Holy Cross College (Autonomous), Nagercoil

Accredited with A$^+$ by NAAC - IV cycle – CGPA 3.35

Nagercoil, Kanyakumari District, Tamil Nadu.

Affiliated to

Manonmaniam Sundaranar University, Tirunelveli

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

SYLLABUS FOR UNDERGRADUATE PROGRAMME

TEACHING PLAN
ODD SEMESTER
2024-2025

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Vision

The Department of Artificial Intelligence and Data Science aims to empower women, with global insight and ecological awareness. Our integrated curriculum focuses on developing advanced AI and data science skills, fostering ethical and socially responsible professionals committed to sustainable and harmonious societal advancements.

Mission

1. To deliver a comprehensive and state-of-the-art education in Artificial Intelligence and Data Science, preparing students for excellence in the global tech arena.
2. To cultivate a strong ethical foundation to apply AI and DS in ways that are beneficial to society.
3. To encourage interdisciplinary collaboration and research, fostering innovation and addressing complex challenges through advanced techniques.
4. To empower students with leadership and entrepreneurial skills to become influential figures in the technology sector.
5. To integrate global awareness and ecological sustainability into the curriculum by developing AI solutions to create environmental and societal impacts.

Programme Educational Objectives (PEOs)

PEOs	Upon completion of B.A/B.Sc. degree programme, the graduates will be able to	Mission addressed
PEO 1	apply appropriate theory and scientific knowledge to participate in activities that support humanity and economic development nationally and globally, developing as leaders in their fields of expertise.	**M1 & M2**
PEO 2	inculcate practical knowledge for developing professional empowerment and entrepreneurship and societal services.	**M2, M3, M4 & M5**
PEO 3	pursue lifelong learning and continuous improvement of the knowledge and skills with the highest professional and ethical standards.	**M3, M4, M5 & M6**

Programme Outcomes (POs)

POs	Upon completion of B.Sc. Degree Programme, the graduates will be able to:	PEOs addressed
PO 1	obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science.	**PEO 1**
PO 2	create innovative ideas to enhance entrepreneurial skills for economic independence.	**PEO 2**
PO 3	reflect upon green initiatives and take responsible steps to build a sustainable environment.	**PEO 2**
PO 4	enhance leadership qualities, team spirit and communication skills to face challenging competitive examinations for a better developmental career.	**PEO 1 & PEO 3**
PO 5	communicate effectively and collaborate successfully with peers to become competent professionals.	**PEO 2 & PEO 3**
PO 6	absorb ethical, moral and social values in personal and social life leading to highly cultured and civilized personality	**PEO 2 & PEO 3**
PO 7	participate in learning activities throughout life, through self-paced and self-directed learning to develop knowledge and skills.	**PEO 1 & PEO 3**

Programme Specific Outcomes (PSOs)

PSOs	Upon completion of the B.Sc Artificial Intelligence and Data Science, the graduates will be able to:	Mapping with POs
PSO – 1	evolve AI and Data Science based domain knowledge and skills to pursue advanced studies in the field and integrate these techniques with emerging technologies.	**PO 1**
PSO - 2	develop innovative ideas in AI and data science to enhance entrepreneurial and employability skills for real-world challenges.	**PO 2**
PSO – 3	cultivate versatile skills for problem-solving, technical proficiency, effective communication, and community engagement through self-directed activities.	**PO 4 & PO 7**
PSO - 4	communicate and collaborate proficiently to become competent AI professionals, while addressing biases, and upholding data privacy regulations.	**PO 5 & PO 6**
PSO - 5	reflect on green initiatives and leverage AI to address economic challenges while promoting sustainable development.	**PO 3**

Teaching Plan

Department : Artificial Intelligence and Data Science
Class : I B. Sc Artificial Intelligence and Data Science
Title of the Course : Core Course I : Programming for Problem Solving
Semester : I
Course Code : IU241CC1

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
IU241CC1	**4**	1	-	-	**5**	**5**	**75**	**25**	**75**	**100**

Objectives

1. To recognize the importance of programming languages, recall memory management and identify bugs in C programs.
2. To apply problem-solving techniques, implement memory-efficient modularization and develop C programs with varied data types.

