars; semantic analysis.

Planning : Overview- An example Domain: The Blocks World; Component of planning systems: Goal Stack Planning (linear planning); Non-linear planning using goal sets; probabilistic reasoning and Uncertainty; probability theory; Baye's Theorem and Bayesian networks; certainty factor.

March

UNIT - V:

Expert Systems: Introduction to expert systems and Applications of expert systems; various expert system shells: vidwan; frame work; knowledge acquisition; case studies; MYCIN.

Learning: Role learning; learning by induction; Explanation based learning.

April

BOOKS RECOMMENDED :

- 1. Elaine Rich and Kevin knight: Artificial Intelligence-Tata McGraw hill.
- 2. Dan W. Patterson: Introduction to Artificial Intelligence and Expert Systems, Prentice hall of India.
- 3. Nills j. Nilson: Principles of Artificial Intelligence; Narosa publishing house.
- 4. Clocksin & C.S. Melish ; Programming in PROLOG - Narosa publishing house.

H.S.D
Department of Computer Science
Govt. Engineering College, Hanamantur

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