



TAKSHASHILA UNIVERSITY

(Tamil Nadu State Private University)

ONGUR, TINDIVANAM TK, VILLUPURAM DT

FACULTY OF ENGINEERING AND TECHNOLOGY SCHOOL OF COMPUTATIONAL ENGINEERING

Department of Computer Science and Engineering

(Data Science)

**REGULATION – R25 NEP
CURRICULUM & SYLLABI**

I Semester



VISION AND MISSION OF UNIVERSITY

VISION:

To create change makers and world leaders similar to the ancient Takshashila University.

MISSION:

The brightest minds and the best resources are used to nurture and develop the leaders of tomorrow, where they are encouraged to be eternally curious and ethically sound.

DEPARTMENT VISION AND MISSION

VISION:

To be a center of excellence in Artificial Intelligence and Data Science by fostering transformative education, interdisciplinary research and innovation to develop intelligent, ethical, and sustainable solutions that address global challenges and contribute to societal progress.

MISSION:

M1: Academic Excellence	Deliver a contemporary, outcome-based curriculum that equips students with strong foundations in Artificial Intelligence, Data Science and computational thinking to solve complex real-world problems.
M2: Research and Innovation	Promote interdisciplinary research, innovation, and the adoption of emerging AI and data-driven technologies to develop impactful solutions for industrial and societal needs.
M3: Industry Readiness and Entrepreneurship	Strengthen employability and entrepreneurial capabilities through industry collaborations, experiential learning, internships, professional certifications and start-up incubation.
M4: Ethics and Lifelong Learning	In still ethical values, responsible AI practices, professional integrity, and a commitment to lifelong learning to develop socially responsible leaders capable of driving sustainable technological advancement.

PROGRAMME OUTCOMES (POs)

PO1: Engineering knowledge

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis

Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8: Ethics

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning

Recognize the need for, and have the preparation and ability to engage in continuous learning in the face of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Competitive Platform

To create a competitive platform for solving critical problems in a wide variety of fields.

PEO2: Exploration

Enthusiastic participation in learning, understanding, designing and applying new innovative research ideas as the field evolves.

PEO3: Career

Applying cutting-edge technology that improves knowledge and to commit students for life-long learning to reach the leading positions in the career.

PEO4: Professional Values

Simulate the graduates to hold the responsibilities in the context of technology, ethics, society and humanity.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: AI and Data Analytics Competency

Apply the principles of Artificial Intelligence and Data Science to develop intelligent, data-driven solutions for complex real-world problems.

PSO2: Research and Innovation

Design and implement AI-based and data-centric solutions using modern tools, emerging technologies and research methodologies to address industrial and societal challenges.

PSO3: Professional Competence

Demonstrate professional ethics, entrepreneurial mind-set and lifelong learning to excel in careers, higher education, research, and innovation in Artificial Intelligence and Data Science.



**TAKSHASHILA
UNIVERSITY**

(Established Under Tamil Nadu State Private Universities Act 2019 &
Recognized by UGC vide 201 of the UGC Act 1956)

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**FACULTY OF COMPUTATIONAL ENGINEERING
B.TECH. IN CSE (DATA SCIENCE)
(REGULATION – R25 NEP)
SEMESTER – I**

Sl. No.	Course Code	Course Title	Category	Periods			Credits	Hrs.	Max. Marks								
				L	T	P			CAT (Best of two)	ASS	MCQ	ATT	SEM	PRAC	CAM	ESM	Total
1	U2SCD01B	Web Application Development I	PC	3	0	2	4	75	20	5	5	5	5	10	50	50	100
2	U2SCD02B	Computer Programming	PC	3	0	2	4	75	20	5	5	5	5	10	50	50	100
3	U2SCD03T	Mathematics for Computer Science	BS	3	1	0	4	60	20	5	5	5	5	-	40	60	100
4	U2SCD06B	Introduction to Generative AI	PC	2	0	2	3	60	20	5	5	5	5	10	50	50	100
5	U2SCD05T	Communicative English Foundation	BS	3	0	0	3	45	20	5	5	5	5	-	40	60	100
6	U2SCD04T	Quantitative Aptitude	BS	3	0	0	3	45	20	5	5	5	5	-	40	60	100
Total							21	360							270	330	600
7	U2SVA02P	Physical Wellness and Yoga	VAC	0	0	2	1	30	-	-	-	-	-	-	100	-	100
Total							1	30							100		100
Semester Total:							22	390							370	330	700

Note:

L – Lecture

T – Tutorial

P – Practical

CAT – Continuous Assessment Test

ESM – End Semester Exam Marks

ASS – Assignment

ATT – Attendance

CAM – Continuous Assessment Marks

SEM – Seminar

PW – Project Work

BoS Chairman

U25CD01B	Web Application Development I	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

To understand the fundamentals of HTML, CSS, and responsive web design principles
To develop interactive and responsive web interfaces using Bootstrap, Flexbox, and CSS layout techniques
To apply JavaScript programming concepts for client-side web development and DOM manipulation
To implement event-driven programming and asynchronous communication using JavaScript and Fetch API
To design and develop dynamic, user-friendly web applications using modern frontend technologies.

