

FACULTY OF SCIENCE AND HUMANITIES

ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMME

**Bachelor of Science (Honors)
in
Artificial Intelligence and Machine Learning**

Four Years

National Education Policy

Learning Outcome-based Curricula Framework

National Credit Framework

Academic Year

2024 - 2025



SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

(Deemed to be University u/s 3 of UGC Act, 1956)

Kattankulathur, Chengalpattu District 603203, Tamil Nadu, India

1. VisionStatement	
Stmt-1	To reach the goals of expansion and improvement of the department and rank among the top computer science departments in the world for teaching, learning, research, and community involvement
Stmt-2	Ensure that students have high quality learning experiences by implementing efficient classroom procedures, using active learning techniques, and creating chances for students and faculty to engage in meaningful interactions

2. MissionStatement	
Stmt-1	To create, disseminate, and apply knowledge in all areas of computer science, including interdisciplinary fields that broaden the field's application and advance humankind
Stmt-2	To equip to work both independently and in teams to solve challenging problems across domains and foster the development of communication skills as an integral part of the profession
Stmt-3	To be successful, moral, ethically strong in the diverse society and encourage consistent and constant active learning through out the life that will positively impact growth of the individual and the country
Stmt-4	To spearhead the progress of computer science by globally acknowledged research and technology transfer
Stmt-5	To be an aspirational, idealized future state for a company, act as inspiration and a roadmap for organizing and making decisions.

“Stmt” stands for Statement

3. Programme Education Objectives (PEO)	
PEO - 1	Graduates commit to understanding, assessing, and demonstrating their knowledge of AI, ML, and human cognition in relation to real world problems in order to meet future challenges.
PEO - 2	Students will be gaining in depth expertise in computer science, engineering, and related fields to create and build unique products and creative solutions for everyday challenges.
PEO - 3	Opportunity to pursue postgraduate studies and research or to succeed in the AIML related sectors .
PEO - 4	Graduates will prosper in the field of machine learning and artificial intelligence by applying their knowledge and skills to create workable and realistic technical solutions.
PEO - 5	Graduates will be capable of managing resources well and pursuing their vocations with morality, social responsibility, and honesty.

4. Consistency of Program Education Objectives with Mission					
	Mission Stmt. 1	Mission Stmt. 2	Mission Stmt. 3	Mission Stmt. 4	Mission Stmt. 5
PEO - 1	High	High	High	Low	Low
PEO - 2	High	High	High	Medium	Medium
PEO - 3	High	High	High	Medium	Medium
PEO - 4	Medium	Medium	Medium	High	High
PEO - 5	Medium	Medium	Medium	High	High

** H – High Correlation, M – Medium Correlation, L – Low Correlation

** H, M, and L have numerical equivalents of 3, 2, 1 correspondingly

5. Programme Learning Outcomes (PLO)	
Graduate Learning Attributes	
PLO - 1	Problem Solving, Critical Thinking, Creativity
PLO - 2	Communication Skills, Collaborating Skills
PLO - 3	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Skills
PLO - 4	Leadership Qualities, Professionalism, Autonomy, Accountability
PLO - 5	Digital Technology Skills
PLO - 6	Value Inculcation, Multicultural inclusivity
PLO - 7	Environmental Action, Community Engagement
PLO - 8	Entrepreneurial Risk Taking
PSO - 1	Graduates will demonstrate a deep understanding of data science principles, techniques, and methodologies, including statistical analysis, machine learning algorithms, and data visualization.
PSO - 2	Graduates will possess strong analytical and problemsolving skills, allowing them to effectively identify patterns, trends, and correlations within data, and to formulate actionable recommendations based on their findings.

PSO – Programme Specific Outcomes

6	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO-8	PLO9	PLO10
PEO - 1	3	2	2	1	2	1	2	1	3	3
PEO - 2	3	2	2	1	2	1	2	1	3	3
PEO - 3	3	2	2	1	2	1	2	1	3	3
PEO - 4	3	2	2	1	2	1	2	1	3	3
PEO - 5	3	2	2	1	2	1	2	1	3	3

7. Programme Structure

Programme Structure												
Discipline Core Courses (C)						Discipline Core / Elective Courses (D)						
Course Code	Course Title	Sessions/Week				Course Code	Course Title	Sessions/Week				
		L	T	P	C					L	T	P
UAI24101J	Computing Fundamentals	3	0	3	4	UAI24D01J	Introduction to Artificial Neural Networks	3	0	2	4	
UAI24102J	Introduction to Artificial Intelligence and Machine Learning	3	0	3	4		UAI24D02J					Applications of Artificial Intelligence
UMS24103T	Mathematics for Artificial Intelligence	4	0	0	4		UAI24D03J					Introduction to Internet of Things
USA24201J	Data Structures and Algorithms	3	0	3	4		UAI24D04J					Human Machine Interaction
UCS24202J	Object Oriented Programming using Java	3	0	3	4	UAI24D05J	Data Science and its Applications	3	0	2	4	
UMS24203T	Statistics for Artificial Intelligence	4	0	0	4	UAI24D06J	Software Engineering and Project Management					
UCS24301J	Operating System	3	0	3	4	UAI24D07J	Deep Learning Techniques					
USA24302J	Database Management System	3	0	3	4	UAI24D08J	BlockchainTechnology					
UAI24303J	Machine Learning using Python	3	0	3	4	UAI24D09J	Reinforcement Learning	3	0	2	4	
UAI24401J	Computer Networks	3	0	3	4	UAI24D10J	Natural Language Processing					
Total Learning Credits					40	UAI24D11J	Robotics and Intelligent Systems					
						UAI24D12J	Applications of Edge IoT and ML					
Elective Courses (Minor) (E)						UAI24D13J	Mobile Application Development	3	0	2	4	
Course	Course	Sessions/Week				UAI24D14J	Real World Computer Visions Applications					
Code	Title	L	T	P	C	UAI24D15J	Business Intelligence					
UDS24E01J	Data Science and Analytics	3	0	3	4	UAI24D16J	Optimization Concepts for Data Science and Artificial Intelligence					
UDS24E02J	Data Analytics using Spreadsheet	3	0	3	4	UAI24D17J	Web Intelligence and Mining	3	0	2	4	
UDS24E03J	Essentials of Machine Learning	3	0	3	4	UAI24D18J	Advanced Analytics and Data Visualization for Enterprise					
UDS24E04J	Programming using R	3	0	3	4	UAI24D19J	Recommendation Systems					
UDS24E05J	Programming using Python	3	0	2	4	UAI24D20J	Planning Techniques for Robotics					
UDS24E06J	Introduction to Deep Learning	3	0	2	4	Total Learning Credits					40	
UDS24E07J	Applications of Computer Vision	3	0	2	4							
UDS24E08J	Data Visualization Tools	3	0	2	4							
Total Learning Credits												
Ability Enhancement Courses (A)						Multidisciplinary Courses (M)						
Course	Course	Sessions/Week				Course	Course	Sessions/Week				
Code	Title	L	T	P	C	Code	Title	L	T	P	C	
ULT24AE1J	Tamil – I	2	0	2	3	UCS24M01J	Introduction to ICT Tools	2	0	2	3	
ULH24AE1J	Hindi – I					UCS24M02J	Fundamentals of Digital Marketing	3	0	1	3	
ULF24AE1J	French – I					UCS24M03J	Basics of Web Application Development	2	0	2	3	
ULE24AE1J	English	2	0	2	3	Total Learning Credits					9	
ULT24AE2J	Tamil – II	2	0	2	3							
ULH24AE2J	Hindi – II											
ULF24AE2J	French – II											
Total Learning Credits					9							
Value Added Courses (V)						Skill Enhancement Courses (S)						
Course	Course	Sessions/Week				Course	Course	Sessions/Week				
Code	Title	L	T	P	C	Code	Title	L	T	P	C	
UCD24V01T	Essential of Artificial Intelligence	1	0	0	1	UCD24S01J	Verbal Ability and Skill Development	1	0	2	2	
UES24V01T	Environmental Studies	2	0	0	2	UCD24S02L	Quantitative Aptitude and Logical Reasoning	0	0	2	1	
UCD24V02T	Universal Human Values	2	0	0	2	UCD24S03J	Industry Oriented Employability and Leadership Skills	1	0	2	2	
Total Learning Credits					5	UEN24S01L	Communication Skills	0	0	4	2	
						UCD24S04J	Career Readiness and Professional Skills	1	0	2	2	
						Total Learning Credits					9	

Project Work/Internship (R)						Mandatory Courses(Y)					
Course	Course	Sessions/Week				Course	Course	Sessions/Week			
Code	Title	L	T	P	C	Code	Title	L	T	P	C
UCS24P01L	Internship – I	0	0	0	1	UNS24Y01L	NSS	0	0	0	0
UCS24P02L	Internship – II	0	0	0	1	UNC24Y01L	NCC				
UCS24P03L	Project Work	0	0	4	2	UNO24Y01L	NSO				
UCS24P04L	Research Project and Dissertation	0	0	24	12	UYG24Y01L	YOGA				
UCS24P05L	Professional Internship					UMI24Y01L	My India Project	0	0	0	0
Total Learning Credits					16	Total Learning Credits					0

Internship – I to be completed during Summer Vacation of the First year

Internship – II to be completed during Summer Vacation of the Second year

Students from other departments can enroll in Elective Courses (Minor) (E)

Students from all departments will be able to enroll in Multidisciplinary Courses (M).

8. Course Allocation across Semesters

Semester I					
Course Code	Course Title	Sessions / Week			C
		L	T	P	
ULT24AE1J	Tamil - I	2	0	2	3
ULH24AE1J	Hindi - I				
ULF24AE1J	French - I				
ULE24AE1J	English	2	0	2	3
UAI24101J	Computing Fundamentals	3	0	3	4
UAI24102J	Introduction to Artificial Intelligence and Machine Learning	3	0	3	4
UMS24103T	Mathematics for Artificial Intelligence	4	0	0	4
UCD24S01J	Verbal Ability and Skill Development	1	0	2	2
Total Learning Credits					20

Semester – II					
Course Code	Course Title	Sessions/ Week			C
		L	T	P	
ULT24AE2J	Tamil - II	2	0	2	3
ULH24AE2J	Hindi - II				
ULF24AE2J	French - II				
USA24201J	Data Structures and Algorithms	3	0	3	4
UCS24202J	Object Oriented Programming using Java	3	0	3	4
UMS24203T	Statistics for Artificial Intelligence	4	0	0	4
UCD24V01T	Essential of Artificial Intelligence	1	0	0	1
	Multidisciplinary Course – I				3
UCD24S02L	Quantitative Aptitude and Logical Reasoning	0	0	2	1
UNS24Y01L	NSS	0	0	0	0
UNC24Y01L	NCC				
UNO24Y01L	NSO				
UYG24Y01L	YOGA				
	Total Learning Credits				20

Total Learning Credits of Courses of FIRST year = 40

Semester III						
Course Code	Course Title	Sessions/ Week			C	
		L	T	P		
UCS24301J	Operating System	3	0	3	4	
USA24302J	Database Management System	3	0	3	4	
UAI24303J	Machine Learning using Python	3	0	3	4	
	Multidisciplinary Course – II				3	
	Elective Course (Minor) – I				4	
UCS24P01L	Internship – I	0	0	0	1	
Total Learning Credits					20	

Semester IV						
Course Code	Course Title	Sessions/ Week			C	
		L	T	P		
UAI24401J	Computer Networks	3	0	3	4	
UAI24D01J	Introduction to Artificial Neural Networks	3	0	2	4	
UAI24D02J	Applications of Artificial Intelligence					
	Elective Course (Minor) – II				4	
	Elective Course (Minor) – III				4	
UEN24S01L	Communication Skills	0	0	4	2	
UCD24S03J	Industry Oriented Employability and Leadership Skills	1	0	2	2	
UMI24Y01L	My India Project	0	0	0	0	
Total Learning Credits					20	

Total Learning Credits of Courses of SECOND year = 40

Semester V					
Course Code	Course Title	Sessions/ Week			C
		L	T	P	
UAI24D03J	Introduction to Internet of Things	3	0	2	4
UAI24D04J	Human Machine Interaction				
UAI24D05J	Data Science and its Applications	3	0	2	4
UAI24D06J	Software Engineering and Project Management				
	Elective Course (Minor) – IV				4
	Multidisciplinary Course – III				3
UES24V01T	Environmental Studies	2	0	0	2
UCD24S04J	Career Readiness and Professional Skills	1	0	2	2
UCS24P02L	Internship – II	0	0	0	1
Total Learning Credits					20

Semester VI					
Course Code	Course Title	Sessions/ Week			C
		L	T	P	
UAI24D07J	Deep Learning Techniques	3	0	2	4
UAI24D08J	Blockchain Technology				
UAI24D09J	Reinforcement Learning	3	0	2	4
UAI24D10J	Natural Language Processing				
	Elective Course (Minor) – V				4
	Elective Course (Minor) – VI				4
UCS24P03L	Project Work	0	0	4	2
UCD24V02T	Universal Human Values	2	0	0	2
Total Learning Credits					20

Total Learning Credits of Courses of THIRD year = 40

Semester VII					
Code	Course Title	Sessions/ Week			C
		L	T	P	
UAI24D11J	Robotics and Intelligent Systems	3	0	2	4
UAI24D12J	Applications of Edge IoT and ML				
UAI24D13J	Mobile Application Development	3	0	2	4
UAI24D14J	Real World Computer Visions Applications				
UAI24D15J	Business Intelligence	3	0	2	4
UAI24D16J	Optimization Concepts for Data Science and Artificial Intelligence				
	Elective Course (Minor) – VII				4
	Elective Course (Minor)– VIII				4
Total Learning Credits					20

Semester VIII					
Code	Course Title	Sessions/ Week			C
		L	T	P	
UAI24D17J	Web Intelligence and Mining	3	0	2	4
UAI24D18J	Advanced Analytics and Data Visualization for Enterprise				
UAI24D19J	Recommendation Systems	3	0	2	4
UAI24D20J	Planning Techniques for Robotics				
UCS24P04L	Research Project and Dissertation	0	0	24	12
UCS24P05L	Professional Internship				
Total Learning Credits					20

Total Learning Credits of Courses of FOURTH year = 40

8.1 Elective Courses (MINOR) offered by the Department of AI& ML to other Departments(Excluding Department of AI & ML)

Elective Courses (Minor) (E)						
Semester	Course Code	Course Title	Sessions per Week			C
			L	T	P	
III	UDS24E01J	Data Science and Analytics	3	0	3	4
IV	UDS24E02J	Data Analytics using Spreadsheet	3	0	3	4
IV	UDS24E03J	Essentials of Machine Learning	3	0	3	4
V	UDS24E04J	Programming using R	3	0	3	4
VI	UDS24E05J	Programming using Python	3	0	2	4
VI	UDS24E06J	Introduction to Deep Learning	3	0	2	4
VII	UDS24E07J	Applications of Computer Vision	3	0	2	4
VII	UDS24E08J	Data Visualization Tools	3	0	2	4
Total Learning Credits						32

8.2 Multidisciplinary Courses offered by the Department of AI & ML to all departments (Including Department of AI & ML)

Multidisciplinary Courses (M)						
Semester	Course Code	Course Title	Sessions per Week			C
			L	T	P	
II	UCS24M01J	Introduction to ICT Tools	2	0	2	3
III	UCS24M02J	Fundamentals of Digital Marketing	3	0	1	3
V	UCS24M03J	Basics of Web Application Development	2	0	2	3
Total Learning Credits						9

9. Programme Articulation Matrix

Course Code	Course Name	Programme Learning Outcomes									
		1	2	3	4	5	6	7	8	PSO1	PSO2
ULT24AE1J	Tamil- I	3	2	2	2	2	2	-	2	2	2
ULH24AE1J	Hindi- I	3	2	2	2	2	2	-	2	2	2
ULF24AE1J	French- I	3	2	2	2	2	3	-	2	2	2
ULE24AE1J	English	3	2	2	2	2	3	-	2	2	2
UAI24101J	Computing Fundamentals	3	1	2	2	3	3	-	2	3	2
UAI24102J	Introduction to Artificial Intelligence and Machine Learning	3	2	2	2	3	3	-	2	3	2
UMS24103T	Mathematics for Artificial Intelligence	1	1	-	-	1	-	-	-	-	-
UCD24S01J	Verbal Ability and Skill Development	3	1	3	-	2	2	-	-	-	-
ULT24AE2J	Tamil -II	3	2	2	2	2	2	-	2	2	2
ULH24AE2J	Hindi -II	3	2	2	2	2	2	-	2	2	2
ULF24AE2J	French -II	3	2	2	2	2	3	-	2	2	2
USA24201J	Data Structures and Algorithms	3	2	2	2	3	3	-	2	2	2
UCS24202J	Object Oriented Programming using Java	3	2	2	2	3	3	-	2	2	2
UMS24203T	Statistics for Artificial Intelligence	1	1	-	-	1	-	-	-	-	-
UCD24V01T	Essential of Artificial Intelligence	3	3	2	2	3	3	-	2	2	2
	Multidisciplinary I	3	2	2	2	3	3	-	2	3	2
UCD24S02L	Quantitative Aptitude and Logical Reasoning	3	2	2	2	3	3	-	2	2	2
UNS24Y01L	NSS	3	2	2	2	-	3	-	1	-	-
UNC24Y01L	NCC	3	2	2	2	-	3	-	1	-	-
UNO24Y01L	NSO	3	2	2	2	-	3	-	1	-	-
UYG24Y01L	YOGA	3	2	2	2	-	3	-	1	-	-
UCS24301J	Operating System	3	2	2	2	3	3	-	2	3	2
USA24302J	Database Management System	3	2	2	2	3	3	-	2	3	2
UAI24303J	Machine Learning using Python	3	2	2	2	3	3	-	2	3	2
	Multidisciplinary Course – II	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – II	3	2	2	2	3	3	-	2	3	2
UCS24P01L	Internship – I	3	2	3	3	3	3	2	2	3	3
UAI24401J	Computer Networks	3	2	2	2	3	3	-	2	3	2
UAI24D01J	Introduction to Artificial Neural Networks	3	2	2	2	3	3	-	2	3	2
UAI24D02J	Applications of Artificial Intelligence	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – II	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – III	3	2	2	2	3	3	-	2	3	2
UEN24S01L	Communication Skills	3	2	2	2	2	3	-	2	2	2
UCD24S03J	Industry Oriented Employability and Leadership Skills	3	2	2	2	3	3	-	2	2	2
UMI24Y01L	My India Project	3	2	3	3	3	3	2	2	3	3
UAI24D03J	Introduction to Internet of Things	3	2	2	2	3	3	-	2	3	2
UAI24D04J	Human Machine Interaction	3	2	2	2	3	3	-	2	3	2
UAI24D05J	Data Science and its Applications	3	2	2	2	3	3	-	2	3	2

UAI24D06J	Software Engineering and Project Management	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – IV	3	2	2	2	3	3	-	2	3	2
	Multidisciplinary Course – III	3	2	2	2	3	3	-	2	3	2
UES24V01T	Environmental Studies	3	2	2	2	3	3	-	2	3	2
UCD24S04J	Career Readiness and Professional Skills	3	2	2	2	3	3	-	2	2	2
UCS24P02L	Internship – II	3	2	3	3	3	3	2	2	3	3
UAI24D07J	Deep Learning Techniques	3	2	2	2	3	3	-	2	3	2
UAI24D08J	Blockchain Technology	3	2	2	2	3	3	-	2	3	2
UAI24D09J	Reinforcement Learning	3	2	2	2	3	3	-	2	3	2
UAI24D10J	Natural Language Processing	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – V	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – VI	3	2	2	2	3	3	-	2	3	2
UCS24P03L	Project Work	3	2	3	3	3	3	2	2	3	3
UCD24V02T	Universal Human Values	3	2	3	3	3	3	2	2	3	3
UAI24D11J	Robotics and Intelligent Systems	3	2	2	2	3	3	-	2	3	2
UAI24D12J	Applications of Edge IoT and ML	3	2	2	2	3	3	-	2	3	2
UAI24D13J	Mobile Application Development	3	2	2	2	3	3	-	2	3	2
UAI24D14J	Real World Computer Visions Applications	3	2	2	2	3	3	-	2	3	2
UAI24D15J	Business Intelligence	3	2	2	2	3	3	-	2	3	2
UAI24D16J	Optimization Concepts for Data Science and Artificial Intelligence	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – VII	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) – VIII	3	2	2	2	3	3	-	2	3	2
UAI24D17J	Web Intelligence and Mining	3	2	2	2	3	3	-	2	3	2
UAI24D18J	Advanced Analytics and Data Visualization for Enterprise	3	2	2	2	3	3	-	2	3	2
UAI24D19J	Recommendation Systems	3	2	2	2	3	3	-	2	3	2
UAI24D20J	Planning Techniques for Robotics	3	2	2	2	3	3	-	2	3	2
UCS24P04L	Research Project and Dissertation	3	2	3	3	3	3	2	2	3	3
UCS24P05L	Professional Internship	3	2	3	3	3	3	2	2	3	3
Average											

Abbreviations

CLR – Course Learning Rationale
CLO – Course Learning Outcomes
PLO – Programme Learning Outcomes
SLO – Session Learning Outcomes
BLoT – Bloom’s Level of Thinking
CLA – Continuous Learning Assessment

SEMESTER - I

Course Code	ULT24AE1J	Course Title	Tamil – I	Category	A	Ability Enhancement Course	L	T	P	C
							2	0	2	3

Course Offering Department	Tamil	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcome (PLO)									
CLR-1	மரபிலிருந்து மாற்றம் பெற்ற புதுக்கவிதை மரபின்சிந்தனைகளை அறியச்செய்தல்	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	நவீன கவிதையின் வழிமனிதவாழ்வியல்விழுமியங்களைத் தெரியச்செய்தல்																	
CLR-3	சுற்றிலக்கியங்கள், காப்பியங்கள்கற்பிக்கும்தமிழ்ச்சமூகத்தின்வாழ்வியலைஅறியச்செய்தல்																	
CLR-4	நவீனதமிழ்இலக்கியவளர்ச்சிவரலாற்றைப்புரியச்செய்தல்																	
CLR-5	மொழிப்பயிற்சிவழிமொழியின்பல்வேறுநூட்பங்களைத்தெரியச்செய்தல்																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	புதுக்கவிதைஉருவாக்கித்தந்தபுதியசிந்தனைக்களங்களைஅறிந்துகொள்ளுதல்	✓	✓	-	-	2	75	60	3		3	-	-	-	3	-	-	-
CLO-2	நவீனகவிதைகள்வழிமாற்றம்பெற்றுவரும்மானுடவிழுமியங்களைத்தெரிந்துகொள்ளுதல்	✓	✓	✓	-	2	80	70	-	-		2	3	3	-	-	-	-
CLO-3	தமிழ்ச்சமூகத்தின்இடைக்காலவாழ்வியல்முறைகளைஉணர்ந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	65	3		3	-	2	-	-	-	-	-
CLO-4	நவீனஇலக்கியவரலாறுவழிதமிழ்க்கல்விவரலாறு, சமூகவரலாறுபெற்றவளர்ச்சிநிலைகளைத்தெரிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	70	-	3		-	2	-	-	-	-	-
CLO-5	மொழியின்நூட்பங்களைத்தெரிந்துமொழிஆளுமையோடுசெயல்படும்திறன்பெறுதல்	✓	✓	✓	✓	3	80	70	3	3		2	-	-	-	-	-	-

Session	CLO – 1	CLO – 2	CLO – 3	CLO – 4	CLO – 5
	12	12	12	12	12
SLO-1	தமிழ்க்கவிதைமரபு	நவீனகவிதைதோற்றம், வரலாறு	தமிழரின்வீரமரபு - போர்விழுமியங்கள்	சுற்றிலக்கியத்தோற்றம் – வகைமை	தமிழ்உரைநடைமரபு – உ.வே.சா. வின்பங்களிப்பு
SLO-2	புதுக்கவிதைஉருவாக்கம், புதுக்கவிதைவளர்ச்சிநெறிகள்	நவீனகவிதைகளில் செல்நெறிகள்	பரணிஅறிமுகம் பரணிஇலக்கியங்கள்	பிள்ளைத்தமிழ் -உலா -தூது	உ.வே.சா. வின்ராஜவைத்தியம்

SLO-3	பாரதியார்பன்முகஆளுமைத் திறன்	கவிதைமொழி - நவீனகவிஆளுமைகள்	தலைவனின்வீரம்- கலிங்கத்துப்பரணி 477,490	புதுக்கவிதையின்தோற்றமும் மொழியும்	நாட்டுப்புறமரபில்சிறுதெய்வவழிபாடு
SLO-4	பாரததேசம் பாரததேசத்தின்வளம்	கவிதையில்நாட்டுப்புறவடிவம்	தமிழ்இலக்கியமரபில் தூதுஇலக்கியங்கள்	புதுக்கவிதையில்சமூகம்- புதுக்கவிதையும்இதழ்களும்	கழனியூரனின்பொன்காத்த ஐயனார்
SLO-5	வெள்ளிப்பனிமலையின்மீதுவலுவோம்...	பெண்களின்கல்விநிலை - இளம்பிறை - அம்மா	தமிழின்பெருமை - தமிழ்விடுதூது (184 - 186)	மணிக்கொடிஇதழ், எழுத்துஇதழ், வானம்பாடிஇதழ்	பிழைநீக்கிஎழுதும்நுட்பங்கள்
SLO-6	20 ஆம்நூற்றாண்டுக்கவிதைமரபில்பாரதிதாசன்	ஆண்பெண்சமத்துவமும் ப.கல்பனா - கீறல்விழுந்தமாலைக்காலங்கள்	செய்யுள்மரபில் கலம்பகஇலக்கியங்கள்	சிறுகதைதோற்றம் - சிறுகதைவளர்ச்சி	எழுத்துப்பிழை - ந - ண - ன ல, ள, ழ, ர, றவேறுபாடுஅறிதல்
SLO-7	பாரதிதாசன்-அழகின்சிரிப்பு ஆல் - ஆயிரம்கிளைகள்கொண்டஅடிமரம்	விளிம்புநிலைவாழ்வியல்: திருநற்களும்சாதனைகளும்	கையறுநிலை - நந்திக்கலம்பகம்- வானுறுமதியை (110)	சிறுகதைவரலாறு- சிறுகதைஆசிரியர்கள்	தொடர்பிழை ஒருமைபன்மைவேறுபாடு
SLO-8	ஆல் - ஆயிரம்கிளைகள்கொண்டஅடிமரம்	திருநங்கைகுணவதி - சமூகப்பார்வை	தமிழ்இலக்கியமரபில் குறவஞ்சிஇலக்கியங்கள்	இதழ்களும்சிறுகதையும்	பிறமொழிச்சொற்களைநீக்கிஎழுதுதல், ஷ, ஜ, ஸ, ஹமாற்றொலிகள்
SLO-9	வானம்பாடிக்கவிஞர்களும்மு. மேத்தாவும்	புலம்பெயர்வாழ்வியல்- வலியும்நம்பிக்கையும்	குற்றாலக்குறவஞ்சி - ஆடுமரவீனுமணி (3)	புதினம்தோற்றம் - புதினம்வளர்ச்சிவரலாறு	தமிழில்சொல்வகைகள் சொல்லும்பயன்பாடும்
SLO-10	மனிதநேயம் - மு.மேத்தாவின் மனிதனைத்தேடி	ஸர்மிளாஸெய்யித் - புராதனஊர்	காப்பியஇலக்கணம் - காப்பியவகைமைகள்	புதினத்தின்வகைமை புதினஆசிரியர்கள்	பெயர்ச்சொற்கள் பெயர்ச்சொற்களும்வகைகளும்
SLO -11	தமிழ்க்கவிதையில்சுற்றுச்சூழலியல்	காலந்தோறும்கவிதைவடிவில் மாற்றங்கள். ஹைக்கூ - மு.முருகேஷ்	சிலப்பதிகாரம் - அறிமுகம் கட்டுரைக்காதை	தமிழ்இலக்கியத்தில்உரைநடைக்கூறுகள் - உரைநடையின்தோற்றம்	வினைச்சொற்கள்அறிதல்
SLO -12	இயற்கையும்சமத்துவமும் பழனிபாரதியின்காடு	லிமரைக்கூ - ஈரோடுதமிழன்பன் சென்ரியூ - மாமதயானை	ஊழ்வினை - கோவலனின்முற்பிறப்பு வரலாறு	தமிழில்உரைநடை வளர்த்தஅறிஞர்கள்	தமிழில்பெயரடை, வினையடை அறிதல்

Resources			
1	முல்லைக்காடு, தொகுப்புப்பதிப்பும்-தமிழ்த்துறைஆசிரியர்கள், எஸ்.ஆர்.எம். அறிவியல்மற்றும்தொழில்நுட்பக்கல்விநிறுவனம், காட்டாங்குளத்தூர், 603203, 2023	4	வல்லிக்கண்ணன், புதுக்கவிதைதோற்றமும்வளர்ச்சியும், ஆழிபதிப்பகம், சென்னை, 2018
2	கா. சிவத்தம்பி, தமிழில்சிறுகதைதோற்றமும்வளர்ச்சியும், என்.சி.பி.எச்., சென்னை, 2013	5	மு.வரதராசன், தமிழ்இலக்கியவரலாறு, சாகித்தியஅக்காதெமி, 1972.
3	மதுரைதமிழ்இலக்கியமின்தொகுப்புத்திட்டம் - https://www.projectmadurai.org/	6	தமிழ்இணையக்கல்விக்கழகம் - http://www.tamilvu.org/

Assessment											Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA - 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 * (10%)			Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)							
												Learning Management System	✓	Group Discussion	✓	Quality Education
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15						
3	Apply	20	25	25	20	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers						
Professional Experts			Higher Institution Experts		Internal Experts	
1	Dr.P.R.Subramanian, Director, Mozhi Trust, Thiruvanmiyur, Chennai – 600 041	1	Dr. V. Dhanalakshmi, Associate Professor, Subramania Bharathi School of Tamil Language & Literature, Pondicherry University, Pondicherry	1	Dr.B.Jaiganesh, Associate Professor and Head, Department of Tamil, FSH, SRMIST, Kattankulathur	
				2	Dr. R. Ravi, Assistant Professor and Head, Department of Tamil, FSH, SRMIST, Vadapalani	
				3	Mr. G. Ganesh, Assistant Professor, Department of Tamil, FSH, SRMIST, Ramapuram	
				4	Dr. T.R.Hebzibahbeulah Suganthi, Assistant Professor, Department of Tamil, FSH, SRMIST, Kattankulathur	
				5	Dr.S.Saraswathy, Assistant Professor, Department of Tamil, FSH, SRMIST, Kattankulathur	

Course Code	ULH24AE1J	Course Title	Hindi – I				Category	A	Ability Enhancement Course	L	T	P	C
										2	0	2	3

Course Offering Department	Hindi	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Prgramme Learning Outcome (PLO)									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	To Communicate in Hindi without any inhibition																	
CLR-2	To appreciate the Hindi language in its various forms																	
CLR-3	To analyze the different writing styles																	
CLR-4	To display moral and social values in the field of social Responsibility and Integrity																	
CLR-5	To be willing listeners and Translators-where need be																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	To Understand the Philosophy of life and living through Stories	✓	✓	-	-	2	85	75	3	2	3	-	-	2	-	-	-	-
CLO-2	To Examine Travelogue writing and Sketch	✓	✓	✓	-	2	85	75	3	-	2	-	3	3	-	-	-	-
CLO-3	To Identify Irony and essay - based writing	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-	-	-	-
CLO-4	Evaluate the various social issues depicted in the prose	✓	✓	✓	✓	3	85	75	2	-	2	3	-	-	2	-	-	-
CLO-5	To Understand the fundamental principal of Translation	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-	-	-	-

Sessions	CLO – 1	CLO - 2	CLO – 3	CLO – 4	CLO - 5
	12	12	12	12	12
SLO-1	KAHANI KI AVDHARNA	REKHACHITRA & YATRAVITRANT	NIBANDH	NATAK	ANUVAD& PARIBHASHIK SHABDAVALI
SLO-2	SWARUP AUR PARIBHASHA	AVDHARNA EVM SWAROOP	NIBANDH KI AVDHARNA EVM SAWROOP	AVDHARNA EVM SAWROOP	ARTH EVM PARIBHASHA
SLO-3	KAHANI KE TATVA EVM MAHATWA	MAHATVA AUR UDDESHYA	MAHATVA EVM UDDESHYA	TATWA EVM PRAKAR	SWARUP EVM PRAKAR
SLO-4	PARIKSHA- PREMCHAND	GESHA REKHACHITRA	KUTAJ- NIBANDH HAJARI PRASHAD DIVEDI	UDDESHYA	MAHATVA

SLO-5	VISLESHAN	PATH KA VISHLESHAN	LEKHIK PARICHAY	NATAK KA MAHATVA	UDDESHYA
SLO-6	UDDESHYA	GURU SHISHYA KA SAMBANDH	SHANGHARSHIL JEEVAN	RANGMANCH KA PARICHAY	ANUVAD KA PRAYOGAN EVM PRAYOG
SLO-7	MALBE KA MALIK- MOHAN RAKESH	THELE PAR HIMALAY (YATRAVITRANT)	PATH KA MAHATVA	LEKHAK PARICHAY	SHROT EVM LAKSHYA BHASHA KA GYAN
SLO-8	LEKHAK PARICHAY	YATRAVITRANT KA MAHATVA	BHOLARAM KA JEEV- (VYANGYA) HARISHANKAR PARSHAI	NATAK KA VISLESHAN	ANUVAD KA DAYITVA
SLO-9	BATWARE KA YATHARTH VARNAN	YATRA KA YATHARTH CHITRAN	VYANGYA KI AVADHARNA	LALCH KA DUSHPARINAM	PARIBHASHIK SHABDAVALI
SLO-10	TATKALIN PARISHTHITI KA VARNAN	PATH KA VISLESHAN	PATH KA VISHLESHAN	GURU SHISHYA SAMBANDH	TAKANIKI SHABDAVALI KA MAHATVA
SLO-11	KAHANI KA VISHLESHAN	HIMALAY KA LOK JEEVAN	SARKARI TANTRA KA KHOKHLA RUP	MAHATTAKANKSHI KA DUSHPARINAM	VIVIDH PRAYOG
SLO-12	KAHANI KA UDDESHYA	HIMALAY KA VARNANA	SANVEDANSHIL BHAVANA	TATKALIN SAMAJIK VYAVASTHA KI CHARCHA	SHABDAVALI KI AVSHYAKTA

Resources					
1	Samanya Hindi, Srijonlok Publication, 2023, New Delhi			4	Bhakti Andolan Aur Surdas Ka Kavya – Manager Pandey
2	Kabir – Hazari Prasad Dwedi			5	Bihari – Vishvnath Prasad Mishr
3	Surdas – Ram Chandra Shukl			6	Aadhunik Vigyapan Aur Jansampark – Taresh Bhatia

Assessment											Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 *			Simulations	✓	Clarification/Pauses	✓	Good Health & Well Being	✓
								(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)						
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15						
3	Apply	20	25	25	20	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers									
Professional Experts				Higher Institution Experts				Internal Experts	
1	Ms. Reetha Govindan, Senior Manager (Rajbhasha)			1	Dr. S. Padmapriya, Professor and Head, Pondichery University, Kalapet, Puducherry - 605014			1	Dr. S Preeti. Associate Professor, SRMIST
2	Mr. Vipin Kumar Jha, Senior Translation Officer (ALUMNI)							2	Dr. Md. Shwahidul Islam, Assistant Professor, SRMIST
								3	Dr. S. Razia Begum, Assistant Professor, SRMIST
								4	Dr. Nisha Murlidharan Assistant Professor, SRMIST

Course Code	ULF24AE1J	Course Title	French – I	Category	A	Ability Enhancement Course	L	T	P	C
							2	0	2	3

Course Offering Department	French	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Prgramme Learning Outcome (PLO)									
CLR-1	Extend and expand their savoir-faire through the acquisition of current scenario	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving, Communication Skills, Collaborating Skills	Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills	Value Inculcation, Multicultural Environmental Action, Community	Entrepreneurial Risk Taking	PSO 1	PSO 2				
CLR-3	Make them learn the basic rules of French Grammar.																	
CLR-4	Develop strategies of comprehension of texts of different origin																	
CLR-5	Strengthen the language of the students both in oral and written																	
CLO	At the end of this course, learners will be able to:	✓	✓	-	-	2	85	75	3	2	3	-	-	2	-	-	-	-
CLO-1	To acquire knowledge about French language	✓	✓	✓	-	2	85	75	3	-	2	-	3	-	3	-	-	-
CLO-2	To strengthen the knowledge on concept, culture, civilization, and translation of French	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-	-	-	-
CLO-3	To develop content using the features in French language	✓	✓	✓	✓	3	85	75	2		2	3	-	-	2	-	-	-
CLO-4	To interpret the French language into other language	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-	-	-	-
CLO-5	To improve the communication, intercultural elements in French language	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-	-	-	-

Sessions	CLO – 1 12	CLO - 2 12	CLO – 3 12	CLO – 4 12	CLO – 5 12
SLO-1	Contacts, Emma la championne	Les verbes du premier groupe	Qu'est-cequ'ils font?	Portraits	Les verbes du deuxième groupe –
SLO-2	Les nombres à partir de 31	La liaison	Oùestmon sac	Un casting	Les pronoms personnels toniques
SLO-3	Les pays, les nationalités	Entreren contact	Quelquesobjets	Le Petit Spirou	Les verbes faire et lire
SLO-4	Les jours de la semaine, Les jours	Présenter et se presenter	Les professions	L'aspect physique	Les Sons
SLO-5	Les mois de l'année, Les animaux domestiques	Demander et dire la date	La formation du féminin (2)	Le caractère	Décrirele'aspect physique
SLO-6	La famille (1)	Une rencontre.	Qu'est-ce que c'est?	les états d'âme	Demander et dire l'heure
SLO-7	La formation du féminin (1)	Contacts	C'est / Il est (1)	Les prépositions de lieu (1)	Elle est comment?
SLO-8	Les adjectifspossessifs	Emma la Championne	La phrase négative (1)	La famille (2)	Portraits

Course Code	ULE24AE1J	Course Title	English	Category	A	Ability Enhancement Course	L	T	P	C
							2	0	2	3

Course Offering Department	English	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Prgramme Learning Outcome (PLO)									
CLR-1	Develop an understanding and sensibility of human consciousness through gender inclusive curriculum	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Enhance the abilities of deeper understanding to stay with integrity with the fellow human beings																	
CLR-3	Develop the overall language competency of the learner																	
CLR-4	Develop proficient language skills																	
CLR-5	Learn to express the thoughts clearly, develop logical arguments and enhance the overall communication skills.																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Skills	Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Education, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO 1	PSO 2
CLO-1	Analyze different literary texts to identify the representation of issues related to gender, and class	✓	✓	-	-	2	85	75	3	3	3	3	-	3	3	2	3	3
CLO-2	Apply critical thinking skills to analyze and respond to academic texts.	✓	✓	✓	-	2	85	75	3	2	3	2	-	3	1	-	3	3
CLO-3	Critically evaluate and discuss contemporary issues through online articles.	✓	✓	✓	✓	3	85	75	3	3	3	3	3	3	2	1	3	3
CLO-4	Refine their general writing skills	✓	✓	✓	✓	3	85	75	1	2	2	1	3	3	2	2	3	1
CLO-5	Improve their language application skills	✓	✓	✓	✓	3	85	75	3	3	2	3	1	1	1	1	3	1

