



**Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore**  
**Shri Vaishnav Institute of Forensic Science**  
**B.Sc. With Major Digital & Cyber Forensics- Batch (2022-26)**  
**SEMESTER-III**

**BDCF301 FUNDAMENTALS OF ONLINE SOCIAL NETWORK FORENSICS**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
BDCF301	Major	Fundamentals of Online Social Network Forensics	60	20	20	60	40	4	0	4	6	

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Th. - Theory

\***Teacher Assessment** shall be based on following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

### COURSE OBJECTIVES

The student will have ability to:

1. Understand fundamentals of social media networks.
2. Understand dynamics and evolution of social networks.
3. Acquainted to protect personal data, securing simple computer networks, and safe Internet usage.

### COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Understand how various social media networks are working and using SNA in their infrastructure.
2. Secure both clean and corrupted systems, protecting personal data, securing simple computer networks, and safe Internet usage.
3. Understand dynamics and evolution of social networks.
4. Understand the framework of network analysis.

### COURSE CONTENT

#### Unit I:

Introduction to Cybercrimes and Cyber security. Cybercrime Scenario in India. Various Cybercrimes and their legal status around the World. Introduction to online social networking, social network forensics. Top social networking sites currently available in India and their privacy and security measures.

#### Unit II:

Indian Laws to counter cybercrimes in India. Introduction to Indian IT Act. Major Cyber Crimes and their punishments as provided in Indian Information Technology Act. Challenges to prevent cybercrimes in India. Security and Privacy in Social Network.

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**Unit III:**

Understanding ethics, Cyber Ethics. Cyber security and Society. Understanding privacy issues over internet. Regulation and Jurisdiction for global Cyber security. Introduction to Intellectual Property. Piracy, Internet Infringement, Fair Use, Postings, and Criminal Liability.

**Unit IV:**

Introduction to Social Media Behavior. Social Ties and Information Diffusion. Social Ties and Link Prediction, Social Network Analysis, and online social networks -Concepts: How Services such as Facebook, LinkedIn, Twitter, Couch Surfing, etc. are using SNA to understand their users and improve their functionality.

**Unit V:**

Privacy in a Networked World, Social Spam and Malicious Behavior, Leakage and Linkage of user information and content, predicting the future with social media, Friendship paradox and detection of contagions. Social Media and Network Analysis.

**List of Practical:**

1. To review Indian laws related to online social networking crimes.
2. Case study of Cyber Crimes.
3. Case study in which punishment awarded as per IT Act.
4. Practical analysis of Social Networking sites.
5. Finding out the vulnerable data on Social Networking sites.
6. Case study of Social Networking related crimes
7. Finding malwares in social networking sites.

**Suggested readings:**

1. Sunit Belapure and Nina Godbole, Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Wiley India Pvt. Ltd, 2011.
2. John Scott, Social Network Analysis, 3rd Edition, SAGE, 2012.
3. Wouter de Nooy, Andrej Mrvar, Vladimir Batagelj, Exploratory Social Network Analysis with Pajek, 2nd Revised Edition, Cambridge University Press, 2011
4. Patrick Doreian, Frans Stokman, Evolution of Social Networks, Routledge, 2013.

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**BDCF302 DATA COMMUNICATION**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
BDCF302	Minor	Data Communication	60	20	20	60	40	4	0	4	6	

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Th. - Theory

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### COURSE OBJECTIVES

The student will have ability to:

1. Understand fundamentals of techniques to solve problems related to communication.
2. Formulate and evaluate possible solutions to problems.
3. To defend applied solutions.
4. Configure networks and switches, routers, and draw appropriate network design.

### COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Develop mathematical algorithmic thinking to apply in problem solving.
2. Understand the basics of discrete probability and number theory.
3. Be able to use techniques to analyze basic network design and algorithms.
4. Understand asymptotic notation, its significance, and be able to use it with basic algorithmic examples.
5. Acquaint with some basic properties of communication and network.

### COURSE CONTENT

#### Unit I:

Introduction to data communication and networking. Significance of data communication studies, Data Communication, Networks, Protocols and Standards, Standards Organizations. Line Configuration, Topology, Transmission Modes, Categories of Networks Internet works.

#### Unit II:

OSI and TCP/IP protocol suit: The Model, Functions of the layers, TCP/IP Protocol Suites, About DTE-DCE in brief: Digital data transmission, DTE-DCE Interface, Modems, 56K Modems, Cable Modems.

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**Unit III:**

Introduction to Sets, Venn Diagrams, Complements, Cartesian Products, Power Sets, Counting Principle, Countable and Uncountable Sets, and Pigeonhole Principle. Introduction of Function, Composition of Functions, Recursively Defined Functions. Introduction of Relation, Properties of Relation, Types of Relation, Composition of Relations, Domain and Range of a Relation, Pictorial Representation of Relation, Partial Ordering Relation.

**Unit IV:**

Proposition Logic, Basic Logic, Logical Connectives, Truth Tables, Tautologies, Contradiction, Normal Forms (Conjunctive and Disjunctive), Validity, Predicate Logic, Universal and Existential Quantification. Notion of Proof: Proof by Implication, Converse, Inverse, Contrapositive, Negation, and Contradiction, Direct Proof, Proof by Using Truth Table, Proof by Counter Example.

**Unit V:**

Introduction to networks and network devices, brief description of Network classes, Repeaters, Hub, Bridges, Switches, Routers, Gateways Routers. Introduction to V-SAT, Distance Vector Routing, Link State Routing.