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Explain the fundamentals of HTML, CSS, and responsive web design for developing static web pages.
CO2:	Apply Bootstrap, Flexbox, CSS Grid, media queries, and animations to create responsive and visually appealing user interfaces.
CO3:	Develop interactive web pages using JavaScript programming concepts and DOM manipulation techniques.
CO4:	Implement event handling, form validation, asynchronous programming, and HTTP requests using the Fetch API and JSON.
CO5:	Design and develop complete frontend web applications by integrating HTML, CSS, Bootstrap, JavaScript, and asynchronous web technologies.

UNIT I:	HTML / CSS BASICS	9 Hrs.
Importance of Web/Frontend - Fundamentals: Syntax, Debugging, Tweaking Code - Getting Started with HTML and CSS - HTML Elements: Headings, Paragraphs, Buttons, Images, Containers, Lists, CSS - Rulesets: Units, Padding, Margins, Box Model - Selectors: Class, ID, Type, Specificity, Block vs. Inline Elements, Inheritance, Cascading.		

UNIT II:	BOOTSTRAP AND FLEXBOX	9 Hrs.
Bootstrap Grid System - Container Components - Row Implementation - Column Structure - Display Properties - Flex Utilities - Sizing Utilities - Spacing Utilities - Color Systems - UI Components (Navbar, Buttons) - Dynamic Elements (Carousel) - Media Integration - Flexbox - Flex Container Properties - Flex-wrap Mechanics - Flex-direction Applications - Alignment Properties (Align-items, Align-self) - Justify-content - Responsive Design Principles.		

UNIT III:	CSS MEDIA QUERIES, LAYOUT AND ANIMATIONS	9 Hrs.
Media Query Fundamentals - Media Types Implementation - Media Feature Detection - Logical Operators in CSS - Layout Sizing Properties - Width and Height Manipulation – Minimum / Maximum Constraints - Overflow Control - CSS Grid System - Grid Layout Implementation - CSS Transition Properties - Transform Functions - Animation Keyframes - Animation Properties - Animation Timing.		

UNIT IV:	JAVASCRIPT BASICS AND DOM MANNIPULATION	9 Hrs.
JavaScript Language Basics - Data Type Systems - Variable Declaration - Operators and Expressions - Control Structures - Conditional Statements - Loop Implementations - Function Declaration - Parameter Passing - Document Object Model - DOM Hierarchy - Element Selection Methods - Node Properties - Text Content Manipulation - Attribute Modification - Style Property Access		

UNIT V:	EVENTS AND HTTP REQUESTS	9 Hrs.
Form Structure, Input Element Types - Form Control Components (Text area, Select), Form Validation - Event Model - Event Listener Registration, Event Propagation, Event Object Properties, Asynchronous JavaScript - Callbacks - Scheduler Functions - HTTP Communication - Fetch API Implementation - JSON Data Structure - JSON Parsing and Serialization.		

Total Hours: 45

LIST OF EXERCISE:	
1.	Build Portfolio website using HTML, CSS and Bootstrap
2.	Build a Todos Application Website by implementing the storage mechanisms
3.	Build a Food munch website by using Bootstrap grid system
4.	Build a simple Bookmark Maker using HTML Form Elements
5.	Build a Speed typing test application with random quotation using fetch

6.	Build a Library Management page to search the books using fetch
7.	Build a Word cloud page using random function
8.	Build a Wikipedia Search Application using fetch URL
9.	Build a chatbot page by dynamically creating the elements
10.	Build a Movie Reviews Page using HTML Form Elements

Total Hours: 30

TEXT BOOKS:	
1	Duckett, J. HTML and CSS: Design and Build Websites. Wiley, 2011.
2	Adler, Ronald B., et al. <i>Understanding Human Communication</i> . 13th ed., Oxford University Press, 2013. Flanagan, D. <i>JavaScript: The Definitive Guide</i> (7th Ed.). O'Reilly. Access via NITC Library, 2020.
3	Keith, J. <i>Responsive Web Design with HTML5 and CSS</i> . A press, 2022.

