

FACULTY OF SCIENCE AND HUMANITIES

ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMME

**Bachelor of Science (Honors)
in
Computer Science with Specialization in Cyber Security**

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. Vision Statement	
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. Mission Statement	
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	Proficiency: To develop skills in students that can help them plan, implement, and ensure the protection of information technology assets
PEO - 2	Analytical Ability: To develop skills in students that can help them plan, implement, and monitor cyber security
PEO - 3	mechanisms to ensure the protection of information technology assets
PEO - 4	Continuous learning: To systematically educate the necessity to understand the impact of cyber crimes and threats with solutions in a global and societal context
PEO - 5	Demonstration Skill: To equip students with cyber threats with the technical knowledge and skills needed to protect and defend against cyber threats

4. Consistency of Programme Education Objectives with Mission					
	Mission Stmt. – 1	Mission Stmt. – 2	Mission Stmt. -3	Mission Stmt. - 4	Mission Stmt. – 5
PEO - 1	High	High	Medium	Low	Medium
PEO - 2	Medium	High	Medium	Low	Medium
PEO - 3	High	High	Medium	High	Medium
PEO - 4	High	Medium	Medium	High	High
PEO - 5	High	High	High	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	The capacity to apply mathematical and computer knowledge relevant to the field to recognize, formulate, and create solutions for computational problems.
PLO - 2	The capacity to interact and converse with a variety of stakeholders in an efficient manner.
PLO - 3	An understanding towards the tradeoffs involved in design decisions and the capacity to use algorithmic concepts, computer science theory, and mathematical underpinnings to the modeling and design of computational systems.
PLO - 4	Accept responsibility for personal behavior and actions, cultivate self-assurance, and have faith in the ideas.
PLO - 5	A proficiency with the techniques, skill sets, and software/hardware tools required for computing practice.
PLO - 6	A comprehension of the duties and obligations related to the computer profession in terms of professionalism, ethics, law, security, and society in diverse culture and multi-lingual work environments.
PLO - 7	The capacity to evaluate the impact of computers and software/hardware products among common people, groups, and society as a whole.
PLO - 8	Advancement towards the development of science and society by entrepreneurship and innovative technologies for various needs and demands across sectors.
PSO - 1	Make an effort to use and create simulation tools that can aid in the solution of simple to complicated problems requiring computation-based and computation-oriented solutions that are low-complexity, optimized, energy-efficient, and indigenous.
PSO - 2	A zeal to engage with cutting-edge technologies in order to quickly find solutions for an ecosystem of intelligent applications.

*PSO – Programme Specific Outcomes

6.	PLO - 1	PLO - 2	PLO - 3	PLO - 4	PLO - 5	PLO - 6	PLO - 7	PLO - 8	PSO - 1	PSO - 2
PEO - 1	2	2	3	2	2	1	1	3	2	2
PEO - 2	3	3	2	1	2	1	1	3	2	2
PEO - 3	3	3	2	3	3	2	3	2	1	2
PEO - 4	1	1	3	3	2	1	3	3	1	3
PEO - 5	3	3	3	3	2	3	3	3	1	3

7. 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			L	T	P
USC24101J	Hardware Maintenance and Troubleshooting	3	0	3	UMS24D01T	Resource Management Techniques	4	0	0
USA24102J	Programming for Problem Solving	3	0	3	UMS24D03T	Statistical Methods			
UMS24101T	Discrete Mathematical Structures	4	0	0	UCS24D01J	Software Engineering			
UCS24201T	Office Productivity Software	4	0	0	UCS24D02J	Computer Networks and Data Communication	3	0	3
UCS24202J	Object Oriented Programming using Java	3	0	3	USC24D01J	Penetration Testing	3	0	3
USC24202J	Introduction to Cyber Security	3	0	3	USC24D02J	Social Media Cyber Security			
UCS24301J	Operating System	3	0	3	USC24D03J	Security Threats and Principles	3	0	3
USA24302J	Database Management System	3	0	3	USC24D04J	Malware Analysis			
USC24301J	Basics of Ethical Hacking for Cyber Security	3	0	3	USA24D07J	Cloud Computing	3	0	3
USC24401J	Data Privacy and Security	3	0	3	USC24601J	Data Science using Python Programming			
Total Learning Credits				40	USC24D05J	E - Commerce, Digital Payments and Security	3	0	3
					USC24D06J	Cyber Security of Digital Devices			
					USC24D07J	Cyber Security Plan and Crisis Management	3	0	3
					USC24D08J	Cyber Crimes			
					USC24D13J	Big Data Analytics	3	0	2
					USC24D14J	Cryptography and Network Security			
					USA24D20J	Blockchain Technology	3	0	2
					USC24D18T	Introduction to Physical Cyber Systems	4	0	0
					USC24D15J	AI and Business Analytics			
					UAI24D17J	Web Intelligence and Mining	3	0	2
					Total Learning Credits				40
Elective Courses (Minor) (E)					Multidisciplinary Courses (M)				
Course Code	Course Title	Sessions/ Week			Course Code	Course Title	Sessions/ Week		
		L	T	P			L	T	P
UDS24E01J	Data Science and Analytics	3	0	3	UCS24M01J	Introduction to ICT Tools	2	0	2
UDS24E02J	Data Analytics using Spreadsheet	3	0	3	UCS24M02J	Fundamentals of Digital Marketing	3	0	1
UDS24E03J	Essentials of Machine Learning	3	0	3	UCS24M03J	Basics of Web Application Development	2	0	2
UDS24E04J	Programming using R	3	0	3	Total Learning Credits				9
UDS24E05J	Programming using Python	3	0	2	Value Added Courses (V)				
UDS24E06J	Introduction to Deep Learning	3	0	2	Course Code	Course Title	Sessions/ Week		
UDS24E07J	Applications of Computer Vision	3	0	2			L	T	P
UDS24E08J	Data Visualization Tools	3	0	2	UCD24V01T	Essentials of Artificial Intelligence	1	0	0
Total Learning Credits				32	UES24V01T	Environmental Studies	2	0	0
					UCD24V02T	Universal Human Values	2	0	0
					Total Learning Credits				5
Ability Enhancement Courses (A)					Skill Enhancement Courses (S)				
Course Code	Course Title	Sessions/ Week			Course Code	Course Title	Sessions/ Week		
		L	T	P			L	T	P
ULT24AE1J	Tamil - I				UCD24S01J	Verbal Ability and Skill Development	1	0	2
ULH24AE1J	Hindi - I	2	0	2	UCD24S02L	Quantitative Aptitude and Logical Reasoning	0	0	2
ULF24AE1J	French - I				UCD24S03J	Industry Oriented Employability and Leadership Skills	1	0	2
ULE24AE1J	English	2	0	2	UEN24S01L	Communication Skills	0	0	4
ULT24AE2J	Tamil - II				UCD24S04J	Career Readiness and Professional Skills	1	0	2
ULH24AE2J	Hindi - II	2	0	2	Total Learning Credits				9
ULF24AE2J	French - II				Mandatory Courses (Y)				
Total Learning Credits				9	Course Code	Course Title	Sessions/ Week		
							L	T	P
Project Work / Internship (P)					UNS24Y01L	NSS			
Course Code	Course Title	Sessions/ Week			UNC24Y01L	NCC			
		L	T	P	UNO24Y01L	NSO	0	0	0
UCS24P01L	Internship - I	0	0	0	UYG24Y01L	YOGA			
UCS24P02L	Internship - II	0	0	0	UMI24Y01L	My India Project	0	0	0
UCS24P03L	Project Work	0	0	4	Total Learning Credits				0
UCS24P04L	Research Project and Dissertation								
UCS24P05L	Professional Internship	0	0	24					
Total Learning Credits				16					



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					
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
USC24101J	Hardware Maintenance and Troubleshooting	3	0	3	4
USA24102J	Programming for Problem Solving	3	0	3	4
UMS24101T	Discrete Mathematical Structures	4	0	0	4
UCD24S01J	Verbal Ability and Skill Development	1	0	2	2
Total Learning Credits					20

Semester – II					
Code	Course Title	Sessions/ Week			C
		L	T	P	
ULT24AE2J	Tamil - II	2	0	2	3
ULH24AE2J	Hindi - II				
ULF24AE2J	French - II				
UCS24201T	Office Productivity Software	4	0	0	4
UCS24202J	Object Oriented Programming using Java	3	0	3	4
USC24202J	Introduction to Cyber Security	3	0	3	4
UCD24V01T	Essentials 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				
Code	Course Title	Sessions/ Week			C
		L	T	P	
UCS24301J	Operating System	3	0	3	4
USA24302J	Database Management System	3	0	3	4
USC24301J	Basics of Ethical Hacking for Cyber Security	3	0	3	4
	Elective Course (Minor) - I	3	0	2	4
	Multidisciplinary Course – II				3
UCS24P01L	Internship – I	0	0	0	1
	Total Learning Credits				20

	Semester - IV				
Code	Course Title	Sessions/ Week			C
		L	T	P	
USC24401J	Data Privacy and Security	3	0	3	4
UMS24D01T	Resource Management Techniques	4	0	0	4
UMS24D03T	Statistical Methods				
	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					
Code	Course Title	Sessions/ Week			C
		L	T	P	
UCS24D01J	Software Engineering	3	0	3	4
UCS24D02J	Computer Networks and Data Communication				
USC24D01J	Penetration Testing	3	0	3	4
USC24D02J	Social Media Cyber Security				
	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					
Code	Course Title	Sessions/ Week			C
		L	T	P	
USC24D03J	Security Threats and Principles	3	0	3	4
USC24D04J	Malware Analysis				
USA24D07J	Cloud Computing	3	0	3	4
USC24601J	Data Science using Python Programming				
	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	
USC24D05J	E - Commerce, Digital Payments and Security	3	0	3	4
USC24D06J	Cyber Security of Digital Devices				
USC24D07J	Cyber Security Plan and Crisis Management	3	0	3	4
USC24D08J	Cyber Crimes				
UCS24D13J	Big Data Analytics	3	0	2	4
UCS24D14J	Cryptography and Network Security				
	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	
USA24D20J	Blockchain Technology	3	0	2	4
UCS24D18T	Introduction to Physical Cyber Systems	4	0	0	
UCS24D15J	AI and Business Analytics	3	0	2	4
UAI24D17J	Web Intelligence and Mining				
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 Computer Science in Specialization with Cyber Security to other Departments (excluding Department of Computer Science in Specialization with Cyber Security)

Elective Courses (Minor) (E)						
Semester	Course Code	Course Title	Sessions per Week			C
			L	T	P	
III	UDS24E01J	Introduction to Data Science and Analytics	3	0	3	4
IV	UDS24E02J	Data Analytics using Spreadsheets	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 Department of Computer Science in Specialization with Cyber Security to all departments (including Department of Department of Computer Science in Specialization with Cyber Security)