**List of Practical:**

1. Study of Network Components.
2. Study of Analog and Digital Signals.
3. To make straight and cross cable using IBM standard.
4. To connect two pc's using peer to peer communication.
5. Implementation of small network using hub and switch.
6. Study of Networks.

**Suggested Reading:**

1. Computer Networks by Andrew S. Tanenbaum.
2. Data and Computer Communications by William Stallings
3. Behrouz A. Forouzan, "Data communication and Networking", Fourth Edition, Tata McGraw Hill, 2011.
4. Larry L. Peterson, Peter S. Davie, "Computer Networks", Fifth Edition, Elsevier, 2012.
5. Data communication & Networking by BahrouzForouzan.

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**BDCF303 PROGRAMING WITH C**

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME									
			THEORY			PRACTICAL			L	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*					
BDCF303	SEC	Programing with C	60	20	20	60	40	2	0	4	4	

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### COURSE OBJECTIVES

The student will have ability to:

1. Know about C language.
2. Understand usages of C language.
3. Learn programming task involved in various computational problems.
4. Write the program on a computer, edit, compile, debug, correct, recompile and run it.

### COURSE OUTCOMES

Upon completion of the subject, students will be able to:

1. Know about C language.
2. Understand the basic terminologies used in computer programming.
3. Understand the use of functions, pointers, arrays and files in programming.
4. Learn programming task involved in various computational problems.
5. Understand the fundamentals of programming and be able to apply it in computer program development.

### COURSE CONTENT

#### Unit I:

Introduction to Programming Languages, Evolution of Programming Languages, Structured Programming, The Compilation Process, Object Code, Source Code, Executable Code, Operating Systems, Interpreters, Linkers, Loaders, Fundamentals of Algorithms, Flowcharts.

#### Unit II:

Introduction to 'C' Language: Character Set. Variables and Identifiers, Data Types. Arithmetic Operators and Expressions, Constants And Literals, Simple Assignment Statement, Basic Input/ Output Statement, Decision Making Within a Program, Conditions, Relational Operators, Logical Connectives, If Statement, If-Else Statement, Loops: While Loop, Do While, For Loop. Nested Loops, Switch Statement.

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**Unit III:**

Arrays and Pointers: Array Manipulation; Searching, Insertion, Deletion of an Element from an one dimensional Array; Finding the Largest/Smallest Element in an Array; Two Dimensional Arrays, Addition/Multiplication of Two Matrices, Transpose of a Square Matrix.

**Unit IV:**

Functions: Modular Programming and Functions, Prototype of a Function: Parameter List, Return Type, Function Call, Block Structure, Call by Reference, Call by Value, Recursive Functions and Arrays as Function Arguments.

**Unit V:**

Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Pointer Arrays. Structure: Structure Variables, Initialization, Structure Assignment, Structures and Arrays: Arrays of Structures.

**List of Practical:**

1. Write a C program to display “I am learning C program”.
2. Write a C program to calculate area and circumference of a circle.
3. Write a C program to perform addition, subtraction, division and multiplication of two numbers.
4. Write a program to calculate simple and compound interest.
5. Write a program to swap values of two variables with and without using third variable.
6. Write a program to display the size of every data type using “sizeof” operator.
7. Write a program to illustrate the use of unary prefix and postfix increment and decrement operators.
8. Write a program to input two numbers and display the maximum number.
9. Write a program to find the largest of three numbers using ternary operators.
10. Write a program to find the roots of quadratic equation.
11. Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored and the class of result.
12. Write a Program to Check Whether a Number is Prime or not.
13. Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.
14. Write a program to find the factorial of a number.
15. Write a program to check number is Armstrong or not. a. (Hint: A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself).
16. Write a program to check whether a number is Palindrome or not.
17. Write a program to generate Fibonacci series.
18. Write a program to find GCD (greatest common divisor or HCF) and LCM (least common multiple) of two numbers.
19. Write a Program to Search an element in array.
20. Write a Program to perform addition of all elements in Array.
21. Write a Program to find the largest and smallest element in Array.
22. Write a Program for deletion of an element from the specified location from Array.
23. Write a Program to access an element in 2-D Array.
24. Write a program for addition of two matrices of any order in C.
25. Write a Program to multiply two 3 X 3 Matrices.
26. Write a program to add, subtract, multiply and divide two integers using user-defined type function with return type.

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27. Write a program to generate Fibonacci series using recursive function.
28. Write a program to find the sum of all the elements of an array using pointers.
29. Write a program to swap value of two variables using pointer.
30. Write a program to add two numbers using pointers.
31. Write a program to input and print array elements using pointer.
32. Write a program to create a structure named company which has name, address, phone and no of Employee as member variables. Read name of company, its address, phone and no of Employee. Finally display these members' value.
33. Write a program to read Roll No, Name, Address, Age & average-marks of 12 students in the BCT class and display the details from function.
34. Write a program to add two distances in feet and inches using structure.

**Suggested Reading:**

1. Herbert Schildt "C: Complete Reference", Tata McGraw Hill 2000.
2. Yashwant Kanetkar, "Let us C", BPB Publication, 16th Edition 2018.
3. Fundamentals of Programming Languages, R. Bangia, Cyber Tech .
4. Allen B. Tucker, "Programming Languages", Tata McGraw Hill.
5. Tennen W. Pratt, "Programming languages design and implementation", Prentice Hall of India.

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