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	Poetry	Short Stories	Learning About Writing	Learning About Speaking	Reflection of the Language Learning
	12	12	12	12	12
SLO-1	Introduction to the poet-Sukirtharani- Reading and recitation of the poem –Debt	Introduction to the short story writer Katherine Mansfield. Reading the story- The Doll’s House Explaining the story through depiction of characters and representation of injustices.	Introduction to Creative Writing. Explaining the elements of creative writing.	Building the discourse- The significance of conversation and the key elements of discourse-	Reflecting the learning. -Review writing

	Analysis and Critical interpretation of the poem.		Grouping the Students belonging to States other than Tamilnadu	Art of conversation in digital and verbal discourse- Lee Mockobe's A Powerful Poem of what it means to be a Transgender. TEDX TALK- POEM RECITATION	Explaining the process of reviewing and the method of reviewing. Choosing the subject for reviewing.
SLO-2	Introduction to the poet Kalki Subramaniam. Reading and recitation of the poem Phallus I cut. Analysis and Critical interpretation of the poem. Part-1	Analysis and critical interpretation of the short story Doll's House.	Stand-up comedy show - translate the audio content in English. (any regional language) Practice the writing activity - creative ways of engaging in translation.	Reflecting on the style and the tone of the poem. Practicing conversation	Choosing and planning the topic for students- group 1 and group 2
SLO-3	Analysis and Critical interpretation of the poem. Phallus I cut- Part-2	Class room activity- reviewing characters Group Discussion- social consciousness	Correction of errors- attempting to translate. Identifying equivalent terms to certain regional words - learn the art of translation.	Classroom- Speaking activity- reflection about the issues regarding gender expression and gender identity. Reviewing activity- group discussion- communicating effectively- importance	Choosing and planning the topic for students- group 3 and group 4
SLO-4	Introduction to the poet -Imtiaz Dharker. Reading and reciting the poem Purdah 1. Analysis and Critical interpretation of the poem- Purdah 1- part 1	Speaking activity- society and its portrayal in the short story- Magnifying and analyzing the characters from contemporary perspective	Introducing famous art works and the contexts of creation. Salvador Dali- The Face of War Pablo Picasso- Guernica Edward Munch- The Scream Pieter Bruegel- The Tower of Babel. Understanding the art works- Part 1	Introducing Content writing in Social Media- the importance of content writing.	Introducing the students to the review of the various works. Understand the review process how effectively a review of any work can be done.
SLO-5	Analysis and Critical interpretation of the poem- Purdah 1- part 2	Introduction to the writer Haruki Murakami. Reading the Confessions of a Shinawaga monkey. Discussion and analysis of the Confessions of a Shinawaga monkey.	Understanding the art works- Part 2 creative and/ or thoughtful writing - contemporary themes of modern day	BLOG WRITING - Subtleties Of Workplace Inclusion: Mental Health And Queer Community- Salik Ansari. Reading the text- content in the blog by the students- Reading Activity	Reviewing -record -post in the social media pages of SRMIST
SLO-6	Reading and reciting the poem Purdah 2 Analysis and Critical interpretation of the poem- Purdah 2- part 1	Group discussion activity reflecting the understanding of the character Shinagwa monkey Speaking activity- review on life and existentialism and identity crisis	Course instructor guidance- Classroom activity for creative writing- discussion on generation of ideas discussion on working and reflection of ideas	Analysing the text- content in the blog by the students- Discussion Activity writer's conversation with the readers - the blog in other blog articles.. Practice blog writing	Thoughtful conversation with your team member post the same in the official social media page of SRMIST. Choosing the team based on the abilities that are comfortable to match the peer members

SLO-7	Analysis and Critical interpretation of the poem- Purdah 2- part 2	Introduction to Crystal Wilkinson Reading Endangered Species: Case 47401.	Elements of writing Incorporate the elements of story in story writing	Apprehending Life by reading the texts of influence- Chimamanda Ngozi Adiche's Notes on Grief- A BRIEF NOTE, We should all be Feminists- An Essay.	Choosing the topics for a thoughtful conversation Planning and preparation for the script of conversation with a team member
SLO-8	Introduction to the poet Arundathi Subramanian. Reading and reciting the poem- Home Student activity- recitation Analysis and Critical interpretation of the poem- Home	Discussion and analysis of Endangered Species: Case 47401.	Students -writing abilities- building stories- a visual treat of variety of pictures.	Class discussion- essay by the author -subjective depiction of life. Understand -subjective opinions - perspectives- Practising the task multiple times with all the students in the classroom.	Drafting , editing and revising the script of conversation and enacting the conversation with the team members Enactment -proper rehearsal -final performance -conversation- whole performance should be recorded. The recording should be posted in the official media page and social handles of SRMIST.
SLO-9	Recollection of study of the writing styles and intentions of the poets prescribed in the syllabus.	Introduction to C.S Lakshmi also known as Ambai. Reading the short story- In a Forest, A Deer.	Practice -write stories - pictures given or shown . Classroom activity- evaluation of writings and reflections for suggesting, correction and improvement	Interposing opinions in famous interviews- FII Interviews: Tasveer Co-Founder And Filmmaker Rita Meher On The Seattle Legislation, Minority Rights And The Fight Against Oppression- INTERVIEW- Analysing the text and discussing the aspects of an interview	work for this social post - reflect on their experience of learning communicative English course and the testimonial has to be recorded and posted in the social media pages of SRMIST..
S-10	Group Discussion activity for students to reflect up on gender consciousness	Discussion and Analysis of In a Forest, A Deer.	A writing task to write a script is introduced in the classroom.	Students -enact as interviewer and interviewee and practice building the discourse.	Involving the students for the project work. Introducing what is project work and inculcating the interest -Giving instructions to do the project works -
SLO-11	Revision of the poems Debt and Phallus I cut, Purdah 1 and Purdah 2	Classroom activity- speaking about identity, power of women and contemporary issues and perspectives up on women like Thangam Attalai	creative scripts inspiring from the dialogues of their favourite films by changing the scenario to their own wish according to their own whims and fancies. Creative writing -writing news reports. recreated with new characters, places, scenes, incidents.	Certain role plays like celebrity personalities, political personalities -conduct the interview and be the interviewer and interviewee. The art of conversation and the ability to build a discourse	Discussion of ideas and generation of creative ideas- Preparation for next semester. Assignment on any piece of creative writing (OR) Presentation- Mastering the art of Public Speaking. (OR) Project on compiling the real life influential events on gender inclusive issues and a presentation of the same. Interview Scripting /Blog writing.- Guidance

				Reflecting on the points- Student reviewing activity- art of conversation in the text	
SLO-12	Revision of the poem Home. Creative activity for the students to reflect up on gender consciousness, influence of religion on women freedom.	Retrospecting the writing styles of the authors- Katherine Mansfield, Haruki Murakami, Crystal Wilkinson and Ambai. Overall Revision- The Doll's House, Confessions of a Shinawaga Monkey, Endangered Species: Case 47401 Classroom activity- speaking about racism in contemporary society- an attempt to understand the issues prevailing in the society from the perspectives of students	Watch debate shows - summarising the arguments Enhance -descriptive writing skill. Repetitive practice and continuous assessment - writing skills-master the writing skill.	Reflecting on the points- Student reviewing activity- art of conversation in the text The evaluation and assesment of the conversation -constructive feedbacks to the students.	Reflection, Evaluation and Assessment of ideas- Students can opt any of the project from the given choice. Ready for the next semester- reflection of the learning through assignments practiced

Resources				
1	Horizon- English Text Book – Compiled and Edited by the Faculty of English Departement, FSH, SRMIST, 2023	5	The Art of Public Speaking by Stephen E. Lucas- 2019	
2	The Creative Writing Coursebook: Forty Authors Share Advice and Exercises for Fiction and Poetry by Julia Bell and Paul Magrs- 2001	6	Talk Like TED: The 9 Public-Speaking Secrets of the World's Top Minds by Carmine Gallo – 2014	
3	On Writing: A Memoir of the Craft by Stephen King 2000	7	The Anatomy of a Book Review: A Guide for College Students by Ronald J. Weber 1994	
4	The Writing Life: Writers on How They Think and Work edited by Marie Arana -2003	8	How to Write a Simple Book Review: It's easier than you think! by Allyson R. Abbott 2013	

Assessment											Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4 *			Simulations	Clarification/Pauses	✓	Good Health & Well Being		
		(10 %)		(10 %)		(20 %)		(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)						
1	Remember	15	15	15	15	10	10	10	10	15			Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15			Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25			Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers										
Professional Experts			Higher Institution Experts						Internal Experts	
1	Krishna Raj, Sutherland Technologies		2	Dr. J Mangayarkarasi Associate Professor and Head, Department of English, Ethiraj College for Women, Chennai					1	Dr. Pushpanjali Sampathkumar, Assistant Professor, Department of English, FSH, SRMIST
				Dr. K S Antonysamy Associate Professor and Head, Department of English, Loyola College, Chennai					2	Dr. Dr. Shanthichitra, Associate Professor, & Head, Department of English, FSH, SRMIST
									3	Dr Anchal Sharma, Professor and Head, Department of EFL SRMIST
									4	Dr T Sridevi, Assistant Professor, FSH, SRMIST
									5	Dr Shanmuga Priya, Assistant Professor SRMIST

Course Code	UAI24101J	Course Title	Computing Fundamentals				Category	C	Discipline Core Courses	L	T	P	C
										3	0	3	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes (PLO)									
CLR-1	To understand computing fundamentals	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To explain the concepts of basic units of computer and its organization.																	
CLR-3	To acquire basic knowledge about programming in C																	
CLR-4	To enhance knowledge in C programming and developing programming skills																	
CLR-5	To apply code reusability with user defined data types and pointers																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Appreciate the basic understanding of the working of a computer	✓	✓	-	-	2	85	75	1	1	1	2	1	-	-	-	2	2
CLO-2	Learn the basic structure of CPU, computer memory and Input – Output Units	✓	✓	✓	-	2	85	75	1	2	1	2	2	-	-	-	2	3
CLO-3	Familiarize the students with the fundamentals of C programming language	✓	✓	✓	✓	3	85	75	3	2	2	1	3	-	-	-	2	3
CLO-4	Use and implement data structures like arrays, control structures and functions to obtain solution	✓	✓	✓	✓	3	85	75	3	2	2	1	3	-	-	-	3	3
CLO-5	Implement user defined data types and to performing operations on files.	✓	✓	✓	✓	3	85	75	3	3	2	1	3	-	-	-	3	3

Sessions	CLO – 1	CLO – 2	CLO – 3	CLO – 4	CLO – 5
	18	18	18	18	18
SLO-1	Introduction to Computers	Storage Units, Central Processing Unit	Overview of C	Arrays	User defined data types
SLO-2	Evolution, Generations of computers	Primary memory and Secondary memory	Features of C nguage	Declaration and initialization array	Defining and processing structure
SLO-3	Tutorial: Computing concepts	Tutorial: Secondary storage devices	Tutorial: Structure of C program	Tutorial: One-dimensional and Two-dimensional array	Tutorial: Array of structures
SLO-4-6	Practice: Components of a computer system	Practice: Magnetic and Optical media	Practice: C Tokens	Practice: Example programs	Practice: Programs with structure
SLO-7	Applications of computers	Cache memory	Keywords and identifiers	Character array and strings	Unions: Defining and accessing union
SLO-8	Software and its types	Virtual Memory	Constants, Variables	Control statements-Types of control statements	Typedef and Enum

SLO-9	Tutorial: Software and hardware systems	Tutorial: I/O storage devices	Tutorial: Input and Output Statements	Tutorial: Decision making statements	Tutorial: Fundamentals of pointers
SLO-10-12	Practice: Case study data processing	Practice: Input Devices	Practice: simple programs	Practice: if, if-else, nested if and switch	Practice: Pointer declarations
SLO-13	Internal communications	Output Devices	Data types	Looping statements – for, while, do-while loop	Pointers with array and functions
SLO-14	High level and low-level languages	Application and system software	Expressions and operators	Jump statements – break and continue	File management in C
SLO-15	Tutorial: Algorithm, Flowcharts, pseudocode	Tutorial: Operating Systems	Tutorial: Operator Precedence	Tutorial: Functions	Tutorial: file operations and error handling
SLO-16-18	Practice: Writing program for simple problems	Practice: case study	Practice: Expressions and operators	Practice: Programs with functions	Practice: I/O and Error handling on files

Resources					
1	E.Balagurusamy, “Computing fundamentals and C Programming”, Tata McGraw-Hill Publishing Company Limited, (2008)			2	Ashok.N.Kamthane, “ Computer Programming”, Pearson Education (India) (2008)
3	Behrouz A.Forouzan and Richard.F.Gilberg, “A Structured Programming Approach Using C”, II Edition, Brooks-Cole Thomson Learning Publications, (2007)			4	Pradip Dey, Manas Ghoush, “Programming in C”, Oxford University Press. (2007)

Assessment												Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4									
		(10 %)		(10 %)		(20 %)		(10%)									
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)						
1	Remember	15	15	15	15	10	10	10	10	15	15						
2	Understand	15	15	15	15	10	10	10	10	15	15						
3	Apply	20	25	25	20	25	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10	10						
6	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Mr. Navarathnamani, Datayan Solutions (P) Ltd., Chennai	1	Dr. Neelamarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr.D.Kanchana, SRMIST, kanchand@srmist.edu.in<name>
				2 Dr. V. Saravvanan, SRMIST, RMP

Course Code	UAI24102J	Course Title	Introduction to Artificial Intelligence and Machine Learning				Category	C	Discipline Core Course	L	T	P	C
										3	0	3	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	NIL	Progressive Courses	NIL	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes (PLO)									
CLR-1	To familiarize on fundamental concepts, theories and applications of artificial intelligence	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To proficiency on first order predicate logic, knowledge representation and probabilistic reasoning																	
CLR-3	To understand the machine learning basics and its algorithms																	
CLR-4	To gain knowledge on non-linear regression, Bayesian belief networks and random forest algorithms																	
CLR-5	To understand on unsupervised learning algorithms																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Form a solution for a problem in artificial intelligence	✓	✓	-	-	2	85	75	3	2	2	1	-	-	-	3	2	
CLO-2	Ability to select a suitable algorithm for a problem and characterize its time and space complexities	✓	✓	✓	-	2	85	75	3	3	1	2	-	-	-	3	2	1
CLO-3	Able to understand on basics on machine learning and its algorithms	✓	✓	✓	✓	3	85	75	3	2	3	1	-	2	-	-	3	2
CLO-4	Ability to enhance skill in forecasting and learning theory	✓	✓	✓	✓	3	85	75	3	3	2	3	-	-	-	3	2	1
CLO-5	Proficiency in selecting suitable unsupervised learning algorithms	✓	✓	✓	✓	3	85	75	3	3	2	3	-	2	-	-	3	2

Sessions	CLO – 1	CLO – 2	CLO – 3	CLO – 4	CLO – 5
	15	15	15	15	15
SLO-1	Definition – Future of Artificial Intelligence	Logical Agents	Machine Learning basics, Applications of ML	Non-linear regression	Expectation-Maximization Algorithm
SLO-2	Characteristic of Intelligent Agents	Propositional and first order Predicate logic	Supervised Learning- Naïve Base Classifier	Logistic regression	Hierarchical Clustering
SLO-3	Tutorial 1: Study of Artificial Intelligence Techniques	Tutorial 4: Analyzing FOPL problems	Tutorial 7: Analyzing Jupyter notebook environment	Tutorial 10: Study on Non-Linear Regression	Tutorial 13: Study on Unsupervised Learning
SLO-4-6	Practice 1: Implementation of Simple AI Techniques	Practice 4: To solve problems in FOPL	Practice 7: Study on Jupyter notebook environment for Machine learning	Practice 10: To Implement Non-Linear Regression	Practice 13: To implement Unsupervised Learning
SLO-7	Typical Intelligent Agents –Problem Solving Approach to Typical AI problems.	Inference	Classifying with k-Nearest Neighbour classifier	Random forest	Supervised Learning after Clustering
SLO-8	Problem solving by Searching: Uninformed and informed strategies and implementation	Knowledge representation and Automated Planning	Decision Tree classifier, Naïve Bayes classifier	Bayesian Belief networks	Choosing the number of clusters
SLO-9	Tutorial 2: Analyzing Travelling Salesman Problem	Tutorial 5: Analyzing knowledge representation	Tutorial 8: Analyzing Commonly used libraries and packages	Tutorial 11: Analyzing Random Forest algorithm	Tutorial 14: Study on Supervised Learning

SLO-10-12	Practice 2: To solve Travelling Salesman Problem	Practice 5: Knowledge Implementation	Practice 8: Study on commonly used libraries and packages for supervised and unsupervised learning in Python	Practice 11: To implement Random Forest	Practice 14: To Implement Supervised Learning
SLO-13	Path planning	Uncertain Knowledge and Reasoning: Quantifying uncertainty	Unsupervised Learning - Grouping unlabeled items using k-means clustering	Bias/variance tradeoff	Learning using ANN
SLO-14	Constraint Satisfaction Problems (CSP)	Probabilistic reasoning	Association analysis with the Apriori algorithm	Tuning Model Complexity, Model Selection Dilemma	Maximum Likelihood Estimation
SLO-15	Tutorial 3: Analyzing CSP	Tutorial 6: Analyzing Probabilistic Reasoning	Tutorial 9: Study on Linear Regression	Tutorial 12: Analyzing Bayesian Belief Networks	Tutorial 15: Analyzing Maximum Likelihood Estimation
SLO-16-18	Practice 3: To solve problems in CSP	Practice 6: To solve problems in Probabilistic Reasoning	Practice 9: To Implement Linear Regression	Practice 12: To implement Bayesian Belief Networks	Practice 15: To implement Maximum Likelihood Estimation

Resources

1	S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, 2 nd Edition, Prentice Hall	3	Tom Mitchell, Machine Learning, First Edition, McGraw- Hill
2	M. Tim Jones, Artificial Intelligence: A Systems Approach (Computer Science), Jones and Bartlett Publishers, Inc.; 1st Edition, 2008.	4	Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press

Assessment

Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4			
		(10 %)		(10 %)		(20 %)		(10%)			
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)
1	Remember	15	15	15	15	10	10	10	10	15	15
2	Understand	15	15	15	15	10	10	10	10	15	15
3	Apply	20	25	25	20	25	25	25	25	25	25
4	Analyze	20	25	25	20	25	25	25	25	25	25
5	Evaluate	15	10	10	15	15	15	15	15	10	10
6	Create	15	10	10	15	15	15	15	15	10	10
Total (%)		100	100	100	100	100	100	100	100	100	100

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Strategies

Technology	Pedagogy / Andragogy	Sustainable Development	
Simulations	Clarification/Pauses	✓	Good Health & Well Being
Presentation Tools	✓ Group Discussion	✓	Quality Education
Learning Management System	✓ Hands-on Practice	✓	Gender Equality
	Debate	✓	
	Interactive Lecture	✓	
	Brainstorming	✓	

Designers

Professional Experts		Higher Institution Experts		Internal Experts	
1	Mr. Navarathnamani, Datayan Solutions (P) Ltd., Chennai	1	Dr. Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1	Dr. S. Subbaiah, Associate Professor, SRM IST, RMP
				2	Dr. J. Dhilipan, HoD, SRMIST, RMP

Course Code	UMS24103T	Course Title	Mathematics for Artificial Intelligence	Category	C	Discipline Core Course	L	T	P	C
							4	0	0	4

Course Offering Department	Mathematics and Statistics	Pre-requisite Courses	NIL	Co-requisite Courses	NIL	Progressive Courses	NIL	Data Book / Codes/Standards	NIL
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CLR	The purpose of taking this course is to:	Depth				Attainment			Programme Learning Outcome (PLO)										
CLR-1	To apply the basic concepts and theorems of matrices.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10	
CLR-2	To learn the basic concepts of differentiation, basic concepts of integration and to apply Bernoulli's formula.	Conceive	Design	Implement	Operate	Bloom's Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborative Skills	Independent Thinking, Analytical Reasoning	Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incubation, Multicultural Understanding	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2	
CLR-3	To learn the concepts of connectives, validity of arguments and normal forms.																		
CLR-4	Apply Logic, truth table in computer science.																		
CLR-5	To Understand the concept of Graphs, isomorphism of graph, Eulerian graph and Hamiltonian graph.																		
CLO	At the end of this course, learners will be able to:																		
CLO-1	Gain knowledge in basic concepts of matrix method.	✓	✓	-	-	2	85	75	3	-	-	-	-	-	-	-	-	-	
CLO-2	Understand the concepts of differentiation and to solve the problems of Radius of curvature.	✓	✓	✓	-	2	85	75		3	-	-	-	-	-	-	-	-	
CLO-3	Understand the concepts of integration and to evaluate Bernoulli's formula.	✓	✓	✓	✓	3	85	75	3	-	-	-	-	-	-	-	-	-	
CLO-4	Logical knowledge through the Statements, connectives, arguments, validity of arguments and Normal forms using truth tables	✓	✓	✓	✓	3	85	75	-	3	-	-	-	-	-	-	-	-	
CLO-5	Understand the concepts of Graphs terminology Sub graphs, Acyclic, Euler path, Hamiltonian Path	✓	✓	✓	✓	3	85	75	-	-	-	-	3	-	-	-	-	-	

Sessions	CLO - 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	12	12	12	12	12
SLO-1	Definition and types of matrix- Examples	Introduction to Differentiation- Solving basic problems	Logic -Basic explanation- Statements- simple compound- Symbolic representation	Graphs and Their Representation- Basic Graph terminology- Simple Problems	Trees- Basic Definitions-
SLO-2	Symmetric matrix - Skew symmetric matrix	Minima and maxima of functions of single variable	Connectives explanation- conjunction, disjunction, negation- Simple problems	Drawings of Graphs-Special Families of Graphs- Simple Problems	Basic properties of Trees- Labeled Trees
SLO-3	Hermitian matrix- Skew Hermitian matrix	Problems based on Minima and maxima of functions of single variable	Problems using Truth Tables- Tautology, contradiction- Problems using Truth Tables	Incidence graphs - Simple Problems	Problems based on the concepts- Undirected Trees- Simple Problems

SLO-4	Orthogonal matrix - Unitary matrix	Problems using maxima and minima	Logical equivalence- Simple truth table problems	Adjacency Matrices- Problems- vertex degrees matrices	Binary trees- Rooted Trees and Branches
SLO-5	Eigen vectors of a matrix	Introduction to curvature- Radius of curvature (Cartesian co-ordinate)	Tautological implications- Simple problems	Isomorphism of Graphs- Simple Problems	Spanning Trees- Simple problems
SLO-6	Eigen values and eigen vectors of a matrix	Problems based on radius of curvature	Arguments- validity of arguments- Simple problems	Sub graphs- Acyclic Graphs- Simple Problems	Minimal Spanning Trees- Simple Problems
SLO-7	Cayley Hamilton theorem	Introduction to integration- Basic problems on integration- Integration of polynomial functions- Problems based on Integration of polynomial functions	Normal forms – Minterms and maxterms	Digraphs- Problems using Graphs	Problems based on Minimal Spanning Trees
SLO-8	Problems of order 2 based on Cayley Hamilton theorem	Integration by the method of substitution- Problems based on Integration by the method of substitution	Maxterms with examples- Problems using Truth tables	Paths, cycles and connectivity- Euler path and circuits	Kruskal's Algorithm
SLO-9	Problems of order 3 based on Cayley Hamilton theorem	Integration of rational and irrational functions- Integration of the type $\int \frac{P(x)}{Q(x)} dx$ Integration by the method of partial fraction	Principal disjunctive normal form	Eulerian cycles- Euler path and Circuits-	Rooted Tree
SLO-10	Cramer's rule- Problems order 2 based on Cramer's rule.	Integration of the form $\int \frac{dx}{ax^2 + bx + c}$	Problems using Truth tables	Hamiltonian Path and Circuits	binary Tree and Simple Problems
SLO-11	Problems of order 3 based on Cramer's rule.	Bernoulli's formula for Integral by parts	Principal conjunctive normal form	Problems using Hamiltonian Path- Simple Problems	Expression of Trees- Simple Problems
SLO-12	Problems of order 3 based on Cramer's rule.	Problems based on Bernoulli's formula for Integral by parts.	Problems using Truth tables	Problems using Hamiltonian Path- Simple Problems	Expression of Trees- Simple Problems

Resources				
1	Discrete Mathematics with Graph Theory and Combinatorics by T. Veerajan, McGraw Hill Education (India) Pvt Limited, 2007	3	Dr. A. Singaravelu, Allied Mathematics, 7 th edition, A. R. Publications, 2015	
2	Discrete Mathematics by V, Sundaresan, K. S. Ganapathy Subramanian, K. Ganesan, A. R. Publications, 1996.			

Assessment						
Bloom's Level of Thinking	Continuous Learning Assessment (CLA) (50% weightage)				Final Assessment (50 % weightage)	Theory (%)
	CLA – 1	CLA – 2	CLA – 3	CLA – 4 *		
	(10 %)	(10 %)	(20 %)	(10%)		
	Theory (%)	Theory (%)	Theory (%)	Theory (%)		
1	Remember	15	15	10	10	15
2	Understand	15	15	10	10	15
3	Apply	20	25	25	25	25
4	Analyze	20	25	25	25	25
5	Evaluate	15	10	15	15	10
6	Create	15	10	15	15	10
Total (%)		100	100	100	100	100

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Strategies				
Technology		Pedagogy / Andragogy		Sustainable Development
Simulations		Clarification/Pauses	✓	Good Health & Well Being
Presentation Tools	✓	Group Discussion	✓	Quality Education
Learning Management System	✓	Hands-on Practice	✓	Gender Equality
		Debate	✓	
		Interactive Lecture	✓	
		Brainstorming	✓	

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Dr. D. Arivudai nambi, Anna University, Chennai	1	Dr. N.Viswanathan, , Presidency college , Chennai	1 Dr.S.Saravanakumar, SRM IST
				2 Dr.S.Poongodisathya, SRM IST

CourseCode	UCD24S01J	Course Title	Verbal Ability and Skill Development	Category	S	Skill Enhancement Courses	L	T	P	C
							1	0	2	2

Course Offering Department	Career Guidance	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:		Depth					Attainment			Programme Learning Outcome (PLO)									
CLR-1	Expose student's right attitudinal and behavioral aspects and to build the same through activities	Conceive	Design	Implement	Operate			Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incubation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PLO-9	PLO-10	
CLR-2	Develop and nurture interpersonal skills of the students through individual and group activities.																			
CLR-3	Increase efficiency and leadership skills to improve team results.																			
CLR-4	Use the basic mechanics of Grammar.																			
CLR-5	Instill confidence in students and develop skills necessary to face the challenges of competitive exams and placements																			
CLO	At the end of this course, learners will be able to:																			
CLO-1	Re-engineer their attitude and understand its influence on behavior	✓	✓	-	-			2	85	75	2	3	2	2	-	1	2	3	-	
CLO-2	Acquire inter-personal skills and be an effective goal-oriented team player	✓	✓	✓	-			2	85	75	3	3	2	3	-	1	2	1	-	-
CLO-3	Learn the importance of inner management and creativity	✓	✓	✓	✓			3	85	75	3	2	2	3	-	1	2	2	-	-
CLO-4	Understand the correct usage of grammar	✓	✓	✓	✓			3	85	75	3	-	3	-	3	1	1	-	-	-
CLO-5	Help the students succeed in competitive exams and placements	✓	✓	✓	✓			3	85	75	3	-	3	-	3	1	1	-	-	-

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO – 5
	9	9	9	9	9
SLO-1	Introduction to IKIGAI, IKIGAI – Key concepts	Networking skills – relationship building, value exchange, active listening, friendliness and positivity, clear communication	Time management skills - Value of Time, Pomodoro technique.	Basics of Grammar	Sentence Correction
SLO-2	Attitude, Attitude formation and Factors influencing Attitude	Negotiation skills – building rapport and problem-solving	Weekly Planner, To do list, Prioritizing work, Time management activity	Spotting Errors	Sentence completion (Grammar based)

SLO-3	SWOT Analysis, individual SWOT Analysis -SWOT Analysis activity	Entrepreneurial Skills, Entrepreneurial knowledge, Focus, Investment, Risk tolerance, Resilience, Ethics	Creative thinking skills – divergent thinking, Synthesis and collaboration, out-of -the -box thinking	Error spotting based on Parts of Speech	Sentence completion (Vocabulary based)
SLO-4	Presentation skills, Types of presentation, Structure of presentation, Delivery techniques	Creating brands – activity (posters, flyers, business cards)	Creative thinking skills Activity session	Errors how to avoid in Nouns & Pronouns	Cause and Effect - Introduction
SLO-5	Extempore Practice Session I	Stress Management - Causes of Stress and Its Impact	Brainstorming, use of groups and individual brainstorming techniques to promote idea generation	Common Errors: Subject - verb Agreement	Cause and Effect – Practise Session
SLO-6	Extempore Practice Session II	How to Manage Stress and distress, Understanding the circle of control, stress busters	Intercultural communication – beliefs, customs and attitudes of people in different countries (US, UK, Japan, West Asia, China, Russia), Social and cultural etiquettes	Vocabulary - Synonyms - Antonyms - Phrasal verbs-	Theme detection – Introduction - Practice session
SLO-7	Interpersonal Skills, Emotional Intelligence	Conflict Management - Conflict in human relations – reasons, Approaches to conflict resolution	Communication etiquettes, Telephone etiquettes	One Word Substitution - Homophones - Homonyms	Critical Reasoning and Verbal Deduction
SLO-8	Importance of Team Work, Team Building activity	Conflict resolutions – Case studies	Ice breaking, Designing ice breaker games	Words often confused	Types of Critical Reasoning- Tips and Tricks
SLO-9	Leadership skills, Leadership skills - based activity	Importance of decision making, Process of decision making, Practical ways of decision making, weighing positives and negatives	Resume writing skills	Idioms and Idiomatic Expressions – Introduction	Word Analogy - Types of Word analogy

Resources					
1	Jeff Butterfield, Soft Skills for Everyone, CENGAGE, India, 2015	5	Thomas A Harris, I am ok, you are ok, Arrow, London, 2012		
2	Dr. K. Alex, Soft Skills, S. Chand Publishing & Company, India, 2014	6	Daniel Coleman, Emotional Intelligence, Bloomsbury, India, 2016		
3	Covey Sean, Seven habits of highly effective teens, Simon & Schuster, New York, 2014	7	Norman Lewis, Word Power Made Easy New Revised and Expanded Edition, Goyal publication, 2011		
4	Carnegie Dale, How to win friends and influence people, Simon and Schuster, New York, 2016	8	Bhatnagar R P, English for Competitive Examinations, Trinity Press, 2016.		

Assessment										Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (100% weightage)								Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4 *		Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(20 %)		(20 %)		(30 %)		(30%)							
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
1	Remember	20	20	15	15	20	20	20	20	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
2	Understand	20	20	15	15	20	20	20	20			Debate	✓		
3	Apply	15	15	15	15	15	15	20	20			Interactive Lecture	✓		
4	Analyze	15	15	15	15	15	15	20	20			Brainstorming	✓		
5	Evaluate	15	15	20	20	15	15	10	10						
6	Create	15	15	20	20	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100						

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Mr. P. Chockalingam, Senior Lead Software Engineer, Virtusa Consulting Services Private Ltd, DLF IT Park SEZ, Chennai – 600089 p.chockalingam1986@gmail.com	1	Dr. G. Saravana Prabu, Asst. Professor, Department of English, Amrita Vishwa Vidhyapeetham, Coimbatore - 641112 g_saravanaprabu@cb.amrita.edu	1 Dr.SathishK,HOD,DepartmentofCareerGuidanceCell,FSH,SRMIST hod.dcg.c.ktr@srmist.edu.in
	-		-	2 Mrs.Deepalakshmi S, Assistant Professor, Department of Career Guidance Cell, FSH, SRMIST, deepalas@srmist.edu.in
				3 Dr. Sam Israel S, Assistant Professor, Department of Career Guidance Cell, FSH, SRMIST, samisras@srmist.edu.in

SEMESTER - II

Course Code	ULT24AE2J	Course Title	Tamil – II	Category	A	Ability Enhancement Course	L	T	P	C
							2	0	2	3

Course Offering Department	Tamil	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	சங்கஇலக்கியங்கள்வழிதொன்மைஅக, புறவாழ்வியலைஅறியச்செய்தல்																	
CLR-2	தமிழ்ச்சமூகத்தின்அறவியல்குறித்துதெரியச்செய்தல்																	
CLR-3	பக்திஇலக்கியங்கள்போதித்தமனிதமாண்புகளைஉணர்ச்செய்தல்																	
CLR-4	பண்டைத்தமிழ்ச்சமூகத்தின்தொல்இலக்கியங்கள்வளர்ச்சிபெற்றவரலாற்றைப்புரியச்செய்தல்																	
CLR-5	சிறுகதைகள்சொல்லும்வாழ்வியல்நெறி, மொழியின்றூட்பங்கள்ஆகியவற்றைத்தெரியச்செய்தல்																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills	Independent Thinking, Analytical	Leadership Qualities	Digital Technology Skills	Value Incultation, Multicultural	Environmental Action, Community	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	பண்டைத்தமிழ்ச்சமூகத்தின்அக, புறவாழ்வியல்இன்றையசமூகமேம்பாட்டிற்குவழிகாட்டிநிற்பதைஅறிந்துகொள்ளுதல்	✓	✓	-	-	2	75	60		H	H				M			
CLO-2	தமிழ்ச்சமூகம்அறத்தைவலியுறுத்தியசமூகம்என்பதன்வழிமானுடஅறத்தைத்தெரிந்துகொள்ளுதல்	✓	✓	✓	-	2	80	70	M		H			H				
CLO-3	பக்திஇலக்கியம்மூலம்இறைத்தந்துவங்களைஅறிந்துமானுடஒற்றுமைமேம்பாட்டைஅறிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	65		H		H		L				
CLO-4	தொல்தமிழ்ச்சமூகம்இலக்கியம், அரசியல், அறம், பக்திஆகியவற்றில்தழைத்தோங்கியதைத்தெரிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	70	H		H			H				
CLO-5	வாழ்வியலின்நெறிகளைச்சொல்லும்கதைகளைப்படைக்கும்திறனோடுமொழிஆளுமையையும்அறிந்துகொள்ளுதல்	✓	✓	✓	✓	3	80	70	H			M			H			

Sessions	CLO – 1	CLO - 2	CLO – 3	CLO – 4	CLO - 5
	12	12	12	12	12
SLO -1	காலந்தோறும்தமிழ்ச்சமூகத்தின்அக, புறவாழ்வியலைஅறியச்செய்தல்	சங்கமருவியகாலம் அறமும்வாழ்வியலும்	பல்லவர்காலஇலக்கியங்கள்	பண்டைக்காலத்தமிழ்ச்சமூகம் சங்ககாலமக்களின்வாழ்வியல்	தமிழ்ச்சிறுகதையும்தமிழ்ச்சமூகவாழ்வியலும்

SLO -2	எட்டுத்தொகைநூல்களும் பகுப்புமுறையும்	உலகப்பொதுமறை - திருக்குறள்கட்டமைப்பு	பக்தியும்தமிழும் - பக்திஇலக்கியத்தோற்றநிலை	முச்சங்கஅறிமுகமும் வரலாறும்	புதுமைப்பித்தன்- சங்குத்தேவனின்தர்மம்
SLO -3	ஐங்குறுநூறு - 375, 391	திருக்குறள்வான்சிறப்பு (2)	சைவசமயஇலக்கியங்கள் - சைவக்குரவர்நால்வர்	சங்கஇலக்கியப்பாடுபொருளும்வடிவமும்	நபிச்சமூர்த்தி - வேப்பமரம் - மரபும்நம்பிக்கைகளும்
SLO -4	குறுந்தொகை - 02, 03	திருக்குறள் - புலவிநுணுக்கம் (132) -	தேவாரம் - திருஞானசம்பந்தர்- 2834 திருநாவுக்கரசர்- 4262	எட்டுத்தொகைநூல்களின்வரலாறும்கட்டமைப்பும்	தமிழருவிமணியன் - ஒற்றைச்சிறகு - உறவின்மேன்மை
SLO -5	அகநானூறுநூல்கட்டமைப்பு	தமிழ்இலக்கியமரபில்நீதிஇலக்கியங்கள்	திருவாசகம்- மாணிக்கவாசகர்ஆனந்தபரவசம் - பாடல் 10	பத்துப்பாட்டுநூல்களின்வரலாறும்வாழ்வியலும்	ஆர். சூடாமணி - மூடநம்பிக்கை
SLO -6	அகநானூறு -238	நாலடியார் வைகலும்- பாடல்எண் 39	வைணவசமயவளர்ச்சிப்போக்கு	பதினெண்கீழ்க்கணக்கும்தமிழர்அறமரபும்	கிருஷ்ணாடாவின்னி - காலாஅருகேவாடா
SLO -7	கலித்தொகை -11	நீதிஇலக்கியத்தில்மருந்துநூல்கள்	நாலாயிரத்திவ்யப்பிரபந்தம் குலசேகராழ்வார்பாடல்- 678	பதினோருநீதிஇலக்கியங்கள்	மொழிப்பயிற்சி சொற்களைஉருவாக்குதல்
SLO -8	தமிழர்புறமரபு- புறநானூறு-107	சிறுபஞ்சமூலம் -64	ஆண்டாள்பாடல் - 574. திருமழிசைஆழ்வார்பாடல்	காப்பியஇலக்கணம் - காப்பியங்களின்வகைமை	எழுத்துகளில்இருந்துசொற்களைக்கண்டுபிடித்தல்
SLO -9	புறநானூறு -110, 112	பழமொழிநானூறுஅறிமுகம்- தனித்தன்மைகள்	தமிழில்இஸ்லாமிய இலக்கியங்கள்	ஐம்பெருங்காப்பியங்கள்	படம்பார்த்துக்கதைஎழுதுதல்
SLO -10	பத்துப்பாட்டும்ஆற்றுப்படைநூல்களும்	பழமொழிநானூறு - 184	சீறாப்புராணம் - விடமீட்டப்படலம் - 10பாடல்கள்	தமிழ்ச்சமூகமும்சமயத்தத்துவங்களும்	படம்பார்த்துக்கவிதைஎழுதுதல்
SLO -11	சிறுபாணாற்றுப்படை: 84-115	பண்டைக்காலப்போரும் வாழ்வும்-புறம்	தமிழில்கிறித்தவ இலக்கியங்கள்	பன்னிருதிருமுறை - அறிமுகம், வரலாறு	கற்பனையும்படைப்பும் - தமிழில்வாசகம்
SLO -12	பட்டினப்பாலை: 40-50	களவழிநாற்பது - 40	கிறித்துவின்அருள்வோட்டல் - திரு.வி.க.	நாலாயிரத்திவ்வியப்பிரபந்தம் - அறிமுகம், வரலாறு	விளம்பரத்திற்குவாசகம்எழுதுதல்

			அலகிலொளி-5பாடல்		
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Resources					
1	கொன்றை, தொகுப்பும்பதிப்பும் - தமிழ்த்துறைஆசிரியர்கள், தமிழ்த்துறை, எஸ்.ஆர்.எம். அறிவியல்மற்றும்தொழில்நுட்பக்கல்விநிறுவனம், காட்டாங்குளத்தூர், 603203, 2023			2	தமிழண்ணல், புதியநோக்கில்தமிழ்இலக்கியவரலாறு, மீனாட்சிபுத்தகநிலையம், மதுரை, 2017
3	மு. அருணாசலம், தமிழ்இலக்கியவரலாறு, நூற்றாண்டுமுறை(9ஆம்நூ. முதல் 16 வரை), திபார்க்கர், சென்னை, 2005			4	தமிழ்இலக்கியத்தொடரடைவு – http://tamilconcordance.in/
5	மதுரைதமிழ்இலக்கியமின்தொகுப்புத்திட்டம் - https://www.projectmadurai.org/			6	தமிழ்இணையக்கல்விக்கழகம் - http://www.tamilvu.org/

Assessment											Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4 *			Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)						
		Theory (%)														
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15						
3	Apply	20	25	25	20	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts		Higher Institution Experts		Internal Experts	
1	Dr. P.R.Subramanian, Director, Mozhi Trust, Thiruvannmiyur, Chennai – 600 041.	1	Dr. V. Dhanalakshmi, Associate Professor, Subramania Bharathi School of Tamil Language & Literature, Pondicherry University, Pondicherry	1	Dr.B.Jaiganesh, Associate Professor & Head, Dept. of Tamil, FSH, SRMIST, KTR.
				2	Dr. R. Ravi, Assistant Professor and Head, Dept. of Tamil, FSH, SRMIST, VDP.
				3	Mr. G. Ganesh, Assistant Professor, Dept. of Tamil, FSH, SRMIST, RMP.
				4	Dr. T.R.Hezbibahbeulah Suganthi, Assistant Professor, Dept. of Tamil, FSH, SRMIST, KTR.
				5	Dr.S.Saraswathy, Assistant Professor, Dept. of Tamil, FSH, SRMIST, KTR.