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 Code	PLO										
		1	2	3	4	5	6	7	8	PSO 1	PSO 2	
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	
USC24101J	Hardware Maintenance and Troubleshooting	3	3	2	2	2	3	-	-			
USA24102J	Programming for Problem Solving	3	2	2	2	2	3	-	2	2	2	
UMS24101T	Discrete Mathematical Structures	3	1	2	2	3	3	-	2	2	2	
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	
UCS24201T	Office Productivity Software	3	3	3	-	-	-	-	2	2	2	
UCS24202J	Object Oriented Programming using Java	3	2	3	1	3	2	-	-	-	-	
USC24202J	Introduction to Cyber Security	3	2	1	2	2	3	-	2	2	2	
UCD24V01T	Essentials of Artificial Intelligence	3	3	2	2	2	3	-	-	2	2	
	Multidisciplinary I	1	2	2	1	2	2	-	1	2	3	
UCD24S02L	Quantitative Aptitude and Logical Reasoning	2	3	1	1	1	3	-	-	-	-	
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	
USC24301J	Basics of Ethical Hacking for Cyber Security	3	2	2	2	3	3	-	2	3	2	
	Elective Course (Minor) - 1	-	-	-	-	-	-	-	-	-	-	
UCS24P01L	Internship – I	3	2	2	2	3	3	-	2	3	2	
	Multidisciplinary II	3	2	3	3	3	3	2	2	3	3	
USC24401J	Data Privacy and Security	3	2	2	2	3	3	-	2	3	2	
UMS24D01T	Resource Management Techniques	3	2	2	2	3	3	-	2	3	2	
UMS24D03T	Statistical Methods	3	2	2	2	3	3	-	2	3	2	
	Elective Course (Minor) - II	-	-	-	-	-	-	-	-	-	-	
	Elective Course (Minor) - III	-	-	-	-	-	-	-	-	-	-	
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	
UCS24D01J	Software Engineering	3	2	2	2	3	3	-	2	3	2	
UCS24D02J	Computer Networks and Data Communication	3	2	2	2	3	3	-	2	3	2	
USC24D01J	Penetration Testing	3	2	2	2	3	3	-	2	3	2	
USC24D02J	Social Media Cyber Security	3	2	2	2	3	3	-	2	3	2	
	Elective Course (Minor) - IV	-	-	-	-	-	-	-	-	-	-	
	Multidisciplinary 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	

USC24D03J	Security Threats and Principles	3	2	2	2	3	3	-	2	3	2
USC24D04J	Malware Analysis	3	2	2	2	3	3	-	2	3	2
USA24D07J	Cloud Computing	3	2	2	2	3	3	-	2	3	2
USC24601J	Data Science using Python Programming	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) - V	-	-	-	-	-	-	-	-	-	-
	Elective Course (Minor) - VI	-	-	-	-	-	-	-	-	-	-
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
USC24D05J	E - Commerce, Digital Payments and Security	3	2	2	2	3	3	-	2	3	2
USC24D06J	Cyber Security of Digital Devices	3	2	2	2	3	3	-	2	3	2
USC24D07J	Cyber Security Plan and Crisis Management	3	2	2	2	3	3	-	2	3	2
USC24D08J	Cyber Crimes	3	2	2	2	3	3	-	2	3	2
UCS24D13J	Big Data Analytics	3	2	2	2	3	3	-	2	3	2
UCS24D14J	Cryptography and Network Security	3	2	2	2	3	3	-	2	3	2
	Elective Course (Minor) - VII	-	-	-	-	-	-	-	-	-	-
	Elective Course (Minor) - VIII	-	-	-	-	-	-	-	-	-	-
USA24D20J	Blockchain Technology	3	2	2	2	3	3	-	2	3	2
UCS24D18T	Introduction to Physical Cyber Systems	3	2	2	2	3	3	-	2	3	2
UCS24D15J	AI and Business Analytics	3	2	2	2	3	3	-	2	3	2
UAI24D17J	Web Intelligence and Mining	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	3	2	2	2	3	3	1	2	2	2

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 Courses	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/Standard s	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	மரபிலிருந்து மாற்றம் பெற்ற புதுக்கவிதை மரபின் சிந்தனைகளை அறியச்செய்தல்	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	நவீன கவிதையின்வழி மனிதவாழ்வியல் விழுமியங்களைத் தெரியச்செய்தல்																	
CLR-3	சிறுநிலக்கியங்கள், காப்பியங்கள் கற்பிக்கும் தமிழ்ச்சமூகத்தின் வாழ்வியலை அறியச்செய்தல்																	
CLR-4	நவீன தமிழ் இலக்கிய வளர்ச்சி வரலாற்றைப் புரியச்செய்தல்																	
CLR-5	மொழிப்பயிற்சிவழி மொழியின் பல்வேறு நுட்பங்களைத் தெரியச்செய்தல்																	
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 Incultation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO 1	PSO 2
CLO-1	புதுக்கவிதை உருவாக்கித் தந்த புதிய சிந்தனைக்களங்களை அறிந்துகொள்ளுதல்	✓	✓	-	-	2	75	60	3	3	-	-	-	-	3	-	-	-
CLO-2	நவீனகவிதைகள்வழி மாற்றம் பெற்றுவரும் மானுடவிழுமியங்களைத் தெரிந்துகொள்ளுதல்	✓	✓	✓	-	2	80	70	-	-	2	-	3	3	-	-	-	-
CLO-3	தமிழ்ச்சமூகத்தின் இடைக்கால வாழ்வியல் முறைகளை உணர்ந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	65	3	3	-	-	2	-	-	-	-	-
CLO-4	நவீனஇலக்கிய வரலாறுவழி தமிழ்க்கல்வி வரலாறு, சமூக வரலாறு பெற்ற வளர்ச்சி நிலைகளைத் தெரிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	70	-	3	-	1	2	-	-	-	-	-
CLO-5	மொழியின் நுட்பங்களைத் தெரிந்து மொழிஆளுமையோடு செயல்படும் திறன்பெறுதல்	✓	✓	✓	✓	3	80	70	3	3	2	-	-	-	-	-	-	-

Sessions	CLO – 1	CLO – 2	CLO – 3	CLO – 4	CLO - 5
	12	12	12	12	12
SLO-1	தமிழ்க் கவிதைமரபு	நவீன கவிதை தோற்றம், வரலாறு	தமிழரின் வீரமரபு - போர்விழுமியங்கள்	சிறுநிலக்கியத்தோற்றம் - வகைமை	தமிழ் உரைநடை மரபு - உ.வே.சா. விற்பங்களிப்பு
SLO-2	புதுக்கவிதை உருவாக்கம், புதுக்கவிதை வளர்ச்சிநெறிகள்	நவீன கவிதைகளில் செல்நெறிகள்	பரணி அறிமுகம் பரணி இலக்கியங்கள்	பிள்ளைத்தமிழ் - உலா - தூது	உ.வே.சா. வின் ராஜவைத்தியம்
SLO-3	பாரதியார் பன்முக ஆளுமைத்திறன்	கவிதைமொழி - நவீன கவிஆளுமைகள்	தலைவனின் வீரம்- கலிங்கத்துப்பரணி 477,490	புதுக்கவிதையின் தோற்றமும் மொழியும்	நாட்டுப்புற மரபில் சிறுதெய்வ வழிபாடு
SLO-4	பாரததேசம் பாரததேசத்தின் வளம்	கவிதையில் நாட்டுப்புற வடிவம்	தமிழ் இலக்கியமரபில் தூது இலக்கியங்கள்	புதுக்கவிதையில் சமூகம் - புதுக்கவிதையும் இதழ்களும்	கழனிபூரனின் பொன்காத்தஜயனார்
SLO-5	வெள்ளப்பனிமலையின் மீதுலவுவோம்...	பெண்களின் கல்விநிலை - இளம்பிறை - அம்மா	தமிழின் பெருமை - தமிழ் விடுதூது (184 - 186)	மணிக்கொடிஇதழ், எழுத்துஇதழ், வானம்பாடிஇதழ்	பிழைநீக்கிஎழுதும்நுட்பங்கள்
SLO-6	20ஆம் நூற்றாண்டுக் கவிதைமரபில் பாரதிதாசன்	ஆண்பெண் சமத்துவமும் ப.கல்பனா - கீறல் விழுந்த மாலைக்காலங்கள்	செய்யுள்மரபில் கலம்பக இலக்கியங்கள்	சிறுகதை தோற்றம் - சிறுகதை வளர்ச்சி	எழுத்துப்பிழை - ந - ண - ன ல, ள, ழ, ர, ற வேறுபாடு அறிதல்
SLO-7	பாரதிதாசன் - அழகின்சிரிப்பு ஆல் - ஆயிரம்கிளைகள்கொண்ட அடிமரம்	விளிம்புநிலை வாழ்வியல்: திருநற்களம் சாதனைகளும்	கையறுநிலை - நந்திக்கலம்பகம்- வானுறுமதியை (110)	சிறுகதை வரலாறு - சிறுகதை ஆசிரியர்கள்	தொடர்பிழை ஒருமைபன்மை வேறுபாடு
SLO-8	ஆல் - ஆயிரம்கிளைகள்கொண்ட அடிமரம்	திருநங்கைகுணவதி - சமூகப்பார்வை	தமிழ் இலக்கிய மரபில் குறவஞ்சி இலக்கியங்கள்	இதழ்களும் சிறுகதையும்	பிறமொழிச் சொற்களை நீக்கி எழுதுதல், ஷ, ஜ, ஸ, ஹ மாற்றொலிகள்
SLO-9	வானம்பாடிக்கவிஞர்களும் மு.மேத்தாவும்	புலம்பெயர் வாழ்வியல் - வலியும் நம்பிக்கையும்	குற்றாலக்குறவஞ்சி - ஆடுமரவீனுமணி (3)	புதினம் தோற்றம் - புதினம் வளர்ச்சிவரலாறு	தமிழில் சொல்வகைகள் சொல்லும் பயன்பாடும்

SLO-10	மனிதநேயம் - மு.மேத்தாவின் மனிதனைத்தேடி	ஸர்மிளாஸெய்யித் - புராதனஊர்	காப்பிய இலக்கணம் - காப்பிய வகைமைகள்	புதினத்தின் வகைமை புதின ஆசிரியர்கள்	பெயர்ச்சொற்கள் பெயர்ச்சொற்களும் வகைகளும்
SLO -11	தமிழ்க்கவிதையில் சுற்றுச்சூழலியல்	காலந்தோறும் கவிதைவடிவில் மாற்றங்கள்- ஹைக்கூ - மு.முருகேஷ்	சிலப்பதிகாரம் - அறிமுகம் கட்டுரைக்காதை	தமிழ் இலக்கியத்தில் உரைநடைக்கூறுகள் - உரைநடையின் தோற்றம்	வினைச்சொற்கள் அறிதல்
SLO -12	இயற்கையும் சமத்துவமும் பழனிபாரதியின்காடு	லிமரைக்கூ - ஈரோடு தமிழன்பன் சென்ரியூ - மாமதயானை	ஊழ்வினை - கோவலனின் முற்பிறப்பு வரலாறு	தமிழில் உரைநடை வளர்த்த அறிஞர்கள்	தமிழில்பெயரடை, வினையடை அறிதல்

Resources

1	முல்லைக்காடு, தொகுப்பும்பதிப்பும் - தமிழ்த்துறை ஆசிரியர்கள், எஸ்.ஆர்.எம். அறிவியல் மற்றும் தொழில்நுட்பக் கல்வி நிறுவனம், காட்டாங்குளத்தூர், 603203, 2023	4	வல்லிக்கண்ணன், புதுக்கவிதை தோற்றமும் வளர்ச்சியும், ஆழிபதிப்பகம், சென்னை, 2018
2	கா. சிவத்தம்பி, தமிழில் சிறுகதை தோற்றமும் வளர்ச்சியும், என்.சி.பி.எச்., சென்னை, 2013	5	மு.வரதராசன், தமிழ் இலக்கிய வரலாறு, சாகித்தியஅக்காதெமி, 1972.
3	மதுரை தமிழ் இலக்கியமின் தொகுப்புத்திட்டம் - https://www.projectmadurai.org/	6	தமிழ் இணையக் கல்விக்கழகம் - 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%)			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			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	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 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. Hezbibahbeulah 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 Courses	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			PLO									
CLR-1	To Communicate in Hindi without any inhibition	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
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:	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	Leadership Qualities, Professionalism, Autonomy, Digital Technology Skills	Value Incubation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO 1	PSO 2	
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	AVDHARNA EVM SWAROOP	NIBANDH KI AVDHARNA	AVDHARNA EVM SAWROOP	ARTH EVM PARIBHASHA

