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 EVEN SEMESTER 2024-2025

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Vision

To establish a centre of excellence in Artificial Intelligence and Data Science that promotes innovation, sustainability, and social transformation by developing professionals and leaders with strong ethical values to tackle global issues for a balanced and sustainable future.

Mission

To provide quality education through the use of advanced tools, promote a culture of collaboration, and encourage customer-oriented innovations that bridge academia and industry, making a significant contribution to societal improvement.

PEOs	Upon completion of B.A/B.Sc. degree programme, the	Mission
	graduates will be able to	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 Educational Objectives (PEOs)

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

		I caching I lan
Department	:	Artificial Intelligence and Data Science
Class	:	I B. Sc Artificial Intelligence and Data Science
Title of the Course	:	Core Course II : Python Programming
Semester	:	II
Course Code	:	IU242CC1

Teaching Plan

Course Code	L	т	Р	S	Credits	Inst. Hours	Total Marks			
	-	-	-		er cuits		Hours	CIA	External	Total
IU242CC1	4	1	-	-	5	5	75	25	75	100

Objectives

- 1. To understand and identify, important libraries in Python, and explain best practices and idiomatic expressions for writing clean and efficient Python code.
- 2. To develop proficiency in core Python scripting elements and build applications.

Course Outcomes

СО	Upon completion of this course, the students will be able to:	Cognitive level
1	remember fundamental python syntax and basic data types, and understand the concepts.	K1&K2
2	analyze and apply functions, control statements, strings, lists and dictionaries in python programming	K3&K4
3	demonstrate the concept of object, class inheritance and polymorphism in Python.	K2
4	apply user defined functions and classes in python.	К3
5	develop programming skills to solve real time computational problems	К3

K1 - Remember; K2 - Understand; K3 – Apply; K4 – Analyze

Teaching plan

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

Unit	Module	Торіс	TopicTeaching HoursCognitive level		Pedagogy	Assessment/ Evaluation
Ι						
	1.	Python, Data Types, Expressions Introduction about Python Programming	2	K1(U)	Introductory session	Word Cloud
	2.	Running Code in the Interactive Shell - Input - Processing and Output	2	K2(R)	Demonstration	Practice Snippets
	3.	Editing - Saving and Running a Script	2	K2(U)	Concept Explanations	Diagnostic test
	4.	Data Types - String Literals - Escape Sequences	3	K2(U)	Interactive PPT	Quiz using Slido
	5.	String Concatenation - Variables and the Assignment Statement	2	K2(U)	Syntax Explanations	Write the syntax
	6.	Numeric Data Types and Character Sets	2	K3(A)	Demonstration	Write the syntax
	7.	Expressions - Arithmetic Expressions and Mixed-Mode Arithmetic and Type Conversions.	2	K2(U), K3(A)	Logical Thinking	Problem solving questions
II	1					
	1.	Functions, Modules and Control Statements : Functions and Modules- An Introduction	2	K1(R)	Lecture using Chalk and talk	Evaluation through short test
	2.	Calling Functions - The math Module - The Main Module	1	K2(U)	Lecture with examples	List some applications of using math module
	3.	Program Format and Structure and Running a Script from a Terminal Command Prompt	1	K2(U)	Lecture using videos	Slip Test
	4.	Iteration - for loop - Selection - Boolean Type - Comparisons - and Boolean Expressions	2	K3(A)	Syntax Explanations with examples	Debugging Activities

	5.	if-else Statements - One-Way Selection Statements - Multi-way if Statements	2	K3(A)	Syntax Explanations	Review and debug the given code
	6.	Logical Operators and Compound Boolean Expressions	2	K2(U)	Syntax Explanations	Debug the given snippets
	7.	Short-Circuit Evaluation and Testing Selection Statements	2	K2(U)	PPT	Slip Test
	8.	Conditional Iteration - while loop	1	K2(U)	Interactive ppt	Develop programs using while
	9.	Sample Exercises	2	K1(R)	Project Based	Create programs using iteration concepts
III		·				•
	1.	StringsandTextFiles:Strings-AccessingCharactersandSubstrings inStrings	2	K2(U)	PPT	Slip Test
	2.	String Methods	3	K1(R)	Syntax Explanations	Create programs using String functions.
	3.	Text Files - Text Files and Their Format	3	K4(An)	Flipped Classroom	MCQ
	4.	Writing Text to a File - Writing Numbers to a File	3	K4(An)	Lecture using videos	Practice Exercises
	5.	Reading Text from a File - Reading Numbers from a File and	2	K3(A)	Blended Learning	MCQ Using Nearpod
	6.	Accessing and Manipulating Files and Directories on Disk	2	K3(A)	Syntax Explanations	Develop programs using files
	7.	Sample Exercises				
IV						
	1.	Lists and Dictionaries: Lists - List Literals and Basic Operators	2	K2(U)	Context Based	Short summary
	2.	Replacing an Element in a List	2	K3(A)	Demonstration	Create a snippet using list
	3.	List Methods for	2	K3(A)	Computational	Evaluation