Course outcomes

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
1	remember the fundamentals of C programming and describe the program development process.	PSO – 1	**K1&K2**
2	prepare solutions for problems using branching and looping statements.	PSO – 2	**K3**
3	decompose a problem into functions and synthesize a complete program using divide and conquer approach.	PSO – 4	**K3**
4	formulate algorithms and programs using arrays, pointers and structures	PSO – 5	**K3**
5	analyze various programming constructs and structures.	PSO – 3	**K4**

Teaching plan

Total Contact hours: 75 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I						
	1.	**Introduction To Computing:** Introduction - Art of Programming through Algorithms and Flowcharts.	2	K1(U)	Introductory session	Word Cloud
	2.	Overview of C: History and importance of C- Basic structure of C program	2	K2(R)	Lecture using Chalk and talk	Write the Structure of a C program.
	3.	Executing a C program. Constants, Variables and Data Types	2	K2(U)	Concept Explanations	Diagnostic test
	4.	Character Set- C Tokens	2	K2(U)	Interactive PPT	Quiz using Slido
	5.	Declaration of Variables- Assigning Values to Variables	2	K2(U)	Syntax Explanations	Write the syntax
	6.	Defining Symbolic Constants. Managing Input and Output Operations	1	K3(A)	Demonstration	Write the syntax
	7.	Operators and Expressions.	1	K2(U), K3(A)	Logical Thinking	Problem solving questions
II						
	1.	**Control Structures**: Decision Making and Branching: Introduction	2	K1(R)	Lecture using Chalk and talk	Evaluation through short test
	2.	Decision Making with IF Statement- Simple IF Statement- IF-ELSE Statement	1	K2(U)	Lecture with examples	List some applications of decision-making ideas
	3.	Nesting of IF-ELSE Statements- ELSE IF Ladder	1	K2(U)	Lecture using videos	Write the syntax and semantics for nested if else
	4.	Switch statement- The Conditional Operator-	2	K3(A)	Syntax Explanations	Create a program

		goto statement			with examples	using conditional operator
	5.	Decision Making and Looping: Introduction- while Statement- do statement- for statement	2	K3(A)	Syntax Explanations	Create example programs using loops.
	6.	Nested control structures- break statement- continue statement.	2	K2(U)	Syntax Explanations	Debug the given snippets
	7.	Sample Exercises	2	K1(R)	Project Based	Create programs using control structures.
III						
	1.	**Arrays and Strings:** Defining an array	1	K2(U)	PPT	Slip Test
	2.	Processing an array - Multidimensional arrays	3	K1(R)	Syntax Explanations	Create programs using arrays.
	3.	Searching algorithm - Linear search	3	K4(An)	Flipped Classroom	Practice Exercises
	4.	Sorting algorithm - Bubble sort algorithm	3	K4(An)	Lecture using videos	Practice Exercises
	5.	Strings - Defining a string - Initialization of strings- Reading and writing a string	2	K3(A)	Blended Learning	MCQ Using Nearpod
	6.	Processing the strings	2	K3(A)	Syntax Explanations	Create programs using string manipulation functions.
IV						
	1.	**Functions and Pointers:** Functions- Overview- Defining a function	2	K2(U)	Context Based	Short summary
	2.	Accessing a function- Function prototypes	2	K3(A)	Demonstration	Create a snippet using function
	3.	Passing arguments to a function- Passing arrays to functions	2	K3(A)	Computational Learning	Evaluation through short test
	4.	Recursion	2	K4(An)	PPT	Find the factorial of a given number

						using recursion
	5.	Pointers: Introduction- Declaring Pointer Variables- Initialization of Pointer variables	2	K3(A)	Demonstration	Exercises to create programs using pointers
	6.	Accessing a Variable through its Pointers- Dynamic memory allocation	2	K4(An)	Analytical Study	Evaluation through short test
V						
	1.	**Structures and File Management:** Defining a structure- Declaring structure variables	1	K1(R)	Context Based	True/False
	2.	Accessing structure members- Array of structures	2	K3(A)	Lecture	Evaluation through exercises
	3.	Structures and pointers	2	K3(A)	Lecture using videos	Evaluation through short test
	4.	File Management in C: Introduction	1	K4(An)	Syntax Explanations	MCQ
	5.	Defining and opening a file- closing a file	2	K3(A)	Lecture method	Develop a simple file program.
	6.	Input/output and Error Handling on Files.	2	K2(U)	Interactive ppt	Quiz Using Slido