	PARIBHASHA		EVM SAWROOP		
SLO-3	KAHANI KE TATVA EVM MAHATWA	MAHATVA AUR UDDESHYA	MAHATVA EVM UDDESHYA	TATVA EVM PRAKAR	SWARUP EVM PRAKAR
SLO-4	PAIKSHA- PREMCHAND	GESHA REKHACHITRA	KUTAJ- NIBANDH HAJARI PRASHAD Divedi	UDDESHYA	MAHATVA
SLO-5	VISLESHAN	PATH KA VISHLESHAN	LEKHIAK 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 VILHLESHAN	GURU SHISHYA SAMBANDH	TAKANIKI SHABDAVALI KA MHATVA
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		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 (%)		Learning Management System	✓	Hands-on Practice	✓	Gender Equality
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	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			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	Independent Thinking, Analytical	Leadership Qualities, Professionalism, Autonomous	Digital Technology Skills	Value Incultication, Multicultural Inclusivity	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 deuxièmegroupe –
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 présenter	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 adjectifs possessifs	Emma la Championne	La phrase négative (1)	La famille (2)	Portraits
SLO-9	La phrase interrogative	Mots et expressions	Les verbes aller et venir	La formation du féminin	Mots et Expressions
SLO-10	Les nombres	Grammaire	Les formules de politesse	La formation du pluriel (2)	Grammaire.
SLO-11	Intonation et est-ce que	Communication	C'est qui?	Il y a	Communication
SLO-12	Les exemples	Les verbes du ER –groupe	Mots et Expressions	Les articles contractés	Les concepts

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											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 (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
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	Mr. KavaskarDanasegarane, Language Specialist, Process Expert Maersk Global Service Center Pvt. Ltd	1	Dr. C Thirumurugan, Professor, Department of French, Pondicherry University	1	Mr. Kumaravel K. Assistant Professor and Head, SRMIST
2	Mr. Shrivathsan S, Journalist, Senior Sports Reporter/Sub-Editor, Times of India, Chennai			2	Ms. Abigail A, Assistant Professor, SRMIST
				3	Mrs. M. Mahalakshmi, Assistant Professor, SRMIST

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			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	Leadership Qualities, Professionalism, Accountability	Digital Technology Skills	Value Incultation, Multicultural Inclusivity	Environmental Action, Community	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	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	Introduction to Creative Writing. Explaining the elements of creative writing.	Building the discourse- The significance of conversation and the key elements of discourse- Art of conversation in digital and verbal discourse- Lee Mockobe'sA	Reflecting the learning. -Review writing Explaining the process of reviewing and the method of

	Analysis and Critical interpretation of the poem.	depiction of characters and representation of injustices.	Grouping the Students belonging to States other than Tamilnadu	Powerful Poem of what it means to be a Transgender. TEDX TALK- POEM RECITATION	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 SocialMedia- 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		Elements of writing	Apprehending Life by reading the	Choosing the topics for a

	interpretation of the poem- Purdah 2- part 2	Introduction to Crystal Wilkinson Reading Endangered Species: Case 47401.	Incorporate the elements of story in story writing	texts of influence- Chimamanda Ngozi Adiche's Notes on Grief- A BRIEF NOTE, We should all be Feminists- An Essay.	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- Analaysing 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 Athai	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 Reflecting on the points- Student reviewing activity- art of conversation in the text	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
SLO-12	Revision of the poem Home.	Retrospecting the writing styles of	Watch debate shows -	Reflecting on the points- Student	Reflection, Evaluation and

	Creative activity for the students to reflect up on gender consciousness, influence of religion on women freedom.	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	summarising the arguments Enhance -descriptive writing skill. Repetitive practice and continuous assessment -writing skills-master the writing skill.	reviewing activity- art of conversation in the text The evaluation and assesment of the conversation -constructive feedbacks to the students.	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
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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%)			Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
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	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 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		USC24101J	Course Title	Hardware Maintenance and Troubleshooting						Category	C	Discipline Core Course				L 3	T 0	P 3	C 4					
Course Offering Department		Computer Science in specialization with Cyber Security	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			PLO											
CLR-1	Understand Basics of Hardware Components							1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Install, Configure and Maintain Various Components in Computer System and Peripherals.							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	Identify the Purpose of Various Types of Preventive Maintenance Products and Procedures.																							
CLR-4	Understand and Diagnose Faults of Different Component																							
CLR-5	Manage Data Backup & Restore Operations and Update Anti-Virus Software and Set Schedules																							
CLO	At the end of this course, learners will be able to:																							
CLO-1	Describe the Function of the Essential Components of a Computer							✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Perform Installation of Operating System, Printer and Assemble/Upgrade a Computer System.							✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Perform Preventive Maintenance and Advanced Troubleshooting							✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Diagnose Faults of Different Component							✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Partition/Format Hard Disk Drives							✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO – 1	CLO – 2	CLO – 3	CLO - 4	CLO - 5
	18	18	18	18	18
SLO-1	Hardware Basics: Introduction to Computer Organization	Hardware Components Input / Output Devices	Preventive Maintenance: Overview of Installation and Preventive Maintenance	Troubleshooting: General PC Troubleshooting:	Partitioning, Cloning, Virus Maintenance: Disk Partitioning/Cloning
SLO-2	The PC Hardware- consisting Input, Processing and Output Sections	Keyboard: Keyboard and Mouse Operation	Introduction to preventive Maintenance	Introduction- Types of PC Faults	Disk Partitioning Concept, Disk Cloning Concept
SLO-3	Overview of System Components, Motherboard Components	Scanner: Working PrinciplePrintersPrinterInstallationTypes of Printers	System Configuration Pre-Installation Planning	Solid Faults Intermittent Faults Developing Strategy	Advantages of Disk Cloning Steps involved in Disk Cloning, Partitioning
SLO-4-6	Lab 1: Identify and handling of Internal components in the PC Cabinets	Lab 4: -Implement functions to display the sizes of directories and files in a readable format.	Lab 7: Installing Software on Computer	Lab 10: Study of Faults Diagnosis Based on Different Beeps	Lab 13: Partition and Manage Hard Disk, Format Hard Drives with Different IV 2 File Systems.

SLO-7	Identifying type SMPS: Circuit Diagrams and Pin Assignments,	Storage Devices, Hard Drives, Wireless Bluetooth Based Keyboards	Types of Preventive Maintenance Benefits of Preventive Maintenance	Fault Diagnosis, Fault Rectification	Virus Management, What is Virus?
SLO-8	Knowing Working of SMPS Input and Load Requirement mother board of PC	Monitors: Display Basics Wireless Mouse	PC Assembling and Integration, BIOS Setup	Troubleshooting Levels, Advanced Testing Tools	Symptoms of an Infected Computer Installing Anti-Virus Programs
SLO-9	SMPS: Circuit Diagram and Pin Assignments,	Other wireless components for PC	Need for Preventive Maintenance Tools used for Preventive Maintenance Avoiding preventive Maintenance Preventative Maintenance Planning	Diagnostic Hardware Tools, Diagnostic and Repair Tools	Types of viruses Detecting and Removing
SLO- 10 - 12	Lab 2: Assembly of PC using Various Parts,	Lab 5: Study and Installation of Various Types of Display Graphic Cards	Lab 8: Install Operating System – Windows Family	Lab 11: Use Diagnostic Software for Fault Finding and Viruses	Lab 14: Installing/Scheduling/Running of Anti-Virus Program
SLO-13	Working of SMPS Input and Load Requirement, Interrupts, I/O Techniques, Circuit diagrams, Pin assignments	Inbuilt and External Keyboards Compact Multimedia Keyboards Special Peripherals	Active Hardware Maintenance Active Software Maintenance	Hand Tools For Service Engineers, Completing Maintenance Tasks	Data Recovery, Transferring Recovered Files to Backup Disk
SLO-14	Interconnection between Devices, Cable Polarities, Memory – Virtual Memory, Cache Memory	Working Principle and Connection to Computers Display adapter cards	Data Recovery, Virus	Case and Components, Power Supplies	Recovering Files and Directories Recovering Erased Files
SLO-15	Micro Computer Concepts, Multitasking, Multi Programming	VGA and super VGA	Overview of Anti-Virus Software Uses of Anti-Virus	UPS, Ventilation and Air flow	Data Backup Data Backup Process
SLO-16-18	Lab 3: list out all hardware devices connected to a computer.	Lab 6: check the health and performance of a hard disk drive (HDD) or solid-state drive (SSD).	Lab 9: Undertake Preventive Maintenance of PC Using Simple Tools.	Lab 12: Hands on Practice with Different Types of Securities Might Be Imposed for a Safe System.	Lab 15: Taking the Backup of Directories, Files & Complete Hard Disk

Resources					
1	IBM PC & Clones: Hardware Troubleshooting and Maintenance by B. Govindarajalu, 2nd Edition, Tata McGraw Hill			3	Upgrading and Repairing PCs: Muller – Prentice Hall – 10th Edition.
2	Complete PC Upgrade and Maintenance Guide: Mark Minasi–BPB Publishers 15th Edition.			4	PC Systems, Installation and Maintenance, Second Edition by R. P. Beales.

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			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	Mr. Navarathnamani, Datayan Solutions (P) Ltd., Chennai	1	Dr. Neela Narayanan V, Professor, VIT chennai	1 Mr.D.B. Shanmugam, SRM IST Ramapuram Campus, shanmugd@srmist.edu.in

Course Code	USA24102J	Course Title	Programming for Problem Solving	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			PLO									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	Introduction to programming language.																	
CLR-2	Understanding basic element of programming language.																	
CLR-3	Use and implement data structures like arrays and structures to obtain solutions.																	
CLR-4	Customizing functions and procedures to encourage reusability																	
CLR-5	Establish interaction between stored files and the application code																	
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,	Communication	Independent	Leadership Qualities,	Digital Technology	Value Incultation,	Environmental	Entrepreneurial Risk	PSO-1	PSO-2
CLO-1	Evaluation of programming language	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Choose operators, control structures to solve the problem optimally	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Analyze the problem thoroughly and choose the prebuilt functions/ customize functions to solve the problem	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Able to use dynamic memory allocation concepts for problems that demand	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Defend the need for files storage and the access privilege modes	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	18	18	18	18	18
SLO-1	Evolution of Programming Languages Problem solving through programming	Arithmetic operators, Assignment operator, Increment and decrement operator, Comma, Arrow and Bitwise and sizeof operator Relational and logical Operators Character and Numbers: Manipulation	Understanding contiguous memory allocation Array: Advantages and Limitations	Formal and Actual Parameters Functions: Returning values	File Types: text and binary, File operations: basics File permissions and access privileges, Changing permissions
SLO-2	Writing algorithms/pseudo codes Drawing flowcharts	Expressions with pre / post increment operator Expression with conditional and	String Basics String Declaration and Initialization	Advantages of using Functions Passing Array to Function	Writing contents to file, reading file contents, Appending an existing file