		Inserting and Removing			Learning	through short	
		Elements				test	
	4.	Searching and Sorting a	2	K4(An)	PPT	Practice	
		List		· · · ·		Exercises	
	5.	Mutator Methods and					
		the Value None -					
		Aliasing and Side	2	K3(A)	Demonstration	Short Test	
		Effects					
	6.	Equality and Tuples -					
		Defining Simple					
		Functions - Parameters	2	K2(U)	Interactive ppt	Ouiz	
		and Arguments -			11		
		return Statement					
	7.	Boolean Functions and					
		main function	1	K1(R)	Interactive ppt	Quiz	
	8.	Dictionaries:					
		Dictionary Literals -					
		Adding Keys and	1	K4(An)	Demonstration	Slip Test	
		Replacing Values -					
		Accessing Values					
	9.	Removing Keys and	4	TT A (A)	Analytical	Evaluation	
		Traversing a	1	K4(An)	Study	through short	
N/		Dictionary.			•	test	
v	1	Design with Functions					
	1.	and Design with					
		Classes: Design with	2	$K1(\mathbf{R})$	Context Based	True/False	
		Functions and Design	2	K I(K)	Context Bused	11ue/1 dise	
		with Classes					
	2.	Functions as				Evaluation	
		Abstraction	2	K3(A)	Lecture	through	
		Mechanisms				exercises	
	3.	Problem Solving with	3	$\mathbf{K2}(\mathbf{II})$	Interactive pot	Quiz Using	
		Top-Down Design	5	K2(U)	interactive ppt	Slido	
	4.	Design with Recursive				Evaluation	
		Functions and	3	K3(A)	Lecture using	through short	
		Managing a Program's	5	113(11)	videos	test	
	~	Namespace			~		
	5.	Design with classes:	2	K4(An)	Syntax	МСО	
	-	Objects and Classes -	_	< <i>,</i>	Explanations	- (
	6.	Data Modeling and			T /		
		Structuring Classes	3	K3(A)	Lecture	Recall	
		with inneritance and			method		
		FOIYIIIOIPIIISIII					

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

Activities (Em/ En/SD): 1. Implement basic Python Programs using loops. 2. Lists and Dictionaries 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. Problem Solving with Top down design

2. Inheritance and Polymorphism

Seminar Topic: String methods

Sample questions (minimum one question from each unit)

Part A

- List. append() method can be used to add an element to the end of a list? Say True or False.
- 2. Which of the following data types is immutable in Python?a) Listb) Dictionaryc) Setd) Tuple
- 3. What will be the output of the following code?

```
x = [1, 2, 3]
y = x
y.append(4)
print(x)
```

a) [1,2,3,4] b) [1,2,3] c) [1,2,3,4,4] d) Error

- 4. Which of the following is used to define a function in Python?a) function()b) func()c) defd) lambda
- 5. Which feature of object-oriented design helps model real-world entities effectively?
 a) Recursive functions
 b) Polymorphism
 c) Top-down design
 d) Flat namespaces

Part B

- 6. Explain the concept of type conversion in Python with examples.
- 7. What is the purpose of the if-else statement in Python? Provide a basic example.
- 8. Differentiate between for loop and while loop in Python.

- 9. Describe the use of the math module in Python. List two functions from the module and their uses.
- 10. Explain string slicing in Python with an example.

Part C

- 11. Describe the process of reading and writing text files in Python. Explain with examples.
- 12. Explain control flow statements with examples.
- 13. Illustrate the concept of polymorphism in Python.
- 14. What are dictionaries in Python? Explain.
- 15. Explain the concept of top-down design and its significance in function-based programming.