Course Code	ULH24AE2J	Course Title	Hindi – II				Category	A	Ability Enhancement Course	L	T	P	C
										2	0	2	3
Course Offering Department	Hindi	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil				

CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcome (PLO)									
CLR-1	They get to learn Ancient ,Medieval,and Modern poetry	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To understand the Significance of poems of great poets like Kabir,Tulsidas,Bihari and Dhananand																	
CLR-3	To Enhance and Enrich their knoeledge through poetry																	
CLR-4	Media based understanding for employability																	
CLR-5	Job Oriented writing skills																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	To provide a brief Introduction of Hindi poetry(Bhaktikal,Reetikal and Aadhunikkal)	✓	✓	-	-	2	85	75	3	2	3	-	-	2	-		PSO-1	PSO-2
CLO-2	To Discuss the origin and development of various forms of poetry in Hindi	✓	✓	✓	-	2	85	75	3		2	-	3	-	3			
CLO-3	Focus on Evaluating the social changes through poetry	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-			
CLO-4	To Examine Transcreation in advertisement	✓	✓	✓	✓	3	85	75	2	-	2	3	-	-	2			
CLO-5	To guide the students in the learning of the technical aspect of the HindiLanguage,this would help them in the field administration	✓	✓	✓	✓	3	85	75	-	3	-	3	3	2	-			

Sessions	CLO – 1	CLO – 2	CLO – 3	CLO – 4	CLO – 5
	12	12	12	12	12
SLO-1	BHAKTI KALIN KAVITA	RITI KALIN KAVITA	ADHUNIK KAVITA	VIGYAPAN	PATRA LEKHAN&PARIBHASHIK SHABDAVALI
SLO-2	BHAKTIU KALIN KAITA KI AVADHARNA	AVADHARNA EVM SAWROOP	AVADHARNA EVM SAWROOP	AWADHARNA EVM SAROOP	AVADHARNA EVM SAROOP
SLO-3	SWARUP EVM MAHATWA	RITI KAL VIBHAJAN	MAHATVA EVM UDDESHYA	ARTH EVM PARIBHASHA	ARTH EVM PARIBHASHA
SLO-4	BHAKTIKAL KI PRASANGIKTA	MAHATVA EVM UDDESHYA	MATHLI SHARAN GUPT- NAR HO NA NIRASH KARO MAN KO	VIGYAPAN KE PRAKAR	PRAYOJAN EVM PRYOG
SLO-5	DOHE- KABIRDAS	DOHE- BIHARI	KAVI PARICHAYA EVM KAVITA KA VISHLESHAN	VIGYAPAN KI VISHESHTAYEN	PRAKAR EVM MAHATVA
SLO-6	SANT PARICHAY	KAVI PARICHAYA	SURYAKANT TRIPATHI NIRALA- VAR DE VEENAVADINI VAR DE	VIGYAPAN KA MAHATVA	VYAKTIGAT PATRA
SLO-7	DOHE KA VISLESHAN	DOHE KA VISLESHAN	KAVI PARICHAYA EVM VISHLESHAN	VIGYAPAN KI BHASHA	AUPCHARIK PATRA

SLO-8	GURU KA MAHATVA	DOHE- GHANANAND	NAGARJUN-- AKAL AUR USKE BAD	VIGYAPAN AUR ROZGAR	PARIBHASHIK SHABDAVALI
SLO-9	DOHE- TULSHIDAS	SNEH KI SARLTA KA VARNAN	AKAL KA VASHTAVIK CHITRAN	PRINT EVM ELECTRONIC VIGYAPAN	SHABDAVALI KI AVSHYAKTA
SLO-10	DOHE KA VISLESHAN	PREM KA MAHATVA	KATTIS- BADRINARAYAN	VIGYAPAN KI VYAPAKTA	KARYALYIN SHABDAVALI
SLO-11	DAYA KA MAHATVA	GHANANAND KI KAVYA SHAILI KA MAHATVA	SAMBAND VICCHED KI PARICHARCHA	VIGYAPANLEKHAN KI KALA	EK DIN EK SHABD
SLO-12	RAM KI MAHIMA	DHOHA PARICHARCHA	KAVYA PARICHARCHA	UDDESHYA	HINDI SE ANGREJI AUR ANGREJI SE HINDI SHABD

Resources					
1	Edited Book: “Samanya Hindi”, Srijonlok Publication, 2023, New Delhi.			4	Bhakti Andolan Aur Surdas Ka Kavya – Manager Pandey
2	Kabir – Hazari Prasad Dwedi			5	Bihari – Vishvnath Prasad Mishr
3	Surdas – Ram Chandra Shukl			6	Aadhunik Vigyapan Aur Jansampark – Taresh Bhatia

Assessment											Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4			Simulations	Clarification/Pauses	✓	Good Health & Well Being		
		(10 %)		(10 %)		(20 %)		(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15			Debate	✓		
3	Apply	20	25	25	20	25	25	25	25	25			Interactive Lecture	✓		
4	Analyze	20	25	25	20	25	25	25	25	25			Brainstorming	✓		
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers		
Professional Experts	Higher Institution Experts	Internal Experts
1 MS.REETHAGOVINDAN,Senior Manager (Rajbhasha) ritushivani@yahoo.com	1 Dr. S. PADMAPRIYA, PROF& HEAD, PONDICHERRY University, kalapet, puducherry-605014 padmapriya.srirka@gmail.com	1 Dr.S Preeti. Associate Professor & Head, SRMIST- hod.hindi.ktr@srmist.edu.in
2 ALUMINI - VIPIN KUMAR JHA, Senior Translation Officer anju.bipin.jha@gmail.com		2 . Dr. Md.Shwahidul Islam Assistant Professor, SRMISTshwahidj@srmist.edu.in 3 Dr. S. Razia Begum, Assistant Professor, SRM IST raziabes@srmist.edu.in 4 Dr.NishaMurlidharan Assistant Professor, VDP,SRM IST Murulidharan- nishamup@srmist.edu.in

Course Code	ULF24AE2J	Course Title	French – II				Category	A	Ability Enhancement Course	L	T	P	C
										2	0	2	3

Course Offering Department	French	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	Strengthen the language of the students both in oral and written	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Express their sentiments, emotions, and opinions, reacting to information, situations	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborative Skills, Independent Thinking, Analytical Reasoning, Leadership Qualities, Professionalism, Autonomy, Digital Technology Skills	Value Inculcation, Multicultural Inclusivity, Environmental Action, Community Engagement, Entrepreneurial Risk Taking	PSO-1	PSO-2					
CLR-3	Make them learn the basic rules of French Grammar.																	
CLR-4	Develop strategies of comprehension of texts of different origin																	
CLR-5	Enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French																	
CLO	At the end of this course, learners will be able to:	✓	✓	-	-	2	85	75	3	2	3		2	-	-	-	-	
CLO-1	To acquire knowledge about French language	✓	✓	✓	-	2	85	75	3		2	3	3	3	-	-	-	
CLO-2	To strengthen the knowledge on concept, culture, civilization, and translation of French	✓	✓	✓	-	2	85	75	3		2	3	3	3	-	-	-	
CLO-3	To develop content using the features in French language	✓	✓	✓	✓	3	85	75		3		3	3	3	-	-	-	
CLO-4	To interpret the French language into other language	✓	✓	✓	✓	3	85	75	2		2	3		2	-	-	-	
CLO-5	To improve the communication, intercultural elements in French language	✓	✓	✓	✓	3	85	75		3		3	3	2	-	-	-	

Sessions	CLO – 1	CLO – 2	CLO - 3	CLO - 4	CLO – 5
	12	12	12	12	12
SLO-1	Temps libre	Le pronom indéfini on	Vendre	Il faut	Les gallicismes
SLO-2	Les loisirs	Les adjectifs interrogatifs	Acheter	Le verbe devoir	Les pronoms personnels COI
SLO-3	Les moments de la journée	Les prépositions avec les noms géographiques	Les aliments	Le verbe pouvoir	Le pronom Y
SLO-4	Les matières scolaires	Les verbes prendre et sortir	Les emballages	Le verbe vouloir	Des pronoms compléments
SLO-5	Les activités quotidiennes, Les quotidiennes	Les sons	Les quantités	Demander et dire le prix	Les nombres ordinaux
SLO-6	Le temps, L'heure	Parler de ses goûts	Les commerces	Faire des achats	Les verbes écrire et voir
SLO-7	La fréquence	Parler de ses préférences	Les commerçants	Les activités	Le E caduc ou instable
SLO-8	Les sons [u], Les sons [y]	Parler de sa routine	L'impératif	Les activités	Présenter ses vœux
SLO-9	L'heure, Quelle heure est-il ?	A la recherche d'un cadeau	Les articles partitifs	Mots et expressions	Présenter ses félicitations
SLO-10	Les pronoms personnels COD	Temps libre	Très ou beaucoup (de)	Communication	Répondre à une invitation
SLO-11	Les pronominaux, Se promener, se coucher etc...,	Mots et expressions	Le pronom en (la quantité)	Les sorties	Écrire un message amical
SLO-12	Les verbes du premier groupe, Parler, Demander, Poser	Grammaire– Communication	La phrase négative (2)	Les fêtes	Parler au téléphone

Resources			
1	“La Nouvelle Génération-AI” Méthode de français, Marie-Noëlle COCTON, P. DAUDA, L. GIACHINO, C. BARACCO, Les éditions Didier, Paris, 2018.	4	https://www.elearningfrench.com/learn-french-grammar-online-free.html
2	Cahier d'activités avec deux discs compacts.	5	https://www.lawlessfrench.com/grammar
3	https://www.fluentu.com/blog/french/french-grammar	6	https://blog.gymglish.com/2022/12/15/basic-french-grammar

Assessment										
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)
		CLA – 1		CLA – 2		CLA – 3		CLA - 4		
		(10 %)		(10 %)		(20 %)		(10%)		
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)
1	Remember	15	15	15	15	10	10	10	10	15
2	Understand	15	15	15	15	10	10	10	10	15
3	Apply	20	25	25	20	25	25	25	25	25
4	Analyze	20	25	25	20	25	25	25	25	25
5	Evaluate	15	10	10	15	15	15	15	15	10
6	Create	15	10	10	15	15	15	15	15	10
Total (%)		100	100	100	100	100	100	100	100	100

Strategies					
Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses		✓	Good Health & Well Being
Presentation Tools		✓	Group Discussion	✓	Quality Education
Learning Management System		✓	Hands-on Practice	✓	Gender Equality
			Debate	✓	
			Interactive Lecture	✓	
			Brainstorming	✓	

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts		Higher Institution Experts		Internal Experts	
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	2				Miss. Abigail A, Assistant Professor , SRMIST,,VDP abigaila@srmist.edu.in
2	Mr. Shrivathsan S, Journalist, Senior Sports Reporter/Sub-Editor, Times of India, Chennai shrivathsangilramhanga@gmail.com			3	Mrs.M.Mahalakshmi, Assistant Professor , SRMIST,,RMP mahalakm2@srmist.edu.in

Course Code	USA24201J	Course Title	Data Structures and Algorithms				Category	C	Discipline Core Course	L	T	P	C
										3	0	3	4

Course Offering Department	Computer Applications	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Prgramme Learning Outcome (PLO)									
CLR-1	Utilize the different data types; Utilize searching and sorting algorithms	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Utilize linked list in developing applications																	
CLR-3	Utilize stack and queues in processing data for real-time applications																	
CLR-4	Utilize tree data storage structure for real-time applications																	
CLR-5	Utilize algorithms to find shortest data search in graphs for real-time application development																	

CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research, Leadership Qualities, Professionalism, Autonomy, Accountability, Digital Technology Skills	Value Inculcation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2			
CLO-1	Identify linear and non-linear data structures. Create algorithms for searching and sorting	✓	✓	-	-	2	85	75	3	-	1	-	3	-	2	1		
CLO-2	Create the different types of linked lists and evaluate its operations	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Construct stack and queue data structures and evaluate its operations	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Create tree data structures and evaluate its types and operations	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Create graph data structure, evaluate its operations, implement algorithms to identify shortest path	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Session s	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to theory of data structures Data representation	Introduction to stack Representation of stack through array	Tree Traversals – In order, preorder Tree Traversals - Post order	Introduction to sorting Different types of sorting	Graph Terminology Representation of graph – Arrays
SLO-2	Abstract Data type Classification of data types	Representation of stack through linked list Operations on stack	Binary Search Tree Threaded Binary Search Tree	Bubble sort Example	Representation of graph – Linked list Graph Traversal – BFS
SLO-3	Asymptotic Notation Algorithm Analysis, Recursion	Disadvantages of Stack, Polish notations Applications – Evaluation of	Binary Search Tree :Construction Binary Search Tree : Insertion, Searching	Insertion Sort Quick sort Example	Example Graph Traversal – DFS, Topological Sorting

		Expression, Tower of Hanoi, Infix to Postfix expression			
SLO 4-6	Lab1:Recursion	Lab4:Implementationofstackanditsapplications	Lab7: Implement all the three type of Tree Traversals	Lab10:ImplementationofBubbleandInsertionsort	Lab13:ImplementationofGraphusingArray
SLO-7	Introduction to Data structures Data Structures and its uses	Queue, Representation of Queue using Arrays and Linked list	Applications of trees Applications of BST	Selection sort Example	Shortest Path Algorithm- Introduction Shortest Path Algorithm: Dijkstra
SLO-8	Linear and Non Linear Data Structures, Operations on data structure	Operations on Queue, Circular Queue	Expression trees, Example	Merge sort, Example	Applications of Graph,
SLO-9	Array types Array operations, Applications of arrays Dynamic memory allocation	Double ended Queue Priority Queue, Reversing a Queue using another queue, Applications of Queue	AVL Tree AVL Tree Rotations, Applications of AVL tree	Radix sort Heap Sort Example, Comparison of sorts	Minimum spanning tree – Prims Minimum Spanning Tree – Kruskals
SLO 10-12	Lab2:Arrays	Lab 5:Queue implementation using array and pointers	Lab8:ImplementationofBSTHeapDataStructure	Lab11:ImplementationofQuicksortandmergesort	Lab14:Implementationofshortestpathalgorithm
SLO-13	Introduction to lists Linked list operations	Introduction to nonlinear data structures Tree ADT and Terminologies	Minimum Heap Construction Example	Introduction to searching , Linear search Binary search	Algorithm Design And Analysis Greedy Algorithms
SLO-14	Types of Linked Lists Linked list vs. Arrays	Tree Terminologies Tree Representation	Minimum Heap Deletion Construction Example	Comparison of different search Define Hashing, Hash functions	Backtracking Example
SLO-15	Application of linked list, Performance Analysis and Measurement of algorithm Efficiency of algorithm, Time complexity and space complexity	Tree Types and Operations Binary Tree Representation, Properties of binary tree	Maximum Heap Construction Maximum Heap Deletion Construction Applications of Heaps and AVL trees	Hashing : Collision avoidance Hashing : Separate chaining, Open addressing, Advantages of Hashing	Divide And Conquer Example
SLO 16-18	Lab3: Implementation of LinkedList	Lab6:ImplementationofbinarytreeusingArrays	Lab9:Implementation of Min and Max Heap	Lab12:LinearsearchandBinarysearch	Lab15:Implementationofminimumspanningtree

Resources											
1	Seymour Lipschutz, (2014), "Data Structures with C", McGraw Hill Education, Special Indian Edition								4	SRD Group, (2013), "Data Structures using C", McGraw Hill, 2 nd Edition,	
2	R.F. Gilberg, B.A. Forouzan, (2005), "Data Structures", Thomson India, 2 nd Edition,								5	A.V. Aho, J.E Hopcroft, J.D. Ullman, (2003), "Data Structures and Algorithms", 1 st Edition, Pearson Education	
3	Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2 nd Edition, Pearson Education								6	Reema Thareja, (2011), "Data Structures Using C", 1 st Edition, Oxford 3er Education	

Assessment											
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)			
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)
1	Remember	15	15	15	15	10	10	10	10	15	15
2	Understand	15	15	15	15	10	10	10	10	15	15
3	Apply	20	25	25	20	25	25	25	25	25	25
4	Analyze	20	25	25	20	25	25	25	25	25	25
5	Evaluate	15	10	10	15	15	15	15	15	10	10
6	Create	15	10	10	15	15	15	15	15	10	10
Total (%)		100	100	100	100	100	100	100	100	100	100

Strategies					
Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses		✓	Good Health & Well Being
Presentation Tools		✓	Group Discussion	✓	Quality Education
Learning Management System		✓	Hands-on Practice	✓	Gender Equality
			Debate	✓	
			Interactive Lecture	✓	
			Brainstorming	✓	

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. Valliyappan, Full Stack Developer, Lentra Technologies, Chennai					1	Dr.S.Gopinathan, Professor, University of Madras, Chennai			1	Dr.R.Aruna Rani, Assistant Professor, FSH, SRMIST

Course Code	UCS24202J	Course Title	Object Oriented Programming using Java	Category	C	Discipline Core Courses	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	To learn the fundamentals of object-oriented programming																	
CLR-2	Learning to write object-oriented programs in Java																	
CLR-3	Developing skills in creating graphical and database applications through Java																	
CLR-4	Build Resilient code using Exception Handling mechanism																	
CLR-5	Be able to apply object oriented or non-object-oriented techniques to solve bigger real world computing problems																	
		Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Communication Skills, Independent Thinking, Leadership Qualities, Digital Technology Skills, Value Incultation, Environmental Action, Entrepreneurial Risk Taking	PSO-1	PSO-2							
CLO	At the end of this course, learners will be able to:																	
CLO-1	Remember and understand Java program and application structureand understand Java program and application structure	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	-	-
CLO-2	Apply the principles of OOPs and develop simple Java program or application	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	-	-
CLO-3	Analyze the problem specific requirements and develop java programs	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	-	-
CLO-4	Evaluate the program using extended functionalities	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	-	-
CLO-5	Create and Design an interactive application using swing and event handling	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	-	-

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Overview of Java Programming: History and Evolution, Features of Java, JVM	Introduction: Classes, Objects	Understanding Exceptions: Types of Exception Exception Hierarchy	Understanding Thread: Creating a thread Running Thread	Undestanding Java Swing
SLO-2	Structure of Java Program:Main Method, Statements and Expressions Declaring Variables and Initializing variables	Functions Inheritance and its types	Try-Catch Blocks: Handling Exception Throwing Exception	Thread Life Cycle Extending thread class	Adding components: Layouts, Buttons and Textareas
SLO-3	Primary Data types: int, flot, char, Boolean	Polymorphism, Encapsulation, Abstraction	Multiple catch clauses	Creating multiple thread	Custom components: Simple Toolbars

SLO 4-6	Practice: Work with IDE and writing simple programs	Practice: Programs using Classes and objects	Practice: Program using Exception Handling	Practice: Program to create multi thread	Practice: Creating Basic Swing Application
SLO-7	Scope and Lifetime of variable	Constructors & Destructors, Default & Parameterized constructor	Working with finally, throw and throws	Synchronization and Coordination	Communication between components, Listeners, Events
SLO-8	Operators: Arithmetic, Relational and Logical Operators	Garbage Collection Passing Arguments, object as arguments	User defined exception	Thread safety and deadlock	Component settings: size, setting borders
SLO-9	Operator precedence	Overloading: Method, Constructor Overriding: Method	Understanding Packages	Inter-Thread Communication	Custom events, Form submissions
SLO 10-12	Practice: Program using various operators	Practice: Program using Constructors and Destructors	Practice: Program using simple packages	Practice: Program to Inter Thread Communication	Practice: Creating applications using events
SLO-13	Flow Control Statements: Conditional Statements: if, else if, else statements Switch-case statements	Recursion, Understanding Static variables, methods	Importing Packages	File Handling: Reading and Writing to files	Menus, Tables
SLO-14	Looping Statements for or while, do-while loops Enhanced for loop	Introduction: String Class String functions	Built-in Packages User Defined Packages	Working with Input and Output Stream	File Choosers, Color Choosers, Dialog boxes
SLO-15	Working with break, continue and return statements	Command Line Arguments	Sample Packages	StringbufferInput stream	MVC Architecture
SLO 16-18	Practice: Programs using control statements	Practice: Program using string class and functions	Practice: Program using built-in and user defined packages.	Practice: Program to read and write on files	Practice: Program to implement MVC in swing.

Resources					
1	Java : The Complete Reference, Twelfth Edition, Herbert Schildt,			4	Head First Java, A Brain Friendly Guide, Kathy Sierra,
2	Core Java Fundamentals, Volume 1			5	Introduction to Java Programming and Data Structures, Comprehensive Version Y :Liang
3	Java All in One for Dummies, Dong Lowe			6	https://www.coursera.org/learn/java-introduction

Assessment												Strategies			
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy	Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4							
		(10 %)		(10 %)		(20 %)		(10%)							
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)				
1	Remember	15	15	15	15	10	10	10	10	15	15				
2	Understand	15	15	15	15	10	10	10	10	15	15				
3	Apply	20	25	25	20	25	25	25	25	25	25				
4	Analyze	20	25	25	20	25	25	25	25	25	25				
5	Evaluate	15	10	10	15	15	15	15	15	10	10				
6	Create	15	10	10	15	15	15	15	15	10	10				
Total (%)		100	100	100	100	100	100	100	100	100	100				

Technology	Pedagogy / Andragogy	Sustainable Development	
Simulations	Clarification/Pauses	✓	Good Health & Well Being
Presentation Tools	✓ Group Discussion	✓	Quality Education
Learning Management System	✓ Hands-on Practice	✓	Gender Equality
	Debate	✓	
	Interactive Lecture	✓	
	Brainstorming	✓	

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT chennai			1	Dr. G. Kalpana, Professor, FSH, SRMIST

Course Code	UMS24203T	Course Title	Statistics for Artificial Intelligence	Category	C	Discipline Core Course	L	T	P	C
							4	0	0	4

Course Offering Department	Mathematics and Statistics	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of taking this course is to:	Depth				Attainment			Programme Learning Outcomes (PLO)									
CLR-1	To provide foundations in Statistics	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To provide a strong foundation of organizing the data, diagrammatic and graphical presentation.																	
CLR-3	To apply Statistical techniques in AI																	
CLR-4	To provide the application of correlation and regression in AI.																	
CLR-5	To analyze the sample data in order to estimate or predict characteristics of the larger population from which the sample is drawn.																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Bloom's Level of Thinking												
CLO-1	To understand the statistical modeling and its limitations, and have skill in description, interpretation and exploratory analysis of data by graphical and other means	✓	✓	-	-	2	8	75	3	-	-	-	-	-	-	-	-	-
CLO-2	To calculate and apply measures of central tendency - grouped and ungrouped data cases.	✓	✓	✓	-	2	8	75	-	3	-	-	-	-	-	-	-	-
CLO-3	To understand and apply measures of dispersion - grouped and ungrouped data cases.	✓	✓	✓	✓	3	8	75	3		-	-	-	-	-	-	-	-
CLO-4	Find the relationship between two or more variables using correlation and regression.	✓	✓	✓	✓	3	8	75	-	3	-	-	-	-	-	-	-	-
CLO-5	Perform Test of Hypothesis for small sample. Learn non-parametric test such as the Chi- Square test for Independence and Goodness of Fit, Perform the Analysis of Variance - One way Classifications.	✓	✓	✓	✓	3	8	75	-	-	-	-	3	-	-	-	-	-

Sessions	CLO - 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	Nature and scope of statistical methods	Measures of Central tendency	Measures of Dispersion	Correlation Analysis	Conditional Probability, Testing of Hypotheses
	12	12	12	12	12

SLO-1	Definition of statistics, Numerical Data, Nature and Importance of statistics, Functions of statistics	Measures of Central tendency i. Definition ii. Functions of average iii. Characteristics of a typical average Arithmetic mean, Individual series	Range – Individual, Discrete series and Continuous series	Correlation - Definition and uses, Types of correlation, Methods for Finding Correlation Coefficient, Properties of correlation coefficient	Random experiment, types of events with Examples, Definition of probability, addition and multiplication law
SLO-2	Limitations, Distrust of Statistics, Classification: Meanings, Objects	Arithmetic mean Discrete series, Arithmetic mean Continuous series	Quartile Deviation - Individual and Discrete series	Karl Pearson's Correlation Coefficient	Problems based on addition and multiplication law, Conditional probability - formula
SLO-3	Rules of classification, Types of classification, Characteristics of good classification- Tabulation: Parts of Tabulation, Rules of Tabulation, Types of tables - Objective of Tabulation	Arithmetic mean Cumulative series	Quartile Deviation - Continuous series	Spearman's Rank Correlation, Coefficient with non-repeated Ranks	Problems on conditional probability, Definition of Baye's theorem
SLO-4	Components of Good Table, Rules of construction of the table	Arithmetic mean Merits and Demerits, Median Individual series, Median Discrete series,	Mean Deviation about Mean – Individual Series, Mean Deviation about Mean – Discrete series, Mean Deviation about Mean – Continuous series	Spearman's Rank Correlation, Coefficient with repeated Ranks	Problems on Baye's theorem, Definition of probability distribution and its Type- Testing of Hypotheses
SLO-5	Difference between classification and tabulation.	Median Continuous series- Median Merits and Demerits	Mean Deviation about Median – Individual series, Mean Deviation about Median – Discrete series, Mean Deviation about Median – Continuous series	Spearman's Rank Correlation Coefficient, Problems on finding the best pair of judgements- Bivariate Distribution	Testing Procedures Definition of test statistic t and its uses, t-test Small Sample tests, t-test - Test for Single Mean, t-test -Test for two Sample Means
SLO-6	Diagrammatic representation of various types of statistical data : Bar Diagram, Types of Bar diagram	Mode Individual series, Mode Discrete Series	Standard Deviation – Individual and Discrete Series	Regression Analysis:Regression - Definition and Uses, Regression Coefficients	t-test - t Test Statistic, when sample standard deviations are not known, but Population Standard Deviations are known
SLO-7	One dimensional Diagrams, Two dimensional Diagrams	Mode Continuous Series	Standard Deviation - Continuous Series	Regression Equations, Types of Regression Equations	Chi-Square distribution - Definition and its Uses, Chi-Square test - Testing Procedure
SLO-8	Pie chart, Histogram, Frequency Polygon, Frequency Curve	Mode Continuous Series	Coefficient of Variation,	Regression Equation of X on Y and Regression Equation of Y on X	Chi-Square test - Problems
SLO-9	Less than O gives, more than O gives	Mode Merits and Demerits, Empirical Relation	Graphical solution of Dispersion Lorenz curve-	Relationship between Correlation and Regression Coefficients,	F-test - Test Statistic of F-test, Uses and testing Procedures
SLO-10	Less than O gives, more than O gives	Graphical solution of Median	Skewness Bowley's coefficient of Skewness	Relationship between Correlation and Regression Coefficients,	Testing the equality of variance using F distribution- Problems based on F-test

SLO-11	Lorenz Curve	Graphical solution of Mode	Skewness Bowley's coefficient of Skewness	Problems on the Relationship between the Coefficients	Analysis of Variance – Definition and Uses
SLO-12	Lorenz Curve	Graphical solution of Mode	Concept of Kurtosis	Finding the corrected Correlation Coefficient values by correcting the wrongly entered inputs	Analysis of Variance – testing procedure, ANOVA - One Way Classification

Resources				
1	Pillai, R.S.N, Bagavathi, V. (2009), Statistics, Theory and Practice, 7th Edition, S. Chand Ltd, New Delhi.	3	Gupta, S.P. (2012), Statistical Methods, 4th Edition, Sultan Chand & Sons, New Delhi.	
2	Khan and Khanum, (2008), Fundamentals of Bio Statistics, 3rd Edition, Ukaaz Publications, Hyderabad	4	Ken Black, (2013), Business Statistics for Contemporary Decision Making, 7th Edition, John Wiley Publications	

Assessment					
Bloom's Level of Thinking	Continuous Learning Assessment (CLA) (50% weightage)				Final Assessment (50 % weightage)
	CLA – 1	CLA – 2	CLA – 3	CLA – 4 *	
	(10 %)	(10 %)	(20 %)	(10%)	
	Theory (%)	Theory (%)	Theory (%)	Theory (%)	
1 Remember	15	15	10	10	15
2 Understand	15	15	10	10	15
3 Apply	20	25	25	25	25
4 Analyze	20	25	25	25	25
5 Evaluate	15	10	15	15	10
6 Create	15	10	15	15	10
Total (%)	100	100	100	100	100

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Strategies				
Technology	Pedagogy / Andragogy		Sustainable Development	
Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓
Presentation Tools	✓ Group Discussion	✓	Quality Education	✓
Learning Management System	✓ Hands-on Practice	✓	Gender Equality	✓
	Debate	✓		
	Interactive Lecture	✓		
	Brainstorming	✓		

Designers					
Professional Experts			Higher Institution Experts		Internal Experts
1	Dr. N.Viswanathan, Presidency College, Chennai		1	Dr. M.Vasantha, ICMR, Chennai	
					1 Dr.S.Parvathi, SRM IST
					2 Dr.S. Poongodisathya, SRM IST

Course Code	UCD24V01T	Course Title	Essentials of Artificial Intelligence	Category	V	Value Added Course	L	T	P	C
							1	0	0	1

Course Offering Department	Computer Applications	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	Study the basics of designing intelligent agents that can solve general purpose problems'	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Discover appropriate AI methods to solve a given problem																	
CLR-3	Perform intellectual task as decision making, problem solving, perception, understanding																	
CLR-4	Formalize a given problem using different AI methods																	
CLR-5	Provides adaptive learning																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Skills	Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	Demonstrate fundamental understanding of the history of artificial intelligence and its foundations	✓	✓	-	-	2	85	75	3	-	-	1	2	1	-	-	-	1
CLO-2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	✓	✓	✓	-	2	85	75	2	-	1	-	2	2	-	1	-	1
CLO-3	Identify systems with Artificial Intelligence. evaluation of different algorithms on a problem formalization	✓	✓	✓	✓	3	85	75	2	3	2	-	2	1	-	1	-	2
CLO-4	Use classical Artificial Intelligence techniques, such as search algorithms,	✓	✓	✓	✓	3	85	75	3	-	2	-	2	2	-	2	-	-
CLO-5	Ability to apply Artificial Intelligence techniques for problem solving.	✓	✓	✓	✓	3	85	75	2	2	-	-	2	-	-	-	-	-

Session	CLO-1 3	CLO-2 3	CLO-3 3	CLO-4 3	CLO-5 3
SLO-1	Introduction to Artificial Intelligence, History of Artificial Intelligence- AI models,	Logical Reasoning-Introduction-Knowledge Representation	Unification and Conditions, Unification algorithm	Partial-order planning, planning graphs	Probability Theory, Uncertain Knowledge, Axioms of probability.
SLO-2	Problem Solving with Artificial Intelligence- ProblemSolvingProcess	Logical Agents, Knowledge basedAgents, Syntax of Firstorder logic, Basic elements of First order logic	Planning: designing programs to search for data or solutions to problem.	Uses of planning graph, Planning and acting in the realworld	Bayes Theorem, Bayes' Rules & uses, Bayesian networks, Types of Bayesian Network
SLO-3	Problem Types, Characteristics and Representation-Agents- Examples of Agents, Types of agents	Forward chaining andBackward Chaining- Properties Examples	State-space search, Problems to solve: Water Jug Problem, State representation: Initial, operator, goal state	Forward march, Backward march and Limited resources	Temporal models, Hidden Markov models, HMM components

Resources			
1	Russel.SandNorvig.P, (2003), “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education	2	S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education

Assessment						Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (100% weightage)				Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1	CLA – 2	CLA – 3	CLA – 4	Simulations	✓	Clarification/Pauses	✓	Good Health & Well Being	
		(20 %)	(20 %)	(40 %)	(20%)						
		Theory (%)	Theory (%)	Theory (%)	Theory (%)						
1	Remember	15	15	10	10			Debate			
2	Understand	15	15	10	10			Interactive Lecture	✓		
3	Apply	20	25	25	25			Brainstorming	✓		
4	Analyze	20	25	25	25						
5	Evaluate	15	10	15	15						
6	Create	15	10	15	15						
Total (%)		100	100	100	100						

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts		Higher Institution Experts		Internal Experts	
1	Mr.JothiPeriaswamy, Founder/Chief Data Scientist, DeepSphere AI, 2 Venture Drive, #13-26 Vision Exchange, Singapore, 608526	1	Dr.S.Gopinathan, Professor and Head, Department of Computer Science, University of Madras, Guindy Campus,,Chennai-600025	1	Dr.S.Belina V J Sara, SRMIST Kattankulathur

Course Code	UCD24S02L	Course Title	Quantitative Aptitude and Logical Reasoning				Category	S	Skill Enhancement Courses				L	T	P	C
													0	0	2	1

Course Offering Department	Career Guidance	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	Illustrate the application of different principles in solving mathematical problems	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creative Skills	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Skills, Teamwork	Leadership Qualities, Professionalism, Entrepreneurial Skills	Digital Technology Skills	Value Incultation, Multicultural Understanding	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PLO-9	PLO-10
CLR-2	Foster students' curiosity and understanding of concepts related to profit/loss, interest computation, and averages																	
CLR-3	Analyze fundamental mathematical concepts concerning permutation and combination, as well as time and work, with a critical perspective																	
CLR-4	Equip students with the abilities essential for generating and comprehending data, focusing on topics such as cubes, dices and blood relations																	
CLR-5	Empower students to grasp the fundamentals of reasoning																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Grasp, evaluate, and tackle problems involving numbers and percentages	✓	✓	-	-	2	85	75	3	1	3	-	2	2	-	-	-	-
CLO-2	Develop, solve, interpret, and apply fundamental mathematical models relevant to everyday situations	✓	✓	✓	-	2	85	75	3	1	3	-	2	2	-	-	-	-
CLO-3	Realize the principles of permutation and combination, probability, time and work, and adopt simplified and innovative approaches to problem- solving	✓	✓	✓	✓	3	85	75	3	1	3	-	2	2	-	-	-	-
CLO-4	Comprehend the concepts of data interpretation, data sufficiency, coding and decoding	✓	✓	✓	✓	3	85	75	3	1	3	-	2	2	-	-	-	-
CLO-5	Solve logical puzzles and reasoning challenges	✓	✓	✓	✓	3	85	75	3	1	3	-	2	2	-	-	-	-

Sessions	CLO – 1	CLO -2	CLO - 3	CLO - 4				CLO – 5	
	6	6	6	6				6	
SLO-1	Classification of numbers and Test of divisibility	Profit and Loss	Permutation and Combination	Cubes and Dice				Direction Sense	
SLO-2	Unit digit and Trailed zeroes	Ratio and Proportions	Problems on Probability	Data Interpretation				Number Series and Word Series	
SLO-3	Problems on HCFand LCM	Simple Interest and Compound Interest	Time and work - Men and Work	Data sufficiency				Odd man out	

					Missing Number and Wrong Number
SLO-4	Problems on Partnership	Word problems on Linear and Simultaneous Equations	Time and Work - Pipes and Cisterns	Seating Arrangements – Linear and Circular	Puzzles - Concepts & Problems Syllogisms - Concepts & Problems
SLO-5	Problems on Percentage	Problems on Averages	Time, Speed and Distance - Problems on Trains	Problems on Blood Relations	Problems on Clocks
SLO-6	Percentage - Increasing & Decreasing functions	Mixtures and Alligations	Time, Speed and Distance - Boats & Streams	Coding – Decoding	Problems on Calendars

Resources

1	Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Tata McGraw Hill, 5 th Edition	4	Dr. Agarwal. R. S, Quantitative Aptitude for Competitive Examinations, S.Chand and Company Limited, 2018 Edition
2	Archana Ram, Place Mentor: Tests of Aptitude for Placement Readiness, Oxford University Press, Oxford, 2018	5	Edgar Thrope, Test of Reasoning for Competitive Examinations, Tata McGraw Hill, 6 th Edition
3	Dinesh Khattar, The Pearson Guide to Quantitative Aptitude for competitive examinations, Pearson, 3 rd Edition	6	PA Anand, Quantitative Aptitude for competitive examinations, Wiley publications, ebook, 2019

Assessment						Strategies				
Bloom's Level of Thinking	Continuous Learning Assessment (CLA) (100% weightage)					Technology	Pedagogy / Andragogy		Sustainable Development	
	CLA – 1	CLA – 2	CLA – 3	CLA – 4		Simulations	✓	Clarification/Pauses	✓	Good Health & Well Being
	(20 %)	(20 %)	(30 %)	(30%)		Presentation Tools	✓	Group Discussion		Quality Education
	Practice (%)	Practice (%)	Practice (%)	Practice (%)		Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	20	10	20	10			Debate		
2	Understand	20	10	20	10			Interactive Lecture	✓	
3	Apply	20	20	20	20			Brainstorming	✓	
4	Analyze	20	20	20	20					
5	Evaluate	10	20	10	20					
6	Create	10	20	10	20					
Total (%)		100	100	100	100					

* The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers			
Professional Experts		Higher Institution Experts	Internal Experts
1	Mr. P. Chockalingam, Senior Lead Software Engineer, Virtusa Consulting Services Private Ltd, DLF IT Park SEZ, Chennai – 600089 p.chockalingam1986@gmail.com	1 Dr. G. Saravana Prabu, Asst. Professor, Department of English, Amrita Vishwa Vidhyapeetham, Coimbatore - 641112 g_saravanaprabu@cb.amrita.edu	1 Dr.SathishK ,HOD, Department of Career Guidance Cell,FSH,SRMIST hod.dcgk.ktr@srmist.edu.in
			2 Dr.AarthiS,Assistant Professor, Department of Career Guidance Cell ,FSH, SRMIST aarthis4@srmist.edu.in

Course Code	UNS24Y01L / UNC24Y01L / UNO24Y01L / UYG24Y01L /	Course Title	NSS/NCC/NSO/YOGA	Category	Y	Mandatory Course	L	T	P	C
							0	0	0	0

Course Offering Department	NSS	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO												
CLR-1	Understand themselves in relation to their community	Conceive	Design	Implement	Operate	1	2	3	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Develop among themselves a sense of social and civic responsibility					Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creative Skills	Communication Skills	Collaborative Skills	Independent Thinking, Analytical Thinking, Logical Reasoning	Leadership Qualities	Professionalism, Autonomy	Digital Technology Skills	Value Incubation, Multicultural Understanding	Environmental Action, Community Engagement	Entrepreneurial Thinking	PSO 1	PSO 2	
CLR-3	Utilize their knowledge in finding practical solution to individual and community problems																				
CLR-4	Develop competence required for group-living and sharing of responsibilities																				
CLR-5	Acquire leadership qualities and democratic attitude																				
CLO	At the end of this course, learners will be able to:	✓	✓	✓	✓	2	85	75	3	-	-	1	2	3	3	2					
CLO-1	realize themselves in relation to their community	✓	✓	✓	✓	2	85	75	3	2	1	2		3	3	1					
CLO-2	Develop among themselves a sense of social and civic responsibility	✓	✓	✓	✓	3	85	75	3	1	3	1		3	3	1					
CLO-3	find practical solution to individual and community problems	✓	✓	✓	✓	3	85	75	3	3	2	3		3	3	2					
CLO-4	Develop competence required for group-living and sharing of responsibilities	✓	✓	✓	✓	3	85	75	3	3	2	3		3	3	3					
CLO-5	develop leadership qualities and democratic attitude	✓	✓	✓	✓	3	85	75	3	3	2	3		3	3	3					

Assessment is Fully Internal

Assessment					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (100% weightage)			
		CLA – 1 *	CLA– 2 *	CLA– 3 *	CLA – 4 *
		(20%)	(30%)	(30%)	(20 %)
		Practice (%)	Practice (%)	Practice (%)	Practice (%)
1	Remember	20	20	20	20
2	Understand	20	20	20	20
3	Apply	40	40	40	40
4	Analyze	20	20	20	20
5	Evaluate				
6	Create				
Total (%)		100	100	100	100

Strategies					
Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses		Good Health & Well Being	✓
Presentation Tools		Group Discussion		Quality Education	
Learning Management System		Hands-on Practice		Gender Equality	✓
		Debate			
		Interactive Lecture			
		Brainstorming			

***CLA s are evaluated based on (i) participation in awareness programmes, (ii) participation in outreach programme, (iii) Community Services (iv) Camps (National, State, Regional)**

Resources	
1.	NSS Manual (Revised), Government of India

Designers		
Professional Experts		Higher Institution Experts
1	Dr Samuel Chellaiya C Regional Director, NSS Government of India	1 State Officer, NSS Tamil Nadu NSS
		2 Dr Yogalakshmi, NSS Programme Officer, FSH, SRMIST.