		assignment operators			Difference: Append and write
SLO-3	Evolution of C language Program structure	Ternary operator L value and Rvalue in expression	Understanding String Functions: gets(), puts(), getchar(), putchar(), printf() String Functions: atoi, strlen, strcat, strcmp	Call by Value Call by Reference (An introduction on pointers shall be effective)	Writing contents to file, Reading file contents fscanf (), fprintf ()
SLO 4-6	Lab 1: Basic Program	Lab 4: Operators and Expressions	Lab 7: Arrays: Multi dimensional	Lab 10: Functions	Lab 13: File: reading and writing
SLO-7	Need for file header files Need for linkers and loaders	Operator precedence Type conversion	String Functions: sprintf, sscanf, strrev, strcpy, strstr, strtok Need for tokenization	Nested functions Functions: advantages and limitations	fscanf(), fprintf(), fseek(), ftell(), fputc(),
SLO-8	Input and output statements: scanf, printf Identifiers, Variables and Scope and lifetime of variables,	Control Statements: Sequential, Branching, looping and Jump If, if ..else, else if ladder	Need for user-defined data types Structures	Pointers and address operator sizeof Pointer Variable and Pointer Operator	fgetc(), fputs(), fgets(), fputw(), fgetw(),
SLO-9	Keywords, Literals	Nested if, switch case for loop	Unions Accessing members of the structure	Pointer Declaration and dereferencing pointers void Pointers and sizeof void Pointers	feof(), remove(), ferror() End_of_file in file handling
SLO 10-12	Lab 2: Program using Input and Output Statements	Lab 5: Control Statements	Lab 8: Strings, structures and union	Lab 11: Pointers	Lab 14: File Handling fputw(), fgetw(), remove();
SLO-13	Expressions Single line and multiline comments	while loop do while	Accessing members of the structure Structure and arrays	Function and call by reference Functions and Returning array (use of pointers)	Processor Directives Predefined macros and macros
SLO-14	Data types classification: Basic, data type, Derived data type, and User-defined data type	goto, break, continue, exit: Jump statements Understanding jump statements with branch and iterative statements	Structure and arrays Nested structures	Structures and pointers: dynamic creation of data structures(list) Incrementing Pointers, Constant Pointers	conditional compilation Processor Directives
SLO-15	Constants and its types	Array Basic, Array Declaration, Initialization, manipulating one dimensional arrays with indices, Methods: sort, append, reverse, traverse, Manipulating two dimensional arrays with indices, Problems: matrix manipulations	Functions declaration and definition, Function prototypes, Defining and calling functions Prebuilt and user defined functions, Multiple functions, Recursion, recursive Functions, Scope of variables across functions	Pointers and strings, Function Pointers, Array of Function Pointers Null Pointers, Using sizeof (), malloc, calloc () File Handling, Open (), close ()	#pragma , Creating include and macros
SLO 16-18	Lab 3: Program using Operators	Lab 6: Arrays – One Dimensional	Lab 9: Functions	Lab 12: Pointers	Lab 15: Creating Macros

Resources											
1	R. G. Dromey, “How to solve it by Computer”, Pearson Education, ISBN 0-13-433995-9								3	Reema Thareja, “Python Programming: Using Problem Solving Approach”, Oxford University Press;	
2	The ‘C’ programming language by Kernighan and Ritchie, Prentice Hall								4	https://www.coursera.org/learn/c-for-everyone	

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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT chennai			1	Dr. G. Kalpana, Professor, FSH, SRMIST

Course Code	UMS24101T	Course Title	Discrete Mathematical Structures	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 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 provide a strong foundation in discrete mathematics																	
CLR-2	To apply mathematical techniques for solving real life problems																	
CLR-3	Apply Boolean algebra, truth table, logic gates, in computer science and communication.																	
CLR-4	To enable the use of logical, graphical and algebraic techniques wherever relevant.																	
CLR-5	Understanding of computer science through the applications of Discrete Mathematics																	
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,	Communication Skills,	Independent Thinking,	Leadership Qualities,	Digital Technology	Value Incultation,	Environmental Action,	Entrepreneurial Risk	PSO-1	PSO-2
CLO-1	Problem solving in sets and relations. Gaining knowledge, solving the simple problems using elementary concepts.	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Understand the concepts of Graphs terminology Sub graphs, Acyclic, Euler path, Hamiltonian Path	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Logical knowledge through the Statements, connectives, arguments, validity of arguments and Normal forms using truth tables	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Gain the knowledge about Trees, Labeled Trees, Binary trees, Rooted Trees, Spanning Trees Minimal Spanning Trees	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Apply the concepts of Boolean Algebra in real world problems related to Computer Science	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO – 5
	12	12	12	12	12
SLO-1	Introduction to Sets – simple examples.	Logic – Basic explanations	Graphs and Their Representation- Basic Terminology	Trees – Basic properties of trees	Partition of a set - Relation concepts
SLO-2	Properties of sets, Types of sets	Statements- simple compound	Drawings of Graphs – Special families of graph – Simple problems	Labeled trees	Matrix representation of relation – Hasse Diagrams - Lattices as posets
SLO-3	Venn diagram – Problems using Venn Diagram	Symbolic representation and Connectives explanations	Incidence graphs -Adjacency matrices –Vertex degree matrices	Undirected Trees – Binary trees	Definition of Lattices- Properties of Lattices - Problems on Lattices as posets
SLO-4	Tutorial	Tutorial	Tutorial	Tutorial	Tutorial

SLO-5	Relation definitions – Types of Relations	Problems using Truth Tables – logical equivalence	Isomorphism of Graphs – Sub graph	Rooted Trees and Branches –	Introduction to Boolean Algebra- basic definitions.
SLO-5	Problems on Relations	Tautological implications	Acyclic graph –Digraph – Simple problems	problems based on concepts	Problems using the postulates of Boolean Algebra
SLO-7	Reflexive-Symmetric-Transitive – basic Explanations	Arguments- validity of arguments and normal forms	Euler path and circuits	Spanning Trees - Minimal Spanning Trees	Expression of a Boolean function By Truth table method – Properties of Boolean Algebra
SLO-8	Tutorial	Tutorial	Tutorial	Tutorial	Tutorial
SLO-9	Functions-Types of functions – Comparison of Relations and Functions	Minterms and maxterms with examples	Eulerian cycles	Kruskal's Algorithm - Rooted Tree	Boolean function in canonical form by Truth table method.
SLO-10	Composite of two functions	Principal disjunctive normal form	Hamiltonian Path and Circuits.	binary Tree and Simple Problems	DNF by Truth table method
SLO-11	Composite of three functions – Simple problems	Principal conjunctive normal form - Problems using Truth Tables	Hamiltonian Path and Circuits – problems using graph – simple problems	Expression of Trees and Simple Problems	CNF by Truth table method – Simple problems
SLO-12	Composite of three functions – Simple problems	Principal conjunctive normal form - Problems using Truth Tables	simple problems	Expression of Trees and Simple Problems	CNF by Truth table method – Simple problems

Resources			
1	Discrete Mathematics with Graph Theory and Combinatorics by T. Veerajan, McGraw Hill Education (India) Pvt Limited, 2007	2	Dr. A. Singaravelu, Allied Mathematics, 7 th edition, A. R. Publications, 2015.

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	-	10	-	15	-		Debate	✓			
2	Understand	15	-	15	-	15	-	10	-	15	-		Interactive Lecture	✓			
3	Apply	20	-	25	-	25	-	25	-	25	-		Brainstorming	✓			
4	Analyze	20	-	25	-	25	-	25	-	25	-						
5	Evaluate	15	-	10	-	10	-	15	-	10	-						
6	Create	15	-	10	-	10	-	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

Designers											
Professional Experts						Higher Institution Experts					
1 Dr. D. Arivudai nambi, Anna University, Chennai						1 Dr. N. Viswanathan, , Presidency college , Chennai					

CourseCode	UCD24S01J	Course Title	Verbal Ability and Skill Development				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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CLR	The purpose of learning this course is to:	Depth				Attainment				PLO									
CLR-1	Expose students to right attitude 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 Leadership Qualities, Professionalism, Autonomy, Accountability Research Skills Digital Technology Skills Value Education, 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	Time management skills - Value of Time, Pomodoro technique.	Basics of Grammar	Sentence Correction

		positivity, clear communication			
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, Iamok, youareok, Arrow, London,2012		
2	Dr.K. Alex, SoftSkills, 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, NewYork,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, Simonand Schuster, NewYork,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%)		Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
1	Remember	20	20	15	15	20	20	20	20			Debate	✓		
2	Understand	20	20	15	15	20	20	20	20			Interactive Lecture	✓		
3	Apply	15	15	15	15	15	15	20	20			Brainstorming	✓		
4	Analyze	15	15	15	15	15	15	20	20						
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, Department of Career GuidanceCell, FSH, SRMIST hod.dcgk.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			Programme learning Outcomes									
CLR-1	சங்க இலக்கியங்கள்வழி தொன்மை அக, புறவாழ்வியலை அறியச்செய்தல்	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	தமிழ்ச்சமூகத்தின் அறவியல்குறித்து தெரியச்செய்தல்																	
CLR-3	பக்திலக்கியங்கள் போதித்த மனிதமாண்புகளை உணரச்செய்தல்																	
CLR-4	பண்டைத் தமிழ்ச்சமூகத்தின் தொல்இலக்கியங்கள் வளர்ச்சிபெற்ற வரலாற்றைப் புரியச்செய்தல்																	
CLR-5	சிறுகதைகள் சொல்லும் வாழ்வியல்நெறி, மொழியின்நுட்பங்கள் ஆகியவற்றைத் தெரியச்செய்தல்																	

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, Analytical Reasoning, Learning to Learn, Research Skills, 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	பண்டைத் தமிழ்ச்சமூகத்தின்அக, புறவாழ்வியல் இன்றைய சமூகமேம்பாட்டிற்கு வழிகாட்டி நிற்பதை அறிந்துகொள்ளுதல்	✓	✓	-	-	2	75	60	1	1		2			
CLO-2	தமிழ்ச்சமூகம் அறத்தைவலியுறுத்திய சமூகம் என்பதன் வழிமானுட அறத்தைத் தெரிந்துகொள்ளுதல்	✓	✓	✓	-	2	80	70	2	1		1			
CLO-3	பக்திலக்கியம் மூலம் இறைத்தந்துவங்களை அறிந்துமானுட ஒற்றுமைமேம்பாட்டை அறிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	65	1		1	3			
CLO-4	தொல்தமிழ்ச்சமூகம் இலக்கியம், அரசியல், அறம், பக்திஆகியவற்றில் தழைத்தோங்கியதைத் தெரிந்துகொள்ளுதல்	✓	✓	✓	✓	2	70	70	1	1		1			
CLO-5	வாழ்வியலின் நெறிகளைச் சொல்லும் கதைகளைப்படைக்கும் திறனோடுமொழி ஆளுமையையும் அறிந்துகொள்ளுதல்	✓	✓	✓	✓	3	80	70	1		2		1		