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): 1. Implement basic C Programs using loops.
2. Text Processing Exercises

Course Focussing on Cross Cutting Issues (Professional Ethics/ Human Values/Environment Sustainability/ Gender Equity): Professional Ethics

Activities related to Cross Cutting Issues: Nil

Assignment: 1. Recursion

2. Bubble Sort Algorithm

Seminar Topic: Linear Search

Sample questions (minimum one question from each unit)

Part A

1. _____ refers to the names of variables, functions and arrays.
2. 'switch' is a multi-way branching statement. Say True or False.
3. Sequence of characters is called as_____.
   a. a) array b) string c) nibble d) word
4. Recursion is a process in which a function calls____.
   a. a) itself b) another function c) main function d) None of these
5. Select a function which is used to read a single character from a file at a time?
   a) fscanf() b) getch() c) fgetc() d) fgets()

Part B

6. Write an algorithm and develop a C program that reads N integer numbers and arrange them in ascending order using selection Sort.
7. Explain formatted input and output statement with examples.
8. Write a C program using functions to generate the Fibonacci series.
9. What is the difference between the function malloc () and calloc ()?
10. How do we declare a file in a C program? Explain the opening modes of file.

Part C

11. What is a token? What are the different types of tokens available in C? Explain.
12. Explain the different types of loops in C with syntax.
13. Explain with example the following string functions.
    i. (i) strlen( ) (ii) strcpy( )
    ii. (iii) strcat( ) (iv) strcmp( )
    iii. (v) strstr
14. What is a pointer? Explain how the pointer variable declared and initialized.
15. Elaborate File Management Concepts in C.

Dr. S. Immaculate Shyla
Head of the Department

Dr. S. Immaculate Shyla
Course Instructor

Teaching Plan

Elective Course I: Mathematical Foundations for Artificial Intelligence

Department : Artificial Intelligence and Data Science

Class : I B.Sc. Artificial Intelligence and Data Science

Title of the Course : Elective Course I: Mathematical Foundations for Artificial Intelligence

Semester : I

Course Code : IU241EC1

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
IU241EC1	3	1	-	-	3	4	60	25	75	100

Learning Objectives:

1. To utilize logical connectives to form and evaluate complex logical statements.
2. To apply basic Boolean algebra laws to simplify logical expressions.
3. To solve linear systems using the Gauss Elimination Method.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	understand the basics of computers and the number conversions	**K1 & K2**
2.	analyze and evaluate logical arguments and statements using formal logical principles.	**K4 & K5**
3.	acquire knowledge of lattice structures and Boolean algebra, including the application of Boolean algebra laws and the principle of duality to solve logical problems.	**K2 & K3**
4.	understand the basic concepts of set theory and relations including inclusion-exclusion principles, types of relations and demonstrate the ability to apply these concepts in problem-solving.	**K2 & K3**
5.	learn various methods to solve algebraic and transcendental equations.	**K1 & K2**

Teaching Plan

Total contact hours: 60 (Including lectures, assignments and tests)

Unit	Module	Topics	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	**Introduction to Programming**					
	1	Introduction to Computers - Computer characteristics - Hardware vs software	4	K1 (R), K2 (U)	Lecture with illustration	Questioning
	2	Types of Computers- System Software and Application Software- Types of programming languages	4	K2 (U), K4 (An)	Flipped classroom	Group discussion
	3	Number Systems and Base Conversions- 1's and 2's complement of a Binary Number- Binary Coded Decimal	4	K3 (Ap)	Lecture with illustration	Class Test
II	**Propositional Logic in AI**					
	1	Statement (Propositions) – Laws of Formal Logic	1	K1 (R), K2 (U)	Lecture with illustration	Questioning
	2	Basic Set of Logical Operators / Operations – Conjunction – Disjunction – Negation – Prepositions and Truth Tables	3	K4 (An)	Blended learning	Quiz using Nearpod
	3	Connectives – Compound Propositions –Conditional Statement – Converse, Contrapositive and Inverse – Biconditional Statement	4	K4 (An)	Lecture with illustration	Slip Test
	4	Algebra of Propositions– Propositional Functions– Tautologies and Contradictions –System Specifications– Principle of Substitution	4	K4 (An)	Reflective Thinking	Brainstorming
III	**Lattices Theory and Boolean Algebra**					