SEMESTER – III

Course Code	UCS24301J	Course Name	Operating System	Course Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO (PLO)									
CLR-1 :	Utilize operating systems based on its features and utility	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2 :	Utilize the Process Management functions of an Operating system																	
CLR-3 :	Utilize the features of Memory Management concepts of an Operating system																	
CLR-4 :	Analyze how Device Management part of an Operating system functions																	
CLR-5 :	Utilize the File Management functions of an Operating system																	
CLR-6 :	Analyze the practical operating systems and evaluate their utility																	
CLO	At the end of this course, learners will be able to:																	
CLO-1 :	Identify functions of an operating system, analyze the process management functions	✓	✓	-	-	2	80	70	1	1	1	1	1	2	3	2	1	2
CLO-2 :	Analyze CPU scheduling and synchronization process of an operating system	✓	✓	✓	-	3	85	75	1	1	1	1	1	2	3	2	1	2
CLO-3 :	Analyze the need of Memory management functions of an operating system	✓	✓	✓	✓	3	75	70	1	1	1	1	1	2	3	2	1	2
CLO-4 :	Identify the significance of device management and file management's role of an operating system	✓	✓	✓	✓	3	85	80	1	1	1	1	1	2	3	2	1	2
CLO-5 :	Identify the essentials of inter process communication in an operating system, evaluate hypervisors	✓	✓	✓	✓	3	85	75	1	1	1	1	1	2	3	2	1	2
CLO-6 :	Analyze how operating systems are constructed, analyze the features and aspects of different operating environments	✓	✓	✓	✓	3	80	70	1	1	1	1	1	2	3	2	1	2

Sessions		CLO – 1	CLO - 2	CLO – 3	CLO – 4	CLO - 5
		18	18	18	18	18
S-1	SLO-1	Introduction Operating Systems (OS):	Process concept : Introduction, Process states : Process creation and process termination	Process Synchronization - Background	Deadlocks - System model	Memory management: introduction
	SLO-2	Operating System overview ,Operating system as a resource management	Process state transition diagram, Operation on process	The Critical section problem		
S-2	SLO-1	Operations, Assembler, Compiler, loader, linker, Evolution of Operating Systems ,serial processing and batch processing	Symmetric multiprocessing, Concurrent process	Two process Solutions	Deadlock characterization - Necessary conditions	Logical Vs physical address space

	SLO-2	Batch: Simple, Multiprogramming, Multiprocessor, Time Sharing, parallel systems	CPU Scheduling: Process Scheduler (long, short, medium term), Scheduling criteria	Multi process Solutions, Synchronization hardware solution		
S-3	SLO-1	Distributed (client-server, peer-to-peer), Real-Time (hard, soft Clustering (symmetric, asymmetric, parallel)), Network,)	Laboratory 4: Simulation of FCFS CPU scheduling algorithm	Semaphores – Usage, Semaphores – Implementation	Resource Allocation Graph	swapping
	SLO-2	Laboratory 1: Comparison between various Operating Systems			Methods for handling deadlocks	Organization : physical and logical organization
S-4	SLO-1	Microkernel: Architecture, Kernel mode, user mode, Monolithic, differences	CPU utilization, throughput, time: (a) turnaround (b) waiting (c) response Scheduling Types: FCFS, SJF	Laboratory 7: Write a procedure for timer interrupt handler	Deadlock Prevention - Mutual exclusion, Hold and Wait, No Preemption, Circular Wait	Memory allocation method
	SLO-2				Deadlock Avoidance - Safe state	Single partition allocation
S-5-8	SLO-1	System Call Types, ((a) process control: fork(), exit(), wait(b)file manipulation: open(), read(), write(), close() (c)device mgt: ioctl(), read(), write()	Scheduling Types: FCFS, SJF	Binary semaphores	Laboratory 10: Program to implement Bankers Algorithm	Laboratory 13: multiple partition (dynamic)
	SLO-2					
S-9	SLO-1	b)file manipulation: open(), close(),read(), write()	Priority Scheduling: Preemptive, non-preemptive, Other Scheduling Types: Round Robin	Classic Problems of Synchronization - The Bounded Buffer problem	Resource Allocation Graph Algorithm	Multiple partition memory management : contiguous (fixed, dynamic)
	SLO-2	Operating System services		The Readers - Writers Problem	Banker's Algorithm - Safety Algorithm	
S-10-12	SLO-1	Laboratory 2: Booting process in GNU/Linux OS	Laboratory 5: Priority CPU scheduling algorithm	The Dining philosophers problem	Resource request algorithm, Examples	Contiguous Types: memory protection, allocation, fragmentation (c) partitioned
	SLO-2			Critical Regions: Race condition and process synchronization		Compaction, Paged memory management, Paging technique
S-13	SLO-1	System Programs: file management, status info	multilevel queue, multilevel feedback queue	Laboratory 8: classical inter process communication problem (Producer consumer)	Laboratory 11: Program to implement memory allocation with pages	Segmentation, Segmentation with paging
	SLO-2					
S-14	SLO-1	File modification, language support	multiple processor Scheduling	Implementation of Critical region, Mutual Exclusion Algorithm: Peterson , Monitors	Deadlock Detection - Single instance of each resource type	Laboratory 14 : Simulation of FIFO page replacement algorithm
	SLO-2	Loading and execution, communications,				
S-15	SLO-1	Communications Threads: Single thread, Multi-thread, Operating System structure	Real time scheduling	Producer consumer problem	Several instances of a Resource type	Demand paging, Page replacement algorithms ,FIFO, optimal
	SLO-2					
S-16	SLO-1	Layered approach, Micro kernels, Symmetric multiprocessing	Performance comparison	IPC : Inter process communication	Recovery from deadlock, Process termination, Resource preemption	LRU page replacement, Thrashing
	SLO-2			Message passing, Bounded Buffer Problem	Concurrency mechanism, Comparison between deadlock and starvation	

S-17-18	SLO-1	Laboratory 3: Multi-thread Programming	Laboratory 6: Simulation of Round Robin CPU scheduling algorithm	Laboratory 9: Write a procedure to make message passing in inter process communication	Laboratory 12: Simulation of FIFO page replacement algorithm	Laboratory 15: Simulation of optimal page replacement algorithm
	SLO-2					

Learning Resources	1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne,(2013), “Operating Systems”, 9 th Ed., John Wiley & Sons 2. William Stallings, (2012), “Operating Systems-Internals and Design Principles”, 7 th Ed., Prentice Hall	1. Andrew S. Tanenbaum, Herbert Bos,(2015), “Modern Operating Systems”, 4 th ed., Pearson 2. Bryant O’Hallaxn, (2015), “Computer systems- A Programmer’s Perspective”, Pearson
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Assessment												Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)									
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
7	Remember	15	15	15	15	10	10	10	10	15	15						
8	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓			
9	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓			
10	Analyze	20	25	25	20	25	25	25	25	25	25						
11	Evaluate	15	10	10	15	15	15	15	15	10	10						
12	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts			Higher Institution Experts		Internal Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr.Neelamarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1 Mr.D.RajKumar
					2 Dr .P.J. Arul Leena Rose

Course Code	USA24302J	Course Title	Database Management System	Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes									
CLR-1	Understand the fundamentals of Database Management Systems and Its architecture	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To impart in-depth knowledge of database design process through ER Model and Relational Model																	
CLR-3	Understand the using Structure Query Language (SQL) and PL/SQL																	
CLR-4	Basic knowledge of Improvement of the database design using normalization criteria and optimize queries																	
CLR-5	Basic knowledge of the practical problems of concurrency control and gain knowledge about failures and recover																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating	Independent Thinking, Analytical	Leadership Qualities, Professionalism, Accountability, Decision-making Skills	Digital Technology Skills	Value Incultation, Multicultural Understanding	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	Have a thorough Understanding of the Database Systems	✓	✓	-	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-2	Realize the concepts of ER Model and Relational Model	✓	✓	✓	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-3	Create real time applications of SQL and PL/SQL	✓	✓	✓	✓	3	85	75	3	-	-	3	-	-	-	-	-	-
CLO-4	Design and implementation knowledge of a Normalized Database	✓	✓	✓	✓	3	85	75	3	3	-	-	-	-	-	3	3	
CLO-5	Design and implementation knowledge of Concurrency Control	✓	✓	✓	✓	3	85	75	3	3	-	3	-	-	3	3	3	

Sessions	CLO - 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	18	18	18	18	18
SLO-1	What is a DBMS	Introduction to Entity Relationship	Defining Constraints through SQL	CODD Rules	Recoverability in Transaction
SLO-2	Advantage of DBMS over File Systems	E-R Model Construction	SQL Aggregate Functions Introduction	Normalization: 1Nf, 2Nf, 3Nf	Concurrent Execution
SLO-3	Applications of DBMS	Case Study	Built Functions : In Numeric, Date	BCNF 4Nf and 5Nf	Concurrency Control – Lock Based, Two-Phase Control Commit
SLO 4-6	Lab1 : Creating a Simple DB	Lab 4: Working with Built In SQL Functions	Lab 7: Working with Aggregate Functions	Lab 10: Normalize a DB	Lab 13: Working with Transactions
SLO-7	DBMS Architecture	Issues in E-R Model	Built Functions: String, Set	Referential Integrity	DB Stored Procedures : PL/SQL
SLO-8	Over View of SQL	Keys, Attributes, Constraints	SQL Joins	Indexing: Primary, Secondary, Multilevel	Multilevel Granularity
SLO-9	SQL : Data Definition- DDL	Mapping Cardinality	Creating Sub Queries	ISAM, B-Trees	Deadlock Prevention
SLO 10-12	Lab2: Working with DDL	Lab 5- Working with Primary and Secondary Key	Lab 8: Working With Sub Queries	Lab 11: PL/SQL work with Iterative Statements	Lab 14: Creating DB Stored Procedures
SLO-13	SQL : Data Manipulation -DML	Extended ER - Aggregation	Transaction Control Commands : Commit, Roll Back, Save Point	PL/SQL Variables and Control Structures	PL/SQ: Exception Handling, Triggers
SLO-14	Evolution of Data Models	Extended ER – Generalization, Specialization	Relational Algebra : Fundamental Operations	Cursors and Functions in PL/SQL	Need For DB Security
SLO-15	Comparison of Data Models	Conversion of ER to Relational Table	Functional Dependency : Trivial, Non Trivial	Transactions : ACID Property	Mandatory Access control and SLO-2 Multilevel Security
SLO 16-18	Lab 3: Working with DML	Lab 6: Working with Nested Queries	Lab 9: Correlated Sub Queries	Lab 12: PL/SQL Working with Cursors	Lab 15: Implementation of Payroll Processing, Student Mark Report

Resources

1	AnanthiSheshasaayee,J.G. Sheshasaayee, Digital Logic Fundamentals, Margham Publications, 2005	3	Leach D.P, Malvino A.P, Digital Principles and Applications, TM, 2002
2	Vijayendran.V, Digital Fundamentals, S.V. Publishers, 2003	4	Moris ManoM, Digital Logic and Computer Design, Pearson, 2001

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15					
2	Understand	15	15	15	15	10	10	10	10	15	15		Debate	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Interactive Lecture	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT Chennai			1	Dr. E. Sweetty Bakyarani, Assistant Professor, FSH,

Course Code	UAI24303J	Course Name	Machine Learning using Python	Course Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes (PLO)									
CLR-1 :	To provide basic concepts of machine learning	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2 :	To provide deeper understanding of various tools and techniques for Machine learning Algorithms and outputs	Conceive	Design	Implement	Operate	Bloom's Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2	
CLR-3 :	Understand and Implement the major classification techniques																	
CLR-4 :	Understand and Implement the various Clustering Methods																	
CLR-5 :	Learn and Understand the Tree based machine Learning Algorithms																	
CLO	At the end of this course, learners will be able to:	✓	✓	-	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-1 :	Understand the concepts of machine learning	✓	✓	✓	-	2	85	75	3	2	3	-	2	-	-	-	-	-
CLO-2 :	Learn and understand machine tools and libraries of machine learning	✓	✓	✓	✓	3	85	75	3	2	-	-	2	-	-	-	-	-
CLO-3 :	Learn and understand the linear learning models and classification in machine learning	✓	✓	✓	✓	3	85	75	3	2	-	-	2	-	-	-	-	-
CLO-4 :	Understand the clustering techniques and their utilization in machine learning	✓	✓	✓	✓	3	85	75	3	2	-	-	2	-	-	-	-	-
CLO-5 :	Study the tree based machine learning techniques and to appreciate their capability	✓	✓	✓	✓	3	85	75	3		-	2	2	-	-	-	-	-

Sessions		CLO – 1	CLO - 2	CLO – 3	CLO – 4	CLO - 5
Duration (hour)		15	15	15	15	15
S-1	SLO-1	Machine Learning: What and Why?	Principal Component Analysis(PCA)	Linear Regression with multiple variables	Multi class classification	Decision tree representation
	SLO-2					
S-2	SLO-1	Types of Machine Learning , Supervised Learning	Regularization	Logistic Regression	Unsupervised Vs. Supervised Machine learning	Basic decision tree learning algorithm
	SLO-2	Unsupervised Learning, Reinforcement learning	Kernel smoothing methods	spam filtering with logistic regression		
S-3	SLO-1	Platform for machine learning	Machine learning python libraries	Evaluation Matrix	Case study on Multi class classification problem	Decision tree construction , Classification and regression trees (CART)
	SLO-2	The Curse of dimensionality	training data – testing data – validation data			
S-4 to S-6	SLO-1	Laboratory 1 : Practice elementary mathematical operations and control statements	Laboratory 4 : Creating Various types of plots /charts from various data source	Laboratory 7 : Implementation of Linear regression with multiple regression	Laboratory 10: Implementation of classifier problem	Laboratory 13 : Implementation of decision tree
	SLO-2					
S-7	SLO-1	Over fitting and under fitting	Ensemble learning:-Bagging, Boosting	Data Preprocessing methods – tokenization, Regular expressions	Introduction to clustering	Example for CART

	SLO-2		Maximum likelihood estimation (least squares)			
S-8	SLO-1	Bias and Variance tradeoff	Kernel density estimation	Data Preprocessing methods - stemming Lemmatization, Feature scaling , Feature Selection	K nearest neighbor , K nearest neighbor classification	Issues in decision tree , Random Forest
	SLO-2	Plotting of Data, Vectorization	cross validation Features , k-fold cross validation			
S-9	SLO-1	Matrices and Vectors	Statistical methods for machine learning	Correlation matrix	Case Study on K nearest neighbor Classification	Random Forest with scikit-learn,
	SLO-2	Linear Algebra for machine learning	Probability for machine learning	Introduction to classifiers		Multivariate adaptive regression trees (MART)
S-10-12	SLO-1	Laboratory 2 : Operations on Matrices and Vectors	Laboratory 5 : Create subplots and color plots	Laboratory 8 : Implementation of Data preprocessing methods , Correlation matrix	Laboratory 11 : Implementation of K-Mean Clustering	Example 14 : Implementation of Random Forest
	SLO-2					
S-13	SLO-1	Gradient Descent – Batch	Performance metrics	Naïve Baiyes Method	Introduction to Clustering Bi-clustering	Introduction to Artificial Neural Networks
S-14	SLO-2	Resampling methods, Boot Strapping	MSE, accuracy, Confusion matrix	Baiysean Classifier, Support Vector Machine	Multi-view clustering, K-Means clustering	Perceptron learning, Gradient Descent Vs Perceptron Learning
S-15	SLO-1	Linear Discriminate Analysis	Precision, Recall	Classifier using support vector machine	Case study for K-Mean Clustering	Backpropogation Algorithm
	SLO-2	Parametric vs. non-parametric models	Linear regression with one variable	Spam and Not spam classification		
S-16 to S-18	SLO-1	Laboratory 3 : Vectorized operation on simple matrix operations	Laboratory 6 : Implement Linear regression problem	Laboratory 9 : Implementation of spam and non-spam classification problem.	Laboratory 12 : Implementation of K-Mean Clustering	Laboratory 15 : Implementation of CART
	SLO-2					

Learning Resources	- Kevin P. Murphy, “Machine Learning: A Probabilistic Perspective”, MIT Press, 2012. - EthemAlpaydin, “Introduction to Machine Learning”, Prentice Hall of India, 2005 - Tom Mitchell, "Machine Learning", McGraw-Hill, 1997.	- Sebastian Raschka, VahidMirjilili, "Python Machine Learning and deep learning", 2nd edition, kindle book, 2018 - Carol Quadros, "Machine Learning with python, scikit-learn and Tensorflow", Packet Publishing, 2018. - Gavin Hackeling, "Machine Learning with scikit-learn", Packet publishing, O'Reily, 2018.
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Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses		✓	Good Health & Well Being
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion		✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice		✓
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr.Neelananarayan., Professor, School of Computer Science and Engineering, VIT Chennai			1	Mrs.E.Aarthi
										2	Dr.P.Muthulakshmi

Course Code	UCS24P01L	Course Title	Internship – 1				Category	P	Project Work/Internship	L	T	P	C
										0	0	0	1

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)		The purpose of learning this course is to:	Depth				Attainment			Program Learning Outcomes									
CLR-1	Demonstrate skills learnt in the real time environment.		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Explore the different industries that are using IT		Conceive Design Implement Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incalucation, Multicultural inclusivity	Environmental Action, Community Engagement	Entrepreunerial Risk Taking	PLO-9	PLO-10				
CLR-3	Enhance the skills in the system aspects																		
CLR-4	Understanding the professional connections with the knowledge learnt																		
CLR-5	Applying the skills in problem solving																		
Course Learning Outcomes (CLO)																At the end of this course, learners will be able to:			
CLO-1	To get an insight of an industry and organization/company	✓	✓	-	-	2	85	75	3	2	1	3	3	-	3	2	3	3	
CLO-2	To gain valuable skills and knowledge	✓	✓	✓	-	2	85	75	2	1	1	3	2	-	2	1	3	3	
CLO-3	To make professional connections and enhance networking	✓	✓	✓	✓	3	85	75	2	3	3	3	2	3	3	1	3	3	
CLO-4	To get experience in a field to allow the student to make a career transition	✓	✓	✓	✓	3	85	75	2	3	2	3	2	-	3	2	3	3	
CLO-5	To get an inside view of an industry and organization/company	✓	✓	✓	✓	3	85	75	1	2	2	3	3	-	2	2	3	3	

Students can choose a company of their own interest for internship for a period of minimum four weeks to learn about the application of IT in real time environment. In the first week of July, all the students have to give a presentation about their observations made by them in internship. At the end of the internship period, every student shall submit a structured internship report within 15 days from the date of the completion of the internship period.

LearningAssessment				
ProjectWork/Internship	Continuous Learning Assessment (50%weightage)		FinalEvaluation (50%weightage)	
	Review-1	Review-2	InternshipReport	Viva-Voce
	20%	30%	30%	20%

SEMESTER – IV

Course Code	UAI24401J	Course Name	Computer Networks	Course Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes (PLO)										
CLR-1 :	Understand the evolution of computer networks using the layered network architecture	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10	
CLR-2 :	Understand the addressing concepts and learn networks devices	Conceive	Design	Implement	Operate	Bloom's Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn	Research Skills	Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLR-3 :	Design computer networks using subnetting and routing concepts																		
CLR-4 :	Understand the error types, framing, flow control																		
CLR-5 :	Understand the various Medium Access Control techniques and also the characteristics of physical layer functionalities																		
CLR-6 :	Know the algorithms behind the protocols that helps data transfer																		
CLO	At the end of this course, learners will be able to:	✓	✓	-	-	2	85	75	3	3	3	3	3	3	-	2	2	1	
CLO-1 :	Understand the need for Network and various layers of OSI and TCP/IP reference model.	✓	✓	✓	-	2	85	75	1	3	3	3	3	3	-	2	2	1	
CLO-2 :	Explain various Data Communications media	✓	✓	✓	✓	3	85	75	1	3	3	3	3	3	-	2	2	1	
CLO-3 :	Identify the different types of network topologies and Switching methods.	✓	✓	✓	✓	3	85	75	1	3	3	3	3	3	-	2	2	1	
CLO-4 :	Identify the different types of network devices and their functions within a network.	✓	✓	✓	✓	3	85	75	1	3	3	3	3	3	-	2	2	1	
CLO-5 :	Analyze and Interpret various Network and Transport Layer protocols.	✓	✓	✓	✓	3	85	75	1	3	3	3	3	3	-	2	2	1	
CLO-6 :	Explain different application layer protocols.	✓	✓	✓	✓	3	85	75	1	3	3	3	3	3	-	2	2	1	

Sessions		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
		18	18	18	18	18
S-1	SLO-1	Evolution of Computer Networks	Data Link Layer	Network Layer	Transport Layer	Physical Layer - Functionalities
	SLO-2	The Internet	Functionalities	Functionalities	Functionalities	Transmission Terminology
S2	SLO-1	The Internet today	MAC Addressing	Network Addressing	Port Number	Frequency, Spectrum, And Bandwidth
	SLO-2	Computer Network Architecture	Framing	Classfull Addressing	TCP	Data And Signals
S3	SLO-1	Categories of Networks (LAM,WAN,MAN)	Data Link Control	Routers and Their Functions	TCP Functionalities	Analog And Digital Transmission
	SLO-2	A Data Communications Model-Networks	Line Discipline	Routing Metrics	UDP	Transmission Impairments

S4 – S6	SLO-1	Laboratory 1: Basic Network Commands and their functionalities	Laboratory 4: Construct N/W using bus topology, Star topology	Laboratory 7: Multi-routing connection with static router	Laboratory 10: Implementing a simple application using UCP	Laboratory 13: Analyse the Working of a DNS
	SLO-2					
S7	SLO-1	Protocols	Flow Control – Stop and Wait	Routing Table	UDP Functionalities	Analog to Digital Conversion
	SLO-2	Elements of Protocol	Flow Control – Sliding Window	Routing Algorithm Types	TCP Vs UDP	Digital to Analog Conversion
S8	SLO-1	Network Topologies	Error Control – Stop and Wait	Distance Vector Routing	Application Layer Functionalities	Noise in transmission Attenuation
	SLO-2	Transmission Modes in a Network	Error Control – Go back N	Distance Vector Routing with an Example	HTTP	Twisted Pair-Physical Description-Applications-Unshielded And Shielded Twisted Pair
S9	SLO-1	N/W Layerd Architecture	Error Control –Selective Reject	Link State Routing	HTTP Messages	Coaxial Cable- Physical Description-Applications-Transmission Characteristics
	SLO-2	OSI Model Reference Model		Link State Routing Example		Optical Fiber- Physical Description Applications-Transmission Characteristics
S10-12	SLO-1	Laboratory 2: Introduction to CISCO Packet Tracer (CPT)	Laboratory 5: Construct N/W using Ring topology, Mesh topology	Laboratory 8: Connecting 2 LANS Using Dynamic Routing	Laboratory 11: Analyzing the Working of RIP	Laboratory 14:Implementing a simple web server
	SLO-2					
S-13	SLO-1	Functions of the Various Layers of OSI reference model	Errors in Transmission - Types	Switching in N/W	DNS	Compare the various features of Guided Transmission media
	SLO-2	TCP/IP Reference Model		Circuit-Switching	Electronic mail	Radio Waves -Applications-Transmission Characteristics
S-14	SLO-1	Functionalities of the Various layers of the TCP/IP reference model	Error Detection – Parity, Checksum	Circuit-Switching Advantages	Basic Electronic Mail Operation	Micro Waves Applications-Transmission Characteristics
	SLO-2	Comparison of the OSI and TCP/IP Reference Models	Error Detection – CRC	Packet-Switching Principles	SMTP & MIME	Infrared Waves Characteristics-Applications
S-15	SLO-1	Comparison of Layers	Error Correction -Types	Advantage of Packet Switching	SMTP Overview-Connection Setup-	Satellite Communication
	SLO-2	Comparison of the services	Hamming Code	Compare Circuit and Packet Switching	Mail Transfer	Compare Feature of Guided VsUnGuided Transmission Media
S16-18	SLO-1	Laboratory 3: Build a Peer to Peer N/W using Hub and Switch. Analyse the difference between the working of a Hub and a Switch	Laboratory 6: Connecting two LANS using router with static Router	Laboratory 9: Implementing a simple application using TCP	Laboratory 14 :ARP simulation in CPT	Laboratory 15: Emulate Working of a complete N/W using CPT

Learning Resources	1.BehrouzA.Forouzan,(2010), "Data Communications and Networking", 5th Edition	3.WilliamStallings,(2010), "Data and Computer Communications", Ninth Edition
	2. ToddLammle,(2011), "CCNA Study Guide", Seventh Edition	4. https://www.netacad.com/courses/packet-tracer

Assessment												Strategies											
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development							
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)				Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓							
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)						Presentation Tools	✓	Group Discussion	✓	Quality Education	✓	
1	Remember	15	15	15	15	10	10	10	10	15	15	Learning Management System	✓	Hands-on Practice	✓	Gender Equality							✓
2	Understand	15	15	15	15	10	10	10	10	15	15												
3	Apply	20	25	25	20	25	25	25	25	25	25							Interactive Lecture	✓				
4	Analyze	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓									
5	Evaluate	15	10	10	15	15	15	15	15	10	10												
6	Create	15	10	10	15	15	15	15	15	10	10												
Total (%)		100	100	100	100	100	100	100	100	100	100												

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers		
Professional Experts		Higher Institution Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1 Dr.Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai
		Internal Experts
		1 SWEETY BAKYARANI E

Course Code	UAI24D01J	Course Title	Introduction to Artificial Neural Networks				Category	E	Discipline Core / Elective Courses	L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	NIL	Progressive Courses	NIL	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment													
CLR-1	To understand the biological neural network					1	2	3	4	1	2	3		1	2	3	4	5	6	7	8	9	10
CLR-2	To model equivalent neuron models																						
CLR-3	To understand the architecture																						
CLR-4	To understand the learning algorithm																						
CLR-5	To understand issues of various feed forward and feedback neural networks																						
Outcomes (CLO)		At the end of this course, learners will be able to:																					
CLO-1	To Understand basic neuron models and learning algorithms					✓	✓	-	-	2	85	75		3	2	2	1	-	-	-	-	3	2
CLO-2	Ability to Develop an Artificial Neural Network using algorithms					✓	✓	✓	-	2	85	75		3	2	1	2	-	-	-	-	2	1
CLO-3	To able to gain knowledge in back propagation algorithm					✓	✓	✓	✓	3	85	75		3	1	3	1	-	-	-	-	3	2
CLO-4	Ability to enhance skill in Self-Organization Maps and its algorithm					✓	✓	✓	✓	3	85	75		3	3	2	3	-	-	-	-	2	1
CLO-5	Proficiency in understanding neuro dynamics and its model.					✓	✓	✓	✓	3	85	75		3	3	2	3	-	-	-	-	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction and Learning Process	Single Layer Perceptrons	Multilayer Perceptron	Self-Organization Maps	Neuro Dynamics
Duration (hour)	15	15	15	15	15
SLO-1	A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs	Adaptive Filtering Problem	Back Propagation Algorithm, XOR Problem	Two Basic Feature Mapping Model	Dynamical Systems
SLO-2	Network Architectures	Unconstrained Organization Techniques	Heuristics, Output Representation and Decision Rule	Self-Organization Maps	Stability of Equilibrium States
SLO-3	Tutorial 1: Analysis on Neural Network	Tutorial 4: Applying Linear Least Square Filters to creating a ANN	Tutorial 7: Understanding ADALINE network	Tutorial 10: To apply Linear / Logistic regression to build an ANN	Tutorial 13: Analysis on Recurrent Network architectures

SLO-4-5	Practice 1: Case Study on Neural Network	Practice 4: Write a study on Applying Linear Least Square Filters to create a neural network	Practice 7: Create a simple ADALINE network with appropriate no. of input and output nodes.	Practice 10: Develop an ANN using Linear/Logistic regression	Practice 13: To study on Recurrent Network Architectures
SLO-6	Knowledge Representation, Artificial Intelligence and Neural Networks	Linear Least Square Filters, Least Mean Square Algorithm	Computer Experiment, Feature Detection	SOM Algorithm	Attractors, Neuro Dynamical Models
SLO-7	Error Correction Learning, Memory Based Learning	Learning Curves, Learning Rate Annealing Techniques	Back Propagation and Differentiation	Properties of Feature Map	Manipulation of Attractors as a Recurrent Network Paradigm
SLO-8	Tutorial 2: Learning Error Correction Algorithm	Tutorial 5: To apply Least Mean Square Algorithm for developing ANN	Tutorial 8: Applying Back propagation algorithm to develop an ANN	Tutorial 11: Identifying the working functionality of Naïve Bayes / SVM	Tutorial 14: Applying Convolution Neural Network for classifying text or image
SLO-9-10	Practice 2: Build an Artificial Neural Network using Error Correction Learning	Practice 5: Develop an ANN using Least Mean Square Algorithm	Practice 8: Build an ANN by using Back propagation algorithm	Practice 11: Implementation of Naïve Bayes / SVM on text	Practice 14: To Implement Convolution Neural network for Text classification or Image Classification
SLO-11	Hebbian Learning, Competitive, Boltzmann Learning	Perceptron –Convergence Theorem	Hessian Matrix, Generalization, Cross Validation	Computer Simulations	Hopfield Models
SLO-12	Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process	Relation Between Perceptron and Bayes Classifier for a Gaussian Environment	Network Pruning Techniques, Accelerated Convergence, Supervised Learning	Learning Vector Quantization, Adaptive Pattern Classification	Computer Experiment
SLO-13	Tutorial 3: Understanding to build ANN using Memory Based Learning	Tutorial 6: To create a perceptron by giving correct number of inputs	Tutorial 9: Understanding the functionality of Hessian matrix	Tutorial 12: Applying adaptive patterns to know the patterns	Tutorial 15: Identifying working functionality of Cohen-Grossberg Theorem
SLO-14-15	Practice 3: Develop an Artificial Neural Network using Memory Based Learning	Practice 6: Create a perceptron with appropriate no. of inputs and outputs.	Practice 9: Develop an ANN using Hessian matrix	Practice 12:To Implement adaptive pattern classification to identify the patterns	Practice 15: To Apply Cohen-Grossberg Theorem
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Resources					
1	Simon Haykin, Neural Networks a Comprehensive Foundations, 2 nd Edition, PHI.			3	Li Min Fu, Neural Networks in Computer Intelligence, TMH 2003
2	B. Yegnanarayana, Artificial Neural Networks, 2 nd Edition, PHI.			4	James A ,Freeman David ,M S Kapura , Neural Networks, Pearson Education 2004

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)				Simulations	Clarification/Pauses		✓	Good Health & Well Being
												Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

Designers											
Professional Experts						Higher Institution Experts					
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr. Neelanarayanan., Professor, School of Computer Science and Engineering, VIT Chennai				

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction to Artificial Intelligence Applications	AI in Healthcare	AI in Business and Finance	AI in Robotics and Automation	AI in Natural Language Processing and Human-Computer Interaction
Duration (hour)	15	15	15	15	15
SLO-1	Overview of artificial intelligence (AI) and its applications: the concept of AI and its various applications across different sectors	Diagnosis and treatment recommendation systems- how AI is used to assist healthcare professionals in diagnosing medical conditions	Predictive analytics for business forecasting: how AI-driven predictive analytics techniques are used to forecast trends, demand, and market behavior in business and finance settings	Industrial robotics and automation in manufacturing: the role of AI-powered robots and automation systems in streamlining manufacturing processes, improving	Language translation and sentiment analysis: how AI techniques are used in natural language processing (NLP) tasks- language translation, sentiment analysis, and text summarization

				productivity, and enhancing product quality	
SLO-2	the role of AI in enhancing efficiency, automation, and decision-making	Recommending appropriate treatment plans based on patient data	Customer relationship management (CRM) and personalization: the role of AI in CRM systems for analyzing customer data, predicting behavior, and delivering personalized experiences and recommendations	Autonomous vehicles and transportation systems : the development and deployment of AI-driven autonomous vehicles and transportation systems	Virtual assistants and chatbots for customer service- the development and deployment of virtual assistants and chatbots powered by AI technologies for customer service, support, and information retrieval
SLO-3	Tutorial1: Understand how artificial intelligence (AI) is revolutionizing various industries	Tutorial4: Understanding Ethical Principles in Healthcare AI	Tutorial7: Understanding Regulatory Frameworks in AI-driven Finance	Tutorial10: Ensuring Safety in AI-driven Robotics	Tutorial13: Understanding Privacy Concerns in AI-driven Systems
SLO-4-5	Practice1: Implement basic AI algorithms and concepts using Python programming language.	Practice4: Explore algorithms that exhibit human-like intelligence across multiple tasks, such as reinforcement learning or deep learning	Practice7: Implement algorithms for analyzing medical images to detect diseases and abnormalities	Practice10: Explore methods for ensuring the privacy and security of healthcare data in AI-driven systems	Practice13: Create a simulation environment for algorithmic trading using historical financial data
SLO-6	Historical development and milestones in AI applications Traces the historical evolution of AI, highlighting key milestones and breakthroughs that have shaped the field and led to its current applications -Future of Artificial Intelligence	Medical image analysis and interpretation- The role of AI in analyzing medical images such as X-rays, MRIs, and CT scans to assist in the detection of diseases and abnormalities	Algorithmic trading and financial risk management: the use of AI algorithms in algorithmic trading systems for executing trades	self-driving cars, drones, and delivery robots	Speech recognition and voice-enabled interfaces: the use of AI-driven speech recognition technologies in voice-enabled interfaces for interacting with computers, smartphones, and other devices
SLO-7	Types of AI applications: narrow AI vs. general AI Ethical considerations and societal impacts of AI applications	Drug discovery and personalized medicine- how AI techniques are applied to drug discovery processes, including virtual screening, molecular modeling, and personalized medicine approaches based on genomic data	Managing financial risk in stock markets and other trading environments	Service robots in healthcare, hospitality, and household tasks: the use of service robots in various domains such as healthcare, hospitality, and household chores- applications in assistance, companionship, and caregiving	Augmented reality (AR) and virtual reality (VR) applications: the application of AI in augmented reality (AR) and virtual reality (VR) systems for immersive experiences, training simulations, and interactive storytelling
SLO-8	Tutorial2: Explore the historical journey of AI	Tutorial5: Addressing Bias and Fairness in Healthcare Algorithms	Tutorial8: : Addressing Ethical Considerations in AI-driven Finance	Tutorial11: Addressing Security Risks in AI-driven Robotics	Tutorial14: Addressing Bias and Fairness in AI Algorithms
SLO-9-10	Practice2: Research and present key milestones and breakthroughs in the history of AI	Practice5: Discuss and debate ethical considerations in AI development and usage	Practice8: Simulate the process of drug discovery using AI techniques such as virtual screening and molecular modeling	Practice11: Build predictive models for forecasting trends and demand in a business or finance context	Practice14: Implement a fraud detection system using machine learning algorithms for detecting anomalies in financial transactions
SLO-11	Ethical considerations and societal impacts of AI applications	Remote patient monitoring and telemedicine- Investigates the use of AI-powered remote monitoring	Fraud detection and prevention: how AI techniques such as machine learning and anomaly detection are	Drone technology and applications in various industries: the use of drones and UAVs (unmanned aerial vehicles)	Privacy, bias, and inclusivity issues in AI-driven language and interaction systems: the ethical and social

		devices and telemedicine platforms to enable healthcare delivery at a distance, improving access to care and patient outcomes	used to detect and prevent fraudulent activities in financial transactions and systems	equipped with AI technologies for aerial surveillance, mapping, agriculture, and disaster response	implications of AI-driven language and interaction systems
SLO-12	Examines the ethical implications of AI technologies-privacy, bias, job displacement, and the responsibility of AI developers and users	Ethical considerations and challenges in AI-driven healthcare: Considers the ethical dilemmas and challenges associated with AI adoption in healthcare, including data privacy, algorithmic bias, and the impact on patient-provider relationships	Regulatory challenges and ethical implications in AI-driven finance: the regulatory frameworks and ethical considerations surrounding the use of AI in finance, including issues of transparency, accountability, and regulatory compliance	Safety, security, and ethical concerns in AI-driven robotics: the safety, security, and ethical implications of AI-driven robotics - autonomous decision-making, human-robot interaction, and the potential for misuse or harm	Related to privacy, bias, and inclusivity in dataset collection, algorithmic decision-making, and user experience design
SLO-13	Tutorial3: Examine the ethical dimensions of AI	Tutorial6: Balancing Privacy and Data Security	Tutorial9: Navigating Compliance andRisk Management	Tutorial12: Navigating Ethical Dilemmas in AI-driven Robotics	Tutorial15: Promoting Inclusivity and Diversity
SLO-14-15	Practice3:Develop algorithms for specific tasks such as classification, regression, or clustering	Practice6:Develop a prototype system for diagnosing medical conditions and recommending treatment plans based on patient data	Practice9:Design and develop a telemedicine platform for remote patient monitoring and consultation	Practice12: Develop a customer relationship management (CRM) system using AI techniques for analyzing customer data and personalizing experiences	Practice15: Design and build a robotic system using AI techniques for a specific application, such as industrial automation, autonomous vehicles, or service robots
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources		
1	"Artificial Intelligence: A Guide to Intelligent Systems" by Michael Negnevitsky - 3rd Edition, published by Pearson Education in 2021.	2
3	"Artificial Intelligence: Foundations of Computational Agents" by David L. Poole and Alan K. Mackworth - 2nd Edition, published by Cambridge University Press in 2017.	4
5	"Artificial Intelligence and Machine Learning for Business: A No-Nonsense Guide to Data-Driven Technologies" by Steven Finlay - published by Wiley in 2019.	