REFERENCE BOOKS:	
1	Keith, J. <i>Responsive Web Design with HTML5 and CSS</i> . A press, 2022.

WEB REFERENCES:	
1	NPTEL Course – HTML, CSS and JavaScript for Web Developers, IIT Madras.
2	https://nptel.ac.in/courses/106106156

COs/POs/PSOs Mapping:															
COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	2	–	3	–	–	–	–	2	–	2	2	1	2
2	2	2	3	1	3	–	–	–	1	2	1	2	3	2	2
3	2	3	3	2	3	–	–	–	2	2	1	2	3	3	2
4	2	3	3	2	3	–	–	1	2	2	2	2	3	3	2
5	2	3	3	2	3	1	–	1	2	3	2	3	3	3	3

Correlation Level: 1-Low, 2-Medium, 3- High, '–' - no correlation


BoS Chairman

U25CD02B	Computer Programming	L	T	P	C	Total
		3	0	2	4	75

COURSE OBJECTIVES:

To introduce the students to the fundamental concepts of programming and Python syntax through basic operations and data types
To develop logical thinking by implementing decision-making and iterative control structures using conditional and looping statements
To equip the students with the ability to manipulate and format string data effectively using Python's built-in methods
To enable the students to modularize their programs using user-defined functions and understand variable scopes and functional arguments
To provide students with a deeper understanding of Python's built-in Data Structures & Algorithms like lists, tuples, sets, and dictionaries for efficient data organization and manipulation.

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Understand the fundamentals of programming, including variables, data types, and operators, and be able to apply them in real-world scenarios.
CO2:	Develop problem-solving skills using conditional statements, loops, and functions.
CO3:	Gain proficiency in handling strings and working with Data Structures & Algorithms like lists, tuples, sets, and dictionaries.
CO4:	Master object-oriented programming concepts such as encapsulation, inheritance, abstraction, and polymorphism, including method overloading and overriding.
CO5:	Learn to debug effectively and handle errors and exceptions to create robust programs.

UNIT I:	INTRODUCTION	9 Hrs.
Python: Definition - Software - Programming - Programming Language - Syntax - First Program: Hello World, Variable and Data Types, Input-Output Basics, Type Conversions - Operators: Arithmetic, Logical, Comparison, Assignment, Operator Precedence.		

UNIT II:	CONTROL STRUCTURES AND FUNCTIONS	9 Hrs.
Conditional Statements: if, else, else-if (elif), Loops: for Loop, while Loop, Lists and Strings, String - Manipulation: Case Conversion Methods, Counting and Searching Methods, String Formatting - Functions: Defining and Calling Functions, Parameters and Arguments, Return Statements, Local and Global Scope, Default Arguments, Keyword Arguments, Lambda Functions, Recursive Functions.		

UNIT III:	PYTHON DATA STRUCTURES AND ALGORITHMS	9 Hrs.
Lists: Creation, Accessing and Modifying Elements, Traversing Lists, Nested Lists, Copying Lists, Sorting and Merging Lists - Tuples: Definition and Usage, Operations on Tuples, Tuple Unpacking, Nested Tuples, Immutability, Sets: Creating Sets, Operations on Sets, Membership Tests, Set Methods and Use-cases, Dictionaries: Creating and Updating Dictionaries, Accessing and Manipulating Key-Value Pairs - Nested Dictionaries - Iterating through Dictionaries - Lists Comprehensions: Syntax, Applications, Creating Efficient and Readable List Operations		

UNIT IV:	INTRODUCTION TO OBJECT ORIENTED	9 Hrs.
Object Oriented Programming: Basics, Real-life Object Modelling, Organizing Descriptions, - Classes, Defining Classes, Objects and Attributes: Instance Attributes, Class Attributes, Instance Methods, Class Methods, Static Methods, Encapsulation - Access Modifiers, Private Attributes, Getters and Setters, Modelling Classes - Inheritance: Understanding Inheritance, Implementing Class Hierarchies - Abstraction: Abstract Classes and Methods, Abstract Base Classes, Implementations, Polymorphism: Operator Overloading, Function Polymorphism, Method Overriding, Method Overloading.		

UNIT V:	FILE HANDLING AND EXCEPTION HANDLING	9 Hrs.
File Handling: Reading, Writing and Appending Files, Performing File System Operations, Error Handling in File Operations - Exception Handling: Understanding Exceptions, Types of Errors, Handling Exceptions with try-except blocks, Raising Custom Exceptions - Imports and Modules: Importing Libraries, Creating and Managing Modules - Packages: Creating, Managing and Working with Packages, Using Third-Party Libraries.		