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Dr. S. Immaculate Shyla Head of the Department

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Dr. S. Immaculate Shyla Course Instructor

Teaching Plan

Department	:	Artificial Intelligence & Data Science
Class	:	I B.Sc Artificial Intelligence & Data Science
Title of the Course	:	Elective Course II: Discrete Mathematics
Semester	:	II
Course Code	:	IU242EC1

Course Code	т	т	р	ç	Credita	Inst Houns	Inst Hours Total Marks			
Course Coue	L	L	Г	3	Creans	mst. nours	Hours	CIA	External	Total
IU242EC1	3	1	-	-	3	4	60	25	75	100

Learning Objectives

- 1. To impart the knowledge of fundamental concepts in probability to solve problems.2. To understand graph algorithms and representations to solve real-world AI
- problems.

Course outcomes

On the	On the successful completion of the course, student will be able to:						
1.	gain a deep understanding of functions and their role in problem solving.	K1 & K2					
2.	understand the basic principles of counting, including the product, sum rules, and apply combinatorial techniques to solve problems in various contexts.	K2 & K3					
3.	acquire knowledge of the theory of probability and multiplication law of probability.	K1 & K2					
4.	apply the concept of Baye's theorem and compute mathematical expectation.	K2 & K3					
5.	design and implement graph-based solutions to AI problems using appropriate data structures and algorithms.	K2 & K3					

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

Unit	Module	e Topics Teaching Cognitive Pedagogy				Assessment/
			Hours	level		Evaluation
Ι	Function	IS				
	1	Introduction-	3	K1 (R)	Introductory	Questioning,
		Types of			session,	recall steps,
		Functions			Lecture with	concept
					illustration	definitions,
						concept with
	-	~				examples
	2	Classification	4	K2(U)	Flipped	Peer review
		of Functions-			classroom	
		Algebraic				
		Function-				
		Transcendental				
	2	Function Composition of	5		Lasture with	Concent
	3	Eurotions	3	K 2(U)	illustration	concept
		Identity			Problem	solve
		Function			solving	, solve
		Inverse of a			solving	Slip Test
		Function				Shp Test
Π	Combins	atorics				
	1	Introduction-	4	K2 (U)	Introductory	Recall steps.
	-	The Basics of			session.	auestioning.
		Counting			Lecture with	concept
		Principles-			illustration	definitions,
		Product Rule-				concept with
		The Sum Rule				examples
	2	Permutations-	4	K2 (U)	Blended	Quiz using
		Combination			learning	Nearpod,
						Class test
	3	Permutations	4	K3 (A)	Lecture with	concept
		with			illustration,	definitions,
		Repetition-			Problem	concept with
		Circular			solving	examples,
		Permutation.				solve
тт	Diconsta	Duchability				problems
		Introduction	1	K 1 (D)	I poturo with	Concent
	1	Sample Space	1	$\mathbf{K} \mathbf{I} (\mathbf{K})$	illustration	definitions
		Sample Space			musuation	concept with
						evamples
						auestioning
	2	Event -	3	K 2 (II)	Lecture with	Concept
	-	Exhaustive	5	112 (0)	illustration.	with

		Event - Favourable Event - Mutually Exclusive Events - Equally Likely Events- Independent Events			problem solving, Peer tutoring,	examples, solve problems, evaluation through short test
	3	Probability - Axioms of Probability	3	K2 (U)	Lecture Method, problem solving	Concept explanations , solve problems Quiz using Mentimeter
	4	Conditional Property - Multiplication Law of Probability - Multiplication Law of Probability for Independent events - Extension of Multiplication Law of Probability	5	K2 (U)	PPT, problem solving	Group discussion, solve problems
IV	Discrete	Probability		I		
	1	Total Probability	4	K2 (U)	Lecture with illustration	concept definitions, concept with examples, Assignment
	2	Baye's Theorem	4	K3 (A)	Lecture with illustration, problem solving	concept explanations , solve problems, Quiz using Kahoot