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers		
Professional Experts		Higher Institution Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1 Dr.Neelamarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai
		1 Dr.T.PapithaChristobel, SRM Institute of Science and Technology, Ramapuram,Chennai, papithat@srmist.edu.in

CourseCode	UEN24S01L	CourseTitle	Communication Skills	Category	S	SkillEnhancement Course	L	T	P	C
							0	0	4	2

CourseOfferingDepartment	English	Pre-requisiteCourses	Nil	Co-requisiteCourses	Nil	ProgressiveCourses	Nil	DataBook/Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			Programme Learning Outcomes									
CLR-1	Bridge the theoretical language knowledge with practical communication skills, essential for academic and professional contexts.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	focus on enhancing listening, speaking, reading, and writing skills, crucial for effective interaction and teamwork.	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity, Solving	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning,	Leadership Qualities, Professionalism, Autonomy,	Digital Technology Skills	Value Education, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO - 1	PSO - 2
CLR-3	prepare students for employability by building competence in interviews, group discussions, and professional communication.																	
CLR-4	promote understanding and sensitivity towards linguistic and cultural diversity, key to thriving in a globalized world.																	
CLR-5	articulate ideas and emotions clearly, overcoming language barriers.																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	acquire basic proficiency in listening, speaking, reading, and writing, enabling effective interaction in everyday and academic scenarios.	✓	✓	-	-	2	85	75	3	-	-	1	3	3	-	2	2	1
CLO-2	express ideas clearly using appropriate verbal cues and non-verbal signals in social, academic, and professional contexts.	✓	✓	✓	-	2	85	75	3	-	1	2	3	3	-	1	2	1
CLO-3	enhance their ability to comprehend, evaluate, and respond to diverse forms of written and spoken communication critically.	✓	✓	✓	✓	3	85	75	3	-	3	1	3	3	-	1	1	2
CLO-4	produce well-organized written documents and oral presentations, showcasing logical thinking and clarity of expression.	✓	✓	✓	✓	3	85	75	3	-	2	3	2	3	-	2	3	3
CLO-5	demonstrate awareness and sensitivity towards linguistic and cultural diversity, effectively navigating multicultural interactions.	✓	✓	✓	✓	3	85	75	3	3	2	3	2	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	12	12	12	12	12
SLO-1	Introduction to Communication. Types of Communication- verbal and non-verbal communication	Introduction to Reading Skills. Discussion of techniques of Reading Skill	Introduction to Speaking Skills. Explaining the importance of phonetics and vocabulary	Introduction to Writing Skills. Importance of writing skills	Introduction to appreciation of texts.
	Barriers of Communication dynamics of interpersonal communication, Interpret Cross-Cultural Differences in Non-Verbal Communication Develop and Demonstrate Effective Non-Verbal Communication Skills	Reading Skills.(Barriers of reading skills and strategies of effective communication through reading) Identifying common reading problems in students after making them read a few passages.	Speaking Skills.(Barriers of speaking skills and strategies of effective communication through speaking) Explaining the usage of the Oxford Learner's Dictionary to learn phonetics of the words at the fundamental level.	Writing Skills.(Barriers of writing skills and strategies of effective communication through writing) Explaining various forms of writing with examples:.	Encouraging the students to share a few of their favourite lines from any sources they have read or sharing a few lines from paditthadhill piditthadhu.

	Introduction to Digital language lab/usage of mobile applications	Learners are enabled to record their speech and listen to it in order to correct their problematic areas	The right enunciation of certain words to be taught through phonetic representation and decoding the phonetic symbols by learning to use the dictionary..	Introduction to letter writing. Types of letters- Formal and Informal letters with examples. Learning E-mail etiquette.	Explaining why appreciating texts creates a good reader.
SLO-2	Equipping the listening skill of the learners Listening Skills.(Barriers of listening skills and strategies of effective communication through listening) Exploring Effective Ways of Listening.	repetitive practices of reading select paragraphs from web resources, their standard will be measured.	Observe and repeat and learn the phonetic pronunciation of words by practicing continuously.	Class Assignment - write a formal letter and informal letter and check for e-mail etiquettes in writing.	Enabling the students to reflect in the classroom about any of their favourite books/ articles or magazines.
SLO-3	Introducing google podcasts.	The speed, fluency, pronunciation, comprehension of the words in the paragraph	Teaching the usage of Thesaurus to understand and develop various words and improve vocabulary.	Enabling the students to unleash their potentials in creative writing through writing transcripts for advertisements of any product.	Introducing the text of Letters by Mathrubootham published in the Hindu.
SLO-4	Task to write down the words from the audio they have listened to. This activity should be done in two steps. 1. Jotting down the words simultaneously as they listen to the speaker. 2. Writing the transcript of the audio through repetitive play and pause.	hints and tricks to follow where the pauses are to be followed.	Identifying common errors in concord, preposition, direct speech and indirect speech.	write a review of any book or a movie or an interview or a debate.	Reading and recitation of the text of the first letter-Enjoy within limits, says Mr. Mathrubootham Understanding characters by analyzing the usage of their style of language
SLO-5	Imitating the speakers by listening to them and attempting to learn the pronunciation of the words uttered in the audio.	Students group 1- reads – group 2 identifies the flaws in reading.	Identifying common errors in tenses, punctuation, and syntactical errors..	Mechanics of writing like capitalization, punctuation, spelling, correct pronoun, preposition, concord usage can be taught.	Reading of the second letter- Nobel? What Nobel, asks Mr. Mathrubootham.
	Repetitive listening to enhance pronunciation skills	The roles have to be exchanged between the two groups and the activity should be practiced.	Rectifying the common errors and instructing the learners about the right usage in order to avoid common errors.	meachnaics of writing - assessed and evaluated.	Mathrubootham's humour and the language of code switching from Tamil to English and vice –versa.
SLO-6	Introducing to the audios of TED TALK American Speakers. Listening to the native speakers of English Language through TED TALKS.	Identify the key arguments in a passage -introductory point, lead point, supportive argument statement, concluding point and the common connecting word between all the keywords in the passage.	Practicing how to avoid common errors.	Teaching effective writing by learning to avoid common errors in concord, preposition, conjunction, relative pronouns, question tags.	Reading of the third letter -Mr. Mathrubootham is fully supporting all new technologies
	Introducing to the audios of TED TALK British Speakers. Listening to the native speakers of English Language through TED TALKS.	encouraged to identify the key arguments in other passages on their own.	The learners are introduced to collocations for quick choice of learning	Practicing effective writing by learning to avoid common errors in concord,	Mathrubootham's frustration over the failure of technologies and the language

			how to speak in short time and how to speak effectively.	preposition, conjunction, relative pronouns, question tags.	that he positively uses to denote hopelessness over technologies.
SLO-7	American and British styles can be differentiated.	Guiding the act of reading through scanning and skimming by model reading of the passages by the instructor.	Practice collocations	common errors in tenses, direct and indirect speech and syntax structure.	Reading of the fourth letter in the classroom and discussion Pizza maavu: Welcome to Mr. Mathrubootham food recipe website,
SLO-8	The recognition of different accents should be practiced by speaking after listening.	scanning and skimming activities	Idioms and phrases	Practicing effective writing by learning to avoid common errors in tenses, direct and indirect speech and syntax structure.	Mathrubootham's love for food and the miscommunication about food.
SLO-9	Learning advanced pronunciation and vocabulary through various computer applications like Woodpecker.	Loud reading and slow mind reading	A speaking task to learn- collocations, idioms and phrases, vocabulary and phonetic pronunciation	Teaching how to write statement of purpose for admission to higher educations, and practicing the same.	Analysing the text for regional relevance and National significance.
	imitate the different sounds and accents - repeat it after listening to any of the videos from the library based on individual interest.	Pauses, pronunciation, comprehension and fluency can be checked for improvement at this stage through repetitive practices.	Their speaking activity is to be recorded and played again to rectify the errors and highlight the problematic areas in speaking.	Teaching how to write a story by looking at a picture. Developing the writing skill through word ladders.	Appreciating the aesthetics of the comic element and the embodiment of humour in the narrative in the letter
SLO-10	Repeat listening to the same time frames and move from 02.01 to 03.00	Students -groups -checking the comprehension skills. Analyse the text of a passage.	Automating vocabulary through engaging the students in various activity games like solving crossword puzzle and playing scattergories.	Introduction to blog writing and steps to become an effective blog writer.	importance of bringing in the Indianized way of speaking the English Language in order to depict the character called Mathrubootham.
	Choosing any particular time frame and practicing it.	Brainstorming the comprehension skills-questioning the key points in the passage.	Engaging the students to play the games in order to learn the vocabulary.	Encourage the readers to create their own blogs and post articles on a regular basis.	relatable characters of both formal and informal everyday life experiences.
SLO-11	Interested students can complete listening and reflecting the complete audio listening practice and speaking.	Cross check with misunderstanding if any and rectify- match the question and answers.	Spur of the moment speech.:	Selecting any news article and learning the writing style in it.	Talk about their favourite letter from the letters of Mathrubootham by recollecting the appreciation of the text according to their perception and understanding.
SLO-12	Group activities and games can be conducted to test the listening skills by responding to the speech given by other students	Passages for reading comprehension are to be given for practice that tests their reading skills.	Prepared speech : Giving a speaking task to the students to speak on their own choice	Students are given chances to write reports on various topics.	Enabling the students to share their appreciation of any of their favourite lines form the books they have read.

Resources

1	Horizon-EnglishText Book –CompiledandEditedbytheFacultyofEnglishDepartement,FSH, SRMIST, 2023	5	TheArtofPublicSpeakingbyStephen E.Lucas-2019
2	TheCreativeWritingCoursebook:FortyAuthorsShareAdviceandExercisesforFictionand Poetry by Julia Bell and Paul Magrs- 2001	6	TalkLikeTED:The9Public-SpeakingSecretsoftheWorld's Top MindsbyCarmine Gallo – 2014

3	On Writing: A Memoir of the Craft by Stephen King 2000	7	The Anatomy of a Book Review: A Guide for College Students by Ronald J. Weber 1994
4	The Writing Life: Writers on How They Think and Work edited by Marie Arana-2003	8	How to Write a Simple Book Review: It's easier than you think! by Allyson R. Abbott 2013

Assessment										
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessmen t (50 % weightage)
		CLA – 1		CLA – 2		CLA – 3		CLA – 4*		
		(10 %)		(10 %)		(20 %)		(10 %)		
		Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	Practice
1	Remember	-	20	-	20	-	15	-	20	20
2	Understand	-	20	-	20	-	15	-	20	20
3	Apply	-	20	-	20	-	20	-	20	20
4	Analyze	-	20	-	20	-	20	-	20	20
5	Evaluate	-	10	-	10	-	15	-	10	10
6	Create	-	10	-	10	-	15	-	10	10
Total (%)		-	100	-	100	-	100	-	100	100

Strategies					
Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses	✓	Good Health & Well Being	✓
Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
		Debate	✓		
		Interactive Lecture	✓		
		Brainstorming	✓		

*The evaluation can be done on the one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences

Designers		
Professional Experts	Higher Institution Experts	Internal Experts
1 Krishna Raj Sutherland, Krishna.Raj1@sutherlandglobal.com	1 Dr. J. Mangayarkarasi Associate Professor and Head, Department of English, Ethiraj College for Women, Chennai	1 Dr. Pushpanjali Sampathkumar, Assistant Professor, Department of English, FSH, SRMIST
	2 Dr. K. S. Antony Samy Loyola College Chennai antony.samyks@loyolacollege.edu	2 Dr. Shanthichitra, Professor, Department of English, FSH, SRMIST

Course Code	UCD24S03J	Course Title	Industry Oriented Employability and Leadership Skills	Category	S	Skill Enhancement Courses	L	T	P	C
							1	0	2	2

Course Offering Department	Career Guidance	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)		The purpose of learning this course is to:	Depth	Attainment	Program Learning Outcomes															
CLR-1	Help students to develop essential skills to influence and motivate others				Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Communication Skills, Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills Value Incultation, Multicultural Environmental Action, Community Entrepreneurial Risk Taking	PLO-9	PLO-10						
CLR-2	Inculcate emotional and social intelligence and integrative thinking for effective leadership																			
CLR-3	Create and maintain an effective and motivated team to work for the society																			
CLR-4	Nurture a creative and entrepreneurial mindset																			
CLR-5	Make students understand the personal values and apply ethical principles in professional and social contexts																			
Course Learning Outcomes (CLO)		At the end of this course, learners will be able to:	Depth	Attainment	Program Learning Outcomes															
CLO-1	Examine various leadership models and understand/assess their skills, strengths and abilities that affect their own leadership style and can create their leadership vision				Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Communication Skills, Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills Value Incultation, Multicultural Environmental Action, Community Entrepreneurial Risk Taking	PLO-9	PLO-10						
CLO-2	Learn and master a set of practical skills such as time management, self-management, handling conflicts, team leadership																			
CLO-3	Understand the basics of entrepreneurship and develop business plan																			
CLO-4	Apply the design thinking approach for leadership																			
CLO-5	Appreciate the importance of ethics and moral values for making of a balanced personality & be an integral human being																			

Sessions	CLO - 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	9	9	9	9	9
SLO-1	Leadership - definition & Qualities	Team building & dynamics	Management – definition & Manager traits	Innovative leadership – Concept of emotional and social intelligence	Entrepreneurship
SLO-2	Leadership – styles	Work delegation with activity	Work schedule with activity	Synthesis of human and Artificial intelligence	Successful Indian entrepreneurs – case study
SLO-3	Difference between leader and boss	Decision making with activity	Strategic planning	Design thinking	Ethics – definition & Corporate ethics

SLO-4	Case study (based on leadership styles)	Motivation & Motivation for results	Conflict management	Measuring and Sustaining innovation	Importance of ethics
SLO-5	Leadership in diverse organizational hierarchy , cultures and communications	Argumentation, Persuasion, Negotiation, Networking	Energy Management & Novel Ways to manage energy in work place – activity	Case study: Organizations with sustained innovation.	Essential elements of business ethics
SLO-6	Leading the organisation through stability and turbulence	Interpersonal communication	Workforce management	Key elements of design thinking	Creating a harmonious life with work-life balance
SLO-7	Understanding Leadership and its importance.	Budget planning	Time Management	How to transform challenges into opportunities	Ethics and Conduct : Ethical decision-making
SLO-8	Models of Leadership	Workflow optimization	Recruiting and Retaining Talent	How to develop human-centric solutions for creating socially good humans	Importance of ethical principles in professional and social contexts.
SLO-9	Basic Leadership Skills	Critical thinking and Multitasking	Conflict & Stress Management	Emerging trends in design thinking	Building ethical culture: promoting ethical behavior in organization.

Resources

1	Craig E Johnson, Meeting the ethical challenges of leadership, Sage publications, 2018	4	Alexander Osterwalder, Business Model Generation, Wiley, 2013
2	T V Rao, Managers who make a difference: Sharpening your management skill, Random House India, 2016	5	Deborah Tannen, Talking from nine to five: Women and men in the workplace, Harper Collins Publishers, 2010
3	Allan R Cohen, David L Bradford, Influence without authority, Wiley, 2018	6	Dr Carrie Picardi Leadership Essentials you always wanted to know Vibrant Publishers,2021

Assessment

Level of Thinking		Continuous Learning Assessment (CLA) (100% weightage)							
		CLA – 1		CLA – 2		CLA – 3		CLA – 4	
		(20 %)		(20 %)		(30 %)		(30%)	
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)
1	Remember	5	5	5	5	15	15	10	10
2	Understand	5	5	5	5	15	15	10	10
3	Apply	25	25	25	25	20	20	20	20
4	Analyze	25	25	25	25	20	20	20	20
5	Evaluate	20	20	20	20	15	15	20	20
7	Create	20	20	20	20	15	15	20	20
Total (%)		100	100	100	100	100	100	100	100

Strategies

Technology	Pedagogy / Andragogy	Sustainable Development	
Simulations	Clarification/Pauses	✓	Good Health & Well Being
Presentation Tools	✓ Group Discussion	✓	Quality Education
Learning Management System	✓ Hands-on Practice	✓	Gender Equality
	Debate	✓	
	Interactive Lecture	✓	
	Brainstorming	✓	

***The evaluation can be done on the one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences**

Designers			
Professional Experts		Higher Institution Experts	Internal Experts
1	Mr. P. Chockalingam, Senior Lead Software Engineer, Virtusa Consulting Services Private Ltd, DLF IT Park SEZ, Chennai – 600089 p.chockalingam1986@gmail.com -	1 Dr. G. Saravana Prabu, Asst. Professor, Department of English, Amrita Vishwa Vidhyapeetham, Coimbatore - 641112 g_saravanaprabu@cb.amrita.edu -	Mrs. Deepalakshmi 1 S, HOD, Department of Career Guidance, FSH, SRMIST hod.dcgk.ktr@srmist.edu.in 2 Dr. Elamathiyan E, Assistant Professor, Department of Career Guidance, FSH, SRMIST, elamathe1@srmist.edu.in

Course Code	UMI24Y01L	Course Title	My India Project	Category	Y	Mandatory Courses	L	T	P	C
							0	0	0	0

Course Offering Department	Mathematics and Statistics	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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(Assessment Method - Fully Internal)

Assessment Tools	Marks
Review I (Activities)	50
Review II (Project Report & Presentation)	50
Total	100

SEMESTER – V

Course Code	UAI24D03J	Course Name	Introduction to Internet of Things	Course Category	E	Discipline Core / Elective Course				L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	NIL	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Learning Rationale (CLR):		The purpose of learning this course is to:						Depth			Attainment		Program Learning Outcomes (PLO)																
CLR-1 :	Demonstrate the design, communication model and enabling technologies for IoT.							Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	Explore the system management and domain for various applications of IoT														Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-3 :	Categorize the various protocols that are used for developing IoT applications.														3	1	-	1	3	-	-	-	3	3	-	1	-	-	-
CLR-4 :	Deploy an IoT application and connect to the cloud.														2	1	3	2	3	-	-	-	2	3	-	1	-	-	-
CLR-5 :	Develop IoT application for real time scenario														2	1	2	1	3	-	-	-	2	3	-	1	-	-	-
CLR-6 :	Implemetation of IoT application for real world problems														70	75	70	85	80										
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:																											
CLO-1 :	Apply the knowledge/understanding of mathematics, science, to the solution of complex problems applicable to the discipline							✓	✓	-	-	3	80	70	3	1	-	1	3	-	-	-	3	3	-	1	-	-	-
CLO-2 :	Design, implement, and evaluate a computer-based system, process, component, or program to meet desired solutions that meet the specified needs with suitable concern for the public health and safety, and the cultural, societal, and environmental considerations.							✓	✓	✓	-	3	85	75	2	1	3	2	3	-	-	-	2	3	-	1	-	-	-
CLO-3 :	Create, select, and apply applicable techniques, resources, and modern engineering and IT tools to complex engineering activities with an understanding of the limitations.							✓	✓	✓	✓	3	75	70	2	1	2	1	3	-	-	-	2	3	-	1	-	-	-
CLO-4 :	Function successfully as an individual, and as a member or leader in assorted teams, and in multidisciplinary settings.							✓	✓	✓	✓	3	85	80	2	1	2	1	3	-	-	-	2	3	-	1	-	-	-

CLO-5 :	Prove knowledge and understanding of the engineering and management principles and apply the same to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	✓	✓	✓	✓	3	85	75	1	1	2	1	3	-	-	-	2	3	-	1	-	-	-
CLO-6 :	Apprehend the importance of technology with the current scenario	✓	✓	✓	✓	3	80	70	3	1	-	1	3	-	-	-	3	3	-	1	-	-	-

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (Sessions)	15	15	15	15	15
S-1	Introduction Definition& Characteristics of IoT	Introduction Application of IoT	Introduction about Iot protocols Infrastructure	IoT Platforms Design Methodology Purpose & Requirements, process model specification, domain model specification	Introduction about RESTful API Designing a RESTful Web API
S-2	Physical design of IoT Things in IoT	Home Automation Discuss Home automation problems	6LowPAN Architecture of 6LowPAN	Information model specifications, service specifications, Iot level specifications Functional view specifications, operational view specifications.	Amazon Web Services Amazon Web Services for IoT
S-3	IoT protocols	Cities Discuss cities problem	Ipv6 Architecture of Ipv6	Device & component Integration, Application development IoT System for Weather Monitoring	Creating a ID in Amazon EC2
S-4	Logical Design of IoT IoT Functional Blocks	Industry Discuss Industry problem	Bluetooth Discovery	Purpose & Requirements, process model specification, domain model specification Information model specifications, service specifications, Iot level specifications	Implementation of EC2 Autoscaling
S-5	Laboratory 1: List and summarize few Eclipse IoT Projects..	Laboratory 4: Demonstrate a smart object API gateway service reference implementation in IoT toolkit	Laboratory 7: Explain the application framework and embedded software agents for IoT toolkit.	Laboratory 10: GPIO Programming - Interfacing of I/O devices like LED/Switch etc., and testing the functionality.	Laboratory 13: Smart Irrigation System

S-6	IoT Communication Model	Health & Lifestyle Discuss Health & Lifestyle problem	Physical Web mDNS	Functional view specifications, operational view specifications. Device & component Integration, Application development	Implementation of Autoscaling S3
S-7	IoT Communication APIs	M2M Architecture of M2M	DNS-SD Data Protocols	IoT System for Agriculture Purpose & Requirements, process model specification, domain model specification	Implementation of S3 RDS
S-8	IoT Enabling Technologies Wireless Sensor Networks	SDN Architecture of SDN	MQTT Examples of MQTT	Information model specifications, service specifications, Iot level specifications Functional view specifications, operational view specifications.	Implementation of RDS DynamoDB
S-9	Cloud Computing Big Data Analytics	NFV for IOT Architecture of NFV	Difference between MQTT and HTTP CoAP	Device & component Integration, Application development	Implementation of DynamoDB Kinesis
S-10	Laboratory 2 – Overview of Arduino IDE (Integrated Development Environment)	Laboratory 5: Explain working of Raspberry Pi.	Laboratory 8: How to Use RGB LEDs with Raspberry Pi	Laboratory 11: Home Automation – Level 0	Laboratory 14: Weather Reporting Systems
S-11	IoT Levels and Deployment Templates Level 0	IoT System Management Advantages of IoT system management	Types of CoAP Request and Response methods	Introduction to Cloud Storage Models	Implementation of Kinesis Case studies - Environment
S-12	Level 1 Level 2	Simple Network Management Protocol	Pros and Cons of CoAP	Introduction to Cloud Storage Communication APIs	IoT systems for weather Reporting Bot Air Pollution Monitoring System
S-13	Level 3 Level 4	Limitations of SNMP	Pros and Cons of AMQP	Python Web Application Framework	Forest Fire Detection Case studies - IoT system for Energy
S-14	Level 5 IOT Applications	Network Operator Requirements	Semantic JSON- LD	Raspberry pi Explanation of raspberry pi pin diagram	Smart grid Renewable Energy Systems
S-15	Laboratory 3: Sketch the architecture of IoT Toolkit and explain each entity in brief	Laboratory 6: Describe gateway as a service deployment in IoT toolkit	Laboratory 9: Connect Raspberry Pi with your existing system components	Laboratory 12: Home Automation – Level 4	Laboratory 15: Air Pollution Monitoring System

Learning Resources	1. ArshdeepBahga and Vijay Madiseti, (2015), "Internet of Things - A Hands-on Approach", Universities Press 2. Dieter Uckelmann et.al, (2011), "Architecting the Internet of Things", Springer 3. CunoPfister, (2011), "Getting Started with the Internet of Things", O'Reilly, 2011.	4. Adrian McEwen, Hakim Cassimally, (2014), "Designing the Internet of Things", Wiley 5. HonboZhou, (2012), "The Internet of Things in the Cloud: A Middleware Perspective ", CRC Press 6. Olivier Hersent, David Boswarthick, Omar Elloumi, (2012), "The Internet of Things – Key applications and Protocols", Wiley
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Assessment												Strategies						
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development		
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations		Clarification/Pauses		✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools		✓	Group Discussion		✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System		✓	Hands-on Practice		✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓			
2	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓			
3	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓			
4	Analyze	20	25	25	20	25	25	25	25	25	25							
5	Evaluate	15	10	10	15	15	15	15	15	10	10							
6	Create	15	10	10	15	15	15	15	15	10	10							
Total (%)		100	100	100	100	100	100	100	100	100	100							

Designers														
Professional Experts					Higher Institution Experts					Internal Experts				
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services				1	Dr.Neelanarayanan., Professor, School of Computer Science and Engineering, VIT Chennai				1	1. Dr.S.Umarani, SRM Institute of Science and Technology, Ramapuram,Chennai, papithat@srmist.edu.in			

Course Code	UAI24D04J	Course Title	Human Machine Interaction	Category	E	Discipline Core / Elective Courses	L	T	P	C
							3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	NIL	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)	The purpose of learning this course is to:	Depth	Attainment																
CLR-1	To Understand the foundation of human machine interaction	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10	
CLR-2	To Learn the importance of design and software process in HMI																		
CLR-3	Understand various model based design technologies to meet user requirements.																		
CLR-4	Encourage to familiarize into research in Graphical User Interface design																		
CLR-5	Be aware of mobile interaction design and its usage in day – to – day activities																		
Outcomes (CLO)	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical	Communication Skills,	Independent Thinking,	Leadership Qualities,	Digital Technology Skills	Value Incultation,	Environmental Action,	Entrepreneurial Risk Taking	PSO-1	PSO-2	
CLO-1	Acquire the basics of Human Machine Interaction	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1	
CLO-2	Analysis of effective design and software process in HMI	✓	✓	✓	-	2	85	75	3	2	3	2	2	3	-	1	2	1	
CLO-3	Apply Interactive Design and evaluation process in real world applications	✓	✓	✓	✓	3	85	75	3	1	3	1	3	-	-	1	1	2	
CLO-4	Apply UI design principles in the real-world applications using various technologies	✓	✓	✓	✓	3	85	75	3	2	2	1	3	2	-	2	3	3	
CLO-5	Create mobile application for social and technical task	✓	✓	✓	✓	3	85	75	3	2	2	1	3	2	-	3	3	3	

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Fundamentals of Human Machine Interaction	Design and Software Process	Model Based Design and Evaluation	Graphical User Interface	HMI in Mobile Applications
Duration (hour)	15	15	15	15	15
SLO-1	The Human – introduction	Interaction Design Basics – Process Design	Basic idea, introduction to different types of models,	The Graphical User Interface - Introduction	Mobile Ecosystem: Platform
SLO-2	Input and Output Channels, Human Memories	Navigation Design and Screen Design	GOMS family of models (KLM and CMN-GOMS)	Principles of User Interface Design	framework
SLO-3	Tutorial: Thinking: Reasoning and Problem Solving	Tutorial: Iteration and Prototyping	Tutorial: Fitts' law and HickHyman's law	Tutorial: WWW-Multimedia-Hypertext	Tutorial: Application
SLO-4-5	Practice: Design an Interactive Systems	Practice: Design a simple website with the given design principles	Practice: Model-based design case studies	Practice: Develop a simple UI using design principles	Practice: Develop a simple mobile app
SLO-6	The computer – Introduction	HMI – software life cycle	Cognitive models	Design Goals – Organizing the Screen elements	Types of Mobile Applications: Widgets, Applications

SLO-7	Devices-Memory	usability engineering – Prototyping in practice	Physical and Design Model	Screen navigation and flow-Visually pleasing composition	Mobile Information Architecture
SLO-8	Tutorial:Processing and Networks	Tutorial:design rationale	Tutorial:Cognitive Architecture	Tutorial: Presenting information meaningfully	Tutorial: Games
SLO-9-10	Practice:Solve a problem in the dialog between a user and a computer.	Practice: Develop a prototype for electronic diary systems	Practice: Develop a linguistic and grammatical model to understand the user – system dialog	Practice: Present the information meaningfully for the hospital information systems	Practice: Design a simple gaming app
SLO-11	Models of Interaction-Design Focus	Design Rules: Principles – Standard - Guidelines - Rules	Communication and Collaboration Model	Information retrieval on the web	Mobile 2.0
SLO-12	Ergonomics – Industry Interface	Evaluation Technique	Face to Face Communication	statistical graphics	Mobile Design: Elements of Mobile Design
SLO-13	Tutorial:Interactivity	Tutorial: Universal Design	Tutorial: Text based communication	Tutorial: Technological consideration in interface design	Tutorial:Tools and techniques
SLO-14-15	Practice: Case Studies	Practice: Design a E-commerce site for small retail business	Practice: Develop a text-based communication model	Practice: Case Study on technological	Practice: Case Studies
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment – 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1	Flipped Classroom				
2	Higher Order Thinking				
3	2 Mins Presentation				
4	Webpage design task				
5	Task in simple Mobile App Development				
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6	Online Quiz				
7	Assignment				
8	Case Study Discussions				
9	Application Development				
10	Class Test				
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources					
1	Alan Dix, Janet Finlay, Gregory D. Abowd, Russell Beale Human-Computer Interaction, Third Edition, Pearson Education	3	. Wilbert O. Galitz, —The Essential Guide to User Interface DesignI, Wiley publication.		
2	Brian Fling, —Mobile Design And DevelopmentI, First Edition , O'Reilly Media Inc., 2009	4	Alan Cooper, Robert Reimann, David Cronin, —About Face3: Essentials of Interaction designI, Wiley publication.		

Assessment												Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
13	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓		
14	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓		
15	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓		
16	Analyze	20	25	25	20	25	25	25	25	25	25						
17	Evaluate	15	10	10	15	15	15	15	15	10	10						
18	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts			Higher Institution Experts		Internal Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr S Uma Shankari Associate Professor/CSA, SRMIST - RMP
2			2		2 Dr V Pavithra, Assistant Professor/CSA , SRMIST - RMP

Course Code	UAI24D05J	Course Title	Data Science and its Applications				Category	E	Discipline Core / Elective Courses	L	T	P	C
										3	0	2	4

Course Offering Department	AI& ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:							Depth				Attainment			Program Learning Outcomes(PLO)									
CLR-1	Understanding the Basics of Data Science							1	2	3	4	1	2	3	1	1	2	3	4	5	6	7	8	9	10
CLR-2	Learning the fundamentals of Data Science Methodologies							Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)		Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLR-3	Exploring the various domains in Application of Data Science																								
CLR-4	To Get a strong hands-on skill, knowledge and expertise increasing in challenges using Data science tools																								
CLR-5	Tools for Data Scientists																								
Outcomes (CLO)		At the end of this course, learners will be able to:																							
CLO-1	Describe the significance of data science and understand the process						✓	✓	-	-	2	85	75	3	-	1	1	-	1	-	-	2	-		
CLO-2	Understand different types of data Applications for data science process						✓	✓	✓	-	2	85	75	3	2	3	2	1	3	-	1	2	-		
CLO-3	Gain knowledge on relationships of domain in Data Science						✓	✓	✓	✓	3	85	75	3	2	3	1	2	2	-	1	2	1		
CLO-4	Participating in data science challenges and opportunities						✓	✓	✓	✓	3	85	75	3	3	1	1	1	2	-	1	2	2		
CLO-5	Apply Data scientist tools to interpret and explore data						✓	✓	✓	✓	3	85	75	2	3	3	2	2	3	-	3	3	3		

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)	15	15	15	15	15
SLO-1	Introduction	Introduction to Data Science Methodology	Economic Analysis of Electric Consumption	Challenges in Mathematical and Statistical Foundations	Cloud Infrastructure
SLO-2	Basic concepts of Data Science	Business Understanding	Stock Market Prediction	Data-to-Decision and Actions	Data/Application Integration
SLO-3	Tutorial: Evolution of Data Science	Tutorial: Problem Statement Formulation	Tutorial: Data Warehouse	Tutorial: Challenges in Social Issues	Tutorial: Correlations
SLO-4-5	Practice: Perform Analysis on Simple data set for Data Science Business Intelligence Applications	Practice: Basic plots using Matplotlib	Practice: Application of Data Science in different domains(Finance, Healthcare, Marketing etc	Practice: Descriptive Statistical operation: Mean Median, Mode	Practice: Find the Correlation Matrix
SLO-6	Classifications	Data Collection-Data Understanding	Social Media Analytics	Data Storage and Management Systems	Master Data Management

SLO-7	Regressions	Modeling Data	Email Mining	Data Quality Enhancement	Data Preparation and Processing
SLO-8	Tutorial: Data Science Pipeline	Tutorial: Modeling Evaluation	Tutorial: Time Series Analysis	Tutorial: Deep Analytics and Discovery	Tutorial: Computation Formula-Regression and Multiple Regression line
SLO-9-10	Practice: Reading different types of dataset from web and disk in file in specfic disk location	Practice: Simple Linear Regression	Practice: Data Cleaning Techniques(Missing Data ,Duplicates Outliers)	Practice: Practical Applications of Statistical in data Analysis	Practice: Plot the Correlations plot on dataset and visualize giving an overview of relationship among data
SLO-11	Deep learning	Data Science Mathematical Preliminaries	Big Data Analysis Mining Methods	High-Performance Processing and Analytics	Analytics
SLO-12	Clustering	Statistical inference	Data Mining	Networking, Communication, and Interoperation	Visualization
SLO-13	Tutorial: Data Science vs Business (Real World Example)	Tutorial: Regression	Tutorial: Application of data science in various field- Data Security issues	Tutorial: Modeling Data	Tutorial: Scatterplot
SLO-14-15	Practice: Create a dataframe using a list of elements.	Practice: Write the Python scrip to find basic descriptive statistics using summary,str,quartile function	Practice:Data transformation and manipulation using Pandas	Practice:Model Evaluation technique: Cross Validation, Metrics	Practice: Install, Import Matplotlib. Explore all the Data Visualization Graph
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					

10					
	Test / quiz / assignment Evaluation			Description of Evaluation Methodology	

Resources

1	Aakanksha Sharaff and G. R.Sinha “ Data Science and its Applications CRC Press Taylor & Francis Group 2021.	3	David Cielen, Arno D. B. Meysman, and Mohamed Ali, “Introducing Data Science”, Manning Publications, 2016. (Unit I)
2	Data Visualization: a successful design process by Andy Kirk Publisher(s):Packt Publishing link: https://www.oreilly.com/library/view/data-visualization-a/9781849693462/	4	Robert S. Witte and John S. Witte, “Statistics”, Eleventh Edition, Wiley Publications, 2017.

Assessment

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers

Professional Experts			Higher Institution Experts			Internal Experts		
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr.Neelamarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai		1	Dr.S.Karthiga, Assistant Professor. Karthigs2@srmist.edu.in	

Course Code	UAI24D06J	Course Title	Software Engineering and Project Management				Category	E	Discipline Core / Elective Course	L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses		Progressive Courses		Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment												
CLR-1	To articulate the fundamental principles underlying software project management, including key concepts such as planning, scheduling, and resource management.	1	2	3	4		1	2	3		1	2	3	4	5	6	7	8	9	10		
CLR-2	Understanding of different phases and life cycle models of software development, including Waterfall, Agile, and Spiral models, and their applicability in various contexts.																					
CLR-3	To apply requirements analysis and design techniques to elicit, analyse, document, and validate software requirements, ensuring they align with stakeholder needs.																					
CLR-4	Proficiency in software implementation and testing practices, including coding standards, version control, and various testing methodologies to ensure software quality.																					
CLR-5	Recognize the importance of software project management in ensuring project success, including the ability to identify and mitigate risks, manage change, and communicate effectively with stakeholders.																					
Outcomes (CLO)		At the end of this course, learners will be able to:				Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1	To understand the fundamental principles of software project management.	✓	✓	-	-	2	85	75	3	2	2	1	-	-	-	-	-	-	-	3	2	
CLO-2	To Understand Phases and Life cycle models of Software Development	✓	✓	✓	-	2	85	75	3	2	1	2	-	-	-	-	-	-	-	2	3	
CLO-3	To Comprehend the Requirements Analysis and Design	✓	✓	✓	✓	3	85	75	3	2	3	1	-	-	-	-	-	-	-	3	2	
CLO-4	To Understand Software Implementation and Testing	✓	✓	✓	✓	3	85	75	3	3	2	3	-	-	-	-	-	-	-	2	3	
CLO-5	To Understand the importance of Software Project Management	✓	✓	✓	✓	3	85	75	3	3	2	3	-	-	-	-	-	-	-	3	3	

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
	Software Development Introduction	Phases of Software Development	Requirements Analysis and Design	Software Implementation and Testing	Software Project Management
Duration (hour)	15	15	15	15	15
SLO-1	Defining of Software Development Process - Process - Tailoring the Process	Phases of software development	Requirement Analysis – Analysis process, Requirements specification	Software Coding	Software Project Management Framework
SLO-2	Improving the process discipline - Need for implementing discipline	Feasibility study	Desirable characteristics of an SRS	Programming principles and coding guidelines	Methods to estimate project time and cost, Resource Management, Identification, Analysis, mitigation, and monitoring of Project Risks
SLO-3	Tutorial 1: Stakeholders for Software Development Project	Tutorial 4: Work Breakdown Structure &	Tutorial 7: Use case diagrams & Identifying Actors Use Case	Tutorial 10: .Statechart and Activity Modeling	Tutorial 13: Implementation

		Risk Analysis			
SLO-4&5	Practice 1: STAKEHOLDERS & PROCESS MODELS	Practice 4: Project Effort Based on Resources	Practice 7: Modeling UML Use Case Diagrams and Capturing Use Case Scenarios	Practice 10: Statechart Diagrams, State & Transition	Practice 13: Addition of New requirement & Addition of New Issue
SLO-6	Software Production Process - Identify the Software Model - Software Process Models	Requirement Analysis, Design, Implementation	Structure of an SRS document, Data Flow Diagrams	Method of incrementally developing code	Ensuring Project quality
SLO-7	Testing, and Maintenance phases	Testing, and Maintenance phases	Role of Software Architecture and Architecture Views - Planning for a Software Project	Managing the evolving code	Quality management
SLO-8	Tutorial 2: Requirements & Elicitation Feasibility Study	Tutorial 5: Function Point Analysis COCOMO Model	Tutorial 8: E-R Modeling from the Problem Statements	Tutorial 11: Automate the process of filling and submitting a form on a web page. Using selenium	Tutorial 14: Estimation of Test Coverage Metrics and Structural Complexity
SLO-9&10	Practice 2: Identifying the Requirements from Problem Statements	Practice 5: Estimation of Project Metrics	Practice 8: Entity Relationship Model & Entity Set and Relationship Set	Practice 11: Automated Form Submission	Practice 14: Control Flow Graph & McCabe's Cyclomatic Complexity
SLO-11	Software Engineering – importance	Software Life Cycle Models - Classical waterfall, Iterative, prototyping, Spiral, and Agile	Software Design - Software design concepts - Function Oriented Design and its Complexity Metrics	Testing - Unit testing and Code Inspection - Testing concepts and testing process	Configuration Management, Change management
SLO-12	Software Engineering emergence	Compare Life cycle models	Object Oriented Design and its Complexity Metrics - Detailed Design.	Design of Test case and Test plan - Black-box testing - White box testing	CMMI, different levels and need of accreditation
SLO-13	Tutorial 3: Project Plan & Identify Job Roles and Responsibilities	Tutorial 6: Design	Tutorial 9: Identifying Domain Classes from the Problem Statements	Tutorial 12: Modeling Data Flow Diagrams	Tutorial 15: .Designing Test Suites
SLO-14&15	Practice 3: Project Plan	Practice 6: System Architecture	Practice 9: Domain Class & Using Generalization	Practice 12: Data Flow Diagram & Context diagram and leveling DFD	Practice 15: Software Testing & Testing Frameworks
Assessment	Continuous Learning	Assessment - 1		Continuous Learning Assessment - 2	
			Continuous Learning Assessment - 3		

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					

9				
10				
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology		

Resources				
1	Roger S Pressman, Software Engineering, McGraw Hill, 5th edition and 7th edition, 2020	2	Kathy Schwalbe, Managing Information Technology Project, Cengage Learning, 6th edition, 2019	
3	Jack T Marchewka, Information Technology Project Management, Wiley India, 2016	4	KK Agrawal, Yogesh Singh, Software Engineering, New Age International, 3rd edition, 2017	
5	Richard H. Thayer, Software Engineering Project Management, Wiley India, 2014			

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)				Simulations	Clarification/Pauses		✓	Good Health & Well Being
												Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers						
Professional Experts			Higher Institution Experts		Internal Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr.Neelanarayanan., Professor, School of Computer Science and Engineering, VIT Chennai	1	Dr. R Ramyadevi, SRMIST, ramyader@srmist.edu.in

Course Code	UES24V01T	Course Title	Environmental Studies	Category	V	Value Added Course	L	T	P	C
							2	0	0	2

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	To create awareness on environment and renewable and non-renewable resources																	
CLR-2	To understand about ecosystem and biodiversity																	
CLR-3	To understand the natural and anthropogenic impact of the environmental pollution																	
CLR-4	To create awareness on different environmental problems																	
CLR-5	To create awareness on various environment protection acts and the impact of human population on environment																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PSO 1	PSO 2
CLO-1	Applying knowledge on renewable and non-renewable resources	✓	✓	-	-	1	75	70		-	1	-	-	2	1	-	-	-
CLO-2	Understanding about ecosystem and biodiversity	✓	✓	-	-	1	80	75	3	2	-	1	-	-	2	-	-	-
CLO-3	Gathering knowledge on impact of environmental pollution	-	✓	✓	-	2	80	75	-	3	2	-	3	-	3	-	-	-
CLO-4	Understanding of different environmental problems	✓	-	✓	-	3	80	75	-	2	3	-	-	3	2	-	-	-
CLO-5	Having knowledge on various environment protection acts and the impact of human population on environment problems	✓	-	✓	✓	3	80	75	-	-	3	-	3	2	1	-	-	-

Sessions	CLO - 1 6	CLO - 2 6	CLO - 3 6	CLO - 4 6	CLO - 5 6
SLO-1	Multidisciplinary nature of environmental studies, definition, scope and importance of environmental studies	Energy flow in the ecosystem, energy flow in the ecosystem, ecological succession	Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity	Disaster management- floods, earthquakes, cyclones, landslides	Air, water, wildlife - environment protection act
SLO-2	Need for public awareness. institutions in environment, people in environment	Food chains, food webs and ecological pyramids	Environmental pollution- definition, causes, effects and control measures of air, water, and soil pollution	Social issues and the environment: From unsustainable to sustainable development	Forest conservation act; issues involved in enforcement of environmental legislation, public awareness
SLO-3	Introduction to natural resources- renewable and nonrenewable resources - associated problems	Ecosystem, introduction, types, characteristic features, structure and functions: forest, grassland and desert ecosystems	Causes, effects and control measures of marine, and noise	Urban problems related to energy, waterconservation, rain water harvesting, watershed	Human population and the environment:population growth, variation among nations
SLO-4	Forest, water, mineral, food resources	Aquatic ecosystems; biodiversity and its conservation-genetic, species and ecosystem diversity	Causes, effects and control measures of thermal pollution and nuclear hazards	Environmental ethics: issues and possible solutions, climate change & global warming	Population explosion – family welfare programme, human rights, value education

SLO-5	Energy and land resources; role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles	Biogeographical classification of India, value of biodiversity, biodiversity at global, national and local levels	Role of individuals in pollution prevention	Acid rain & ozone layer depletion	HIV/AIDS, women and child welfare
SLO-6	Concept of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers	India as a mega diversity nation, hot-spots of biodiversity, threats to biodiversity: habitat loss, poaching of wildlife man-wildlife conflicts, endangered and endemic species of India	Solid waste management Causes, effects and control measures of urban and industrial waste	Nuclear accidents and nuclear holocaust; wasteland reclamation	Role of information technology in environment and human health

Resources					
1	Bharucha, E (2013).Textbook of environmental studies for undergraduate courses(2 nd ed.).Orient BlackSwan.			3	Jeyalakshmi, R. (2014).Text book of environmental studies, Devi publications
2	Basu,M., & ,(2017) .,Savarimuthu, X SJ Fundamentals of environmental studies.Cambridge University Press, Cambridge, United Kingdom			4	Bharucha, E (2002).The Biodiversity of India, Mapin Publishing Pvt. Ltd.