Sessions	CLO - 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	12	12	12	12	12
SLO-1	காலந்தோறும் தமிழ் அகத்திணைமரபு- உள்ளடக்கம்	சங்கமருவியகாலம் அறமும் வாழ்வியலும்	பல்லவர்கால இலக்கியங்கள்	பண்டைக்காலத் தமிழகம் சங்ககாலமக்களின் வாழ்வியல்	தமிழ்ச் சிறுகதையும் தமிழ்ச்சமூக வாழ்வியலும்
SLO-2	எட்டுத்தொகை நூல்களும் பகுப்புமுறையும்	உலகப்பொதுமறை – திருக்குறள் கட்டமைப்பு	பக்தியும் தமிழும் - பக்தி இலக்கியத் தோற்றநிலை	முச்சங்க அறிமுகமும் வரலாறும்	புதுமைப்பித்தன்- சங்குத்தேவனின்தர்மம்
SLO-3	ஐங்குறுநூறு – 375, 391	திருக்குறள் வான்சிறப்பு (2)	சைவ சமய இலக்கியங்கள் - சைவக்குரவர் நால்வர்	சங்கஇலக்கியப்பாடு பொருளும் வடிவமும்	ந.பிச்சமூர்த்தி – வேப்பமரம் - மரபும் நம்பிக்கைகளும்
SLO-4	குறுந்தொகை – 02, 03	திருக்குறள் – புலவிநுணுக்கம் (132) -	தேவாரம் – திருஞானசம்பந்தர்- 2834 திருநாவுக்கரசர் - 4262	எட்டுத்தொகைநூல்களின் வரலாறும் கட்டமைப்பும்	தமிழருவிமணியன் – ஒற்றைச்சிறகு - உறவின் மேன்மை
SLO-5	அகநானூறுநூல்கட்டமைப்பு	தமிழ் இலக்கியமரபில் நீதிஇலக்கியங்கள்	திருவாசகம்- மாணிக்கவாசகர் ஆனந்தபரவசம் – பாடல் 10	பத்துப்பாட்டு நூல்களின் வரலாறும் வாழ்வியலும்	ஆர். சூடாமணி – மூடநம்பிக்கை.
SLO-6	அகநானூறு -238	நாலடியார் வைகலும்- பாடல்எண் 39	வைணவ சமய வளர்ச்சிப்போக்கு	பதினெண்கீழ்க்கணக்கும் தமிழர் அறமரபும்	கிருஷ்ணாடாவின்ஸி – காலாஅருகேவாடா
SLO-7	கலித்தொகை –11	நீதி இலக்கியத்தில் மருந்து நூல்கள்	நாலாயிரத்திவ்யப்பிரபந்தம் குலசேகராழ்வார் பாடல்- 678	பதினோரு நீதி இலக்கியங்கள்	மொழிப்பயிற்சி சொற்களை உருவாக்குதல்
SLO-8	தமிழர் புறமரபு- புறநானூறு-107	சிறுபஞ்சமூலம் -64	ஆண்டாள்பாடல் – 574. திருமழிசைஆழ்வார் பாடல்	காப்பிய இலக்கணம் - காப்பியங்களின் வகைமை	எழுத்துகளில் இருந்து சொற்களைக் கண்டுபிடித்தல்
SLO-9	புறநானூறு -110, 112	பழமொழிநானூறு அறிமுகம்- தனித்தன்மைகள்	தமிழில் இஸ்லாமிய இலக்கியங்கள்	ஐம்பெருங்காப்பியங்கள்	படம்பார்த்துக் கதை எழுதுதல்

SLO-10	பத்துப்பாட்டும் ஆற்றுப்படை நூல்களும்	பழமொழிநானூறு - 184	சீறாப்புராணம் - விடமீட்டப்படலம் - 10பாடல்கள்	தமிழ்ச்சமூகமும் சமயத் தத்துவங்களும்	படம்பார்த்துக் கவிதை எழுதுதல்
SLO - 11	சிறுபாணாற்றுப்படை: 84-115	பண்டைக்காலப்போரும் வாழ்வும் - புறம்	தமிழில் கிறித்தவ இலக்கியங்கள்	பன்னிருதிருமுறை - அறிமுகம், வரலாறு	கற்பனையும் படைப்பும் - தமிழில்வாசகம்
SLO - 12	பட்டினப்பாலை: 40-50	களவழிநாற்பது - 40	கிறித்துவின் அருள்வேட்டல் - திரு.வி.க. அலகிலொளி- 5பாடல்	நாலாயிரத் திவ்வியப் பிரபந்தம் - அறிமுகம், வரலாறு	விளம்பரத்திற்கு வாசகம்எழுதுதல்

Resources					
1	கொன்றை, தொகுப்பும் பதிப்பும் – தமிழ்த்துறை ஆசிரியர்கள், தமிழ்த்துறை, எஸ்.ஆர்.எம். அறிவியல் மற்றும் தொழில்நுட்பக் கல்வி நிறுவனம், காட்டாங்குளத்தூர், 603203, 2023	4	தமிழண்ணல், புதியநோக்கில் தமிழ் இலக்கியவரலாறு, மீனாட்சிபுத்தகநிலையம், மதுரை, 2017		
2	மு. அருணாசலம், தமிழ்இலக்கிய வரலாறு, நூற்றாண்டு முறை ^(9ஆம்நூ. முதல் 16 வரை) , திபார்க்கர், சென்னை, 2005	5	தமிழ் இலக்கியத் தொடரடைவு – http://tamilconcordance.in/		
3	மதுரைதமிழ் இலக்கிய மின்தொகுப்புத்திட்டம் - https://www.projectmadurai.org/	6	தமிழ் இணையக் கல்விக்கழகம் - 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%)			Presentation Tools	✓	Group Discussion	✓	Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
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	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 Courses	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			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:	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	Teamwork, Team Leadership, Entrepreneurship, Innovation, Creativity	Digital Technology Skills	Value Inclination, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	To provide a brief Introduction of Hindi poetry (Bhaktikal, Reetikal and Aadhunikkal)	✓	✓	-	-	2	85	75	H	M	H			M				
CLO-2	To Discuss the origin and development of various forms of poetry in Hindi	✓	✓	✓	-	2	85	75	H		M		H		H			
CLO-3	Focus on Evaluating the social changes through poetry	✓	✓	✓	✓	3	85	75		H		H	H	M				
CLO-4	To Examine Transcreation in advertisement	✓	✓	✓	✓	3	85	75	M		M	H			M			
CLO-5	To guide the students in the learning of the technical aspect of the HindiLangue, this would help them in the field administration	✓	✓	✓	✓	3	85	75		H		H	H	M				

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

* 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

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Course Code	ULF24AE2J	Course Title	French – II				Category	A	Ability Enhancement Courses			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																	
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:	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, Entrepreneurial Attitudes	Digital Technology Skills	Value Incubation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	To acquire knowledge about French language	✓	✓	-	-	2	85	75	H	M	H		M				
CLO-2	To strengthen the knowledge on concept, culture, civilization, and translation of French	✓	✓	✓	-	2	85	75	H		M		H		H		
CLO-3	To develop content using the features in French language	✓	✓	✓	✓	3	85	75		H		H	H	M			
CLO-4	To interpret the French language into other language	✓	✓	✓	✓	3	85	75	M		M	H			M		
CLO-5	To improve the communication, intercultural elements in French language	✓	✓	✓	✓	3	85	75		H		H	H	M			

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 caducou 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 (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											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	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
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. KavaskarDanasegarane, Language Specialist, Process Expert Maersk Global Service Center Pvt. Ltd Mailkavas18@gmail.com	1 Dr. C. Thirumurugan, Professor, Department of French, Pondicherry University drcthirumurugan@gmail.com	1 Mr. Kumaravel K. Assistant Professor & Head, SRMIST, KTR., hod.french.ktr@srmist.edu.in
2 Mr. Shrivathsan S, Journalist, Senior Sports Reporter/Sub-Editor, Times of India, Chennai shrivathsangilramhanga@gmail.com		2 Miss. Abigail A, Assistant Professor, SRMIST, VDP abigaila@srmist.edu.in
		3 Mrs.M. Mahalakshmi, Assistant Professor, SRMIST, RMP mahalakm2@srmist.edu.in

Course Code	UCS24201T	Course Title	Office Productivity Software	Category	C	Discipline Core Course	L	T	P	C
							4	0	0	4

Course Offering Department	Computer Scienc in specialization with Cyber Security	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	7	1	2	3	4	5	6	7	8	9	10
CLR-1	Understand the Basic of Microsoft Word Documents	Conceive Design Implement Operate	Level of Thinking Expected Expected	Communication Problem Solving, Communication Independent Leadership Digital Technology Value Incultation, Environmental Entrepreneurial PSO-1 PSO-2	3	1	2	3	4	5	6	7	8	9	10				
CLR-2	Understand the concepts of Formatting and Editing Documents																		
CLR-3	Understand the concepts of Formatting and Editing Spreadsheets																		
CLR-4	Design a presentation with transitions and animations																		
CLR-5	Understand the various types of charts and actions																		
CLO	At the end of this course, learners will be able to:																		
CLO-1	Acquire the basics of Microsoft Word Documents	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1	
CLO-2	Acquire the knowledge of formatting and editing documents	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1	
CLO-3	Design slide design, layout and animation options	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2	
CLO-4	Understand the various types of slide transitions and designs	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3	
CLO-5	Understand the various types of tables and design	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3	

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	15	15	15	15	15
SLO-1	Introduction to MSOffice, Working with documents	Setting Page style, Layout settings	Introduction to Spreadsheet, Opening & Saving Spreadsheet	Introduction to Functions, Text Functions	Name Manager, Trace Precedents
SLO-2	Opening& Saving Files	Border & Shading, Header & footer	Menus & toolbars, Basic Functions, Spreadsheet addressing - Rows, Columns & Cells	Date & Time Functions, Logical Functions – IF, AND, OR, Not	Trace Dependents, Show Formulas
SLO-3	Editing text documents, Formatting Pages and Settings	Setting Footnotes & Endnotes, Inserting page break	Referring Cells & Selecting Cells, Entering Data, Find & Replace	Vlookup & Hlookup functions, Name Manager	Evaluate Formula, Watch Window
SLO-4&5	Practice: Converting files to different formats, Importing & Exporting documents	Practice: Column break, Line break	Practice: Format Cells & Fill Option, Conditional Formatting	Practice: Pivot Table, Pivot Charts,	Practice: Introduction to MsAccess, Steps to create a blank database
SLO-6	Using Toolbars, Ruler & Icons, Creating and Opening document	Creating sections & frames Anchoring, Wrapping	Introduction to Charts, Column Chart,	Get External Data	Table Creation, Data types
SLO-7	Setting font styles, FontSeectin	Creating Tables, Table settings	Tutorial: Bar Chart, Line Chart	Sort, Filter	Primary Key & Indexes, Inserting Data

SLO-8	Formatting Documents, Bulleing and Numbering	Borders, Alignments, Creating Tables	Pie Chart, Doughnut Chart	Advanced Filter, Get External Data	Table Design, Table Properties
SLO-9&10	Practice: Typeface Paste Special,	Practice: Table Setting and Border Options Insertion, deletion	Practice: Scatter Chart, Page Setup	Practice: Data Validation, Consolidate	Practice: Query Wizard, Query View
SLO-11	Setting Paragraph style, Bulleing and numbering	Merging, Splitting	Header & Footer	Text to columns	Query Design, Form Design,
SLO-12	FindandReplace	Sorting, Formula	Page Break Preview	Remove Duplicates, Data Validation	Query Wizard, sample design and report generation, Form Wizard
SLO-13	SelectObjects	Table of Content	Print Titles	Consolidate, Flash Fill	Navigation, Report Design, Report Wizard
SLO-14&15	Practice: FormatPainter	Practice: Insert Citations	Practice: Work book views, Freeze Panes	Practice: What if Analysis, Subtotals	Practice:

Resources

1. Microsoft Office for Beginners, M.L. Humphrey (Author)
2. Microsoft Access Programming - Beginners Guide to Microsoft Access Step-By-Step, Robert Mutia Low
3. <https://www.coursera.org/learn/introduction-to-computers-and-office-productivity-software>

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	-	10	-	10	-	15	-			Debate	✓		
2	Understand	15	-	15	-	10	-	10	-	15	-			Interactive Lecture	✓		
3	Apply	20	-	25	-	25	-	25	-	25	-			Brainstorming	✓		
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

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	Mr.U. Udayakumar, Assistant Professor, FSH, SRMIST, RPM Mr.A. Vignesh, Assistant Professor, FSH, SRMIST, RPM

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 in specialization with Cyber Security	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	To learn the fundamentals of object-oriented programming					1	2	3	4	Level of Thinking	1	2	3	1	2	3	4	5	6	7	8	9	10									
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																							
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	Undestraining Java Swing
SLO-2	Structure of Java Program: Main	Functions	Try-Catch Blocks:	Thread Life Cycle	Adding components: Layouts,