	1	Introduction- Definition (Partially Ordered Set- Poset)	4	K1 (R), K2 (U)	Lecture with illustration	Questioning
	2	Distributive Lattice- Complemented Lattice-	4	K1 (R), K2 (U)	Lecture Method	Evaluation through short test
	3	Definition of Boolean Algebra- Basic Boolean Algebra Laws- Definition (Principle of Duality).	4	K1 (R), K2 (U)	PPT	Group discussion
IV	**Set Theory and Relations**					
	1	Introduction- Set-Finite Set-Cardinality -Operations on Sets- Union- Intersection- Disjoint Sets- Difference Set-Complement Set	3	K1 (R), K2 (U)	Lecture with illustration	Class test
	2	Principle of Inclusion and Exclusion - Ordered Pair - Binary Relation-	3	K2 (U)	Lecture with illustration	Quiz using Slido
	3	Types of Relations- Symmetric Relation-Anti-Symmetric Relation- Reflexive Relation- Transitive Relation	3	K4 (An)	Brainstorming	Assignment
	4	Equivalence Relation- Partially Ordering Relation	3	K3 (Ap)	Lecture Method	Group discussion
V	**Basic Numerical Methods in AI**					
	1	Solution of Algebraic and Transcendental Equations - Bisection Method -	4	K2 (U), K3 (Ap)	Lecture Method	Questioning
	2	Fixed Point Iteration Method - Newton Raphson Method	4	K2 (U), K3 (Ap)	Problem solving	Slip Test
	3	Linear System of Equations - Gauss Elimination Method	4	K2 (U), K3 (Ap)	Problem solving	Assignment

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): Assignment on operations on sets, Group Discussion on equivalence relation

Course Focussing on Cross Cutting Issues (Professional Ethics/ Human Values/Environment Sustainability/ Gender Equity): Nil

Activities related to Cross Cutting Issues: Nil

Assignment: Linear system of equations, Types of Relations

Seminar - Nil

Sample questions

Part A

1.Which of the following is a type of system software?

a) Microsoft Word b) Operating System c) Adobe Photoshop d) Google Chrome

2. Give the negation of the statement: Today is Saturday.

3. When will you say that a lattice is bounded?

4. Say true or false: A set having exactly one element is called singleton set.

5.Write Newton Raphson's formula.

Part B

1. Explain the difference between system software and application software.
2. Write the following statements in symbolic form. (i) If Avinash is not in a good mood or he is not busy, then he will go to Kharagpur. (ii) If Sayantan knows object-oriented programming and oracle, then he will get a job.
3. Let 'A' be a non-empty subset of real numbers. Define a relation r on A by $x\ r\ y$ if x divides $y\ \forall\ x,\ \ y\ \in A$. Show that A is a poset with respect to r.
4. In a class of 50 students, 20 students play football and 16 students play hockey. It is found that 10 students play both the games. Use the algebra of sets to find out the number of students who play neither.
5. Solve the following system of equations using Gaussian elimination method.

$$x + y + z = 9$$

$$2x - 3y + 4z = 13$$

$$3x + 4y + 5z = 40$$

Part C

1. Explain the process of converting a number from binary to Binary Coded Decimal (BCD) and demonstrate with an example.
2. Find the truth set of each of the following propositional function P(x) defined on the set N of positive integers: (i) $P(x)$: $x + 3 < 7$ (ii) $P(x)$: $x + 5 > 8$ (iii) $P(x)$: $x + 4 < 1$
3. Show that every chain is a distributive lattice.
4. Give an example of a relation which is
   (i) not reflexive, not symmetric and not transitive
   (ii) transitive but neither reflexive nor symmetric
   (iii) symmetric, transitive but not reflexive
   (iv) symmetric, transitive and reflexive
5. Find the positive root of $x \log_{10} x = 1.2$ using the bisection method in four iterations.

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Dr. J. Anne Mary Leema
Course Instructor

Teaching Plan

Department : Artificial Intelligence and Data Science
Class : I B. Sc AI & DS
Title of the Course : Foundation Course FC: Web Designing
Semester : I
Course Code : IU241FC1

Course Code	L	T	P	Credits	Inst. Hours	Total Hours	Marks		
							CIA	External	Total
IU241FC1	1	1	-	2	2	30	25	75	100

Objectives

- To understand the design rules in constructing web pages and sites.
- To enable the students to learn the basic working scheme of the Internet and World Wide Web.