Assessment		Continuous Learning Assessment (CLA) (50% weightage)					Strategies				
	Bloom's Level of Thinking	CLA – 1	CLA– 2	CLA– 3	CLA– 4 *	Final Assessment (50 %weightage)	Technology	Pedagogy / Andragogy	Sustainable Development		
		(10%)	(10%)	(20%)	(10%)		Presentation Tools	✓	Clarification/Pauses	✓	Good Health & Well Being
		Theory (%)	Theory(%)	Theory (%)	Theory (%)		Learning Management System	✓	Group Discussion	✓	Quality Education
								✓	Hands-on Practice	✓	Gender Equality
1	Remember	20	20	20	20	20			Debate	✓	Life on Land
2	Understand	20	20	20	20	20			Interactive Lecture	✓	Clean Water and Sanitation
3	Apply	20	20	20	20	20			Brainstorming	✓	Affordable and clean energy
4	Analyze	20	20	20	20	20					
5	Evaluate	20	-	20	20	20					
6	Create	-	20	-	-	-					
	Total (%)	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts			Higher Institution Experts		Internal Experts
1	Dr. Arumugam Perumal, ARMATS BIOTEK Training and Research Institute, Chennai		1	Dr. N. Banu, Bharathi Women's College (Autonomous), Chennai	1 Dr. P. Parthipan,Assistant Professor, Department of Biotechnology, FSH, SRMIST, KTR

Course Code	UCD24S04J	Course Title	Career Readiness and Professional Skills				Category	S	Skill Enhancement Course				L	T	P	C
													1	0	2	2

Course Offering Department	Career Guidance	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)		The purpose of learning this course is to:	Depth				Attainment			Program Learning Outcomes (PLO)													
CLR-1	Develop resume building practice		Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Communication Skills, Collaborating Independent Thinking, Analytical Leadership Qualities, Professionalism, Digital Technology Skills Value Incultation, Multicultural Environmental Action, Community Entrepreneurial Risk Taking PLO-9 PLO-10	2	85	80	2	3	2	3	-	-	-	-	-	-
CLR-2	Prepare for interviews and group discussion																						
CLR-3	Understand the significance of team skills																						
CLR-4	Help students improve their speaking and presenting abilities																						
CLR-5	Acquire career planning skills and fully pursue a successful career path																						
Course Learning Outcomes (CLO)																							
CLO-1	Understand the importance of resume preparation and face interview confidently	✓	✓	-	-	2	85	80	2	3	2	3	-	-	-	-	-	-	-				
CLO-2	Perform appropriately and effectively in group discussions	✓	✓	✓	-	3	85	80	2	3	2	3	-	1	2	3	-	-	-				
CLO-3	Empathize with and trust colleagues for improving interpersonal skills	✓	✓	✓	✓	3	85	80	3	3	3	3	1	-	3	2	-	-	-				
CLO-4	Prepare effective presentations considering the important strategies	✓	✓	✓	✓	3	85	80	1	3	2	3	-	2	2	-	-	-	-				
CLO-5	Explore sources of (online/offline) opportunities	✓	✓	✓	✓	3	85	80	-	3	2	3	-	1	2	2	-	-	-				

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	9	9	9	9	9
SLO-1	Introduction of resume and its Importance - Difference between a CV, Resume and Bio Data	Mock interview – face to face	Listening as a Team Skill	Types of Presentation - Informative, Instructional, Arousing, Persuasive, Decision-making - Structure of a presentation – Introduction of the event, Introducing the speaker, vote of thanks	Process of Career Exploration - Knowing Yourself - Personal Characteristics

SLO-2	Essential components of a good resume, common errors people make while preparing a resume	Mock interview- Feedback	Trust and Collaboration - Importance of Collaboration in Organization	Improvisation and unprepared presentations, man-woman view, feedback – appreciation and critique - Dos and Don'ts	Knowledge about the World of Work - Requirements of Jobs including Self-employment
SLO-3	Resume building format -Video resume – Tips and tricks – Do's and Don'ts	Meaning and Importance of Group Discussion - types of Group Discussion	The Secret to be a high performing Team	PowerPoint presentation–body language and stage etiquette –practice session	Sources of Career Information - Career Opportunities
SLO-4	Meaning and types of interview (face to face, telephonic, video) - Dress code, background research	Procedure of Group Discussion - Ground rules - Evaluation of Group Discussion	Creativity - Meaning - Strategies to increase Creativity - creativity skills at the Workplace	PowerPoint presentation–practice session	Critical Thinking Skills - Problem Solving Skills - Ability to Learn
SLO-5	STAR Technique (situation, task, approach and response) for facing an interview	Group Discussion - Common Errors Group Discussion Rubric	Methods and Process of Creativity Skills	PowerPoint presentation–practice session	Non- Cognitive Skills - Types of non-cognitive Skills and Strategies
SLO-6	Interview procedure (opening, listening skills, closure, asking questions)	Group discussion – Types and Tips to follow	Social Skills - Peer Pressure	Presentation for Internal and External Communication - online & offline Meetings	Non-Cognitive Skills and Gaps I Socio Economic Status
SLO-7	Keys to attain success in an interview	Group Discussion Practice	Stress and Stress Management - Meaning Stress Management Techniques	Visual elements in Presentation	Brainstorming
SLO-8	Rules and Elements of an Interview	Email Drafting – formal and informal	Social and Cultural Etiquette	Oral Skills and Public Speaking Skills	Logic and Rationality of Critical Thinking
SLO-9	Preparation and Practice	Writing Email – Practice	Characteristics and Enhancing Social Skills	Speaking Skills – Practice	Habits and Traits of the Mind

Resources					
1	Scott Bennett, The Elements of Resume Style: Essential Rules for Writing Resumes and Cover Letters That Work, AMACOM, 2014			4	Paul Newton, How to deliver a presentation e-book
2	David John, Tricks and Techniques of Group Discussions, Arihant, 2012			5	Eric Garner, A-Z of Presentation, Eric Garner and Ventus Publishing ApS, 2012, bookboon.com
3	Singh O.P., Art of Effective Communication in Group Discussion and Interview, S Chand & Company, 2014				

Assessment										Strategies				
Level of Thinking		Continuous Learning Assessment (CLA) (100% weightage)								Technology	Pedagogy / Andragogy	Sustainable Development		
		CLA – 1		CLA – 2		CLA – 3		CLA – 4		Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓
		(20 %)		(20 %)		(30 %)		(30%)		Presentation Tools	✓ Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓ Hands-on Practice	✓	Gender Equality	✓
1	Remember	5	5	5	5	15	15	10	10		Debate	✓		
2	Understand	5	5	5	5	15	15	10	10		Interactive Lecture	✓		
3	Apply	25	25	25	25	20	20	20	20		Brainstorming	✓		
4	Analyze	25	25	25	25	20	20	20	20					
5	Evaluate	20	20	20	20	15	15	20	20					
6	Create	20	20	20	20	15	15	20	20					
Total (%)		100	100	100	100	100	100	100	100					

*The evaluation can be done on the one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Mr. P. Chockalingam, Senior Lead Software Engineer, Virtusa Consulting Services Private Ltd, DLF IT Park SEZ, Chennai – 600089 p.chockalingam1986@gmail.com	1	Dr. G. Saravana Prabu, Asst. Professor, Department of English, Amrita Vishwa Vidhyapeetham, Coimbatore - 641112 g_saravanaprabu@cb.amrita.edu	1 Mrs. Deepalakshmi S, HOD, Department of Career Guidance, FSH, SRMIST hod.dgcg.ktr@smist.edu.in 2 Dr. Muthu Deepa, Assistant Professor, Department of Career Guidance, FSH, SRMIST, muthudem@smist.edu.in

Course Code	UCS24P02L	Course Title	Internship - II				Category	P	Project Work/Internship	L	T	P	C
										0	0	0	1

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)		The purpose of learning this course is to:	Depth				Attainment			Program Learning Outcomes (PLO)									
CLR-1	Demonstrate skills learnt in the real time environment.		Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn, Research Skills, Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PLO-9	PLO-10	
CLR-2	Explore the different industries that are using IT																		
CLR-3	Enhance the skills in the system aspects																		
CLR-4	Understanding the professional connections with the knowledge learnt																		
CLR-5	Applying the skills in problem solving																		
Course Learning Outcomes (CLO)		At the end of this course, learners will be able to:																	
CLO-1	To get an insight of an industry and organization/company	✓	✓	-	-	2	85	75	3	2	1	3	3	-	3	2	3	3	
CLO-2	To gain valuable skills and knowledge	✓	✓	✓	-	2	85	75	2	1	1	3	2	-	2	1	3	3	
CLO-3	To make professional connections and enhance networking	✓	✓	✓	✓	3	85	75	2	3	3	3	2	3	3	1	3	3	
CLO-4	To get experience in a field to allow the student to make a career transition	✓	✓	✓	✓	3	85	75	2	3	2	3	2	-	3	2	3	3	
CLO-5	To get an inside view of an industry and organization/company	✓	✓	✓	✓	3	85	75	1	2	2	3	3	-	2	2	3	3	

Students can choose a company of their own interest for internship for a period of minimum one week to learn about the application of IT in real time environment. In the first week of July, all the students have to give a presentation about their observations made by them in internship. At the end of the internship period, every student shall submit a structured internship report within 15 days from the date of the completion of the internship period.

Learning Assessment				
Project Work/Internship	Continuous Learning Assessment (50% weightage)		Final Evaluation (50% weightage)	
	Review-1	Review-2	Internship Report	Viva-Voce
	20%	30%	30%	20%

SEMESTER – VI

Course Code	UAI24D07J	Course Name	Deep Learning Techniques	Course Category	E	Discipline Core / Elective Course	L	T	P	C
							3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)		The purpose of learning this course is to:						Depth		Attainment		Program Learning Outcomes (PLO)												
CLR-1 :	Understand Deep Learning thoroughly from academic and Industry perspective							Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving	Communication Skills, Collaborating Skills	Independent Thinking, Analytical Reasoning, Learning to Learn	Leadership Qualities, Professionalism, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PLO-9	PLO-10
CLR-2 :	Give an exposure to working of neural networks, its architecture, components and related technologies																							
CLR-3 :	Learn Deep world Real world applications across Industries																							
CLR-4 :	Deeply understand the Deep Learning workflow, architecture and frameworks involved																							
CLR-5 :	Get to know all the deep learning models involved in build deep learning applications																							
CLR-6 :	Work on an end to end deep learning use case																							
Course Learning Outcomes (CLO)		At the end of this course, learners will be able to:																						
CLO-1 :	Get Hands-on Knowledge, Skills and Expertise to define deep learning from both the academic and industry perspective and all the related concepts.							✓	✓	-	-	2	85	80	2	3	2	3	-	-	-	-	-	-
CLO-2 :	Get a good understanding of all the real-world deep learning applications across different industry verticals							✓	✓	✓	-	3	85	80	2	3	2	3	-	1	2	3	-	-
CLO-3 :	Solve the deep learning problems of classification, Regression, Image Detection, Image Recognition etc.							✓	✓	✓	✓	3	85	80	3	3	3	3	1	-	3	2	-	-
CLO-4 :	Understand all the data software, hardware requirements for building deep learning models							✓	✓	✓	✓	3	85	80	1	3	2	3	-	2	2	-	-	-
CLO-5 :	Adopt the best strategies for deep learning data collection, pre-processing and model engineering tasks							✓	✓	✓	✓	3	85	80	-	3	2	3	-	1	2	2	-	-
CLO-6 :	Get Hands-on Knowledge, Skills and Expertise on a real world usecase implementation							✓	✓	✓	✓	3	85	80	1	2	1	1	1	2	1	3	1	1

Note: All our curriculum, study materials, assignments, quizzes, lab works, and learning resources are personalized and dynamically generated using machine learning models based on the learner's learning ability. Users can review our learning curriculum only through our intelligent learning management platform (iLMSP), and our learning resources and lab infrastructures are available only in the digital form on our cloud infrastructures.

Sessions		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)		15	15	15	15	15
S-1	SLO-1	Unit 1: Deep Learning Defined - Academic and Industry Perspective	Adding Another input	Model Validation	Popular deep learning frameworks TensorFlow Keras PyTorch Apache MXnet Sonnet DL4J	Benefits
	SLO-2	What is Deep Learning? Deep Learning defined from Academic perspective	Adding more layers Advanced deep learning concepts	Model Test Model Outcome	Unit 7: Deep Learning - Neural Networks an Overview Motivation for Neural Networks	Challenges High level decisions
S-2	SLO-2	Deep Learning defined from Industry perspective	Unit 3: Deep Learning in Real World Applications Model Accuracy		Biological Neural Networks	Choosing the hardware components (GPU, TPU)
S-3	SLO-1	Functions of a deep learning system	Deep learning in healthcare	Tune Hyperparameters	Artificial Neural Networks Neurons Connections and weights Propagation functions Learning rule	Building a Deep learning Hardware system
	SLO-2	What does a deep learning system do?	Deep learning in Retail	Deploy Model	Deep Neural Networks	Benefits
	SLO-1	How a business uses deep learning How deep learning works?	Deep learning in Energy Deep learning in Oil & Gas	Monitor Predictions Manage your models	Classification Classification Models Convolutional neural networks Long Short Term Memory Gated recurrent units Regression Regression Models Artificial Neural Networks Deep Neural Networks Machine Translation Language Translation	Challenges High level decisions
S-4 & S-5	SLO-1	Lab 1:	Lab 4:	Lab 7:	Lab 10:	Lab 13:
	SLO-2	Build a simple artificial Neural Networks with 1 layer, with 1 neuron, and the input shape equal to 1, feed some data, use the equation $y=5x-3$, so where $x = -2$, $y=-4$ and train the network	Build a network with at least 3 hidden layers that achieves better than 92% accuracy on validation and test data. You may need to train for more than 10 epochs to achieve this result	Build a network for classification using the built in MNIST dataset and Use the sigmoid activation function Use the categorical cross entropy loss function.	Build a Recommendation system using Deep Learning techniques	Using Generative Adversarial networks perform Image generation
S-6	SLO-1	What are deep learning promises and challenges?	Deep learning in Automobile	Unit 5: Deep Learning Architectures	Unit 9: Deep Learning Models	Choosing the software components

	SLO-2	Deep Learning Architecture	Unit 4: Deep Learning Workflow	Components of a deep learning solution	Supervised Models Classic Neural Networks Convolutional Neural Networks Recurrent Neural Networks	Choosing the OS
S-7	SLO-1	Deep Learning Libraries	Steps in Deep learning in Implementation	Data Generation	Unsupervised Models Self – Organizing maps Boltzmann’s Machines Autoencoders	Adding Packages
	SLO-2	Deep Learning Technologies	Data Collection	Data Collection	Unit 10: Deep Learning Data Requirements	Unit 12: Deep Learning Hands On Lab Work - Build, Test and Deploy ML Models (Consumer 1)
	SLO-1	Deep Learning Implementation Framework	Public Datasets	Training	Data Collection strategy for ML	Customer Churn
S-8	SLO-1	Unit 2:Demystifying Artificial Intelligence and Deep Learning The core of deep learning: ANN	Existing Databases Web Scraping	Evaluation Task Orchestration	How much data is needed Is your data good enough?	Who is going to churn? When the churn will occur
	SLO-2	Role of deep neural networks	Crowd source labelling	Prediction	Data Structure	Why(reason) is the churn occurring
S-9 & S-10	SLO-1	Lab 2: Using Tensorflow Build a network with a single hidden layer and at least 300,000 trainable parameters	Lab 5: Build a network for classification using the built in MNIST dataset	Lab 8: Working Data Collection, Evaluation	Lab 11:Working on Deep Learning Data Structures	Lab 14: Deep Learning Hands On Lab Work - Build, Test and Deploy ML Models
	SLO-2					
S-11	SLO-1	Deep learning and machine learning	Data Preparation	Infrastructure	Data Format	Problem statement
	SLO-2	Deep learning vs Data Science	Cleaning Data	Authentication	Data Type	Problem type
S-12	SLO-1	Linear Transformation	Feature Scaling	Interaction	Source System	Data engineering
	SLO-2	Teaching artificial neurons unknown functions	Handling categorical data & text	Monitoring	Target system	Data pipeline
S-13	SLO-1	Error measurement in neural networks	Model Engineering	Building your deep learning Architecture	Training Data	Model selection
	SLO-2	Gradient descent	Test Train Split	Unit 6: Deep Learning Implementation Framework	Validation Data	Model engineering
	SLO-1	Loss functions	Handling Imbalanced Data	What is a deep learning framework?	Test Data	Model outcome, analysis, and optimization
	SLO-2	Learning rates	Model Training	Features of a good deep learning framework	Building a Deep learning Hardware system	Model pipeline, Data Visuzlization and User Interface
S-14 & S-15	SLO-1	Lab 3: 3.Using Tensorflow build 3 networks, each with at least 10 hidden layers such that:	Lab 6:	Lab 9:	Lab 12:	Lab 15:
	SLO-2	- The first model has fewer than 10 nodes per layer. - The second model has between 10-50 nodes per layer. - The third model has between 50-100 nodes per layer.	Build a network for classification using the built in MNIST dataset and Use the sigmoid activation function	Conduct an expermint on Object detection using Convolution Neural Network	Use Recurrent Neural network to Perform Sentiment Analysis	Impleeent Transfer learning to retrain models that have been trained on the ImageNet dataset in order to perform classification on the CIFAR dataset.

Learning Resources	1. https://deepsphereai.litmos.com/	3. Introduction to Deep Learning, Book by Eugene Charniak Deep Learning: A Practical Approach, PB Paperback – 1 January 2018 by Rajiv Chopra
	2. Deep Learning from Scratch, by Seth Weidman, Released September 2019, Publisher(s): O'Reilly Media, Inc.	

Assessment											Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4 *			Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)						
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15						
3	Apply	20	25	25	20	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Mr.Jothi, Periyasamy , Chief AI Architect DeepSphere.AI, CA, USA		Dr.S.Gopinathan, Associate Professor, University of Madras, Chennai	Dr.S.Albert Antony Raj, SRMIST Mrs.M.Ramla, SRMIST

Course Code	UAI24D08J	Course Title	Blockchain Technology				Category	C	Discipline Core / Elective Coruses				L	T	P	C
													3	0	2	4

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses		Progressive Courses		Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment																
CLR-1	Grasp the core principles of blockchain technology, including distributed ledger systems, decentralization, consensus mechanisms, and cryptography					Conceive Design Implement Operate	1	2	3	4	Level of Thinking Expected Proficiency (%)	1	2	3	Expected Attainment (%)	Problem Solving Critical Thinking Creativity Communication Skills Analytical Reasoning Research Skills Collaborating Skills Leadership Qualities Learning to Learn Digital Technology	1	2	3	4	5	6	7	8	9	10
CLR-2	Develop a working knowledge of blockchain architecture components like blocks, miners, and nodes, and their interactions within the network.																									
CLR-3	Understand the role of cryptography in blockchain security, including hashing functions, digital signatures, and public-key cryptography																									
CLR-4	Gain proficiency in the concept of smart contracts, their functionalities, and how they are programmed and deployed on a blockchain platform																									
CLR-5	Explore how blockchain technology is being applied across various industries, such as education, industrial sector, and finance																									
Outcomes (CLO)		At the end of this course, learners will be able to:																								
CLO-1	To understand Blockchain Technology core principles					✓	✓	-	-		2	85	75		3	1	2	1	1	3	-	-	-	2	1	
CLO-2	To develop working knowledge of Blockchain Technology					✓	✓	✓	-		2	85	75		3	2	1	2	2	2	-	-	-	2	1	
CLO-3	To understand the role of cryptography in blockchain security					✓	✓	✓	✓		3	85	75		3	1	3	1	3	2	-	-	-	1	2	
CLO-4	To gain proficiency concepts blockchain platforms					✓	✓	✓	✓		3	85	75		3	3	2	3	3	2	-	-	-	3	3	
CLO-5	To explore applications of Blockchain Technology					✓	✓	✓	✓		3	85	75		3	3	2	3	3	3	-	-	-	3	3	

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	15	15	15	15	15
SLO-1	Introduction	Bitcoins or Genesis of Blockchain Technology	Model of Blockchain Technology Implementation	Consensus among Blockchain nodes	Role of Blockchain Technology in Education
SLO-2	Evolution of Blockchain Technology	History of Bitcoins	Traditional centralized Model	Scalability and Decentralization	Why Blockchain in Education
SLO-3	Tutorial: Types of Blockchain	Tutorial: Advantages and Disadvantages of Bitcoins	Tutorial: Problems in Traditional Model	Tutorial: Current State of Transactional Ledgers	Tutorial: Applications of Blockchain in Education
SLO-4&5	Practice: Case study on Blockchain	Practice:Blockchain Implementation Programming code	Practice:Java Code to implement Mining using block chain	Practice: Building a Private Ethereum Network and Deploying Smart Contract	Practice:Creating a Business Network using Hyperledger
SLO-6	Structure of Blockchain	Network and Digital Currency	Modern Decentralized Model	Blockchain Implementation	Role of Blockchain Industrial Sector
SLO-7	Features of Blockchain Technology	Crypto Currency	Selection of Next Block Creator	Blockchain Ecosystems	Intellectual Property
SLO-8	Tutorial: Applications of Hash Functions	FUNCTIONS	Tutorial: What do Block Creators get in return	Tutorial: Service Model Blockchain Technology	Tutorial: Blockchain use cases in Legal Industry
SLO-9&10	Practice:Creating Merkle tree	Practice:CreatingERC20 token	Practice:Java Code to implement peer-to-peer using block chain	Practice:Creating and Building Up Crypto Token	Practice:Creating a Business Network using Hyperledger- II

SLO-11	Layers of Blockchain Technology	B2P Payment Gateway	Sequencing of Blocks	Quality issues with recent Blockchain Implementations	Role of Blockchain Financial Sector
SLO-12	Properties of Blockchain Systems	Bitcoin Network	Distributors System in Practice	Quality requirements and Solutions for Blockchain Implementations	Blockchain in Banking System
SLO-13	Tutorial: Blockchain Scaling	Tutorial: Conditions of Crypto Currency	Tutorial: Decentralization as a Social Template	Tutorial: Testing and Evolution of Blockchain Implementations	Tutorial: Blockchain Platforms
SLO-14&15	Practice:Creation of Block	Practice:Java code to implement blockchain in Merkle Trees	Practice:creating a Crypto-currency Wallet	Practice: Case study on security auditing	Practice:Building and Deploying multichain private Blockchain

Resources					
1	Kumar Saurabh, Ashutosh Saxena Block chain technology: concepts and applications, Wiley; First Edition (9 September 2020)			3	Sakshi Ahlawat, Upendra Pratap Singh, Deepti, Pawan Kumar, Dive into the world of Blockchain Technology, Sultan Chand & Sons, 2023
2	Chandramouli Subramanian, Asha A George, Abhilash K A, Meena Karthikeyan, Blockchain Technology, Universities Press (India) Pvt. Ltd., First Edition (19 August 2020)			4	Sonali Vyas, Vinod Kumar Shukla, Shaurya Gupta, Ajay Prasad Blockchain Technology: Exploring Opportunities, Challenges, and Applications, CRC Press, April 13, 2022

Assessment											Strategies					
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4 *			Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)								
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)						
1	Remember	15	15	15	15	10	10	10	10	15						
2	Understand	15	15	15	15	10	10	10	10	15						
3	Apply	20	25	25	20	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10						
6	Create	15	10	10	15	15	15	15	15	10						
Total (%)		100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers				
Professional Experts		Higher Institution Experts		Internal Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1	Dr.Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr.K.Sutha, SRMIST, suthak@srmist.edu.in
2				2

Course Code	UAI24D09J	Course Title	Reinforcement Learning				Category	E	Discipline Core / Elective Courses				L	T	P	C
													3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment			Program Learning Outcomes (PLO)									
CLR-1	Grasp the basic concepts of reinforcement learning (RL), including agents, environments, states, actions, rewards, and policies					1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Implement RL systems using popular libraries and frameworks like TensorFlow, PyTorch, and OpenAI Gym																					
CLR-3	Identify the dynamic programming as an efficient solution approach to an industrial control problem																					
CLR-4	Learn the policy gradient methods and off-policy approximation																					
CLR-5	Apply RL techniques to real-world problems																					
Outcomes (CLO)		At the end of this course, learners will be able to:				Conceive				Level of Thinking			Expected Proficiency (%)									
CLO-1	Understand the core concepts, algorithms, and techniques in reinforcement learning					✓	✓	-	-	2	85	75	3	-	-	-	-	-	-	-	3	1
CLO-2	Capable of working with reinforcement learning frameworks and libraries to implement RL systems					✓	✓	✓	-	2	85	75	3	2	1	-	-	-	-	-	2	1
CLO-3	Understand value functions, as a general-purpose tool of RL for optimal decision-making					✓	✓	✓	✓	3	85	75	3	2	2	-	-	-	-	-	2	2
CLO-4	Apply reinforcement learning algorithms to solve a wide range of problems					✓	✓	✓	✓	3	85	75	3	3	2	-	-	-	-	-	3	3
CLO-5	Proficient in implementing and experimenting with various reinforcement learning algorithms					✓	✓	✓	✓	3	85	75	3	3	2	-	-	-	-	-	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	The Reinforcement Learning Problem	Monte Carlo Prediction	Temporal-Difference Learning	Approximate Solution Methods	Frontiers
Duration (hour)	15	15	15	15	15
SLO-1	Introduction: Reinforcement Learning, Examples	Dynamic Programming: Policy Evaluation, Policy Improvement, Policy Iteration Value Iteration	Temporal-Difference Learning: TD Prediction	On-policy Approximation of Action Values	Psychology, Neuroscience
SLO-2	Elements of Reinforcement Learning, Limitations and Scope	Asynchronous Dynamic Programming, Generalized Policy Iteration	Advantages of TD Prediction Methods, Optimality of TD(0)	Value Prediction with Function Approximation	Applications and Case Studies TD-Gammon Samuel's Checkers Player
SLO-3	Tutorial1: An Extended Example: Tic-Tac-Toe	Tutorial4: Efficiency of Dynamic Programming	Tutorial7: Sarsa: On-Policy TD Control	Tutorial10: Gradient-Descent Methods, Linear Methods	Tutorial13: The Acrobot
SLO-4&5	Practice1: Implement a tic tac toe game using python	Practice4: Implement Dynamic Programming in Python	Practice7: Implement On-Policy TD Control	Practice10: Implementation of Gradient-Descent	Practice13: Implementation of The Acrobot

SLO-6	Multi-arm Bandits: An n-Armed Bandit Problem, Action-Value Methods, Incremental Implementation	Monte Carlo Methods : Monte Carlo Prediction	Q-Learning: Off-Policy TD Control	Off-policy Approximation of Action Values	Elevator Dispatching
SLO-7	Tracking a Nonstationary Problem, Optimistic Initial Values, Upper-Confidence-Bound Action	Monte Carlo Estimation of Action Values	Games, Afterstates, and Other Special Cases	Policy Approximation	Dynamic Channel Allocation
SLO-8	Tutorial2: Selection, Gradient Bandits	Tutorial5: Monte Carlo Control, Monte Carlo Control without Exploring Starts	Tutorial8: : n-Step TD Prediction	Tutorial11: Example of Off-policy approximation	Tutorial14: Job-Shop Scheduling
SLO-9&10	Practice2:Associative Search (Contextual Bandits)	Practice5:Implement Monte Carlo method in Python	Practice8: Implement n-Step TD Prediction	Practice11: Implementation of Off-Policy approximation	Practice14:Dynamic channel allocation using a basic Q-learning
SLO-11	Finite Markov Decision Processes: The Agent-Environment Interface, Goals and Rewards, Returns	Off-policy Prediction via Importance Sampling	The Forward View of TD(λ) The Backward View of TD(λ)	Actor-Critic Methods Eligibility Traces for Actor	Prospects: The Unified View
SLO-12	Unified Notation for Episodic and Continuing Tasks	Incremental Implementation	Equivalences of Forward and Backward Views Sarsa(λ)	Critic Methods R-Learning and the Average-Reward Setting	State Estimation
SLO-13	Tutorial3: The Markov Property, Markov Decision Processes	Tutorial6: Off-Policy Monte Carlo Control, Importance Sampling on Truncated Returns	Tutorial9: Watkins's Q(λ), Off-policy Eligibility Traces using Importance Sampling, Implementation Issues	Tutorial12: Case study-Actor Critic Method	Tutorial15: Temporal Abstraction
SLO-14&15	Practice3:Implement a Finite Markov Decision Processes	Practice6:Implement Off-Policy Monte Carlo Control	Practice9:Implementation of Watkins's Q(λ) algorithm	Practice12:implement an Actor-Critic method using the Advantage Actor-Critic (A2C) algorithm	Practice15: Implementation of Temporal abstraction
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources											
1	Sutton, R. S., & Barto, A. G. Reinforcement learning: An introduction (2nd ed.). The MIT Press, 2018						2	Hasselt, Hado van, Yotam Doron, Florian Strub, Matteo Hessel, Nicolas Sonnerat, and Joseph Modayil. 'Deep Reinforcement Learning and the Deadly Triad', 2018			

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai			1	Dr. J. Jebamalar Tamilselvi, SRMIST, RMP, jebamalj@srmist.com
										2	

Course Code	UAI24D10J	Course Name	Natural Language Processing	Course Category	E	Discipline Core / Elective Courses	L	T	P	C
							3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:	Depth				Attainment			Program Learning Outcomes (PLO)									
CLR-1		To make the participants comfortable with the fundamentals of Natural Language Processing, their working principles and their functions in a business scenario.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2		To teach the participants to build intelligent and automated real-world natural language processing applications and use cases spanning healthcare, retail, energy verticals by intelligently analyzing different datasets collected from diverse data sources.																	
CLR-3		To teach the participants the various layers of Natural Language processing architecture, detailed steps are involved in transforming raw data into training datasets for critical decision making.																	
CLR-4		To teach the students the about the overall process involved in text processing and building an enterprise grade natural language processing solutions																	
CLR-5		To learn how to apply Natural language processing models to business problems, build data for efficient data collection, preparation, provisioning, model pipelines for model engineering and validation tasks.																	
CLR-6		To bring the learners to an alignment, apply their learning to a real-world business problem, and then performs research, design, development, and delivers an end-to-end Natural language processing solution for a given industry problem. The students will be working either in a group or individually.																	
Outcomes (CLO)		At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1		Have a strong control over the fundamental concepts of Natural Language Processing including the ability to clearly define Natural Language Processing from both academic and industry perspective.	✓	✓	-	-	2	85	75	3	-	2	-	2	-	-	3	1	
CLO-2		Gain hands-on solid skills, knowledge and expertise of real-world situations the applicability of tools and techniques in extracting valuable insights from the data of different formats on time.	✓	✓	✓	-	2	85	75	3	2	1	-	-	-	-	2	1	
CLO-3		Have solid hands-on skills, knowledge and expertise in Data gathering, Data collection, Model training, and model evaluation with domain-specific components.	✓	✓	✓	✓	3	85	75	3	2	2	-	1	-	-	2	2	
CLO-4		Have a good Hands-on skills and knowledge to apply all the required processes on texts	✓	✓	✓	✓	3	85	75	3	3	2	-	-	-	-	3	3	
CLO-5		Have solid hands-on skills, knowledge and expertise in setting up a data platform for building enterprise-grade natural language processing solutions.	✓	✓	✓	✓	3	85	75	3	3	2	-	2	-	-	3	3	

Note: All our curriculum, study materials, assignments, quizzes, lab works, and learning resources are personalized and dynamically generated using machine learning models based on the learner's learning ability. Users can review our learning curriculum only through our intelligent learning management platform (iLMSP), and our learning resources and lab infrastructures are available only in the digital form on our cloud infrastructures.