	3	Mathematical Expectations	4	K3 (A)	Lecture with illustration, problem solving	Concept explanations , solve problems, oral test
V	Graph T	heory				
	1	Introduction - Graph - Undirected Graph - Directed Graph	2	K2 (U)	Introductory session, Lecture with illustration	concept explanations , concept definitions, concept with examples
	2	Multi Graph - Pseudo Graph - Simple Graph - General Graph	3	K2 (U)	Lecture with illustration	concept with examples, Group discussion
	3	Degree of a Vertex - Finite Graph- Order of a Graph - Size of a Graph - Null Graph - Isolated Graph - Regular Graph - Isomorphic Graphs	3	K3 (A)	Lecture with illustration, problem solving	concept explanations , solve problems, Quiz using Quizizz
	4	Matrix Representation of Graphs - Adjacency Matrices - Incidence Matrix - Subgraph - Weighted Graph	4	K3 (A)	Lecture with illustration, problem solving	Brainstormi ng, Class test

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

Activities (Em/ En/SD): Group discussion on Multi Graph, Pseudo Graph, Simple Graph, General Graph

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

Activities related to Cross Cutting Issues: Nil

Assignment: Total probability

Sample questions

Part A

- 1. A function which consists of trigonometric functions, inverse circular functions, exponential functions, logarithmic functions, hyperbolic functions and inverse hyperbolic functions are called _____.
- 2. How many different bit strings are there of length seven?
- 3. Any subset of the sample space is called _____.
 (a) probability (b) outcome (c) random experiment (d) event
- 4. State True or False: If $E_1, E_2, ..., E_n$ is a set of exhaustive and mutually exclusive events and A is another event associated with E_i then $P(A) = \sum P(E_i)P(A/E_i)$.
- 5. A graph which allows more than one edge to join a pair of vertices is called a _____.

(a) multi graph (b) simple graph (c) general graph (d) finite graph

Part B

- 1. Prove that composition of function is associative.
- 2. Each user on a computer system has a password which is six to eight characters long, where each character is an uppercase letter or a digit. Each password must contain at least one digit. How many possible passwords are there?
- 3. What is the probability of having a Jack and a Queen when two cards are drawn from a pack of 52?
- 4. A coin is tossed until a tail appears. What is the expectation and variance of the number of tosses?
- 5. Write the matrix representation of graphs.

Part C

- 1. Prove that the necessary and sufficient conditions for the function $f: A \rightarrow B$ to be invertible is that f is one-to-one and onto.
- 2. Determine the number of integer solution of the equation $x_1 + x_2 + x_3 + x_4 = 32$ where (a) $x_i \ge 0, i = 1,2,3,4$ or $1 \le i \le 4$ (b) $x_i \ge 0, 1 \le i \le 4$ (c) $x_1, x_2 \ge 5$ and $x_3, x_4 \ge 7$ (d) $x_1, x_2, x_3 > 0$ and $0 < x_4 \le 25$.

- 3. Two dice are thrown. Let A be the event that the sum of the points on the faces is odd and B is the event that at least one number is 1. Find the probability of (i) A ∪ B (ii) A ∩ B (iii) A|B (iv) B|A (v) A ∪ B.
- 4. State and prove Baye's theorem.
- 5. Prove that the sum of the degrees of the vertices of a graph G is equal to twice the number of edges in G. Also prove that the number of vertices of odd degree in a graph is always even.

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Head of the Department Dr. S. Immaculate Shyla

Course Instructor Dr. C. Jenila

		Teaching Plan
Department	:	Artificial Intelligence and Data Science
Class	:	I B. Sc AI & DS
Title of the Course	:	SEC1 : Quantitative Aptitude
Semester	:	II

Course Code : IU242SEC1

Course Code	т	т	Р	G		Inst House	Total	Marks		
Course Code	L			3	Creatts	Inst. Hours	Hours	CIA	CIA External	Total
IU242SEC1	1	1	-	•	2	2	30	25	75	100

Objectives

- To develop skill to meet the competitive examinations for better job opportunity.
- To enrich their knowledge and to develop their logical reasoning thinking ability.