Course outcomes

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
1	understand and identify the elements and attributes in a web page	PSO- 1	K1(R) & K2(U)
2	design webpages using DHTML and Cascading Style Sheets	PSO- 3	K3(A)
3	design and construct websites using tables	PSO- 2	K3(A)
4	apply the attributes in designing webpages	PSO- 4	K3(A)
5	analyze a webpage and identify its elements and attributes	PSO- 3	K4(An)

Teaching plan

Total Contact hours: 30 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	**Introduction to HTML**					
	1.	HTML Introduction, Designing a Home page	1	K1(R)	Introductory session	Overview
	2.	History of HTML	1	K2(U)	Lecture using Chalk and talk	Simple definitions
	3.	HTML generations	1	K2(U)	Lecture using Chalk and talk	Example with representation
	4.	HTML Documents	1	K2(U)	PPT	Definition and sample tag representation
	5.	Anchor Tag, Hyperlinks	1	K2(U)	Lecture using Chalk and talk	Simple programs
	6.	Sample HTML documents	1	K2(U)	Demonstration	Concept definitions
II	**Head and Body Section**					
	1.	Head and Body section: Header Section, Title Prologue, Links	1	K2(U)	Lecture using Chalk and talk	Evaluation through short test
	2.	Colourful web page	1	K2(U)	Demonstration	Map knowledge
	3.	Comments lines , designing the body	1	K2(U)	Lecture using videos	Differentiate between various ideas
	4.	Heading printing, Aligning the headings	1	K4(An)	PPT	Seminar
	5.	Horizantal rule, paragraph, tab settings	1	K1(R)	Demonstration	Recall steps
	6.	Image and pictures, Embedding PNG format Images	1	K1(R) & K4(An)	Lecture using Chalk and talk & Demonstration	Map knowledge & MCQ
III	**Ordered and unordered lists**					
	1.	Ordered and unordered lists: List-Unordered lists	1	K1(R)	PPT	Map Knowledge
	2.	Headings in a list, ordered lists	1	K1(R)	Lecture using Chalk and talk	MCQ

	3.	Nested lists, Table handling	1	K2(U)	Demonstration	Recall steps
	4.	Tables- table creation in HTML	1	K1(R)	Lecture using videos	Short Summary
	5.	Width of the Tables and cells	1	K3(A)	Demonstration	MCQ
	6.	Cells spanning multiple rows/Columns- Coloring cells – Column specification	1	K2(U)	PPT	Concept explanations
IV	**Frames**					
	1.	Frames, frame set, definition,	1	K2(U)	Lecture using Chalk and talk	Shortsummary
	2.	Nested frames web page design	1	K1(R)	Lecture using videos	Concept explanations
	3.	Project: Frame set definition – Animals, Birds, Fish	1	K3(A)	Demonstration	Recall Steps
	4.	Forms: Action 15 attributes,	1	K2(U)	Lecture using Chalk and talk	Concept explanations
	5.	Method Attributes, Enctype attributes,	1	K1(R)	PPT	Evaluation through short test
	6.	Drop down list, sample forms	1	K1(R) & K4(An)	Lecture using Chalk and talk	Explanation and Short summary
V	**DHTML and Style sheets**					
	1.	DHTML and Style sheets: Defining styles	1	K2(U)	Lecture using Chalk and talk	True/False
	2.	Elements of styles	1	K2(U)	Demonstration	Evaluation through problems
	3.	Linking a style sheet to an HTML document	1	K2(U)	PPT	Recall Steps
	4.	Inline styles, Internal style sheets	1	K4(An)	Demonstration	MCQ
	5.	External style sheets	1	K3(A)	PPT	Short essays
	6.	Multiple styles	1	K4(An)	Lecture using Chalk and talk	Concept explanations and Seminar

Course Focussing on Employability/ Entrepreneurship/ Skill Development: Skill Development

Activities (Em/ En/SD): 1. Implement the basic tags in HML and create a webpage.

2. Creating interactive web pages using forms.

Course Focusing on Cross Cutting Issues(Professional Ethics/ Human Values/Environment Sustainability/ Gender Equity): Nil

Activities related to Cross Cutting Issues: Nil

Assignment:

1. HTML history and features.
2. Design a web page embedding a video from YouTube using the `<iframe>` tag.

Seminar Topic:

1. Different HTML tags (any 5)
2. Inserting images using the `<img>` tag with `src` attribute for image source, `alt` attribute for alternative text, and optionally `width` and `height` attributes for dimensions.