Total Hours: 45

LIST OF EXERCISE:
1. Convert kilometers (float) to meters (integer).
2. Find the greatest among two numbers.

3.	Given a temperature, check if it is between 15 and 40:
a.	Print "Can go for a walk" if true.
b.	Print "Cannot go for a walk" otherwise.
4.	Print a Hollow Diamond pattern.
5.	Convert uppercase letters to lowercase and vice versa in a given word.
6.	Implement a list manipulation program supporting insert, append, pop, remove, sort, and print operations.
7.	Find the Nth term in the Fibonacci series recursively.
8.	Reverse the letters in words of a given sentence.
9.	Perform set operations:
a.	Check if one set is a superset of another.
b.	Check if one set is a subset of another
c.	Check if two sets are disjoint
10.	A player has collected a few colored balls which have a number on them. To calculate the score, we have to group the colored balls picked by the user and sum up the numbers on them. Write a program to create a dictionary, grouping of colored balls and the corresponding total score.
11.	Implement a Banking class where attributes are private and can only be accessed or modified through getter and setter methods using property decorators
12.	Write a program to read a file, count the occurrences of each word, and handle any file- related exceptions using try-except blocks

Total Hours: 30

TEXT BOOKS:	
1	Zelle, J. M. Python Programming: An Introduction to Computer Science (3rd Ed.). Franklin, Beedle & Associates, 2016.
2	Lutz, M. Learning Python (5th Ed.). O'Reilly, 2013.

REFERENCES BOOKS:	
1	Ramakrishnan, R., & Ramasubramanian, G. Python Programming: A Modern Approach. McGraw-Hill Education, 2018.

WEB REFERENCES:

1	https://nptel.ac.in/courses/106106182
2	https://docs.python.org/3/tutorial/

COs/POs/PSOs Mapping:

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	2	1	1	1	-	-	-	-	-	1	1	3	1	2
2	3	3	1	2	1	-	-	-	-	-	1	1	3	1	2
3	3	2	1	2	1	-	-	-	-	-	1	1	2	2	2
4	3	2	1	2	1	-	-	-	-	-	1	1	2	2	2
5	3	2	2	2	1	1	-	-	-	-	1	1	3	2	2

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BoS Chairman

U25CD03T	Mathematics For Computer Science	L	T	P	C	Total
		3	1	0	4	60

COURSE OBJECTIVES:

To develop a strong foundation in number systems, arithmetic operations, and modular mathematics used in computing
To enhance analytical skills through combinatorics, probability, matrices, and mathematical series
To enable students to apply mathematical concepts for solving computational and data-oriented problems
To introduce set theory and binary operations as fundamental tools for computer science and data analysis
To strengthen logical reasoning and mathematical problem-solving abilities required in Artificial Intelligence and Data Science

COURSE OUTCOME:

After completion of the course, the students will be able to

CO1:	Apply number systems, logical operators, and binary arithmetic to solve computational problems.
CO2:	Analyze problems involving modular arithmetic, GCD, LCM, and error detection techniques.
CO3:	Solve counting and probability problems using permutations, combinations, and probability principles.
CO4:	Apply matrices and mathematical series to solve computational and data-related problems.
CO5:	Analyze and apply set theory and binary operations in data organization and computational applications.

UNIT I:	NUMBER SYSTEMS AND OPERATIONS	12 Hrs.
Number Systems: Binary, Decimal, Octal, Hexadecimal. Conversion between number systems - Representation of signed and unsigned integers - Floating point representation - Logical and Bitwise Operators: AND, OR, NOT, XOR, NAND, NOR, Shift operations.		

UNIT II:	ARITHMETIC AND MODULAR MATHEMATICS	12 Hrs.
Basic arithmetic operations in different number systems - GCD and LCM: concepts and calculation methods - Modulo Arithmetic: basic operations and principles - Introduction to applications in computing - Simple error detection techniques.		

UNIT III:	COMBINATORICS AND PROBABILITY	12 Hrs.
Basic Principles of Counting. Permutations: Arrangements with and without repetition, applications in real-world scenarios - Combinations: Selection problems, techniques and real-life examples - Probability Fundamentals: Basic concepts, probability rules, simple and conditional probability.		

UNIT IV:	MATRICES AND SERIES	12 Hrs.
Matrix Representation and Types - Matrix Addition and Multiplication - Properties and Operations - Determinants - Matrix Applications: Graph Representation, Linear Transformations. Arithmetic Series. Geometric Series. Summation Techniques.		

UNIT V:	SETS AND BINARY OPERATIONS	12 Hrs.
Fundamentals of Set Theory - Set Operations: Union, Intersection, Difference - Venn Diagrams and Applications - Cartesian Products - Binary Operations. Applications of Set Theory in Data Organization and Analysis.		