Course outcomes

СО	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO – 1	understand the basic concepts of numbers.	PSO- 1	K1(R) & K2 (U)
CO – 2	apply the concept of percentage, profit and loss.	PSO- 2	K3(A)
CO – 3	solve problems using distance and time.	PSO- 3	K3(A)
CO – 4	analyze the concepts of discount and probability.	PSO- 4	K4(An)
CO – 5	solve the problems easily with short cut methods.	PSO- 3	K3(A)

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

Unit	Module	е Торіс	TeachingCognitiveHourslevel		Pedagogy	Assessment/ Evaluation
Ι	Number	rs:				
	1.	Numbers - HCF and LCM of numbers- Decimal fractions	1	K1(R) & K3(Ap)	Introductory session	Overview
	2.	Simplification - Square roots and cube roots - Average - Problems on Numbers.	1	K3(Ap)	PPT	Brain Storming
	3.	3. Problems on Divisibility Rules - Finding Units Digit for a Complex Calculation - Finding Perminders		K3(Ap)	Video Lecture	Example with representation
	4.	Problems on Prime Factorization and Decimal Fractions	1	K3(Ap)	Chalk and Talk	Recall Exercises
II	Ages, S	urds and Indices, Perce	ntage, Profit	and Loss		
	1.	Problems on Ages	1	K2(U)	Video Lecture	Oral Presentation
	2.	Surds and Indices - Percentage	1	K3(Ap)	Demonstration	Map knowledge
	3.	Profits and Loss - Ratio and Proportion	1	K2(U)	Lecture using videos	Brain Storming
	4. Partnership - Problems on unitary methods Problems on alternate days and wages - Problems on chain-		2	K4(An)	PPT	Quiz
III	Time ar	nd Work				
	1.	Time and work	1	K1(R)	PPT	Recall steps
	2.	Pipes and Cisterns	1	K2(U)	Lecture using Chalk and talk	MCQ
	3.	Time and Distance	1	K4(An)	Self prepared videos	Solving Problems
	4.	Problems on Trains, Boats and Streams	1	K4(An)	Lecture using videos	Slip Test
	5.	Simple interest - Compound interest	1	K1(R)	Self prepared videos	Group Discussion
	6.	Area-Volume and surface area	1	K1(R)	Interactive PPT	Quiz
	7.	Problems on circular tracks, races and	1	K4(An)	Interactive Classroom Games	Solving Problems

		games.				
IV	Permu	tation and Combination				
	1.	Permutation and combination - Probability	1	K2(U)	Lecture using Chalk and talk	Short summary
	2.	True Discount- Bankers Discount	1	K1(R)	Lecture using self prepared videos	Concept explanation
	3.	Height and Distances- Odd man out	1	K3(A)	Demonstration	Recall Exercises
	4.	Series-Problems on linear arrangement	1	K2(U)	Lecture using videos	Concept explanation
	5.	Problems on circular arrangement	1	K2(U)	Interactive PPT	Evaluation through short test
	6.	Problemswhenrepetitions are allowed-Problemsonselections.	1	K2(U)	Lecture using Interactive PPT	Short summary
V	Calend	ar and Clocks				
	1.	Calendar - Clocks	1	K2(U)	Interactive PPT	Online Assignment
	2.	Problems on stocks and shares	2	K2(U)	Demonstration	Brain Storming
	3.	Data representation - Tabulation	1	K3(A)	Video	Quiz
	4.	Data Interpretation – Bar Graphs – Pie Charts – Line Graphs	3	K4(An)	Demonstration	Online Assessment

Course Focussing on Employability/Entrepreneurship/Skill Development: Skill Development Activities (Em/ En/SD):

Activity 1: Relay Math Race Activity

Objective: Reinforce the understanding of time, distance, and speed calculations through a collaborative and interactive game.

Materials Needed: Stopwatch, pre-prepared problem cards, paper, and pencils.

Procedure:

Divide students into small groups or pairs.

Each group starts at a station with a problem card related to time, distance, and speed (e.g., "A train travels at 60 km/h for 2 hours. How far does it travel?").

Each group solves the problem, writes down the answer, and moves to the next station.

The activity continues in a relay format until each group has completed all stations.

Time each group to see how long it takes them to complete all stations and score based on speed and accuracy.

Skill Development:

Enhances problem-solving and teamwork.

Builds quick mental calculation skills and the ability to apply formulas.

Activity 2: Real-World Scenario Planning

Objective: Apply time and distance concepts to plan a real-world journey, integrating practical math with everyday applications.

Materials Needed: Maps, calculators, travel guides, or online route planners.

Procedure:

Assign students the task of planning a trip (e.g., a road trip from one city to another).