Sessions		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)		15	15	15	15	15
S-1	SLO-1	Unit 1: Natural Language Processing Defined - Academic and Industry Perspective	Pattern Mining	Topic Modelling	DeBERTa	Adding Packages
	SLO-2	What is Natural Language Processing?	Evaluation and Deployment	Text Classification	Unit 10: Natural Language Processing Data Requirements	Unit 12: Natural Language Processing Data Requirements
S-2	SLO-1	Natural Language Processing defined from Academic and Industry perspective	Unit 5: Natural Language Processing Architecture	Keyword Classification	How much data is needed	Patient Readmittance with discharge summaries
	SLO-2	Functions of a Natural Language Processing system, What does a Natural Language Processing system does?	Components of machine learning solution, Data Generation	Lemmatization, Stemming	Is your data good enough?, Data Structure	Who is going to get readmitted?, When will they get readmitted
S-3	SLO-1	How a business uses Natural Language Processing How Natural Language Processing works?	Data Collection Feature Engg pipeline	Part of speech tagging Co-reference resolution	Data Format Data Type	Why will they get readmitted Problem statement
	SLO-2	Unit 2: Demystifying Artificial Intelligence and Natural Language Processing	Training	Unit 8: What Problem Natural Language Processing Solves	Source System	Problem type
S-4 & S-5	SLO-1	Lab 1 : Import the nltk package in python and download 'stopwords', 'punkt' packages, tokenize the string using the 'transformers' package	Lab 4 : Create a monolingual corpus of 200,000 words. Segment it into words, and compute the frequency of each word. How many distinct words are there? count frequencies of bigrams (two consecutive words) and trigrams (three consecutive words).	Lab 7: Choose a corpus of at least 20,000 words of online text, and verify Zipf's law experimentally. Define an error measure and find the value of α where Zipf's law best matches your experimental data	Lab 10 : Estimate how much storage space is necessary for the index to a 100 billion-page corpus of Web pages. Show the assumptions you made	Lab 13: Extract the the topics from the any texts of your choice with Latent dirichlet algorithm
	SLO-2					
S-6	SLO-1	What are Natural Language Processing promises and challenges? Natural Language Processing Architecture, Libraries, Technologies and Framework	Evaluation, Task Orchestration	Machine Translation, Named Entity Recognition	Target system, Training Data	Data engineering, Data pipeline
	SLO-2	Why is Natural Language Processing so important? Components of Natural Language Processing ☐ Natural language Understanding ☐ Natural language Generation	Prediction Infrastructure	Text/Classification Text Summarization	Validation Data Test Data	Model selection Model engineering
S-7	SLO-1	Phases of Natural Language Processing ✓ Lexical Analysis	Authentication	Topic Modelling	Unit 11: Natural Language Processing Data Requirements	Model Outcome

		✓ Syntactic Analysis ✓ Semantic Analysis ✓ Disclosure Integration ✓ Pragmatic Analysis				
	SLO-2	Unit 3: Natural Language Processing in Real World Applications	Interaction	Keyword Extraction	Building a NLP Hardware system	Model Analysis
S-8	SLO-1	NLP in healthcare	Monitoring	Information Retrieval	Benefits	Model Optiization
	SLO-2	NLP in Retail	Building your NLP Architecture	Automatic Image annotation	Challenges	Model pipeline
S-9 & S-10	SLO-1	Lab 2 : With your knowledge of the English language, split 10 sentences of your choice into words and punctuation: Find out the words words that don't usually appear in a standard lexicon? The separators are: whitespaces, quote ('), full-stop/period (.), parenthesis, are kept as tokens, tokenize the earlier sentence.	Lab 5 : Write a program to do segmentation of words without spaces. Given a string, such as the URL "thelongestlistofthelongeststuffatthelongestdomainnameatlonglast.com," return a list of component words: ["the," "longest," "list," ...]. This task is useful for parsing URLs, for spelling correction when words runtogether, and for languages such as Chinese that do not have spaces between words	Lab 8: Create a corpus of spam email and one of non-spam mail. Examine each corpus and decide what features appear to be useful for classification: unigram words? bigrams? message length, sender, time of arrival?	Lab 11: Write a regular expression or a short program to extract company names. Test it on a corpus of business news articles. Report your recall and precision.	Lab 14: Extract the topics from the any texts of your choice using Non-negative Matrix Factorization
	SLO-1	NLP in Energy, NLP in Oil & Gas	Unit 6: Natural Language Processing Implementation Framework, What is a NLP framework?	Unit 9: Natural Language Processing Models, BERT	High level decisions, Choosing the hardware components (GPU, TPU)	
S-11	SLO-2	NLP in Automobile, Unit 4: Natural Language Processing Workflow	Features of a good NLP framework, Popular NLP frameworks • NLTK • Gensim • SpaCy • CoreNLP	GPT2, XLNet	Building a NLP Software system, Benefits	Data visualization
S-12	SLO-1	Text pre-processing • Contraction Mapping • Tokenization • Noise Cleaning • Spell Checking • Stop words Removal • Stemming • Lemmatization	Unit 7: Natural Language Processing - Techniques an Overview	Electra	Challenges	Data Validation
	SLO-2	Exploratory Data Analysis	Pattern Recognition	Text to Text Transfer Transformer	High level decisions	
S-13	SLO-1	Text pre-processing	Named Entity Recognition	RoBERTa	Choosing the software components	User interface
	SLO-2	Text Representation & Feature Engineering	Text Summarization	ALBERTA	Choosing the OS	
S-14 & S-15	SLO-2	Lab 3: Design a NLP application which measures the edit distance between words using the chartbased algorithm.	Lab 6: Perform word segmentation implementation on a bigger example corpus. E.g., try the first N words in the Brown corpus.	Lab 9: Create a test set of ten queries, and pose them to three major Web search engines. Evaluate each one for precision at 1, 3, and 10 documents.	Lab 12: Implement Soft Cosine Similarity in python	Lab 15: Utilize Word2Vec model for representing words and plot the word embedding from the output of the word2Vec model

		Provide the filled data structure resulting from the application of the algorithm to the pair “easy” and “tease”. Briefly justify your answer.		Can you explain the differences between engines?	
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Learning Resources	1. The textbook for the course will be the second edition of Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition, by Daniel Jurafsky and James H. Martin 2. James A.. Natural language Understanding 2e, Pearson Education, 1994 3. Bharati A., Sangal R., Chaitanya V.. Natural language processing: a Paninian perspective, PHI, 2000	4. https://www.nltk.org/book/ 5. Siddiqui T., Tiwary U. S.. Natural language processing and Information retrieval, OUP, 2008
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Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓	
2	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓	
3	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓	
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers					
Professional Experts			Higher Institution Experts		
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	

Course Code	UCS24P03L	Course Name	Project Work	Course Category	P	Project Work / Internship	L	T	P	C
							0	0	4	2

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment			Program Learning Outcomes (PLO)									
CLR-1	:	Demonstrate skills learnt in the real time environment.				1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	:	Explore the different industries that are using IT																				
CLR-3	:	Enhance the skills in the system aspects																				
CLR-4	:	Understanding the professional connections with the knowledge learnt																				
CLR-5	:	Applying the skills in problem solving																				
Outcomes (CLO)		At the end of this course, learners will be able to:				Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1	:	To get an inside view of an industry and organization/company				✓	✓	-	-	3	80	70	3	2	-	1	3	-	-	-	3	3
CLO-2	:	To gain valuable skills and knowledge				✓	✓	✓	-	3	85	75	2	1	3	2	3	-	-	-	2	3
CLO-3	:	To make professional connections and enhance networking				✓	✓	✓	✓	3	75	70	2	1	2	1	3	-	-	-	2	3
CLO-4	:	To get experience in a field to allow the student to make a career transition				✓	✓	✓	✓	3	85	80	2	1	2	1	3	-	-	-	2	3
CLO-5	:	To get an inside view of an industry and organization/company				✓	✓	✓	✓	3	85	75	1	1	2	1	3	-	-	-	2	3

Students can choose a company of their own interest for internship for a period of minimum four weeks to learn about the application of IT in real time environment. In the first week of July, all the students have to give a presentation about their observations made by them in internship. At the end of the internship period, every student shall submit a structured internship report within 15 days from the date of the completion of the internship period.

Learning Assessment			
Project Work	Continuous Learning Assessment (50% weightage)		Final Evaluation (50% weightage)
	Review – 1	Review – 2	Project Report
	20%	30 %	Viva-Voce
			20 %

Course Code	UCD24V02T	Course Name	Universal Human Values	Course Category	V	Value Added Course	L	T	P	C
							2	0	0	2

Course Offering Department	Career Guidance	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Learning Rationale (CLR):		The purpose of learning this course is to:			Learning		
CLR-1 :	Help the students to understand need of value education, appreciate the essential complementarily between 'values' and 'skills' and to ensure sustained happiness and prosperity which are the core aspirations of all human beings,	1	2	3	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	Help students initiate a process of dialog within themselves to know what they really want to be' in their life and profession.						
CLR-3 :	Help students to understand the meaning of happiness and prosperity for a human being. understanding holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.						
CLR-4 :	Help students on right understanding of the Human reality and the rest of existence, harmony at all the levels of human living, and live accordingly.						
CLR-5 :	Highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.						
Course Learning Outcomes (CLO):		At the end of this course, learners will be able to:					
CLO-1 :	Evaluate the significance of value inputs in formal education and start applying them in their life and profession	3	80	70			
CLO-2 :	Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.	3	80	75			
CLO-3 :	Analyze the value of harmonious relationship based on trust and respect in their life and profession	3	85	70			
CLO-4 :	Examine the role of a human being in ensuring harmony in society and nature.	3	85	80			
CLO-5 :	Apply the understanding of ethical conduct to formulate the strategy for ethical life and profession.	3	85	75			

1	2	3	4	5	6	7	8	9	10
Problem Solving, Critical	Communication Skills,	Independent Thinking, Analytical	Leadership Qualities,	Digital Technology Skills	Value Inculcation, Multicultural	Environmental Action,	Entrepreneurial Risk Taking	PLO-9	PLO-10
-	1	1	2	-	3	2	-	-	-
-	-	1	2	-	3	2	-	-	-
-	1	1	2	-	3	2	-	-	-
-	-	1	2	-	3	2	-	-	-
-	-	1	2	-	3	2	-	-	-

Sessions		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)		6	6	6	6	6
S-1	SLO	Right Understanding, Relationship and Physical Facility	Understanding Human being as the Co-existence of the Self and the Body	Harmony in the Family – the Basic Unit of Human Interaction	Understanding Harmony in the Nature	Natural Acceptance of Human Values
S-2	SLO	Understanding Value Education	Distinguishing between the Needs of the Self and the Body	Trust – the Foundational Value in Relationship	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	Definitiveness of (Ethical) Human Conduct
S-3	SLO	Self-exploration as the Process for Value Education	The Body as an Instrument of the Self	Respect – as the Right Evaluation	Exploring the Four Orders of Nature	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order
S-4	SLO	Continuous Happiness and Prosperity – the Basic Human Aspirations	Understanding Harmony in the Self	Other Feelings, Justice in Human-to-Human Relationship	Realizing Existence as Co-existence at All Levels	Competence in Professional Ethics
S-5	SLO	Happiness and Prosperity – Current Scenario	Harmony of the Self with the Body	Understanding Harmony in the Society	The Holistic Perception of Harmony in Existence	Holistic Technologies, Production Systems and Management Models-Typical Case Studies
S-6	SLO	Method to Fulfill the Basic Human Aspirations	Programme to ensure self-regulation and Health	Vision for the Universal Human Order	Exploring Co-existence in Existence	Strategies for Transition towards Value-based Life and Profession

Learning Resources	1. Gaur R.R., Sangal R., Bagaria G.P., 2019 (2nd Revised Edition), A Foundation Course in Human Values and Professional Ethics, Excel Books, New Delhi. 2. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.	3. A Nagraj, 1998, Jeevan Vidya Ek Parichay, Divya Path Sansthan, Amarkantak. 4. A N Tripathy, 2003, Human Values, New Age International Publishers.
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Assessment						Strategies				
Bloom's Level of Thinking	Continuous Learning Assessment (CLA) (100% weightage)					Technology	Pedagogy / Andragogy		Sustainable Development	
	CLA – 1	CLA – 2	CLA – 3	CLA – 4		Simulations	✓	Clarification/Pauses	✓	Good Health & Well Being
	(20 %)	(20 %)	(30 %)	(30%)		Presentation Tools	✓	Group Discussion		Quality Education
	Theory (%)	Theory (%)	Theory (%)	Theory (%)		Learning Management System	✓	Hands-on Practice	✓	Gender Equality
7	Remember	20	10	20	10			Debate		
8	Understand	20	10	20	10			Interactive Lecture	✓	
9	Apply	20	20	20	20			Brainstorming	✓	
10	Analyze	20	20	20	20					
11	Evaluate	10	20	10	20					
12	Create	10	20	10	20					
Total (%)		100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Prof. Rajiv Kumar, Member Secretary, NCC-IP as member at AICTE	Mrs. V Sumathi, Associate Professor, Sri Sairam Engineering College, Chennai, Tamil Nadu	Dr. Supraja P, UHV University Coordinator, SRMIST
		Dr. Deepalakshmi S, HoD, Department of Career Guidance Cell, FSH, SRMIST
		Dr. SweetyBakyanani E, Department of Computer Science, FSH, SRMIST

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:								Depth				Attainment													
CLR-1	To comprehend the basic anatomy and terminology associated with robotics									1	2	3	4		1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To understand the concepts of accuracy, repeatability, resolution, and degree of freedom in robotic systems									Conceive	Design	Implement	Operate		Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLR-3	To explore various mechanisms and transmission systems used in robotics for motion control and manipulation tasks.																										
CLR-4	To understand the principles of fuzzy logic and its application in robotic systems for decision-making and control tasks.																										
CLR-5	To learn about classification techniques, including the classification of different types of datasets and evaluation metrics for assessing classifier performance.																										
Outcomes (CLO)		At the end of this course, learners will be able to:																									
CLO-1	Design and simulate robotic systems with a clear understanding of their anatomy, movement, and components.									✓	✓	-	-		2	85	75	3	2	2	1	-	-	-	3	2	
CLO-2	Demonstrate the ability to evaluate and optimize the performance of robotic systems based on accuracy, repeatability, and resolution criteria.									✓	✓	✓	-		2	85	75	3	2	1	2	-	-	-	2	3	
CLO-3	Acquire knowledge of fuzzy logic principles and apply them to develop control systems for robotic applications.									✓	✓	✓	✓		3	85	75	3	2	3	1	-	-	-	3	2	
CLO-4	Demonstrate the ability to classify different types of datasets using machine learning techniques and evaluate classifier performance using appropriate metrics.									✓	✓	✓	✓		3	85	75	3	3	2	3	-	-	-	2	3	
CLO-5	Gain practical experience in implementing optimization algorithms such as Particle Swarm Optimization for solving engineering problems in robotics and related fields.									✓	✓	✓	✓		3	85	75	3	3	2	3	-	-	-	3	3	

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction	Setup Environment	Machine Learning	Classification	Optimization
Duration (hour)	15	15	15	15	15
SLO-1	Basic of Robots-Anatomy	Basic Embedded File system	Formal and Fuzzy Logic	Classification of Data Sets	Particle Swarm Optimization
SLO-2	Links and joints - Basic terminology	Simulators and Emulators - Integrated development environments	Turing Machines and Concepts of Machine Learning	Task Planning for Individual and Multiple Agents	Expert Systems- Production Systems
SLO-3	Tutorial 1: basic components of a robot arm - links and joints.	Tutorial 4: Explore popular simulators and emulators for embedded systems such as QEMU, SimulIDE, and Proteus.	Tutorial 7: Implement a simple fuzzy logic controller for a room temperature control system.	Tutorial 10: Understand the concept of data classification and different types of data sets, such as binary, multi-class, and multi-label. Learn about common	Tutorial 13: Learn the basics of Particle Swarm Optimization, understanding how particles move in search of optimal solutions.

				evaluation metrics like accuracy, precision, recall, and F1-score.	
SLO-4&5	Practice 1:Create a simple 2D or 3D model of a robotic arm using a library like Pygame or PyBullet.	Practice 4:Set up an embedded development environment using an IDE of your choice and simulate the execution of a simple embedded program using a simulator/emulator.	Practice 7: use MATLAB or Python.	Practice 10: Use Python libraries like scikit-learn or TensorFlow to implement classifiers such as Decision Trees, Support Vector Machines (SVM), or Neural Networks on various datasets.	Practice13:Implement a PSO algorithm in Python to solve optimization problems. Use libraries like NumPy for matrix operations and Matplotlib for visualizing the optimization process.
SLO-6	Accuracy, Repeatability, Resolution, Degree of freedom	Analog signal - Digital signal - I/O of Sensors –	Probability and Error Models	Numerical Methods for Evaluation and Search	Forward Chaining- Backward Chaining
SLO-7	Robot Movement: Pitch, Roll, Yaw	Calibration of sensors Python for Robot Programming - Program structure,data types, control structure	Bayesian Belief Networks	Monte Carlo Simulation	Neural Networks for Classification and Control
SLO-8	Tutorial 2: Understand how these factors affect the performance of a robot.	Tutorial 5: Study the principles of sensor calibration and its importance in ensuring accurate measurements.	Tutorial 8: Build a Bayesian belief network to diagnose simple medical conditions based on symptoms.	Tutorial 11: Use Monte Carlo simulation to estimate the value of π .	Tutorial 14: understand the concepts of forward chaining and backward chaining in inference engines.
SLO-9&10	Practice 2:Write a Python script to simulate the movement of a robotic arm and measure its accuracy and repeatability.	Practice 5:Develop a Python program to calibrate sensors (such as temperature sensors or distance sensors) using known reference values.	Practice 8:Python with libraries like Pomegranate.	Practice 11:use python or matlab	Practice 14: Implement forward chaining and backward chaining algorithms in Python for a simple knowledge base
SLO-11	Mechanisms and transmission	Sensor- Principle of sensors	Simultaneous Location and Mapping (SLAM)	Genetic Algorithms	Feed-Forward Networks -Associative Networks
SLO-12	Work volume - End effectors.	I/O of Sensors – Calibration of sensors	Decision Trees Extended Kalman and Particle Filters	Simulated Annealing	Deep-Learning Algorithms
SLO-13	Tutorial: 3Study different mechanisms used in robotic systems such as gears, pulleys, and belts.	Tutorial 6: principles of various types of sensors commonly used in robotics, such as proximity sensors, temperature sensors, and accelerometers.	Tutorial 9: Implement a decision tree algorithm to classify fruits based on their features (e.g., size, color, texture).	Tutorial 12: Use a genetic algorithm to optimize the parameters of a simple mathematical function (e.g., minimizing/maximizing a function).	Tutorial 15: Train a feed-forward neural network to classify handwritten digits from the MNIST dataset.
SLO-14&15	Practice 3:Build a simple robotic gripper mechanism using Python and simulate its operation.	Practice 6:Write Python scripts to interface with different types of sensors, understand their working principles, and extract relevant data.	Practice 9:Python with libraries like scikit-learn.f	Practice 12:Python with libraries like DEAP (Distributed Evolutionary Algorithms in Python).	Practice 15: Python with libraries like TensorFlow or PyTorch.
Assessment	Continuous Learning Assessment – 1		Continuous Learning Assessment – 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					

8					
9					
10					
	Test / quiz / assignment Evaluation		Description of Evaluation Methodology		

Resources					
1	Mikell P. Groover, "Industrial Robotics", McGraw Hill, 2nd edition, 2012			2	John J. Craig, "Introduction to Robotics", 3rd Edition, Addison Wesley, ISE 2008.
3	H. Asada and J.-J. Slotine, Robot Analysis and Control, J. Wiley & Sons, 1986.			4	C. Asfahl, Robots and Manufacturing Automation, J. Wiley & Sons, 1992.
5	C. Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.			6	E. Charniak and D. McDermott, Introduction to Artificial Intelligence, Addison-Wesley, 1985.
7	D. Goldberg, Genetic Algorithms in Search, Optimization, and Machine Learning, Addison-Wesley, 1989.			8	C. Lau, ed., Neural Networks: Theoretical Foundations and Analysis, IEEE Press, 1992.

Assessment												Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% Weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being		
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education	
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	
19	Remember	15	15	15	15	10	10	10	10	15	15						
20	Understand	15	15	15	15	10	10	10	10	15	15						
21	Apply	20	25	25	20	25	25	25	25	25	25						
22	Analyze	20	25	25	20	25	25	25	25	25	25						
23	Evaluate	15	10	10	15	15	15	15	15	10	10						
24	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers			
Professional Experts		Higher Institution Experts	Internal Experts
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1 Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr. M.. AnoopSRMIST, ramyader@srmist.edu.in

Course Code	UAI24D12J	Course Title	Applications of Edge IOT and ML	Category	E	Discipline Core / Elective Courses	L 3	T 0	P 2	C 4
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Course Offering Department	AI&ML	Pre-requisite Courses	Nil	Co-requisite Courses		Progressive Courses		Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment												
CLR-1	Understand the concept of edge computing					1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand the Edge computing Architecture																					
CLR-3	Implement the edge computing in Internet of things																					
CLR-4	Realize the improved performance of edge computing in Internet of things																					
CLR-5	Understand the concept of multi-access edge computing and Implement edge computing in MEC																					
Outcomes (CLO)		At the end of this course, learners will be able to:				Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency	Expected Attainment	Problem Solving	Critical Thinking	Creativity	Communication	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1	Identify the benefits of edge computing					✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Develop the microservices in iofog					✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Develop user defined services in the edge					✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Create use cases in IOT with edge computing					✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Develop services in MEC & Implement use cases in MEC					✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)	15	15	15	15	15
SLO-1	Edge Computing-Concept- basic characteristics and attributes	Edge Computing reference architecture – Modle-driven-	Edge Computing in the IoT- Introduction- Mobile operation IoT edge	From Cloud computing to Multi access edge computing- The Edge and not to edge	Infrastructure Evolution – Datacenter-Communication Network Evolution
SLO-2	Edge –Real time-Benefits of edge computing	Multi_view Display	Key benefits of edge for the IoT- Unique requirements of edge for the IoT	Edge part of MEC- Access part of MEC	Devices Evolution- Edge cloud deployment options – Real estate model
SLO-3	Tutorial: Cross Value of Edge Computing- Collaboration of Edge Computing and Cloud Computing	Tutorial: Concept view Display	Tutorial: Use cases for IOT edge	Tutorial: Edge computing in the network – ME HOST, MEC Management	Tutorial: IaaS-PaaS
SLO-4&5	Practice:1: Introduction to io fog Tools Installation tools to create and manage ECN's	Practice: Micro services development.	Practice:Platform YAML specification Agent configuration YAML specification	Practice:: System-Hardware abstraction layer	Practice:: ioFog connectors
SLO-6	Fog Computing and Edge Computing- Use case of Edge computing	Edge Computing Domain models	Device management, security- Service enablement	ETSI MEC and ETSI NFV	Collaboration Platform – as a service
SLO-7	Challenges of Edge Computing	Function view- Edge computing Network	Message prioritization	MEC use cases and Service Scenarios	TCO Analysis – an Operator Perspective- Focus on energy cost

SLO-8	Tutorial: Applications of edge computing	Tutorial: Development service framework	Tutorial: Data replication- Cloud enablement- IoT Solutions	Tutorial: Assistance for intensive computation- MEC in the enterprise settin	Tutorial: Deployment cost- Business Model aspects
SLO-9&10	Practice:Deploy micro services and writing your own microservices	Practice:Deploy your microservices	Practice:Writing micro services	Practice:ytem-Bluetooth REST API	Practice:ioFog agents CLI usage
SLO-11	Shared and Central resources versus exclusive and local computation	Deployment operation service framework(Smart services)	Standards for self_organization, self_configuration, self_discovery	Enabling MEC in 4G networks- MEC in 5G networks	Applocations of IOT
SLO-12	IoT disrupts the cloud	Full_life cycle data service	Trust/Decentralized trust- IIOT using edge computing	Network evolution towards 5G	Applications of Edge computing
SLO-13	Tutorial: Characteristics of new computing model	Tutorial: Security service	Tutorial: Use cases –Technical Analytics	Tutorial: Network performance drivers for 5G systems	Tutorial: ML & Edge integrated in IoT
SLO-14&15	Practice:Platform development	Practice:Introduction to iofogctl, common header YAML	Practice:Using microservices catalog	Practice:JSON REST APIand open weather map	Practice:Case study submission for ML-IoT and Edge applications
Assessment	Continuous Learning Assessment - 1		Continuous Learning Assessment - 3		Continuous Learning Assessment - 2

Resources

1	Ajit Singh, Edge Computing: Simply In Depth, 2019	3	Dario Sabella , Alex Reznik, Rui Frazao), Multi-Access Edge Computing in Action, CRC Press, 2019
2	Cao, Jie, Zhang, Quan, Shi, Weisong, Edge Computing: A Primer, Pearson Education, Springer, 2018		

Assessment

[illegible]

Strategies

Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses	✓	Good Health & Well Being	
Presentation Tools	✓	Group Discussion	✓	Quality Education	
Learning Management System	✓	Hands-on Practice	✓	Gender Equality	
		Debate	✓		
		Interactive Lecture	✓		
		Brainstorming	✓		

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers

Professional Experts		Higher Institution Experts		Internal Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1	Dr.Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai	1	Dr N Krishnamoorthy, SRMIST-RMP, Krishnan@srmist.edu.in

Course Code	UAI24D13J	Course Title	Mobile Application Development				Category	E	Discipline Core / Elective Courses	L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment														
CLR-1	To facilitate students to understand android SDK					1	2	3	4	1	2	3		1	2	3	4	5	6	7	8	9	10	
CLR-2	To help students to gain basic understanding of Android application development					Conceive Design Implement Operate Level of Thinking Expected Proficiency Expected Attainment Problem Solving Critical Thinking Creativity Communication Skills Analytical Reasoning Research Skills Collaborating Skills Leadership Qualities Learning to Learn Digital Technology																		
CLR-3	To understand how to work with various mobile application development frameworks																							
CLR-4	To inculcate working knowledge and sharing data of Android Studio development tool																							
CLR-5	To learn the web services and network design concepts and issues of development of mobile applications																							
Outcomes (CLO)		At the end of this course, learners will be able to:																						
CLO-1	Identify various concepts of mobile programming that make it unique from programming for other platforms					✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2			
CLO-2	Create, test and debug Android application by setting up Android development					✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1		
CLO-3	Demonstrate methods in storing, sharing and retrieving data in Android applications					✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2		
CLO-4	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces					✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3		
CLO-5	Create interactive applications in android using databases with multiple activities including audio, video and notifications and deploy them in marketplace					✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3		

Title & Content	Basics of Android Applications	Anatomy of an Android applications	Android views and database	Data sharing in Android	Services in Android
Duration (hour)	15	15	15	15	15
SLO-1	Introduction to Android	Anatomy of an Android applications	Using Basic Views	Sharing Data in Android	Consuming Web Services Using HTTP
SLO-2	The Android Platform	Android Tools and Controls	Using Picker Views	Creating Your Own Content Providers	Consuming JSON Services
SLO-3	Tutorial 1: Android Architecture	Tutorial 4: Android Development Tools	Tutorial 7: Understanding Specialized Fragments	Tutorial 10: Content Provider	Tutorial 13: Web and JSON Services
SLO-4&5	Practice 1: Develop a program to implement Text View and Edit Text	Practice 4: Develop a program to implement Checkbox and Radio Button	Practice 7: Develop a program to implement List View, Grid View, Image View and Scroll View	Practice 10: Develop a Program to send and receive sms	Practice 13: Develop a program to implement web and JSON Services
SLO-6	Eclipse Installation	Application Context	Using Image Views to Display Pictures	Sending Email	Creating Your Own Services
SLO-7	Android Installation	Activities, Services, Intents	Using Menus with Views	Displaying Maps	Binding Activities to Services
SLO-8	Tutorial 2: Building you First Android application	Tutorial 5: Receiving and Broadcasting Intents	Tutorial 8: WebView Controls	Tutorial 11: Configuration to Email and Maps	Tutorial 14: Broadcast services
SLO-9&10	Practice 2: Develop a program to implement Text View and Edit Text	Practice 5: Develop a program to implement new activity using explicit intent	Practice 8: Develop a program to implement to Display images and Menus	Practice 11: Develop a program to send and receive email	Practice 14: Develop a program to implement broadcast services

SLO-11	Understanding Anatomy of Android Application	Using Intent Filter	Saving and Loading User Preferences	Getting Location Data	Android Networking APIs
SLO-12	Android Manifest file.	Permissions	Persisting Data to Files-Creating and Using Databases.	Monitoring a Location	Android Web APIs
SLO-13	Tutorial 3: Android Login Architecture	Tutorial 6: Android Content Provider	Tutorial 9: SQL Lite Database	Tutorial 12: Location Data Configuration	Tutorial 15: Application Programming Interfaces
SLO-14&15	Practice 3: Develop a program to implement login window using UI Controls	Practice 6: Develop a program to implement content provider	Practice 9: Develop a Registration Page using SQL Lite Databases	Practice 12: Develop a program to get current location	Practice 15: Develop a Web API Applications
Assessment	Continuous Learning Assessment - 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources					
1	Jerome DiMarzio, "Beginning Android Programming with Android Studio", 4th Edition			2	Dawn Griffiths, David Griffiths, "Head First Android Development: A Brain-Friendly Guide", 2017.
3	Neil Smyth, "Android Studio 3.0 Development Essentials: Android", 8th Edition.			4	Pradeep Kothari, "Android Application Development (With Kitkat Support)", Black Book 2014.

Assessment												Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development		
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses		✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion		✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice		✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10	10						
6	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers			
Professional Experts		Higher Institution Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1	Dr.Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai
2		2	

Course Code	UAI24D14J	Course Name	Real World Computer Visions Applications	Course Category	E	Discipline Core / Elective Course	L	T	P	C
							3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Progressive Courses	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment			Programme Learning Outcomes (PLO)																									
CLR-1 :	To teach the participants about computer vision and the role it plays in building artificial intelligence solutions, how the machine is trained to understand and interpret the visual world.	1	2	3	4	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology																
CLR-2 :	To build intelligent and automated real-world computer vision applications and use cases spanning healthcare, retail, energy verticals by intelligently analyzing different datasets collected from diverse data sources.																																					
CLR-3 :	To teach the participants with wide variety of computer vision techniques such as digitization, histogram manipulation, warping, filtering, segmentation, restoration and compression.																																					
CLR-4 :	To teach the participants to build computer vision applications involving optical character recognition for converting printed or handwritten text into a digital format.																																					
CLR-5 :	To teach the participants about medical imaging that helps in mimicking the tasks performed by human vision.																																					
CLR-6 :	To understand all that is involved in building a computer vision use case for tracking the predicting customer Instore wait time at the store using all the computer vision techniques out there																																					
Outcomes (CLO)		At the end of this course, learners will be able to:																																				
CLO-1 :	Be exposed to the role of computer vision techniques play in building real-world artificial intelligence solution by training the machines to understand and interpret the visual world.	✓	✓	-	-					2	85	75	1	1	1	1	1	2	2	1	1	1																
CLO-2 :	Have hands-on skills and knowledge, expertise in training a generative model by framing the problem as a supervised learning problem with two sub-models.	✓	✓	✓	-					2	85	75	1	1	1	1	1	2	2	1	1	1																
CLO-3 :	collect and utilize related computer vision tasks that involve identifying objects in digital photographs	✓	✓	✓	✓					3	85	75	1	1	1	1	1	2	2	1	1	1																
CLO-4 :	Have a firm control on the concepts of augmented reality, the business benefits of augmented reality, its challenges of implementation etc.	✓	✓	✓	✓					3	85	75	1	1	1	1	1	2	2	1	1	1																
CLO-5 :	Get hands-on skills, knowledge and expertise in creating a full scale Medical Image based on computer vision techniques	✓	✓	✓	✓					3	85	75	1	1	1	1	1	2	2	1	1	1																
CLO-6 :	Have have excellent capabilities of demonstrating their expertise in building a full scale Customer In-store Wait Time Usecase end to end	✓	✓	-	-					2	85	75	1	1	1	1	1	2	2	1	1	1																

Note: All our curriculum, study materials, assignments, quizzes, lab works, and learning resources are personalized and dynamically generated using machine learning models based on the learner's learning ability. Users can review our learning curriculum only through our intelligent learning management platform (iLMSP), and our learning resources and lab infrastructures are available only in the digital form on our cloud infrastructures.

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)	15	15	15	15	15
S-1	SLO-1 Unit 1: Role of Computer Vision in AI	Deepface	Satellite to Map Image Translation Dataset	Unit 9: Augmented Reality with Computer Vision.	Data pipeline
	SLO-2 Computer Vision Overview	Yolo	How to Develop and Train a Pix2Pix Model	Augmented Reality with Computer Vision Overview	Model selection

S-2	SLO-1	Relationship between Computer Vision & AI	Unit 4: Basic Image and Digital Image Processing	How to Translate Images With a Pix2Pix Model	How does Augmented Reality work?	Model engineering
	SLO-2	Tasks in Computer Vision	Image Processing with OpenCV Overview	How to Translate Google Maps to Satellite Images	Sign Translation	Mode Outcome
S-3	SLO-1	Image Processing	Edge Detection and Image Gradients	Unit 6: Facial Recognition with Computer Vision	Text Detection	Mode Analysis
	SLO-2	Image Recognition	Dilation, Opening, Closing, And Erosion	Facial Recognition with Computer Vision Overview	Visual Tracking and Augmented Reality	Model Optimization
S-4	SLO-1	Object Detection	Perspective Transformation	Face Detection Algorithm	Implementation Steps	Model pipeline
	SLO-2	Object Segmentation	Image Pyramids	Face Detection Implementation	Evaluation	Data visualization
S-5 & S-6	SLO-1	Lab 1 : Image loading and display	Lab 4 : Blurring an image	Lab 7: Image classification with pre trained models	Lab 10 : Text extraction from image	Lab 13: Data visualization
	SLO-2					
S-7	SLO-1	Object Recognition	Cropping	Test Photographs	Unit 10: Medical Image Analysis with Computer Vision	User interface
	SLO-2	Unit 2: Computer Vision AI Applications	Scaling	Alternative to OpenCV	Medical Image Analysis with Computer vision overview.	Unit 12: Customer In-store Wait Time Analytics
S-8	SLO-1	Computer Vision in Health	Interpolations	Unit 7: Object Detection with Computer Vision.	Working of Medical Image Analysis	Customer In-store Wait time analysis
	SLO-2	Computer Vision in Retail	Re-Sizing	Object Detection with Computer	Common Imaging Techniques	Problem statement
S-9	SLO-1	Computer Vision in Energy	Thresholding	Object Detection with Computer Vision Overview	Computer vision models in Medical Imaging	Problem type
	SLO-2	Computer Vision in Oil and Gas	Adaptive Thresholding	Benefits of Object Detection	Role of AI in medical Imaging	Data engineering
S-10	SLO-1	Computer Vision in Automobile	Binarization	Working of Object Detection	Diagnostic Assistance	Data pipeline
	SLO-2	Unit 3: Computer Vision Libraries	Sharpening	Create a custom object detector	Screening and Triaging	Model selection
S-11 & S-12	SLO-1	Lab 2 : Use Computer Vision libraries for gray scale image conversion	Lab 5 : Edge detection	Lab 8: Face detection using computer vision	Lab 11: Screening medical images	Lab 14: Image segmentation
	SLO-2					
S-13	SLO-1	OpenCV	Blurring, Contours	Use a Pretrained object Detector, Other object Detection methods	Monitoring, Charting, Applications of Medical Image Analysis	Model engineering, Mode outcome
	SLO-2	TensorFlow, CUDA	Line Detection Using Hough Lines	Unit 8: Optical Character Recognition with Computer Vision, Optical Character Recognition Computer Vision Overview	Unit 11: Computer Tracking understanding of Consumer Interaction and Improving Store Layout Optimization	Model Analysis, Model optimization
S-14	SLO-1	Visual Suite, Matlab	Finding Corners, Counting Circles And Ellipses	How does Optical Character Recognition work?, OCR Applications in the Real World	Customer Interaction and Store optimization, Problem statement	Model pipeline, Data visualization
	SLO-2	Keras, SimpleCV, BoofCV	Unit 5: Image Transformation using Generative Adversarial Networks, Image Transformation overview	Text Recognition with Tesseract OCR, The Different Ways for Text Detection	Problem type, Data engineering	User interface
S-15	SLO-1	Lab 3: Image resizing, cropping, scaling	What Is the Pix2Pix GAN?	Lab 9: Text recognition from image	Lab 12: Using optimization algorithm for image classification	Lab 15: Real time object detection using openCV
	SLO-2		Lab 6: Image generation			

Learning Resources	1. The Computer Vision Workshop by Hafsa Asad, Vishwesh Ravi Shrimali, Nikhil Singh Publisher(s): Packt Publishing 2. Augmented Reality: Principles & Practice by Schmalstieg/Hollerer 3. Guide to Medical Image Analysis: Methods and Algorithms (Advances in Computer Vision and Pattern Recognition) by Klaus D. Toennies	References: 1. Computer Vision Theory and Projects in Python for Beginners by AI Sciences Publisher(s): Packt Publishing 2. Computer Vision: Python OCR and Object Detection Quick Starter by Abhilash Nelson
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Assessment												Strategies							
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development			
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)				Simulations		Clarification/Pauses		✓ Good Health & Well Being			
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Presentation Tools		✓	Group Discussion		✓	Quality Education	
1	Remember	15	15	15	15	10	10	10	10	15	15	Learning Management System		✓	Hands-on Practice		✓	Gender Equality	
2	Understand	15	15	15	15	10	10	10	10	15	15				Debate		✓		
3	Apply	20	25	25	20	25	25	25	25	25	25				Interactive Lecture		✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25				Brainstorming		✓		
5	Evaluate	15	10	10	15	15	15	15	15	10	10								
6	Create	15	10	10	15	15	15	15	15	10	10								
Total (%)		100	100	100	100	100	100	100	100	100	100								

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Designers											
Professional Experts				Higher Institution Experts				Internal Experts			
1	Mr.Jothi, Periyasamy , Chief AI Architect DeepSphere.AI, CA, USA			1	Dr.S.Gopinathan, Associate Professor, University of Madras, Chennai			1	Mrs.Anitha Jasmine, SRMIST		
2				2				2			

Course Code	UAI24D15J	Course Title	Business Intelligence	Category	E	Discipline Core / Elective Courses	L 3	T 0	P 2	C 4
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Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:				Depth				Attainment			Program Learning Outcomes (PLO)										
CLR-1	Define and explain the concept of Business Intelligence (BI).					1	2	3	4	Level of Thinking	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand the role of BI in organizational decision-making and strategic planning.										Expected Proficiency												
CLR-3	Learn about data warehousing principles, including data modeling, schema design, and ETL processes.										Expected Attainment												
CLR-4	Explore various BI techniques for data collection, integration, analysis, and visualization.																						
CLR-5	Gain practical skills and knowledge that are relevant to careers in BI, analytics, and data-driven decision-making.																						
Outcomes (CLO)		At the end of this course, learners will be able to:				Conceive	Design	Implement	Operate		Level of Thinking	Expected Proficiency	Expected Attainment	Problem Solving	Critical Thinking	Creativity	Communication	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1	Understand the fundamentals of Business Intelligence and its role in organizational strategy.					✓	✓	-	-		2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Define the concept of Business Intelligence and its importance in modern organizations.					✓	✓	✓	-		2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Implement Data Warehouse methodology and project life cycle in real world applications.					✓	✓	✓	✓		3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Construct a business scenario, identify the metrics, indicators and make recommendations to achieve the business goal					✓	✓	✓	✓		3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Encourage students to develop critical thinking and problem-solving skills by analyzing and solving business problems using BI tools and methodologies.					✓	✓	✓	✓		3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction to Business Intelligence	Importance of Business Intelligence	Business Intelligence Models	Business intelligence applications	Business Intelligence Tools
Duration (hour)	15	15	15	15	15
SLO-1	Business Intelligence an Introduction: Introduction - Definition - History and Evolution	Importance of Business Intelligence: Introduction - Creating Business Intelligence Environment	Business Data Warehouse: Definition of Data warehouse, Logical architecture of Data Warehouse, Data Warehouse model- Enterprise warehouse; Data Marts	Business intelligence applications: Marketing models: Relational marketing, Sales force management	Business Intelligence User Interfaces: Querying and Reporting - Reporting and Querying Toolkits
SLO-2	Business Intelligence Segments - Difference between Information and Intelligence	Business Intelligence Landscape - Types of Business Intelligence	Populating business Data Warehousing: data integration and extract, transform, load (ETL)	Logistic and production models: Supply chain optimization, Optimization models for logistics planning, Revenue management systems.	Basic Approaches - Building Ad-Hoc Queries- Building On-Demand Self-Service Reports Enhancing and Modifying
SLO-3	Tutorial: Real time Business Intelligence	Tutorial: The Combination of Business and Technology	Tutorial: Data quality-Data Cleansing- data profiling	Tutorial: Emerging trends in BI (e.g., AI, machine learning)	Tutorial:
SLO-4&5	Practice: Use a library like Matplotlib or Seaborn in Python to create simple	Practice: Customer Analysis with Power BI: Import customer data into	Practice: Perform the Extraction Transformation and Loading (ETL)	Practice: Image Classification Program:	Practice: Text Summarization Program:

	visualizations such as line plots, bar charts, or scatter plots.	Power BI from a CSV file.Create a pie chart to visualize the distribution of customers by age group.	process to construct the database in the Sqlserver.	Use a library like TensorFlow or PyTorch in Python to build a simple image classification model.	Use a library like Gensim or NLTK in Python to summarize text documents automatically.
SLO-6	Business intelligence architectures, Ethics and business intelligence	Business Intelligence Platform - Applications in BusinessAnalytics	Online Analytical Processing - OLAP Techniques - OLAP Applications	Data envelopment analysis: Efficiency measures, Efficient frontier,	Data Access Pull-Oriented Data Access Push-Oriented Data Access
SLO-7	Defining Business Intelligence Value Chain Factors ofBusiness Intelligence System	Applications in BusinessAnalytics - Dynamic roles in Business Intelligence - Challenges	Applying OLAP to Data Warehousing - Benefits ofusing OLAP – Dashboard -Key Performance Indicators	The CCR model, Identification of good operating practices	Dashboards EIS Is the Engine Metric System and KPIs Business Intelligence Dashboards
SLO-8	Tutorial: Business Intelligence Operational and Decision Support System	Tutorial: Role of Data Warehousing in BI	Tutorial: Future of Business Intelligence- Critical Challenges for Business Intelligence success	Tutorial: Future directions of Business Intelligence	Tutorial: Considerations for selecting the right BI tool for specific use cases
SLO-9&10	Practice: Load a CSV file containing data (e.g., sales data, student grades data) into a DataFrame using Pandas in Python. Compute basic statistics such as mean, median, standard deviation, and correlation coefficients for numerical variables.	Practice: Use a library like NLTK (Natural Language Toolkit) in Python to perform sentiment analysis on text data.	Practice:Create the cube with suitable dimension and fact tables based on ROLAP, MOLAP and HOLAP model.	Practice: Stock Price Prediction Program: Use historical stock price data from a financial API (e.g., Alpha Vantage) to predict future stock prices.	Practice: Recommendation System Program: Build a simple recommendation system using collaborative filtering.
SLO-11	Use and benefits of Business Intelligence	Business Intelligence Tools -Modern Business Intelligence	OLTP and OLAP systems, Designing business information warehouse	Enterprise and Departmental Business Intelligence	Overview of popular BI tools (e.g., Tableau, Power BI, QlikView)
SLO-12	Business IntelligenceApplications.	Enterprise Business Intelligence - Information Workers	Principles ofdimensional modeling, Data cubes, Data cube operations, data cube schemas.	Strategic and Tactical Business Intelligence Power and Usability in Business Intelligence	Features and capabilities of each tool
SLO-13	Tutorial: BriefIntroduction to Big Data Analytics	Tutorial: BIProcess, BI Technology, BI Roles & Responsibilities	Tutorial: Customer Relationship Management CRM, ERP, and Business Intelligence Customer Decisions	Tutorial: Business Intelligence: Art or Science?	Tutorial: Comparative analysis of BI tools
SLO-14&15	Practice:Use a library like Scikit-learn in Python to implement a simple linear regression mode	Practice: Use a library like BeautifulSoup in Python to scrape data from a website.	Practice:Create the ETL map and setup the schedule for execution.	Practice: Customer Lifetime Value Calculation Program: Use transaction data from a retail store or e-commerce website to calculate the customer lifetime value (CLV) for each customer.	Practice: Employee Attrition Prediction Program: Use HR data containing information about employee demographics, performance, and tenure.
Assessment	Continuous Learning Assessment - 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					