	Method, Statements and Expressions Declaring Variables and Initializing variables	Inheritance and its types	Handling Exception Throwing Exception	Extending thread class	Buttons and Textareas
SLO-3	Primary Data types: int, float, 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				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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT chennai			1	Dr. G. Kalpana, Professor, FSH, SRMIST

Course Code	USC24202J	Course Title	Introduction to Cyber Security	Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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	Have an overview of cybercrime scenario and legal perspective on cybercrime.					Conceive	Design	Implement	Operate	Level of Thinking	Expected	Expected	Problem Solving	Critical Thinking	Creativity	Communication	Analytical	Research Skills	Collaborating skills	Leadership	Learning to learn	Digital Technology
CLR-2	Understand different types of cyber attacks																					
CLR-3	Understand about tools and methods used in cybercrime.																					
CLR-4	Understand the need of cyber laws																					
CLR-5	Understanding know how cyber forensics is used in cyber crime investigations																					
CLO		At the end of this course, learners will be able to:																				
CLO-1	Identify different classification of cyber crimes.					✓	✓	-	-	3	80	70	3	-	-	1	-	3	-	2	2	1
CLO-2	Apply the logic of Performing cyber forensics.					✓	✓	✓	-	3	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Analyze about the various kinds of vulnerabilities and scanning them.					✓	✓	✓	✓	3	75	70	3	1	3	1	3	3	-	1	1	2
CLO-4	Apply the various types of firewalls to effective ensure security of the premises					✓	✓	✓	✓	3	85	80	3	3	2	3	3	3	-	2	3	3
CLO-5	Identify and solve Web Treats for Organizations: The Evils and Perils					✓	✓	✓	✓	3	75	70	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Cyber crime definition and origins	Proxy Servers-Anonymizers	The Legal Perspectives	Historical Background of Cyberforensics, Digital Forensics Science	Organizational Implications, Cost of Cyber crimes and IPR Issues,
SLO-2	Cyber crime and information security	Phishing-Password Cracking	Need of Cyber law:	The Need for Computer Forensics-Cyber forensics and Digital Evidence	Lesson for Organizations, Web Treats for Organizations:
SLO-3	Classifications of cyber crime	Key loggers and Spywares	The Indian Context	Forensics Analysis of Email, Digital Forensics Life cycle	The Evils and Perils, Security and Privacy Implications from Cloud Computing
SLO-4-6	Practice 1: Cyber security attacks-case study Submission	TCP/UDP connectivity using Net catt	Practice 7: Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)	Practice 10: Perform an experiment how to usedumpsec	Practice 13: Setup a honey pot on network.

SLO-7	Cyber crime and the Indian IT A2000	Virus and Worms	The Indian IT Act	Chain of Custody Concept, Network Forensics	Social Media Marketing: Security Risk and Perils for Organization
SLO-8	A global Perspective on cybercrimes	Steganography	Digital Signature and the Indian IT Act	Approaching a Computer Forensics Investigation	Social Computing and the Associated Challenges for Organizations
SLO-9	How criminal plan the attacks	DoS-DDoS Attacks	Amendments to the Indian IT Act	Computer Forensics and Steganography	Protecting People's Privacy in the Organization
SLO-10-12	Practice 2: Cyber security attacks-case study Submission	Practice 5: TCP/UDP connectivity using Netcat	Practice 8: Demonstrate how to provide secure data storage, secure data transmission and for creating digital signatures (GnuPG)	Practice 11: Perform an experiment how to use dumpsec	Practice 14: Monitor the honey pot on network.
SLO-13	Cyber stalking	SQL Injection, Buffer Over Flow	Cyber crime and Punishment	Relevance of the OSI 7 LayerModel to the Computer Forensics and Social Networking Sites	Organizational Guidelines for Internet Usage
SLO-14	Cyber cafe-Cybercrimes-Botnets	Attacks on Wireless Networks, Phishing	Cyber law	The Security/Privacy Threats	Safe Computing Guidelines
SLO-15	Attack vector-Social Engineering-Cloud Computing	Identity Theft (ID Theft)	Technology and Students: Indian Scenario	Forensics Auditing, Anti Forensics	Computer Usage Policy Incident Handling
SLO-15-18	Practice 3: TCP scanning using NMAP Port scanning using NMAP	Practice 6: Perform an experiment to demonstrate sniffing of router traffic by using the tool Wires hark	Practice 9: Perform an experiment to sniff trafficusing ARP Poisoning	Practice 12: Implementingthe Secure Sockets Layer (SSLv2/v3) and Transport Layer Security (TLSv1) network protocols	Practice 15: Demonstrate intrusion detection system(ids) using any tool (snort or any others /w)

Resources			
1	Understanding the basics of Cyber Security by Prakash Kuppuswamy	2	Cyber Security: Learn All the Essentials and Basic Ways to Avoid Cyber Risk for Your Business (Cybersecurity Guide for Beginners) by Ben Chan

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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT chennai			1	Mrrs.SindhuAssistantProfessor, FSH, SRMIST, RPM
											Mr.A. Vignesh, Assistant Professor, FSH, SRMIST, RPM

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	-	-	-	-	-

Sessions	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- ProblemSolving Process	Logical Agents, Knowledge basedAgents, Syntax of First order logic, Basic elements of First order	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

		logic			
SLO-3	Problem Types, Characteristics and Representation-Agents- Examples of Agents, Types of agents	Forward chaining and Backward 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%)		Presentation Tools	✓	Group Discussion		Quality Education	✓
		Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	
1	Remember	20	-	20	-	20	-	10	-			Debate			
2	Understand	20	-	20	-	20	-	10	-			Interactive Lecture	✓		
3	Apply	20	-	20	-	20	-	20	-			Brainstorming	✓		
4	Analyze	20	-	20	-	20	-	20	-						
5	Evaluate	10	-	10	-	10	-	20	-						
6	Create	10	-	10	-	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	
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, 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		
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, TataMcGrawHill, 5thEdition	4	Dr. Agarwal. R. S, Quantitative Aptitude for Competitive Examinations, S. Chandand Company Limited,2018Edition		
2	ArchanaRam, Place Mentor: Tests of Aptitude for Placement Readiness, Oxford University Press, Oxford, 2018	5	EdgarThrope, Test of Reasoning for Competitive Examinations, TataMcGrawHill, 6thEdition		
3	DineshKhattar, The Pearson Guide to Quantitative Aptitude for competitive examinations, Pearson, 3rd Edition	6	PAAnand, Quantitative Aptitude for competitive examinations, Wileypublications, 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. Aarthi S, 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 Courses	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									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	Understand themselves in relation to their community																	
CLR-2	Develop among themselves a sense of social and civic responsibility																	
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:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity, Innovation	Communication Skills, Collaborative Skills	Independent Thinking, Analytical Reasoning, Learning	Leadership Qualities, Professionalism, Attitudes	Digital Technology Skills	Value Incubation, Multicultural Understanding	Environmental Action, Citizenship, Entrepreneurship	Entrepreneurial Risk Taking	PSO 1	PSO 2
CLO-1	realize themselves in relation to their community	✓	✓	-		2	85	75	3	-	-	1		3	3	2		
CLO-2	Develop among themselves a sense of social and civic responsibility	✓	✓	✓		2	85	75	3	2	1	2		3	3	1		
CLO-3	find practical solution to individual and community problems	✓	✓	✓	✓	3	85	75	3	1	3	1		3	3	1		
CLO-4	Develop competence required for group-living and sharing of responsibilities	✓	✓	✓	✓	3	85	75	3	3	2	3		3	3	2		
CLO-5	develop leadership qualities and democratic attitude	✓	✓	✓	✓	3	85	75	3	3	2	3		3	3	3		

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

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)

Designers					
Professional Experts			Higher Institution Experts		Internal Experts
1	Dr Samuel Chellaiya C Regional Director, NSS Government of India		1	State Officer, NSS Tamil Nadu NSS	Dr Prakash V, NSS Coordinator, SRMIST, 1 AP, department of Economics, FSH, SRMIST Prakashv2@srmist.edu.in
					2 Dr Yogalakshmi, NSS Programme Officer, FSH, SRMIST.

SEMESTER – III

Course Code	UCS24301J	Course Title	Operating 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			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																	

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	Digital Technology Skills	Value Identification, Multicultural	Environmental Action, Community	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	Identify functions of an operating system, analyze the process management functions	✓	✓	-	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-2	Analyze CPU scheduling and synchronization process of an operating system	✓	✓	✓	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-3	Analyze the need of Memory management functions of an operating system	✓	✓	✓	✓	3	85	75	3	-	-	3	-	-	-	-	-	-
CLO-4	Identify the significance of device management and file management's role of an operating system	✓	✓	✓	✓	3	85	75	3	3	-	-	-	-	-	3	3	3
CLO-5	Identify the essentials of inter process communication in an operating system, evaluate hypervisors	✓	✓	✓	✓	3	85	75	3	3	-	3	-	-	3	3	3	3

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

SLO-3	Batch: Simple, Multiprogramming, Multiprocessor, Time Sharing, parallel systems	Symmetric multiprocessing	Synchronization hardware solution	Resource Allocation Graph, Methods for handling deadlocks	Swapping, Organization: physical and logical organization
SLO 4-6	Lab 1: Comparison between various Operating Systems	Lab 4: Simulation of FCFS CPU scheduling algorithm Usage	Lab 7: Write a procedure for timer interrupt handler	Lab 10: Program to implement Bankers Algorithm	Lab 13: multiple partition (dynamic Memory allocation method)
SLO-7	Distributed (client-server, peer-to-peer), Real-Time (hard, soft Clustering (symmetric, asymmetric, parallel), Network,)	Concurrent process, Usage	Semaphores – Usage	Deadlock Prevention, Mutual exclusion, Hold and Wait No Preemption, Circular Wait	Memory allocation method, Single partition allocation
SLO-8	Microkernel: Architecture, Kernel mode, user mode, Monolithic, differences, System Call Types	CPU Scheduling: Process Scheduler (long, short, medium term), Scheduling criteria	Semaphores –Implementation, Binary semaphores	Deadlock Avoidance – Safe state, Resource Allocation Graph Algorithm	Multiple partition memory management, contiguous (fixed, dynamic)
SLO-9	process control: fork (), exit (), wait (), file manipulation: open (), close ()	CPU utilization, throughput, time: (a) turnaround (b) waiting (c) response, Scheduling Types: FCFS, SJF	Classic Problems of Synchronization - The Bounded Buffer problem, The Readers - Writers Problem	Banker's Algorithm - Safety Algorithm	Contiguous Types: memory protection, allocation, fragmentation, partitioned, Compaction
SLO 10-12	Lab 2: Booting process in GNU/Linux OS	Lab 5: Priority CPU scheduling algorithm	Lab 8: classical inter process communication problem (Producer consumer)	Lab 11: Program to implement memory allocation with pages	Lab 14: Simulation of FIFO page replacement algorithm Paging
SLO-13	File operations, read (), write ()	Priority, Round Robin Scheduling	The Dining philosopher's problem, Examples	Resource request algorithm, Examples	Paging, Segmentation
SLO-14	Operating System services, System Programs:	Other Scheduling Types, Real Time Scheduling	Critical Regions: Race condition and process synchronization	Deadlock Detection - introduction	Page Replacement Algorithms, Types of Replacement algorithms, Examples
SLO-15	file management, status information	multilevel queue, multilevel feedback queue	Implementation of Critical region, Mutual Exclusion Algorithm: Peterson, Monitors	Single instance of each resource type, Several instances of a Resource type	, Demand paging
SLO 16-18	Lab 3: Multi-thread Programming	Lab 6: Simulation of Round Robin CPU scheduling algorithm	Lab 9: Write a procedure to make message passing in inter process communication	Lab 12: Simulation of FIFO page replacement algorithm	Lab 15: Simulation of optimal page replacement algorithm