Students must calculate the total travel distance and estimate the time it will take based on different vehicle speeds (e.g., 50 km/h, 80 km/h).

Introduce variables like rest stops, which require students to add additional time to their calculations.

Have students create a short itinerary or presentation detailing their travel plan, the calculations, and the reasoning behind them.

Skill Development:

Promotes critical thinking and the application of math concepts to real-life situations.

Develops planning and organizational skills, as well as the ability to make decisions based on variable factors.

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

Activities related to Cross Cutting Issues: Nil

Assignment:

- 1. Problems on LCM and HCF, Squares and Square roots.
- 2. Problems on Odd man out, Series and Arrangements

Seminar Topics:

1. Divisibility Rules, Probability, Simple Interest, Compound Interest

Sample questions (minimum one question from each unit)

Part A

- 1. What is a perfect number?
- 2. By selling a table lamp at Rs.260, Suman makes a profit of 30%. Find the cost price of the table lamp.
- 3. Express a speed of 54 km/hr in meters/second.
- 4. How many words can be formed by using 3 letters from the word "DELHI"?
- 5. Number of odd days in a leap year is ------

Part B

- 6. Explain the rules of divisibility with examples.
- 7. The selling price of 10 pencils is the cost price of 14 pencils. Find the profit percentage.
- 8. A can do a work in 12 days. When he had worked for 3 days B joined him. If they complete the work in 3 more days, in how many days can B alone finish the work?
- 9. How many words can be formed by using the letters from the word "DRIVER" such that all the vowels are never together?
- 10. Which of the following is a better investment -4% stocks at 84 or 8% stock at 128?

Part C

- 11. Find the smallest six digit number, which when divided by 3 or 11 leaves a reminder of 2 in each case.
- 12. If $3^{2x} = 81$, what is the value of x?
- 13. A boat travels 24 km upstream in 6 hours and 20 km downstream in 4 hours. Find the speed of the boat in still water and the speed of water current.
- 14. State the relationship between permutation and combination and their differences.
- 15. What day of the week was 29th February 2016?

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Dr. S. Immaculate Shyla Head of the Department

Dr. V. S. Harilakshmi Course Instructor

		Teaching Plan
Department	:	Artificial Intelligence and Data Science
Class	:	I UG
Title of the Course	:	NME II: Understanding Internet
Semester	:	II
Course Code	:	IU242NM1
		Total Mark

Comme Code	т	т	Р	S Credits Inst. Hours Hours		Inst II.	Total	Marks		
Course Code	L	I			Hours	CIA	External	Total		
IU242NM1	1	1	-	-	2	2	30	25	75	100

Objectives

- To understand and gain knowledge of internet mass medium.
- To study the various features of internet technology, demographic and psychographic description of internet audiences, issues related to cybercrime and cyber security.

Course outcomes

СО	Upon completion of this course, the students will be able to:	PSO addressed	Cognitive level
CO – 1	understand the basic concept of network and HTML.	PSO- 1	K1(R) & K2 (U)
CO – 2	understand the basics of WWW and web browsers.	PSO- 2	K2(U) & K3(A)
CO – 3	describe the security hash function and concepts of security methods.	PSO- 2	K2(U) & K3(A)
CO – 4	solve problems involving malware.	PSO- 3	K3(A) & K4(An)
CO – 5	apply algorithm for secure network.	PSO- 3	K2(U) & K3(A)

Teaching plan

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

Unit	Module	е Торіс	Teaching Hours	Cognitive level	Pedagogy	Assessment/ Evaluation
Ι	Introdu	iction to Internet:				
	1.	1. Working and history of the internet- Uses of the internet - World Wide Web (WWW)		K1(R)	Introductory session	Overview
	2.	Web Client- Web Browser- Webpage – Website	2	K2(U)	PPT	Simple definitions
	3.	Search Engine- Difference between network and internet - Advantages and Disadvantages of the Internet	1	K2(U)	Video Lecture	Terminology Recall
	4.	4. Application Software and Programming Languages – Application Software - Packaged Software Products (Off-the- Shelf Products)		K2(U)	PPT	Different technologies recall
II	WWW	and Web Browsers				1
	1.	WWW-Evolution of Web-Basic Elements of WWW-Web Browsers- Search Engines- Search Criteria.	1	K2(U)	Video Lecture	Evaluation through short test
	2.	Web Publishing: Web Publishing- Web Page Design.	3	K3(Ap)	Demonstration	Map knowledge
	3. Email: E-Mail Basics- E-Mail System-E-Mail Protocol-E-Mail Addresses-Structure of an E-Mail Message		1	K2(U)	Lecture using videos	Brain Storming