Total Hours: 60

TEXT BOOKS:	
1.	Rosen, K. H. Discrete Mathematics and Its Applications (8th Ed.). McGraw-Hill Education, 2019.

REFERENCES BOOKS:	
2.	Grimaldi, R. P. Discrete and Combinatorial Mathematics: An Applied Introduction (5th Ed.). Pearson, 2003.
3.	Tremblay, J. P., & Manohar, R. Discrete Mathematical Structures with Applications to Computer Science. McGraw-Hill Education, 2001.

WEB REFERENCE:

1	https://nptel.ac.in/courses/111107058
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COs/POs/PSOs Mapping:

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	1	–	2	–	–	–	–	–	–	1	2	3	2
2	3	3	2	2	2	–	–	–	–	–	–	1	2	3	2
3	2	3	2	2	2	–	–	–	–	–	–	1	2	3	3
4	3	3	3	2	2	–	–	–	–	–	1	1	2	3	3
5	2	3	2	2	3	–	–	–	–	1	1	1	3	3	3

Correlation Level: 1-Low, 2-Medium, 3- High, '–' - no correlation


BoS Chairman

U25CD06B	Introduction to Generative AI	L	T	P	C	Total
		2	0	2	3	60

COURSE OBJECTIVE:

To introduce the fundamentals of Generative AI, Large Language Models (LLMs), and the evolving AI ecosystem
To familiarize students with modern AI tools for image, audio, video, and speech generation and their practical applications
To develop the ability to design multimodal AI solutions using low-code and no-code workflow platforms
To provide knowledge of AI agent architectures, prompt engineering, Model Context Protocol (MCP), and tool integration
To enable students to build, deploy, and evaluate AI-powered applications using contemporary Generative AI technologies

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Explain the concepts of Generative AI, compare Large Language Models (LLMs), and distinguish between open-source and proprietary AI models.
CO2:	Apply appropriate Generative AI tools to create image, audio, video, and speech-based content for diverse application domains.
CO3:	Develop multimodal AI workflows by integrating AI services using low-code/no-code automation platforms and effective prompt engineering techniques.
CO4:	Design AI agent workflows by integrating LLMs, external tools, and Model Context Protocol (MCP) concepts for task automation.
CO5:	Deploy and evaluate AI agent applications using modern deployment approaches while considering practical, technical, and career-oriented aspects of Generative AI.

UNIT I:	FOUNDATIONS OF GENERATIVE AI	6 Hrs.
Generative AI - Types of Generative AI Content - Large Language Models (LLMs) - Comparing LLMs (OpenAI, Claude, Gemini) - Open-source vs Proprietary Models: Trade-offs, Costs, and Flexibility, Hugging Face Ecosystem, AI Job Landscape and Career Paths.		

UNIT II:	IMAGE, AUDIO GENERATION APPLICATION	6 Hrs.
Image Generation Applications: Use Cases, Tools - GPT-4o, Imagen 3, Midjourney, Stable Diffusion 3.5, Adobe Firefly - Audio Generation Applications: Use Cases - Autoregressive Models - Diffusion Models - GAN-Based Audio Synthesis - Tools - Eleven Labs, Suno, Murf AI, Play.		

UNIT III:	VIDEO AND SPEECH-TO-SPEECH GENERATION APPLICATIONS	6 Hrs.
Video Generation Applications: Use Cases, Text-to-Video Models, Image-to-Video, Video-to-Video Transformation, Tools - Google Veo 2, Runway Gen-3, Kling, Speech-to-Speech Applications.		

UNIT IV:	MULTIMODAL APPLICATIONS AND NO CODE WORKFLOWS	6 Hrs.
Multimodal AI Systems: Combining Vision, Language and Audio, Multimodal Architectures - Low Code / No Code Workflows: Visual Platforms, API Connectors, Tools – Make.com, Zapier, n8n, Bubble, Microsoft Power Automate, Connecting to AI Services - Nodes and Workflow Logic, Prompt engineering basic.		

UNIT V:	AI AGENTS USING NO CODE TOOLS AND DEPLOYING AGENTS	6 Hrs.
AI Agents and Architectures: Autonomous Agents, Agent Workflows and Tool Usage, Auto GPT, Agent GPT, Super-agent, Lang chain - Model Context Protocol (MCP): Introduction, Protocol Layers - Implementing Prompts and Tools - MCP Server Setup – Claude / OpenAI Integration - Deploying Agents: Firecracker Virtualization, Serverless Deployment.		