Sample questions (minimum one question from each unit)

Part A

1. The _____ tag is used to create hyperlinks in HTML documents, allowing navigation between different web pages.
2. Paragraphs (`<p>`) in HTML are used to _____, organizing textual content into logical units.
3. Ordered lists in HTML are created using the `<ol>` tag and are used when a sequence or _____ order is important.
4. Frames in HTML allow for dividing a web page into multiple _____, each containing a separate HTML document.
5. Linking a style sheet to an HTML document can be achieved using _____ methods: inline styles, internal style sheets, and external style sheets.

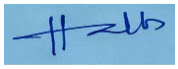
Part B

1. Describe the role of the anchor tag in HTML and provide a practical example of how it can be used to create hyperlinks on a web page.
2. Explain the purpose of the `<title>` tag in the `<head>` section of an HTML document.
3. Describe the purpose of unordered and ordered lists in HTML.
4. Discuss two attributes of the `<form>` tag and their roles in processing form data.

5. Explain the difference between inline styles, internal style sheets, and external style sheets in HTML

Part C

1. Explain the evolution of HTML generations and discuss the significance of each in the context of web development. Provide examples of HTML elements and their usage in designing a basic home page.
2. Explain the importance of the `<head>` section in an HTML document, detailing its key components such as `<title>`, `<meta>`, and `<link>`.
3. Explain the differences between unordered and ordered lists in HTML.
4. Explain the concept of frames in HTML.
5. Explain the concept of Dynamic HTML (DHTML).



Dr. S. Immaculate Shyla
Head of the Department

Dr. V. S. Harilakshmi
Course Instructor

Teaching Plan

Department : Artificial Intelligence and Data Science
Class : I B. Sc /BA/B. Com
Title of the Course : NME I: Cyber Forensics
Semester : I
Course Code : IU241NM1

Course Code	L	T	P	Credits	Inst. Hours	Total Hours	Marks		
							CIA	External	Total
IU241NM1	1	1	-	2	2	30	25	75	100

Objectives

- Understand the definition and core principles of computer forensics fundamentals
- To study the various types of computer forensics evidence and their significance in investigations

Course outcomes

CO	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
1	recall and describe the definition of computer forensics fundamentals	PSO- 1	K1(R) & K2 (U)
2	apply and analyze the different types of computer forensics technology	PSO- 2	K4(An)
3	analyse various computer forensics systems	PSO- 2	K4(An)
4	apply the methods for data recovery, evidence collection and data seizure	PSO- 4	K3(A)
5	gain knowledge of duplication and preservation of digital evidence	PSO- 3	K1(A)

Teaching plan

Total Contact hours: 30 (Including lectures, assignments and tests)

Unit	Module	Topic	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
I	**Overview of Computer Forensics Technology**					
	1.	Overview of Computer Forensics Technology: Computer Forensics Fundamentals, Use of Computer Forensics in Law Enforcement	1	K1(R)	Introductory session	Overview
	2.	Computer Forensics Assistance to Human Resources/Employment Proceedings	1	K2(U)	Lecture using Chalk and talk	Simple definitions
	3.	Computer Forensics Services - Benefits of professional Forensics Methodology	1	K2(U)	Lecture using Chalk and talk	Example with representation
	4.	Steps taken by Computer Forensics Specialists	1	K2(U)	PPT	Steps recall
	5.	Forensics Technology	1	K2(U)	Lecture using Chalk and talk	Different technologies recall
	6.	Types of Law Enforcement	1	K2(U)	Demonstration	Concept definitions
II	**Computer Forensics Evidence and capture**					
	1.	Computer Forensics Evidence and capture: Data Recovery: Data Recovery Defined	1	K2(U)	Lecture using Chalk and talk	Evaluation through short test
	2.	Data Backup and Recovery - The Role of Backup in Data Recovery - The Data Recovery Solution	1	K2(U)	Demonstration	Map knowledge
	3.	Evidence Collection and Data Seizure	1	K2(U)	Lecture using videos	Differentiate between various ideas
	4.	Collection Options, Obstacles	1	K4(An)	PPT	Seminar
	5.	Types of Evidence - The Rules of Evidence	1	K1(R)	Demonstration	Recall steps