Resources

1	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating systems, 9 th ed., John Wiley & Sons, 2013	3	Andrew S. Tanenbaum, Herbert Bos, Modern Operating systems, 4 th ed., Pearson, 2015
2	William Stallings, Operating Systems-Internals and Design Principles, 7 th ed., Prentice Hall, 2012	4	Bryant O'Hallaxn, Computer systems- A Programmer's Perspective, Pearson, 2015

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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT Chennai			1	Dr. Arul Lena Rose P J, Professor, FSH

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, Social Skills	Digital Technology Skills	Value Education, 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			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	✓		
	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. Neela Narayanan V, Professor, VIT Chennai			1	Dr. E. Sweety Bakyarani, Assistant Professor, FSH,

Course Code	USC24301J	Course Title	Basics of Ethical Hacking for Cyber Security	Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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	4	5	6	7	8	9	10	11	12	13	14			
CLR-1	Understand the concept of Hacking																					
CLR-2	Understand the Information gathering techniques																					
CLR-3	Analyze Network sniffing and attacks																					
CLR-4	Understand the structure Internet Infrastructure																					
CLR-5	Understand the concept of cyber crime and encryption																					
CLO	At the end of this course, learners will be able to:																					
CLO-1	Acquire the basics concept of Hacking	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1				
CLO-2	Acquire the knowledge of the Information gathering techniques	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1				
CLO-3	Understand the concept Network sniffing and attacks	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2				
CLO-4	Understand the structure of Internet Infrastructure	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3				
CLO-5	Understand the concept of cybercrime	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3				

Sessions	CLO – 1	CLO - 2	CLO - 3	CLO - 4	CLO - 5
	18	18	18	18	18
SLO-1	Introduction to Hacking, Important Terminologies, Penetration Test	Information Gathering Techniques, Active Information Gathering, Passive Information Gathering	Network Sniffing, Introduction, Types of Sniffing	History of Internet, InternetAddresses, DNS	Clearing Cache for Browsers, Wireless LAN, Major issues with WLAN
SLO-2	Vulnerability Assessments versus, Penetration Test, Pre-engagement	Sources of Information Gathering, Copying Websites Locally, Information Gathering with Whois	Hubs versus Switches, Promiscuousversus, Non promiscuous Mode	Internet Infrastructure, World Wide Web, Introduction to Cyber Crime	Safe Browsing Guideiines for Social Networking Sites, sharing online content, sharing videos and photos and Revealing Location
SLO-3	Tutorial: Rules of Engagement, Milestones Penetration Testing Methodologies	Tutorial: Finding Other Websites Hosted on the Same Server, Tracing the Location	Tutorial: MITM Attacks, ARP Protocol Basics, How ARP Works	Tutorial: Classification of Cyber Crimes, Reasons for Commission of Cyber Crimes	Tutorial: Instant Chats, E-mail security tips
SLO-4-6	Practice: Lab 1: Implementation of Encryption Techniques	Practice: Lab 4: Implementation of encryption and decryption Techniques of the given message by using Caesar Cipher encryption algorithm.	Practice: Lab 7: Study of packet sniffer tools like wireshark, ethereal, tcpdump etc. Use the tools to do the following 1. Observer performance in	Practice: Lab 10: Case study to find Reasons for Commission of Cyber Crimes	Practice: Lab 13: Implementation of sharing Internet content safely.

			promiscuous as well as non- promiscuous mode.		
SLO-7	Categories of Penetration Test, Black box, White box and gray box	Traceroute, ICMP Traceroute, TCP Traceroute,	ARP Attacks, Denial of Service Attacks, Tools of the Trade	Malware and its Types, Kinds of Cyber Crime, Authentication	Introduction, Smartphone Security Guidelines Purses, Wallets, Smartphones
SLO-8	Types of Penetration Tests, Network Penetration Test, Web Application Penetration Test, Penetration Test	TCP Traceroute: Usage, UDP Traceroute, UDP Traceroute: Usage,	Using ARP Spoof to Perform MITM Attacks, Sniffing the Traffic with Dsnif	Encryption, Digital signatures, Antivirus	Platforms and operating systems, Feature Phones, Branded and locked smartphones
SLO-9	Tutorial: Mobile Application, Social Engineering Penetration Test, Physical Penetration Test	Tutorial: NeoTrace, Cheops-ng	Tutorial: Understanding Network Protocols, Transmission Control Protocol, User Datagram Protocol	Tutorial: Firewall, Stenography	Tutorial: General Setup, Installing and updating Applications
SLO-10-12	Practice: Lab 2: Applications of Black Box testing, White box testing	Practice: Lab 5: Study the use of network reconnaissance tools like WHOIS, dig, traceroute, nslookup to gather information about networks and domain registrars.	Practice: Lab 8: Study of packet sniffer tools like Wireshark, ethereal, tcpdump etc. Use the tools to do the following 1. Show that packets can be traced based on different filters.	Practice: Lab 11: Implementation of authentication	Practice: Lab 14 Installing and updating Applications
SLO-13	Report Writing, Understanding the Audience, Writing Reports,	Enumerating and Fingerprinting the Webservers, Intercepting a Response	Internet Control Messaging Protocol, Server Protocols, Text-Based Protocols	Computer Forensics, Generating Secure Password, Using Password Manager	Communication securely with smartphone, Secure Voice communication, Sending message securely
SLO-14	Structure of a Penetration Testing Report, Vulnerability Assessment Summary, Risk Assessment	Acunetix Vulnerability Scanner, WhatWeb, Netcraft	Binary Protocols, Attacking Network Remote Services, Common Target Protocols	Enabling two step verification, Securing Computer using Antivirus	Storing Information in Smartphone, Sending E-mail from smartphone, Capturing media with smartphone
SLO-15	Tutorial: Methodology, Detailed Findings and Reports	Tutorial: Google Hacking, Some Basic Parameters, TIP regarding Filetype	Tutorial: Attacking SQL Servers	Tutorial: Working with Windows Firewall in Windows, SafeBrowsing	Tutorial: Accessing the Internet Securely from your Smartphone, Advanced Smart Phone Security
SLO-16-18	Practice: Lab 3: Implement Penetration Testing Report	Practice: Lab 6: Case studies of Google Hacking	Practice: Lab 9: Case study of Internet Control Messaging Protocol	Practice: Lab 12: Case study to implement firewall	Practice: Lab 15: Implementation of Communication securely with smartphone

Resources					
1	Rafay Baloch, Ethical Hacking and Penetration Testing Guide, CRC Press, (2015)			3	Jeetendra Pande, Introduction to Cyber Security, Uttarakhand Open University, 2017
2	Introduction to Cryptography and Network Security, Behrouz A. Forouzan, McGraw- Hill, First Edition			4	Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education

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. Navarathinamani P, Co-Founder/COO Datayaan Solutions Pvt. Ltd. Chennai		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr S. Belina V J Sara, SRMIST, RPM
					2 Dr V Saravanan, SRMIST, RPM

Course Code	UCS24P01L		Internship - I				Category	P	Project Work / Internship	L	T	P	C
										0	0	0	1

Course Offering Department	Data 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									
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	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 Inculcation, Multicultural Inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
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																	
CLO	At the end of this course, learners will be able to:	✓	✓	-	-	2	85	75	3	2	2	2	2	2	2	2	2	2
CLO-1	To get an insight of an industry and organization/company	✓	✓	✓	✓	3	85	75	3	2	3	3	3	3	2	1	2	2
CLO-2	To gain valuable skills and knowledge	✓	✓	✓	✓	3	85	75	3	2	3	3	3	3	2	1	3	3
CLO-3	To make professional connections and enhance networking	✓	✓	✓	✓	3	85	75	3	2	2	3	3	2	2	2	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	2	2	2	3	3
CLO-5	To get an inside view of an industry and organization/company	✓	✓	✓	✓	3	85	75	3	3	3	3	3	2	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.

Assessment Component	Expected outcome	Type	Evaluators	Criteria or basis	Marks
Review-1	Internship letter Submission Internship title to be described.	Internal	Supervisor / Guide & Internship Coordinator	Feasibility Study of the Internship	20
Review-2	A short presentation about the internship work	Internal	Supervisor / Guide & Project Coordinator	Clarity of the idea, Preliminary work done.	30
Internship Report	Evaluation of internship Report	External	Examiner(s)/ Reviewer(s)	Presentation, Handling Q&A	30
Viva-Voce	Final Presentation				20

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

*Student has to be present for the viva voce for assessment. Otherwise, it will be treated as non-appearance for the examination with final grade as ‘Ab’

SEMESTER – IV

Course Code	USC24401J	Course Title	Data Privacy and Security	Category	C	Discipline Core Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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	Learn the aspects related to personal data privacy, security and get insight into the Data Protection Bill, issues related to social media platforms			
CLR-2	Familiarize the conventional cryptographic techniques, Symmetric and Asymmetric Cryptographic Techniques.			
CLR-3	Conceive the concept of Digital Signature, Certifying Authorities and Authentication Protocols.			
CLR-4	Identify and acquire knowledge in various security attacks, Services and Mechanism			
CLR-5	Ability to identify the network attacks, and select among available network security technology and protocols such as IDS, firewalls etc to prevent the same.			
CLO	At the end of this course, learners will be able to:			
CLO-1	Acquire the basics of data privacy and security and its issues related to social media platform	✓	✓	2 85 75 3 - - 1 - 3 - 2 2 1
CLO-2	Implement security mechanism to protect data and provide data privacy.	✓	✓	2 85 75 3 2 1 2 2 3 - 1 2 1
CLO-3	Design and implement digital signature standards.	✓	✓	3 85 75 3 1 3 1 3 3 - 1 1 2
CLO-4	To gain knowledge in identifying data security attacks, detect and prevent	✓	✓	3 85 75 3 3 2 3 3 3 - 2 3 3
CLO-5	Apply knowledge in protecting data form the various attacks and breach in the social media platform	✓	✓	3 85 75 3 3 2 3 3 3 - 3 3 3

Sessions	CLO -1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Defining data, meta-data, big data	Introduction to cryptographic	Introduction to Digital Signature, Importance of Digital Signature	Security Attacks: Interruption Interception	Buffer overflow attacks & format string vulnerabilities
SLO-2	Non personal data. Data Security and Data Privacy,	Conventional Cryptographic Techniques: Conventional substitution	Model of Digital Signature, Public Key Infrastructure	Security Attacks: Modification Fabrication	Denial-of-Service Attacks
SLO-3	Cyber Security, Three pillars of		Direct Digital Signature,	Security Services: Confidentiality,	Hijacking attacks: exploits and