	4.	E-Mail Clients & Servers- Mailing List- E-Mail Security.	1	K4(An)	PPT	Quiz				
III	Digital	Transformation								
	1.	Data (High Value Commodity) -Digital Transformation in Business - Features of Digital Transformation	1	K1(R)	PPT	Recall steps				
	2.	Banking and Financial Services Industry (BFSI) - Human Resource Management	1	K2(U)	Lecture using Chalk and talk	MCQ				
	3.	Healthcare - Big Data Analytics in Healthcare	2	K4(An)	Demonstration	Slip Test				
	4.	Virtual Reality Wearable medical devices.	1	K4(An)	Lecture using videos	Short Summary				
IV	Cyber	Security			·					
	1.	IT Assets - Risk and Vulnerabilities	1	K2(U)	Lecture using Chalk and talk	Short summary				
	2.	Computer Security Types - Fundamental Principles of Security - Physical Safety and Security	1	K1(R)	Lecture using videos	Concept explanation				
	3.	Access Control - Biometric Access Control - Network Security - AAA Server	1	K3(A)	Demonstration	Recall Steps				
	4.	Firewall – Malware – Spyware – Adware – Spamware – Virus – Ransomware	2	K2(U)	Lecture using videos	Group Discussion				
	5.	Worms	1	K2(U)	PPT	Evaluation through short test				
	6.	Trojan Horse	1	K2(U)	Lecture using interactive PPT	Short summary				
V	V Computer Virus									
	1.	Computer Virus: Types of Computer Viruses - Antivirus	1	K2(U)	Interactive PPT	Kahoot				

	Protection				
2.	Digital Signature - Cyber Crime – Hacking – Phishing - Spam e-mails - Attack using Malware	2	K2(U)	Demonstration	Brain Storming
3.	ATM Skimming – Ransom ware	1	K2(U)	Video	Quiz
4.	Fake News	1	K4(An)	Demonstration	Short Summary
5.	Deep fake	1	K3(A)	PPT	Case Study
6.	Cyber bullying.	1	K4(An)	Lecture using Videos	Case Study

Course Focussing on Employability/Entrepreneurship/Skill Development: Skill Development Activities (Em/ En/SD):

1.Create a Website on your name with two web pages i) About Me ii) My Hobbies

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

Activities related to Cross Cutting Issues: Nil

Assignment:

- 1. History of Internet its advantages and disadvantages.
- 2. Viruses vs Worms vs Trojan Horse.

Seminar Topics:

1. Viruses, Cyber Bullying, Deep Fake, Case Study

Sample questions (minimum one question from each unit)

Part A

- 1. What does WWW stand for?
- 2. What protocol is commonly used for sending email?
 - a. a) HTTP
 - b. b) FTP
 - c. c) SMTP
 - d. d) IMAP
- 3. Which technology is most associated with analyzing large sets of data to find patterns and insights?
 - a. a) Virtual reality
 - b. b) Big data analytics
 - c. c) Manual spreadsheets
 - d. d) Physical data archiving

- 4. Biometric access control includes using facial recognition or fingerprints for security. State True or False.
- 5. Deep fakes are always easy to identify due to their poor quality. State True or False

Part B

- 6. What is the difference between a network and the internet?
- 7. Define an email protocol and list two examples.
- 8. How has digital transformation affected the banking and financial services industry (BFSI)?
- 9. What is the primary purpose of a firewall in network security?
- 10. What is ATM skimming, and how does it affect consumers?

Part C

- 11. Discuss the various advantages and disadvantages of the internet and their impact on society.
- 12. What measures can be taken to ensure email security, and why is this important in today's digital communication?
- 13. Discuss the role of big data analytics in modern healthcare, highlighting its importance and examples of its use in improving patient outcomes.
- 14. Describe various types of malware (such as spyware, adware, ransomware, viruses, worms, and Trojans) and their impacts on computer systems
- 15. Explore the ethical and security implications of deep fake technology in the context of cyber security and social media.

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Hall

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