Total Hours: 30

LIST OF EXERCISE:	
1.	Building a Customer Support Voice Agent
2.	Building an AI Powered Chatbots
3.	Building a Personal Research Assistant
4.	Building a Podcast Creator: Generates a podcast with, bg music and bg image with custom voice
5.	Create an AI application that generates talking avatar videos from text input.
6.	Build an AI-Powered Social Media Manager that generates content ideas, writing posts, creating images, scheduling publications.
7.	Building an AI Powered Auto Job Applier.

TEXT BOOK:

- | | |
|----|--|
| 1. | François Chollet, Deep Learning with Python, Manning, 2nd Ed., 2021. |
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REFERENCE BOOKS:

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|----|--|
| 1. | Laurence Moroney, AI and Machine Learning for Coders, O'Reilly, 2020 |
| 2. | Foster, D. Generative Deep Learning (2nd ed.). O'Reilly, 2022. |

WEB REFERENCES:

- | | |
|---|---|
| 1 | https://huggingface.co/docs |
|---|---|

COs/POs/PSOs Mapping:

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	2	2	–	–	2	–	–	1	–	1	–	2	3	2	2
2	2	2	2	1	3	–	–	1	1	2	–	2	3	2	2
3	2	2	3	2	3	1	–	1	2	2	2	2	3	3	2
4	2	3	3	2	3	1	–	1	2	2	2	2	3	3	2
5	2	2	3	2	3	2	1	2	2	2	3	3	3	3	3

Correlation Level: 1-Low, 2-Medium, 3- High, '–' - no correlation


BoS Chairman

U25CD05B	Communicative English Foundation	L	T	P	C	Total
		3	0	0	3	45

COURSE OBJECTIVES:

- To develop a strong foundation in the use of nouns, pronouns, modifiers, and verbs in English grammar
- To enhance learners' understanding of grammatical structures required for accurate sentence construction
- To enable students to apply appropriate grammatical rules in written and spoken communication
- To develop the ability to construct meaningful sentences using various parts of speech and sentence elements
- To improve students' proficiency in expressing ideas accurately across different contexts and time references

COURSE OUTCOME:

After completion of the course, the students will be able to

CO1:	Identify and apply nouns, pronouns, adjectives, adverbs, and articles appropriately in English communication.
CO2:	Apply correct verb forms and subject-verb agreement in sentence construction.
CO3:	Construct grammatically correct sentences using prepositions, conjunctions, question words, contractions, and interjections.
CO4:	Differentiate and use appropriate grammatical structures to express time, possession, routines, facts, and opinions.
CO5:	Demonstrate proficiency in constructing clear and grammatically accurate sentences for effective written and spoken communication.

UNIT I:	THE FUNDAMENTALS OF NOUNS AND PRONOUNS	9 Hrs.
Exploring Nouns vs. Main Verbs - Understanding Homophones and Homonyms - The Concept of Noun Number and Collective Nouns - Analyzing Pronouns: Referring to People and Objects - The Function of Possessive Nouns: Apostrophes and "Of" Forms, Usage of Possessive Pronouns		

UNIT II:	MODIFIERS IN LANGUAGE	9 Hrs.
Adjectives: Identification, Usage, and Degrees, Adverbs – Types and Usage, Placement of Adverbs in Sentences, Articles – A/An and The, Zero Article and Its Usage, The Role of Articles in Specific and General References, Understanding the Omission of Articles in Certain Contexts		

UNIT III:	EXPLORING VERBS	9 Hrs.
Understanding Verbs and Their Forms - Different Types of Verbs - Regular vs. Irregular Verbs - The Agreement of Subject and Verb		

UNIT IV:	ELEMENTS FOR COMPLEX SENTENCES	9 Hrs.
Prepositions – Expressing Relationships, Conjunctions – Connecting Ideas in Sentences, Question Words – Basics of Formulating Questions, Contractions – Understanding Common Shortened Forms, and Interjections – Expressing Emotions and Reactions		

UNIT V:	INTRODUCTION TO SENTENCE CONSTRUCTIONS	9 Hrs.
Differentiation of Time Periods, Differentiation Between State and Process, How to Describe Possessions in Different Time Periods, Describing General Routines and Daily Practices, Factual Description vs. Opinion, Current Status of Happenings, Commands, Comments, and Suggestions, Simple Present Scenario Identification, Simple Past Scenario Identification.		

Total Hours: 45

TEXT BOOK:	
1.	Yule, G. The Study of Language (4th Edition). Cambridge University Press, 2010.

REFERENCES BOOKS:	
1.	Murphy, R. English Grammar in Use (5th ed.). Cambridge University Press, 2019.