	6.	Controlling Contamination: The chain of custody	1	K4(An)	Demonstration	MCQ
III	**Duplication and Preservation of Digital Evidence**					
	1.	Duplication and Preservation of Digital Evidence : Processing steps	1	K1(R)	PPT	Recall steps
	2.	Legal Aspects of collecting and Preserving Computer forensic Evidence	1	K1(R)	Lecture using Chalk and talk	MCQ
	3.	Computer image Verification and Authentication	1	K2(U)	Demonstration	Recall steps
	4.	Special needs of Evidential Authentication	1	K4(An)	Lecture using videos	Short Summary
	5.	Practical Consideration -	1	K3(A)	Demonstration	MCQ
	6.	Practical Consideration - Practical Implementation	1	K3(A)	PPT	Concept explanations
IV	**Computer Forensics Analysis**					
	1.	Computer Forensics Analysis	1	K2(U)	Lecture using Chalk and talk	Short summary
	2.	Discovery of Electronic Evidence	1	K1(R)	Lecture using videos	Concept explanation
	3.	Electronic Document Discovery	1	K3(A)	Demonstration	Recall Steps
	4.	A Powerful New Litigation Tool	1	K2(U)	Lecture using Chalk and talk	Concept explanation
	5.	Identification of Data: Time Travel	1	K1(R)	PPT	Evaluation through short test
	6.	Forensic Identification and Analysis of Technical Surveillance Devices	1	K4(An)	Lecture using Chalk and talk	Short summary
V	**Reconstructing Past Events**					
	1.	Reconstructing Past Events	1	K2(U)	Lecture using Chalk and talk	True/False
	2.	How to Become a Digital Detective	1	K2(U)	Demonstration	Evaluation through problems
	3.	Useable and Unuseable File Formats, Converting Files	1	K2(U)	PPT	Recall Steps

	4.	Networks: Network Forensics Scenario - a technical approach	1	K4(An)	Demonstration	MCQ
	5.	Destruction of E–Mail - Damaging Computer Evidence	1	K3(A)	PPT	Short essays
	6.	Documenting the Intrusion on Destruction of Data - System Testing.	1	K4(An)	Lecture using Chalk and talk	Seminar

Course Focussing on Employability/ Entrepreneurship/ Skill Development: **Skill Development**

Activities (Em/ En/SD):

1. The Role of Backup in Data Recovery and show an implementation of data recovery solution in real world.
2. Role of Surveillance Devices in cyber forensics.

Course Focussing on Cross Cutting Issues (Professional Ethics/ Human Values/Environment Sustainability/ Gender Equity): Nil

Activities related to Cross Cutting Issues: Nil

Assignment:

1. Legal aspects of collecting and preserving cyber forensic evidences.
2. Forensic Identification and Analysis of Technical Surveillance Devices.

Seminar Topic:

1. How to become a digital detective
2. Computer image verification and authentication

Sample questions (minimum one question from each unit)

Part A

1. ___ is the application of investigative and analytical techniques to gather and preserve evidence from digital devices, networks, and data storage media.
2. Controlling contamination through the chain of custody involves maintaining a _____ and secure process that tracks the handling, transfer, and storage of evidence from its initial collection through its presentation in court.
3. The proper collection and preservation of computer forensic evidences should be within the bounds of _____ requirements and ethical standards.
4. _____ is a powerful tool in litigation.
5. Digital detectives use _____ to identify file formats that are usable for extracting information relevant to investigations

Part B

1. Explain the fundamental role of computer forensics in law enforcement.
2. Discuss the challenges and options available for evidence collection and data seizure in digital investigations,
3. What are the legal aspects of collecting and preserving computer forensic evidence?
4. Describe the process of time travel in computer forensics.
5. Discuss the methodologies of investigating network-related incidents in cyber forensics.

Part C

1. Explain the steps taken by computer forensics specialists during investigations and highlight the types of law enforcement agencies that utilize forensic technology effectively.
2. Explain the concept of the chain of custody in preserving digital evidence.
3. What are the practical considerations in computer image verification and authentication?
4. Discuss the significance of electronic document discovery (EDD) as a powerful tool in litigation.
5. Discuss the importance of identifying usable and unusable file formats in forensic investigations.

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Head of the Department

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Course Instructor