5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources					
1	Grossmann W, Rinderle-Ma, Fundamental of Business Intelligence, Springer Publications, 1 st edition, 2015.	4	Ramesh Sharda, Dursun Delen, Efraim Turban, J.E. Aronson, Ting-Peng Liang, David King, "Business Intelligence and Analytics: System for Decision Support", 10th Edition, Pearson Global Edition, 2013		
2	Mike Biere, "Business intelligence for the enterprise", Pearson Publication, First Edition.	5	Brain, Larson, "Delivering business intelligence with Microsoft SQL server 2008", McGraw-Hill Education, 2008.		
3	Online Platforms: Coursera, edX, Udacity for courses on AI, ML, and BI Kaggle for datasets and competitions	6	https://www.youtube.com/watch?v=zbcCdoHeS4w		

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
												Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers			
Professional Experts		Higher Institution Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1	Dr.Neelananarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai
		1	Dr.Renuga Devi, Associate Professor, SRMIST-RMP

Course Code	UAI24D16J	Course Title	Optimization Concepts for Data Science and Artificial Intelligence				Category	E	Discipline Core / Elective Course	L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)	The purpose of learning this course is to:													Depth	Attainment
CLR-1	Understand foundational concepts of optimization techniques													1	1
CLR-2	Understand foundational material in linear algebra and multivariate calculus required													2	2
CLR-3	Heuristic search, constraint programming, and graphical models.													3	3
CLR-4	Understand foundational material in probability and statistics.													4	4
CLR-5	Analysis of best optimization technique for data science and artificial intelligence													5	5
Outcomes (CLO)	At the end of this course, learners will be able to:													6	7
CLO-1	Demonstrate the concepts of optimization.													8	8
CLO-2	Develop a deeper understanding of the linear regression model													9	9
CLO-3	Understand and apply appropriate regression models and test its assumptions.													10	10
CLO-4	Use appropriate criteria for model selection and evaluate the fitted model													11	11
CLO-5	Develop a strong understanding of Neural Networks													12	12

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction to Optimization	Optimization algorithms	Modern methods of Optimization	Linear Algebra and Graph Theory	Probability and Statistics
Duration (hour)	15	15	15	15	15
SLO-1	Introduction to Optimization	Optimization algorithms for solving unconstrained optimization problems	Modern methods of Optimization	Linear Algebra and Multivariate Calculus; Applications in Data Science	Probability, Statistics, and Randomization
SLO-2	Optimal Problem formulation, Application of Optimization	Gradient based method Cauchy's steepest descent method	Genetic Algorithms	Perception Learning, Linear Regression, Logistic Regression, and Neural Networks.	Constraint and Weighted Constraint Satisfaction Problems; Applications
SLO-3	Tutorial 1: Application of Optimization	Tutorial 4: Discussion of Gradient based method	Tutorial 7: Application of Genetic Algorithm	Tutorial 10: Discussion on Linear Regression	Tutorial 13: Discussion on Constraint Satisfaction Problem
SLO-4&5	Practice 1: Implement any optimization method	Practice 4: Implement Gradient based method	Practice 7: Implement Genetic Algorithms	Practice 10: Implement Linear Regression	Practice 13: Implement Constraint Satisfaction Problem

SLO-6	Classification of Optimization problem	Newton’s method	SimulatedAnnealing	Support Vector Machines, Nonlinearity, and Kernel Methods.	Graphical ModelsBayesian Networks
SLO-7	Convex sets and convex functions and their properties	Conjugategradientmethod	Antcolony optimization	Graph Theory and Cornerstone Graph Algorithms	Markov Random Fields, and Constraint Networks
SLO-8	Tutorial 2: Discussion of Optimization problem	Tutorial 5: Applications of Newton’s and Conjugate method	Tutorial 8: Discussion on Simulated Annealing	Tutorial 11: Discussion Graph theory algorithms	Tutorial 14: Application of Bayesian Networks
SLO-9&10	Practice 2: Implement Convex sets and convex functions	Practice 5: Implement Newton’s Method	Practice 8: Implement Ant Colony optimization	Practice 11: Implement Support Vector Machine	Practice 14: Implement Markov Random Fields
SLO-11	Optimumdesignconcepts	Optimization algorithms for solving constrained optimization problems	Tabu search,	Maxflow Applications	HeuristicSearch;A*andFocal Search;Applications.
SLO-12	GlobalandLocaloptima-Optimalitycriteria-Reviewofbasiccalculusconcepts-Global optimality	direct methods, penaltyfunctionmethods, steepest descent method	Neural-Network based Optimization.	Graph Embedding; FastMap andItsApplications	Causal Reasoning; Planning andScheduling;Workflows.
SLO-13	Tutorial 3: Presentation on Optimum design concepts	Tutorial 6: Presentation on steepest descent method	Tutorial 9: Presentation on Tabu search	Tutorial 12: Mini Project 1	Tutorial 15: Mini Project 2
SLO-14&15	Practice 3: Implement Global and Local optima	Practice 6: Implement constrained optimization problems	Practice 9: Implement Neural Networks based optimization	Practice 12: Implement Graph Embedding	Practice 15: Implement A* algorithm
Assessme nt	Continuous Learning Assessment – 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					

9					
10					
	Test / quiz / assignment Evaluation		Description of Evaluation Methodology		

Resources

7	Rao S. S. – Engineering Optimization, Theory and Practice - 5 th ed.-New Age International Publishers –2020.	8	Deb K. – Optimization for Engineering Design Algorithms and Examples- 2 nd ed.– PHI –2000.
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Assessment

Assessment												Strategies				
Bloom's Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality
1	Remember	15	15	15	15	10	10	10	10	15	15		Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15		Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25		Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers

Professional Experts			Higher Institution Experts			Internal Experts		
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai		1	Dr. Agusthiyar R, Professor, CSA, agusthir@srmist.edu.in	

SEMESTER – VIII

Course Code	UAI24D17J	Course Title	Web Intelligence and Mining				Category	E	Discipline Core / Elective Courses	L	T	P	C
										3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)	The purpose of learning this course is to:	Depth				Attainment												
CLR-1	To articulate the principles and techniques of web intelligence	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To Analyze the use of Social Intelligence Design for various Applications																	
CLR-3	To describe web mining and understand the need for web mining																	
CLR-4	To perform web content mining for retrieving most relevant documents																	
CLR-5	To understand the methods of Web usage mining																	
Outcomes (CLO)	At the end of this course, learners will be able to:																	
CLO-1	To understand the fundamental concepts of Web Intelligence	✓	✓	✓	✓	2	85	75	3	2	2	1	1	1	1	1	3	2
CLO-2	To understand Social Intelligence Design for Web Intelligence	✓	✓	✓	✓	2	85	75	3	2	1	2	1	1	1	1	2	3
CLO-3	To understand the Data Mining Foundations	✓	✓	✓	✓	3	85	75	3	2	3	1	1	1	1	1	3	2
CLO-4	To understand and Perform analysis on web structure and its content	✓	✓	✓	✓	3	85	75	3	3	2	3	1	1	1	1	2	3
CLO-5	To understand Web Content Usage Mining methods	✓	✓	✓	✓	3	85	75	3	3	2	3	1	1	1	1	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction to Web Intelligence (WI) Concepts	Social Intelligence Design for Web Intelligence	Introduction to Web Data Mining and Data Mining Foundations	Web Content Mining	Web Usage Mining
Duration (hour)	15	15	15	15	15
SLO-1	Introduction to The Wisdom Web	Introduction: Social Intelligence Design for Web Intelligence	Web Data Mining-Data Mining, Web Mining, Data Mining Foundations	Classification: Decision tree for Text Document	Web Usage Mining – Data Collection and Preprocessing- Sources and Types of Data, Key Elements of Web usage
SLO-2	Level of WI vs Social Intelligence	Overview of Social Intelligence Design-groups and communities,	Association Rules and Sequential Patterns	Naive Bayesian Text Classification	Data Preprocessing, Data Modeling for Web Usage Mining
SLO-3	Tutorial 1: Intelligence and Semantic Web	Tutorial 4: Applications of social Intelligence Design	Tutorial 7: Association Rule Mining for Recommender Systems	Tutorial 10: . Develop Search engine using indexing	Tutorial 13: Click stream Analysis - Log Files
SLO-4&5	Practice 1: Bringing services to the semantic web	Practice 4: Travelling conversation model	Practice 7: Association Rule Mining for Recommender Systems	Practice 10: Develop Search engine using indexing	Practice 13: Personalized web search using log analysis

SLO-6	Semantic web development and software agent architecture	A Broadcast based approach	Apriori Algorithm- Frequent Itemset Generation	Ensemble of Classifiers	The BIRCH Clustering Algorithm - Modelling web user interests using clustering
SLO-7	Web services as agent behavior	A conversational Agent based approach	Data Formats for Association Rule Mining	Clustering: K-means Clustering	Binning –Web usage mining using Probabilistic Latent Semantic Analysis
SLO-8	Tutorial 2: Designing scenarios for social agents	Tutorial 5: Smart environment based approach	Tutorial 8: Frequent Itemset Generation	Tutorial 11: Prepare inverted indexing for the retrieved document	Tutorial 14 :Session and Visitor Analysis, Cluster Analysis and Visitor Segmentation
SLO-9&10	Practice 2: Designing scenarios Q architecture	Practice 5: Smart environment based approach	Practice 8: Identifying Most Frequently Accessed Web Pages by Multiple Users	Practice 11: Prepare inverted indexing for the retrieved document and represent it as tries	Practice 14: Identifying Most Frequently Accessed Web Pages by Multiple Users
SLO-11	Why Guidebots?	Psychological Evaluation	Mining with multiple minimum supports – Extended Model	Hierarchical Clustering	Association and Correlation Analysis
SLO-12	Generic ADE Architecture	Introduction:Communityware that facilitates knowledge interactions	Mining Algorithm, Mining Class Association Rules, Basic Concepts of Sequential Patterns	Markov Models - Probability- Based Clustering	Analysis of Sequential and Navigation Patterns
SLO-13	Tutorial 3: Hupothesis Based Reasoning:Guide Bots	Tutorial 6: Palm Guide Personal Tour Assistant	Tutorial 9: Mining Sequential Patterns on GSP	Tutorial 12: Vector Space Model and Statistical Language Model	Tutorial 15: Customer Segmentation Clustering
SLO-14&15	Practice 3: Develop student guide bots	Practice 6: Palm Guide Personal Tour Assistant	Practice 9: Mining Sequential Patterns on PrefixSpan	Practice 12: Document Classification with Vector Space Models	Practice 15: Customer Segmentation Clustering in marketing and business analysis
Assessment	Continuous Learning	Assessment – 1	Continuous Learning Assessment - 2		
			Continuous Learning Assessment - 3		

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources					
1	Web intelligence : Ning Zhong, Jiming Liu, Yiyu Yao Publisher -Berlin ; New York : Springer, 2003	4	Building An Intelligent Web: Theory And Practice Hardcover – Oct. 17 2007 by Pawan Lingras , Rajendra Akerkar		

2	Reza Zafarani , MohammadAli Abbasi ,” Social Media Mining: An Introduction” , Cambridge press, First Edition,2014 (Free Ebook available http://dmml.asu.edu/smm/chapter)	5	Mining the Web: Discovering Knowledge from Hypertext Data by Soumen Chakrabarti
3	Zdravko Markov, Daniel T. Larose, “Data Mining the Web: Uncovering Patterns in Web Content, Structure, and Usage”, John Wiley & Sons, Inc., 2007	6	Web Data Mining, Exploring Hyperlinks, Contents, and Usage Data Bing Liu, Second Edition, July 2011, First Edition, Dec 2006, Springer

Assessment												Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1 (10 %)		CLA – 2 (10 %)		CLA – 3 (20 %)		CLA – 4 (10%)						Simulations	Clarification/Pauses	✓	Good Health & Well Being
														Presentation Tools	✓	Group Discussion	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	
1	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓		
2	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓		
3	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓		
4	Analyze	20	25	25	20	25	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10	10						
6	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts				Higher Institution Experts				Internal Experts			
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services			1	Dr.Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai			1	Mr. D. Siva, SRMIST, sivad@srmist.edu.in		
								2			

Course Code	UAI24D18J	Course Name	Advanced Analytics and Data Visualization for Enterprise	Course Category	D	Discipline Core / Elective Courses	L	T	P	C
							3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses	Progressive Courses	Data Book / Codes/Standards	Nil
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Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)
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CLR-1 :	To make the participants learn how to make sense of data by creating informative and engaging reports and dashboards.	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-2 :	To provide the participants with the ways of analyzing the data in a better way, create visual representation of data that helps companies increase their profits through better analysis and better business decisions																		
CLR-3 :	To teach the participants with one of the leading data visualization tool used in the market for data analysis and prediction called SAP SAC.																		
CLR-4 :	To let the participants provide with the details of Creating Stories that are main part of SAP Analytics to explore data and to find deep insight using charts and tables.																		
CLR-5 :	To educate the participants about some of best practices to keep Analytics Designer running smoothly.																		
CLR-6 :	To provide the participants with main innovations that are present in SAP Analytics Cloud (SAC) for planning.																		

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Have a strong hands-on skills knowledge and expertise in transforming data into more useful visuals with the use of charts and visuals.	2	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H
CLO-2 :	Get a strong hands-on skill, knowledge and expertise in creating beautiful stories that are an integral part of SAP analytics	3	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H
CLO-3 :	Get a strong hands-on skill, knowledge and expertise in creating beautiful stories using analytical applications that are an integral part of SAP analytics	3	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H
CLO-4 :	Be introduced to the scripting world in SAP analytics for cloud for creating analytical applications	3	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H
CLO-5 :	Use a hybrid solution where SAC serves as a front-end on top of your BPC backbone called Financial Planning in SAP SAC.	3	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H
CLO-6 :	Use all three types of Smart Predict scenarios– Classification, Regression & Time-Series – provided by SAC to address prediction on different business use cases	3	85	80	H	H	H	H	H	H	H	H	H	M	M	H	H	H	H

Note: All our curriculum, study materials, assignments, quizzes, lab works, and learning resources are personalized and dynamically generated using machine learning models based on the learner's learning ability. Users can review our learning curriculum only through our intelligent learning management platform (iLMS), and our learning resources and lab infrastructures are available only in the digital form on our cloud infrastructures.

Sessions		CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Duration (hour)		15	15	15	15	15
S-1	SLO-1	Unit 1: Foundations of Data Visualization	Bar Chart	Data Modelling in SAP SAC	Creating Analytic Applications in SAP Data Warehouse Cloud	Pall the right information on the page
	SLO-2	Data Visualization Overview	Column Chart	Data Visualization in SAP SAC	Defining Busy Indicator	Select the right type of dashboard

S-2	SLO-1	Business Benefits of Data Visualization	Pie Chart	Predictive modelling in SAP SAC	Using Popups	Unit 13: Financial Planning in Analytics Designer
	SLO-2	Business Challenges of Data Visualization	Scatter Plot	Unit 7: Creating Stories in SAP SAC	Unit 10: Scripting in SAP SAC Analytic Applications	Financial Planning in Analytics Designer overview
S-3	SLO-1	When to use Data Visualization	Entitle a specific audience and mark their needs	Stories in SAP SAC Overview	Scripting in SAP SAC overview	Business Benefits of Financial Planning in SAP SAC
	SLO-2	Types of Data Visualization	Choose the right visual	Business Benefits of SAP SAC Stories	Create a new Script object	Cost center Planning
S-4	SLO-1	Data Visualization tools and techniques	Apply Text Carefully and Intentionally	Steps to Create stories in SAP SAC	Create a new function	Product Cost Planning
	SLO-2	Unit 2: Why Would a Company Want to Visualize Data	Use the predictable pattern for layouts	Save the Story	Edit the script function	Sales and Profitability Planning
S-5	SLO-1	Lab 1 : Introduction to various Data Visualization tools	Lab 4 : Bar, Line, Pie, Scatter Chart in Tableau	Lab 7: Creating a Story in SAP Analytics Cloud	Lab 10 : Creating Analytic Applications in SAP Data Warehouse Cloud	Lab 13: Create a Financial Planning in Analytics Designer overview
	SLO-2					
S-6	SLO-1	Solving data inefficiencies and data visuals	Select the right data visualization tool	Unit 8: Typical Workflow in creating an Analytic Application?	Create a new argument for the function	Project Planning
	SLO-2	Speed of Decision Making	Use attractive colors for telling data stories	Analytic Application in SAP SAC Overview	Save the Analytic application	Internal Order Planning
S-7	SLO-1	Identify Data Inaccuracies	Unit 5: Types of Data Visualization	Place the widget in the canvas	Unit 11: Scripting in SAP SAC Analytic Applications	Capital Expense Planning
	SLO-2	Access real-time information	Types of Data Visualization	Choose the Data Visualization Component	Widgets in SAP SAC overview	Financial Statement Planning
S-8	SLO-1	Promote Storytelling	Business Benefits of Data Visualization	Add more widgets	Uses of Widgets in SAP SAC	Unit 14: Predictive Modelling in SAP SAC
	SLO-2	Exploring business Insights	Charts	Add Scripts to your widgets	Create a New Widget	Predictive Modelling in SAP SAC Overview
S-9	SLO-1	Discover latest Trends	Tables	Save the Analytic application	Adding a Custom Widget	Predictive Modelling in SAP SAC Overview
	SLO-2	Tailor made Reports	Graphs	Unit 9: Creating Stories using Analytic Application in SAP SAC	Modifying the Custom Widget	Business Benefits of Predictive Analytics in SAP SAC
S-10	SLO-1	Lab 2 : Basic Visualization in Python	Lab 5 : Insights on the Sale in Tableau	Lab 8: Creating a Widgets in SAP Analytics Cloud	Lab 11: Creating a custome widget in SAP	Lab 14: Create a Predictive Modelling in SAP SAC
	SLO-2					
S-11	SLO-1	Unit 3: What Does the Future Hold for Visualizing Data	Maps	Analytic Application in SAP SAC Overview	Unit 12: Scripting in SAP SAC Analytic Applications	Steps to implement Predictive modelling in SAP SAC
	SLO-2	Future of Data Visualizations	Infographics	Create a New Analytic Application	SAP SAC Best Practices	Identify the ML Scenario
S-12	SLO-1	Location Based Analysis	Dashboards	Changing the Name of Widgets	Consider your audience	Data Acquisition
	SLO-2	Storytelling will become crucial	Unit 6: Types of Data Visualization	Adding Comments to Widgets and Table Cells	Determine your goals	Data Acquisition
S-13	SLO-1	Interactive Dashboards	SAP Analytics for Cloud Overview	Working with the Comment Widget in an Analytic Application	Choose relevant KPIs	Data Discovery
	SLO-2	Data Visualizations for everyone	Features of SAP SAC	Copying and Pasting Widgets and Scripting Objects	Tell a story with your data	Data Processing
S-14	SLO-1	Unit 4: Techniques and Best Practices Techniques	Business Benefits of SAP SAC	Copying and Pasting Widgets from Story to Analytic Application	Provide context	Model Creation

	SLO-2	Data Visualization techniques Overview	Key Capabilities of SAP SAC	Restoring Deleted Widgets or Scripting Objects	Pall the right information on the page	Generating Predictions
S-15	SLO-1 SLO-2	Lab 3: Basic Visualization in R	Lab 6: Map view in Tableau	Lab 9: Creating a Analytic Applications in SAP Analytics Cloud	Lab 12: Creating a Scripting in SAP SAC Analytic Applications	Lab 15: Create a Data Acquisition in SAP SAC

Learning Resources	Text books: 1. Data Visualization: a successful design process by Andy Kirk Publisher(s): Packt Publishing link : https://www.oreilly.com/library/view/data-visualization-a/9781849693462/ 2. SAP Analytics Cloud by Abassin Sidiq publisher : SAP press with Rheinwerk publisher	References: 1. The Truthful Art: Data, Charts, and Maps for Communication by Alberto Cairo Publisher(s): New Riders 2. Learning SAP Analytics Cloud by Riaz Ahmed Publisher(s): Packt Publishing
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Assessment												Strategies					
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology		Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses	✓	Good Health & Well Being	✓	
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
1	Remember	15	15	15	15	10	10	10	10	15	15						
2	Understand	15	15	15	15	10	10	10	10	15	15						
3	Apply	20	25	25	20	25	25	25	25	25	25						
4	Analyze	20	25	25	20	25	25	25	25	25	25						
5	Evaluate	15	10	10	15	15	15	15	15	10	10						
6	Create	15	10	10	15	15	15	15	15	10	10						
Total (%)		100	100	100	100	100	100	100	100	100	100						

Designers												Internal Experts		
Professional Experts						Higher Institution Experts						1	Mr. D. Siva, SRMIST, sivad@srmist.edu.in	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr.Neelannarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai					2		

Course Code	UAI24D19J	Course Title	Recommendation Systems				Category	D	Discipline Core / Elective Courses				L	T	P	C
													3	0	2	4

Course Offering Department	AI & ML	Pre-requisite Courses	Nil	Co-requisite Courses		Progressive Courses		Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:								Depth				Attainment												
CLR-1	To introduce Recommendation systems and its basic concepts.									1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To analyze design and working of Content-based recommendation.																									
CLR-3	To understand design and working of Knowledge based recommendation.																									
CLR-4	To understand design and working of Ensembled- Based and Hybrid Recommendation Systems.																									
CLR-5	To identify the methods for evaluation of recommendation systems																									
Outcomes (CLO)		At the end of this course, learners will be able to:								Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLO-1	To have a broad understanding of the field of Recommendation Systems.									✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Understanding the architecture and working of Content based recommendation systems.									✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Analysing hybrid and ensembles recommendation systems.									✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Analyzing Resistant Recommender Systems									✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Evaluation of recommendation systems by selecting right evaluation parameter.									✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Introduction to Recommendation System	Collaborative Filtering	Content-based recommendation	Ensembled- Based and Hybrid Recommendation System	Evaluating Recommendation System
Duration (hour)	15	15	15	15	15
SLO-1	Introduction to Recommender Systems: Goals of Recommender Systems	Architecture of Collaborative Filtering, User-based nearest neighbour recommendation, Item-based nearest neighbour recommendation	Hybrid recommendation approaches: Opportunities for hybridization	Opportunities for hybridization, Monolithic hybridization design: Feature recombination, Feature augmentation	Evaluating Recommender Systems Evaluating Paradigms
SLO-2	Basic Models of Recommender Systems	Modelbased and pre-processing based approaches, Clustering for recommendation system	Monolithic hybridization design	Parallelized hybridization design: Weighted, Switching, Mixed	User Studies – Online and Offline evaluation
SLO-3	Tutorial1: Domain Specific Challenges in Recommender Systems	Tutorial 4: Attacks on collaborative recommender systems, Advantages	Tutorial 7: Parallelized hybridization design	Tutorial 10: Pipelined hybridization design: Cascade Meta-level	Tutorial 13: Goals of evaluation design – Design Issues

		and drawbacks of Collaborative Filtering.			
SLO-4-5	Practice 1: Implement Data similarity measures.	Practice 4: the role of clustering methods with respect to recommendation systems	Practice 7: Implement content-based recommendation systems	Practice 10:Implement User-based Nearest neighbor recommendation.	Practice 13:Implementation of a recommendation system using Ensembled approach.
SLO-6	Linear Algebra notation: Matrix addition, Multiplication, transposition, andinverses	High-level architecture of content-based systems	Pipelined hybridization design Explanations in recommender systems: Introduction	Limitations of hybridization strategies.	Accuracy metrics – Limitations of Evaluation measures.
SLO-7	covariance matrices, Understanding ratings, Applications of recommendation systems, Issues with recommender system.	Item profiles, Representing item profiles, Methods for learning user profiles	Explanations in constraint-based recommenders	Attack-Resistant Recommender SystemsIntroduction – Types of Attacks	Comparison between evaluation design of classification model and recommendation system
SLO-8	Tutorial 2: Collaborative recommendation: User-based nearest neighbor recommendation	Tutorial 5: Similarity-based retrieval, and Classification algorithms	Tutorial 8: Explanations in case-based recommenders	Tutorial 11: Detecting attacks on recommender systems	Tutorial 14: Error metrics, Decision
SLO-9-10	Practice 2:Implementation of Matrix operations and data representation towards understanding mathematics for recommendation system	Practice 5:Feature engineering and pre-processing of data for recommendation systems.	Practice 8:Feature engineering and pre-processing of data for recommendation systems.	Practice 11:Implement collaborative filter techniques	Practice 14:Implementation of a Regression based recommendation system.
SLO-11	Item-based nearest neighbor recommendation	Introduction - Knowledge representation and reasoning	Bayes classifier for recommendation, Regression based recommendation System.	Individual attack – Group attack	Support metrics
SLO-12	Further model-based and pre-processing-based approaches	Interacting with constraint-based recommenders	Advantages and drawbacks of content-based filtering	Strategies for robust recommender design	User-Centred metrics.
SLO-13	Tutorial 3: Recent practical approaches and systems	Tutorial 6: Interacting with case-based recommenders	Tutorial 9: The Role of User Generated Content inthe Recommendation Process.	Tutorial 12: Robust recommendation algorithms.	Tutorial 15: Comparative analysis between different types of Recommendation systems.
SLO-14-15	Practice 3: Implement dimension reduction techniques for recommender systems	Practice 6: Implement user profile learning	Practice 9:Implementation of Bayes classifier for recommendation.	Practice 12:Implement Item-based Nearest neighbor recommendation	Practice15:Analyze results on the basis of different evaluation parameters and graphical representations for recommendation systems.
Assessment	Continuous Learning Assessment - 1		Continuous Learning Assessment - 2		
			Continuous Learning Assessment - 3		

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					

2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources

1	Jannach, D.Zanker, M., Felfernig, A., & Friedrich, G., Recommender System: an introduction., Cambridge University Press., 2010	3	Ricci, F., Rokach, L., & Shapira, B., Introduction to Recommender Systems Handbook, Springer, Boston, MA, 2011
2	Aggarwal, C. C., Recommender Systems (Vol. 1), Cham: Springer International Publishing, 2016	4	

Assessment												Strategies				
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)		Technology	Pedagogy / Andragogy		Sustainable Development	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4				Simulations	Clarification/Pauses		✓	Good Health & Well Being
		(10 %)		(10 %)		(20 %)		(10%)				Presentation Tools	✓	Group Discussion		✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice		✓
1	Remember	15	15	15	15	10	10	10	10	15	15			Debate	✓	
2	Understand	15	15	15	15	10	10	10	10	15	15			Interactive Lecture	✓	
3	Apply	20	25	25	20	25	25	25	25	25	25			Brainstorming	✓	
4	Analyze	20	25	25	20	25	25	25	25	25	25					
5	Evaluate	15	10	10	15	15	15	15	15	10	10					
6	Create	15	10	10	15	15	15	15	15	10	10					
Total (%)		100	100	100	100	100	100	100	100	100	100					

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers															
Professional Experts						Higher Institution Experts						Internal Experts			
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai					1	Dr. J. Jebamalar Tamilselvi, Associate Professor, SRM IST, RMP		
												2			

Course Code	UAI24D20J	Course Title	Planning Techniques for Robotics				Category	D	Discipline Core / Elective Course	L	T	P	C
										3	0	2	4

Course Offering Department	AI& ML	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)		The purpose of learning this course is to:								Depth				Attainment													
CLR-1	Understanding the role and importance of planning in robotics									1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10	
CLR-2	Planning algorithms form the backbone of robotic systems, influencing their ability to perform tasks efficiently.									Conceive Design Implement Operate				Level of Thinking	Expected Proficiency	Expected Attainment		Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology
CLR-3	Knowledge of planning algorithms is valuable, but practical implementation																										
CLR-4	Assessing the performance of planning algorithms																										
CLR-5	Design, execute, and optimize plans for real-world robotic tasks.																										
Outcomes (CLO)		At the end of this course, learners will be able to:																									
CLO-1	Understand the fundamental concepts of planning in robotics									✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1	
CLO-2	Apply appropriate algorithms to solve specific planning problems in robotic scenarios.									✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1	
CLO-3	Integrate planning modules with robotic systems to enable autonomous decision-making and task execution									✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2	
CLO-4	Analyze and evaluate the performance of planning algorithms based on metrics									✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3	
CLO-5	Integrate planning techniques with localization, mapping, and control systems to enhance overall robotic functionality and autonomy.									✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3	

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
Title & Content	Fundamentals of Robotics and Automation	Sensors, Drives and Grippers	Actuators and Motion	Kinematics of Manipulators	Problem-solving through Search
Duration (hour)	15	15	15	15	15
SLO-1	Introduction to robotics in industry and society, historical perspectives	Characteristics of sensing devices	Role and characteristics of robotic actuators	Rotation Matrix, Homogeneous Transformation Matrix	Forward and backward, state-space search
SLO-2	Classification of robots and overview of current research in robotics, applications of AI/ML	Criterion for selections of sensors	Electrical motors – servos, stepper motors, and drive mechanisms	D-H transformation matrix	Blind, heuristic, problem reduction,
SLO-3	Tutorial1: Robotics market, current challenges, and opportunities	Tutorial4 Role of interoceptive and exteroceptive sensing	Tutorial 7: Pneumatic and hydraulic actuators	Tutorial 10: D-H method of assignment of frames	Tutorial 13: Basic Search algorithms
SLO-4-5	Practice 1: Python-based program for simulating an autonomous warehouse robot system	Practice: Python program to simulate the characteristics of sensing devices, criteria for selecting sensors, and the role of interoceptive and exteroceptive sensing in a robotic context	Practice 7: Python implementation for electrical motors (servos and stepper motors) and pneumatic actuators:	Practice 10: Rotation Matrix	Practice 13: state-space search for a robot navigating a grid world
SLO-6	System-level architecture of robots – levels of autonomy	Position, velocity, and acceleration sensors	Soft robotic actuators	Direct and Inverse Kinematics for industrial Robots.	Alpha-beta pruning, minimax, constraint propagation

SLO-7	Fundamental concepts of robots – components, joints, coordinate systems, workspace	Internal sensors: Position sensors, & Velocity sensors	Electroactive polymers, shape memory actuators, and emerging paradigms	Differential Kinematics for planar serial robots	Neural, stochastic, and evolutionary search algorithms
SLO-8	Tutorial2: Controlled system & chain type: Serial manipulator &Parallel Manipulator	Tutorial5: External sensors: Proximity sensors, Tactile Sensors Force and torque sensing	Tutorial 8: Biomimetic actuators, artificial muscle technology and wearable actuators	Tutorial 11: Motion planning with kinematics constraints	Tutorial 14: Road map methods
SLO-9-10	Practice 2:program in Python that demonstrates the fundamental concepts of robots, including components, joints, coordinate systems, workspace, and different levels of autonomy.	Practice 5:Python program to simulate different types of sensors including position, velocity, acceleration, proximity, tactile, force, and torque sensors.	Practice 8:Python implementation for a basic soft robotic actuator using shape memory alloy (SMA) as a shape memory actuator	Practice11:Homogeneous Transformation Matrix:	Practice 14:Neural Search Algorithm
SLO-11	Components of Industrial robotics- precession of movement-resolution, accuracy & Repeatability	Drives – Basic types of drives. Advantages and Disadvantages of each type. Selection / suitability of drives for Robotic application.	Role of 3D printing and mechanical testing in robotic fabrication	Robot Applications: Material transfer and machine loading/unloading	foundations of knowledge representation and reasoning
SLO-12	Dynamic characteristics- speed of motion, load carrying capacity	Mechanical Gripper-Grasping force	Introduction to Artificial Intelligence: Overview: foundations, scope, problems, and approaches of AI	Processing operations assembly and Inspection	Representing and reasoning about objects
SLO-13	Tutorial 3: speed of response	Tutorial 6: Mechanisms for actuation	Tutorial 9: Intelligent agents: reactive, deliberative, goal driven, utility-driven, and learning agents	Tutorial 12: Localization, navigation and environment representation	Tutorial 15: Navigation function and Potential Field in 3D
SLO-14-15	Practice 3: Program in Python to simulate and demonstrate the dynamic characteristics	Practice 6:Python program that simulates different types of drives and a mechanical gripper	Practice 9:Python demonstrating a biomimetic actuator inspired by artificial muscles, along with the role of 3D printing and mechanical testing in robotic fabrication	Practice 12:D-H Transformation Matrix	Practice 15:Stochastic Search Algorithm (Monte Carlo)
Assessment	Continuous Learning Assessment - 1		Continuous Learning Assessment - 2		
	Continuous Learning Assessment - 3				

Session-wise Teaching Plan for a One Credit Course

(Continue with the required number of sessions and add sessions for Evaluation in between wherever necessary)

Ssn. No	Topics To Be Taught	Reference	CO Mapping	PO Mapping	Materials to be uploaded in LMS
1					
2					
3					
4					
5					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			
6					
7					
8					
9					
10					
	Test / quiz / assignment Evaluation	Description of Evaluation Methodology			

Resources											
9	John J. Craig, Introduction to Robotics, Pearson Education Inc., Asia, 3rd Edition, 2005								10	Dilip Kumar Pratihari, Fundamentals of Robotics, Narosa Publishing House, 2019.	
11	S. K. Saha, Introduction to Robotics, TATA McGraw Hills Education, 2014.								12		

Assessment											
Bloom’s Level of Thinking		Continuous Learning Assessment (CLA) (50% weightage)								Final Assessment (50 % weightage)	
		CLA – 1		CLA – 2		CLA – 3		CLA – 4			
		(10 %)		(10 %)		(20 %)		(10%)			
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)
1	Remember	15	15	15	15	10	10	10	10	15	15
2	Understand	15	15	15	15	10	10	10	10	15	15
3	Apply	20	25	25	20	25	25	25	25	25	25
4	Analyze	20	25	25	20	25	25	25	25	25	25
5	Evaluate	15	10	10	15	15	15	15	15	10	10
6	Create	15	10	10	15	15	15	15	15	10	10
Total (%)		100	100	100	100	100	100	100	100	100	100

Strategies					
Technology		Pedagogy / Andragogy		Sustainable Development	
Simulations		Clarification/Pauses		✓	Good Health & Well Being
Presentation Tools		✓	Group Discussion	✓	Quality Education
Learning Management System		✓	Hands-on Practice	✓	Gender Equality
		Debate		✓	
		Interactive Lecture		✓	
		Brainstorming		✓	

*The evaluation can be done on one or more parameters that include, (i) Seminars, (ii) Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi) Presentation of Research Work in Conferences, (vii) Assignments

Designers											
Professional Experts						Higher Institution Experts				Internal Experts	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services					1	Dr. Neelanarayanan,, Professor, School of Computer Science and Engineering, VIT Chennai			1	Dr. G. Savitha , SRMIST, savithag@srmist.edu.in

Course Code	UCS24P04L	Course Title	Research Project and Dissertation	Category	P	Project Work / Internship	L	T	P	C
							0	0	24	12

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Rationale (CLR)	The purpose of learning this course is to:	Depth	Attainment																	
CLR-1:	Become job ready along with real corporate exposure	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10		
CLR-2:	Increase self-confidence and helps in finding their own proficiency																			
CLR-3:	Cultivate leadership ability and responsibility to perform or execute the given task																			
CLR-4:	Inculcate learners hands on practice with in areal job situation																			
CLR-5:	Create a wareness of the social, cultural, global and environmental responsibility as an engineer																			
CLR-6:	Become able to identify, formulate and model problems and find engineering solution based on a systems approach																			
Outcomes (CLO)	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving	Critical Thinking	Creativity	Communication Skills	Analytical Reasoning	Research Skills	Collaborating Skills	Leadership Qualities	Learning to Learn	Digital Technology		
CLO-1:	Develop capability to acquire and apply fundamental principles of engineering	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1		
CLO-2:	Become updated with all the latest changes in technological world	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1		
CLO-3:	Make deep connections between ideas	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2		
CLO-4:	Learn to take creative risks	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3		
CLO-5:	Be ready for the creative economy also engage initerative thinking and divergent thinking	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3		

Learning Assessment	
Project Report (30%weightage) and Review(30%)	FinalPresentationand Viva Voce(40%weightage)

Course Code	UCS24P05L	Course Title	Professional Internship	Category	P	ProjectWork /Internship	L	T	P	C
							0	0	24	12

Course Offering Department	Computer Science	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	Data Book / Codes/Standards	Nil
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Course Rationale (CLR)	The purpose of learning this course is to	Depth				Attainment			Program Learning Outcomes									
CLR-1	Demonstrate skills learnt in the real time environment.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Explore the different industries that are using IT	Conceive Design Implement Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Communication Skills, Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills	Value Inculcation, Multicultural Environmental Action, Entrepreneurial Risk Taking	Project Management	Individual & Team work									
CLR-3	Enhance the skills in the system aspects																	
CLR-4	Understanding the professional connections with the knowledge learnt																	
CLR-5	Applying the skills in problem solving																	
Course Learning Outcomes (CLO)	At the end of this course, learners will be able to																	
CLO-1	To get an insight of an industry and organization/company	✓	✓	-	-	2	85	75	3	-	3	3	3	-	-	-	3	3
CLO-2	To gain valuable skills and knowledge	✓	✓	✓	-	2	85	75	3	-	3	3	3	-	-	-	3	3
CLO-3	To make professional connections and enhance networking	✓	✓	✓	✓	3	85	75	3	-	3	3	3	-	-	-	3	3
CLO-4	To get experience in a field to allow the student to make a career transition	✓	✓	✓	✓	3	85	75	3	-	3	3	3	-	-	-	3	3
CLO-5	To get an inside view of an industry and organization/company	✓	✓	✓	✓	3	85	75	3	-	3	3	3	-	-	-	3	3

*** Internship Training Selection: List of Industries/Research Centre's for Internship Training for students would be finalized by the Department Internship/Industrial Training Bachelor's Programme, Regulations 2024

Committee

Learning Assessment				
Project Work/Internship	Continuous Learning Assessment (50%weightage)		Final Evaluation (50%weightage)	
	Review-1	Review-2	Internship Report	Viva-Voce
	20%	30%	30%	20%