WEB REFERENCE:	
1	https://dictionary.cambridge.org/grammar/
2	https://www.oxfordlearnersdictionaries.com/

COs/POs/PSOs Mapping:															
COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	1	–	–	–	–	–	–	1	–	3	–	2	2	–	–
2	1	1	–	–	–	–	–	1	–	3	–	2	2	–	–
3	1	1	–	–	–	–	–	1	2	3	–	2	2	–	–
4	1	2	–	–	–	1	–	1	2	3	–	2	2	–	–
5	1	2	–	–	1	1	–	2	2	3	1	3	3	–	1

Correlation Level: 1-Low, 2-Medium, 3- High, '–' - no correlation


BoS Chairman

U25CD04T	Quantitative Aptitude	L	T	P	C	Total
		3	0	0	3	45

COURSE OBJECTIVES:

- To develop a strong foundation in number systems and their applications for solving quantitative problems.
- To enhance analytical and computational skills using advanced numerical techniques and arithmetic concepts.
- To enable students to solve real-life problems involving percentages, ratios, proportions, and financial mathematics.
- To develop logical reasoning and quantitative aptitude for solving time, speed, and distance problems.
- To strengthen problem-solving abilities required for competitive examinations, higher studies, and professional careers.

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Apply the concepts of number systems, divisibility, LCM, and GCD to solve quantitative problems.
CO2:	To apply advanced number system concepts, including power cycles, remainder cycles, trailing zeros, and complex numerical problem-solving techniques.
CO3:	Solve quantitative problems involving percentages, profit and loss, discounts, and simple and compound interest.
CO4:	Apply ratio, proportion, mixtures, partnership, averages, and related concepts to solve practical mathematical problems.
CO5:	Analyze and solve problems involving time, speed, distance, trains, races, and related quantitative aptitude concepts.

UNIT I:	NUMBER SYSTEMS AND ITS APPLICATIONS	9 Hrs.
Number Systems: Classification of numbers, divisibility rules, concept of co-primes - Applications: Understanding multiples, factors, least common multiple (LCM) and greatest common divisors (GCD) along with their properties and applications.		

UNIT II:	NUMBER SYSTEMS – ADVANCED CONCEPTS	9 Hrs.
Power cycles - remainder cycles - trailing zeros and complex numerical problems		

UNIT III:	PERCENTAGES AND ITS APPLICATIONS	9 Hrs.
Percentages: Percentage formula, conversion between decimals and fractions, percentage increase and decrease - Applications: Solving problems related to profit and loss, discounts, simple interest, and compound interest in business and financial scenarios.		

UNIT IV:	RATIOS, PROPORTIONS AND ITS APPLICATIONS	9 Hrs.
Ratios and Proportions: Understanding ratio concepts, direct and inverse proportion and their mathematical applications - Applications: Mixtures and allegations, partnership-based profit sharing, age-based problems, and calculating averages in different contexts.		

UNIT V:	TIME, SPEED AND DISTANCE	9 Hrs.
Time, Speed and Distance: Understanding the relation between time, speed and distance, unit conversions, average speed, relative speed, effective speed and solving problems related to trains and races.		

Total Hours: 45

TEXT BOOK:	
1.	R. S. Aggarwal, Quantitative Aptitude for Competitive Examinations. S. Chand, 2021.

REFERENCE BOOKS:	
1.	Arun Sharma, How to Prepare for Quantitative Aptitude for CAT. McGraw-Hill Education, 2021.
2.	Abhijit Guha, Quantitative Aptitude for All Competitive Examinations. McGraw-Hill Education, 2020.

WEB REFERENCES:	
1	www.indiabix.com
2	https://prepinsta.com/quantitative-aptitude/

COs/POs/PSOs Mapping:															
COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3	3	–	–	2	–	–	–	–	–	–	2	2	1	2
2	3	3	–	1	2	–	–	–	–	–	–	2	2	2	2
3	2	3	2	–	2	–	–	–	–	–	1	2	2	2	2
4	2	3	2	–	2	–	–	–	–	–	1	2	2	2	2
5	2	3	2	1	2	–	–	–	–	1	1	3	2	2	3

Correlation Level: 1-Low, 2-Medium, 3- High, '–' - no correlation


BoS Chairman

U25VA02P	Physical Wellness and Yoga	L	T	P	C	Total
		0	0	2	1	30

COURSE OBJECTIVES:

To introduce students to loosening exercises and Surya Namaskar for flexibility, awareness, and foundational yoga practice
To develop knowledge of various asanas, their procedures, breathing techniques, contraindications, and benefits for physical well-being
To provide understanding of pranayama techniques for enhancing respiratory efficiency, concentration, and relaxation
To familiarize students with kriyas and bandhas, their physiological effects, and role in cleansing and energy regulation
To equip learners with knowledge of mudras and relaxation techniques for holistic well-being and stress management

COURSE OUTCOMES:

After completion of the course, the students will be able to

CO1:	Explain the structure and movement of the major joints of the human body and their role in physical activities and yoga practices.
CO2:	Demonstrate the principles, techniques, and benefits of various asanas and pranayama practices.
CO3:	Analyze the purpose, benefits, precautions, and therapeutic applications of different asanas, pranayama, and relaxation techniques.
CO4:	Perform and demonstrate various yoga practices with correct posture, breathing techniques, alignment, and safety measures.
CO5:	Apply appropriate mudras and relaxation techniques to promote relaxation, concentration, and overall wellness.

UNIT I:	LOOSENING EXERCISES AND SURYA NAMASKAR	6 Hrs.
Loosening Exercise Loosening the joints, Joint freeing series, Surya Namaskar: (Bihar school of yoga 12 Steps) – Prayer, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contraindication, and Benefits.		

UNIT II:	ASANAS AND THEIR PRACTICE	6 Hrs.
Asana: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, Benefits, Type and Category of each asana. Standing: Ardhashakrasana, Padmasana, Trikonasana, Ekapadasana. - Sitting: Padmasana, vajrasana, Ustrasana, Pashchimotrasana. - Supine: Uttanapadasana, Ardhamakrasana, Savasana. - Prone: Bhujangasana, Shalabhasana, Makrasana.		

UNIT III:	PRANAYAMA AND BREATHING PRACTICES	6 Hrs.
Pranayama: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, Benefits, Type and Category of each one Pranayama: Surya nadi, Chandra nadi, surya bhedhana, Chandra bhedhana, Nadisudhi.		

UNIT IV:	YOGIC KRIYAS AND BANDHAS	6 Hrs.
Kriyas and Bandha: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, Benefits, Type and Category of each one Kriya – Kapalabhati, Vamana dhauti. Bandha: Jalandhara Bandha, Moolabandha.		

UNIT V:	MUDRAS AND RELAXATION TECHNIQUES	6 Hrs.
Mudra and Relaxation Technique: Name, Meaning, Definition, Guidelines, Procedure, Breathing technique, Awareness, Contra-indication, Benefits, Type and Category of each one Mudras: Chin mudra, chinmaya mudra, adi mudra, Brahma mudra, Bhairava mudra, Bhairavi mudra. Relaxation Technique: Instant Relaxation Technique, Quick Relaxation Technique.		

Total Hours: 30

REFERENCES BOOKS:	
1	B.K.S. Iyengar, " <i>Light on Yoga</i> ", Unwin Paperbacks, 1976.
2	Swami Sivananda Saraswati, " <i>Yoga Asanas</i> ", My Magazine of India, 1934.
3	Swami Satyananda Saraswati, " <i>Asana, Pranayama, Mudra, Bandha</i> ", Yoga Publications Trust, 2008.
4	B.K.S. Iyengar, " <i>Light on Pranayama</i> ", HarperCollins Publishers India, 2008.
5	K. Chandrasekaran, " <i>Sound Health Through Yoga</i> ", Prem Kalan Publications, 1999.

6	Swami Vishnu Devananda, " <i>The Complete Illustrated Book of Yoga</i> ", Pocket Books, 1972.
7	Yogeshwaran and Swami Saraswati, " <i>First Steps to Higher Yoga</i> ", Yoga Niketan Trust, 1975.
8	H. David Coulter, " <i>Anatomy of Hatha Yoga</i> ", Body and Breath Inc., 2001.
9	Martin Kirk, " <i>Hatha Yoga Illustrated</i> ", Human Kinetics, 2006.
10	M. L. Gharote, " <i>Applied Yoga</i> ", Kaivalyadhama, 2004.

WEB REFERENCES :

1.	https://www.ayush.gov.in
2.	https://yogaportal.nic.in
3.	https://www.svyasa.edu.in
4.	https://www.yogaalliance.org

COs/POs/PSOs Mapping:

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
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2	-	-	-	-	-	2	2	1	1	-	3	3	-	-	2
3	-	-	-	-	-	3	2	1	1	-	3	3	-	-	2
4	-	-	-	-	-	3	2	1	1	-	3	3	-	-	2
5	-	-	-	-	-	3	3	2	1	-	3	3	-	-	3

Correlation Level: 1-Low, 2-Medium, 3- High, '-' - no correlation


BoS Chairman