	Information security	Transposition ciphers	Arbitrated Digital Signature	Authentication	defences
SLO-4-6	Practice: Lab :1 Privacy settings on social media platform	Practice: Lab 4: Implement Simple Columnar Transposition technique	Practice: Lab 7: Implement Direct and Arbitrated Digital Signature	Practice: Lab 10: Implement Custom Building Hybrid Algorithm for cryptography	Practice: Lab 13: Implement and demonstrate Buffer overflow attack
SLO-7	Data protection and Its principles	One-time Pad, Block cipher and Stream Cipher,	Authentication Protocol: One-way Authentication Protocol, Mutual Authentication Protocol	Security Services: Integrity, Non-repudiation, Access Control and Availability	Internet worms – viruses spyware – phishing – botnets
SLO-8	Personal Data Protection Bill and its compliance	Steganography	User Authentication password-based authentication, password security	Security Mechanism: Specific and Pervasive Security Mechanism	TCP session hijacking
SLO-9	Big data security issues and challenges	Symmetric and Asymmetric Cryptographic Techniques: DES, AES,	DSS Standards, Digital Signature algorithms	A Model for Internetwork Security	UDP hijacking - man-in-the-middle attacks
SLO-10-2	Lab 2: Do's and Dont's for posting content on social media platforms.	Lab 5: Implement Simplified DES	Practice: Lab 8: Write a program to implement digital signature standard.	Practice: Lab 11: Implementation of Classical Encryption techniques in security mechanism	Practice: Lab 14: Implement the Botnet attack detection using publically available dataset
SLO-13	Data protection regulations of other countries- General Data Protection Regulations (GDPR),2016	RSA algorithms	Digital Certificate, Certifying Authorities	Types of Data Security	Network Security Devices- and its types
SLO-14	Personal Information Protection and Electronic Documents Act (PIPEDA), Social media- data privacy and security issues.	Authentication and Digital Signatures	Key Functions of CA	Data Security Strategies	Firewalls, Antivirus, Content Filtering Intrusion Detection systems
SLO-15		Use of Cryptography for authentication, Secure Hash function, Key management – Kerberos	Benefits and drawback of cryptography	Data Security Trends	Information Technology Act, Cyber Laws
SLO-16-18	Lab 3: Registering complaints on a Social media platform.	Lab 6: Implement Simple RSA Algorithm with small numbers.	Practice: Lab 9: Case Study on Certificate Based Authentication	Practice: Lab 12: Case Study on Data Security Capabilities and Solutions	Practice: Lab 15: Case Study on Information Technology Act

Resources					
1	William Stallings, Cryptography and Network Security Principles and Practice, Fourth or Fifth Edition, Pearson			2	Henry A. Oliver, Security in the Digital Age: Social Media Security Threats and Vulnerabilities, Create Space Independent Publishing Platform.
3	Natraj Venkataramanan and Ashwin Shriram, Data Privacy Principles and Practice, CRC Press, 2022			4	William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall.,2000

[illegible]

*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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai	1 Dr. Neela Narayanan V, Professor, VIT Chennai
		1 Mrs.S. Suriya, SRMIST, Ramapuram

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	✓		

Course Code	UMS24D01T	Course Title	Resource Management Techniques	Category	D	Discipline Core/ Elective 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 learning this course is to:	Depth				Attainment			PLO									
CLR-1	To provide foundations in Operations Research	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	To apply basic concepts of Linear programming problems																	
CLR-3	To learn and understand Operations research approach to various applications																	
CLR-4	To provide a set of algorithms for solving sequencing problems																	
CLR-5	To employ appropriate methods of Game theory																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking			Problem Solving, Critical Thinking, Creativity, Communication Skills, Independent Thinking, Leadership Qualities, Digital Technology Skills, Value Incubation, Multicultural Environmental Action, Entrepreneurial Risk Taking, PSO-1, PSO-2									
CLO-1	To recognize the scope and models of Operations research methods for decision making process.	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	To apply Operations research techniques for solving real life problems	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	To know optimization through various transportation and assignment problems	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	To schedule jobs through machines using the prescribed algorithm	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	To calculate saddle point, strategy and value of the game by various methods	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO- 1	CLO- 2	CLO- 3	CLO- 4	CLO- 5
	12	12	12	12	12
SLO-1	Introduction to Operations Research (O.R)	Introduction to Linear Programming Problem (LPP)	Transportation Problems (TP) - Examples, Definitions – decision	Sequencing Problems: Introduction;	Game theory: Definitions, Examples; Characteristics of Game theory

			variables, supply and demand constraints		
SLO-2	Scope of O.R, Some O.R. Models;	Mathematical formulation of LPP; Basic assumptions to formulate LPP; Procedure for forming a LPP model; Formulation of LPP Model	Mathematical formulation of TP; Balanced and Unbalanced TP; Methods for finding Initial basic feasible solution	Assumptions made while solving Sequencing problem; Total elapsed time, Idle time, No passing Rule;	Pure Strategies: Maximin - Minimax Principle, Saddle point and value of the game
SLO-3 & 4	Characteristics of O.R; Principles of Modelling; General methods for solving O.R. Models	Graphic method of solving LPP; Graphic method Special Cases: Infeasibility, Unboundedness, Redundancy.	North West Corner Rule; Row Minima Method; Column Minima Method;	Procedure for sequencing n jobs on 2 machines	Mixed Strategies: Games without saddle points
SLO-5	Main phases of O.R: Formulation of the problems;	Advantages of LPP	Least Cost Method	Sequencing n jobs on 2 machines	Solving 2x2 games;
SLO-6	Construction of a mathematical model	Limitations of LPP	Vogel's Approximation Method (VAM)	Sequencing n jobs on 2 machines	Solving 2x2 games;
SLO-7 & 8	Solving the model constructed; Controlling and updating	General Linear Programming Problem; Types of Solutions	Unbalanced Transportation Problem; Maximization case in TP	Procedure for sequencing n jobs on 3 machines	Matrix oddment method for 3x3 games
SLO-9	Testing the model and its solution, Implementation	Canonical form of LPP and Standard form of LPP	Assignment Problem (AP): Examples, Definitions – decision variables, supply and demand constraints	Procedure for sequencing n jobs on m machines	Matrix oddment method for nxn games
SLO-10	Role of O.R in industry; various fields; O.R and decision making;	Simplex Algorithm Introduction; Simplex method: non-degenerate basic solution, degenerate basic solution	Mathematical formulation of AP, Balanced and Unbalanced AP	Processing of 2 jobs on n machines	Dominance property
SLO-11	Role of computers in O.R.;	Simplex method: basic feasible solution	Assignment Algorithm: Hungarian Method; Solving Unbalanced AP;	Processing of 2 jobs on n machines Graphical method	Dominance property: computational details
SLO-12	Limitations of O.R.	Simplex method-problem solved	Maximization case in AP	Processing of 2 jobs on n machines Graphical method	Dominance property: computational details

Resources											
1	Resource Management Techniques by Prof.V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan						3	Operations Research: An Introduction.H.A. Taha			
2	Linear Programming. K.G. Murthy						4	Operations Research. KantiSwarup, Gupta, P.K. and Manmohan			

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	-	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	-

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	Dr. D. Arivudai nambi, Anna University, Chennai			1	Dr.N. Viswanathan, Presidency college, Chennai			1	Dr.S. Saravanakumar, SRM IST, KTR, saravans14@srmist.edu.in		
								2	Dr.S. Poongodisathiya, SRM IST, KTR, poongods@srmist.edu.in		

Course Code	UMS24D03T	Course Title	Statistical Methods	Category	D	Discipline Core/ Elective 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 learning this course is to:	Depth				Attain ment			PLO									
CLR-1	To provide foundations in Bio 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 for biological problems.																	
CLR-4	To understand the characteristics of biological problems.																	
CLR-5	To provide the application of correlation and regression in biological sciences.																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected	Expected	Problem Solving, Critical	Communication Skills	Independent Thinking,	Leadership Qualities,	Digital Technology	Value Incultation,	Environmental Action,	Entrepreneurial Risk	PSO-1	PSO-2
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	85	75	3	-	-	-	-	-	-	-	-	-
CLO-2	To calculate and apply measures of central tendency - grouped and ungrouped data cases.	✓	✓	✓	-	2	85	75	3	-	-	-	-	-	-	-	-	-
CLO-3	To understand and apply measures of dispersion - grouped and ungrouped data cases.	✓	✓	✓	✓	3	85	75	3	-	-	-	3	-	-	-	-	-
CLO-4	Find the relationship between two or more variables using correlation and regression.	✓	✓	✓	✓	3	85	75	3	3	-	-	-	-	-	3	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.	✓	✓	✓	✓	3	85	75	3	3	-	-	3	-	-	3	3	3

Sessions	CLO- 1	CLO- 2	CLO- 3	CLO- 4	CLO- 5
	12	12	12	12	12
SLO-1	Nature and scope of statistical methods Definition of statistics Nature and scope of Statistical methods- Definition of Statistics- Numerical Data	Measures of Central tendency – Definitions-functions-characteristics of average	Measures of Dispersion - Range – Individual, Discrete series and Continuous series	Correlation Analysis: Correlation - Definition and uses Types of correlation	Testing of Hypotheses -Testing Procedures
SLO-2	Nature of statistics	Arithmetic mean Individual series	Quartile Deviation - Individual and Discrete series	Methods for Finding Correlation Coefficient, Properties of correlation coefficient	Definition of test statistic t and its uses- t-test-Small Sample tests
SLO-3	Importance of Statistics – Function of Statistics	Arithmetic mean Discrete series	Quartile Deviation - Continuous series	Karl Pearson's Correlation Co-efficient - Spearman's Rank Correlation Coefficient with non-repeated Ranks	t-test - Test for Single Mean
SLO-4	Limitations - Distrust of Statistics	Arithmetic mean Continuous series	Mean Deviation about Mean – Individual Series- Discrete series- Continuous series	Spearman's Rank Correlation Coefficient with repeated Ranks	t-test - Test for two sample Means
SLO-5	Classification-Types of classification and its good Characteristics	Arithmetic mean Cumulative series	Standard Deviation – Individual and Discrete Series	Spearman's Rank Correlation Co-efficient	t-test - t Test Statistic, when sample standard deviations are not known, but Population Standard Deviations are known
SLO-6	Tabulation-Types of Tabulation – Parts of Tabulation - Components of Good Table - Rules of construction of the table.	Arithmetic mean Merits and Demerits	Standard Deviation-Continuous Series	Problems on finding the best pair of judgments	Chi-Square distribution - Definition and its Uses-Testing procedure
SLO-7	Components of Good Table Rules of construction of the table. -Difference between classification and tabulation.	Median Individual series -- Discrete series- Continuous series	Standard Deviation-Continuous Series	Bivariate Distribution	Test based on Goodness of fit- Testing the Independence of Attributes using Chi-Square
SLO-8	Diagrammatic representation of various types of statistical data: Bar Diagram	Median Merits and Demerits	Coefficient of Variation	Regression Analysis: Regression - Definition and Uses - Regression Coefficients- Regression Equations- Types of Regression Equations	F-test - Test Statistic of F-test-
SLO-9	Types of Bar diagram - One dimensional Diagrams	Mode Individual series -- Discrete series- Continuous series	Graphical solution of Dispersion Lorenz curve	Regression Equation of X on Y and Regression Equation of Y on X	Uses and testing Procedures

		Merits and Demerits			
SLO-10	Two dimensional Diagrams-Histogram-pie charts	Empirical Relation	Graphical solution of Dispersion Lorenz	Relationship between Correlation and Regression Coefficients	Testing the equality of variance using F distribution
SLO-11	Frequency Polygon - Frequency Curve - Less than O gives-more than O gives	Graphical solution of Median	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	ANOVA - One Way Classification

Resources					
1	Pillai,R.S.N, Bagavathi, V. (2009), Statistics, Theory and Practice,7 th Edition, S. ChandLtd, NewDelhi.			3	Gupta, S.P. (2012), Statistical Methods, 4 th Edition, Sultan Chand & Sons, New Delhi.
2	Khan and Khanum, (2008), Fundamentals of Bio Statistics, 3 rd 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 (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)	Theory (%)	Practice (%)
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	-

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	Dr. D. Arivudai nambi, Anna University, Chennai	1	Dr.N. Viswanathan, Presidency college , Chennai	1	Dr.S. Lakshmi Priya, SRMIST
				2	Dr.J. Madhumitha, SRMIST

Course Code	UEN24S01L	Course Title	Communication Skills	Category	S	Skill Enhancement Course	L	T	P	C
							0	0	4	2

Course Offering Department	English, FSH, KTR	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil	DataBook/Codes/Standards	Nil
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CLR	The purpose of earning this course is to:	Depth				Attainment			PLO									
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 Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity Solving	Communications 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	Reading Skills. (Barriers of reading skills and strategies of effective communication through reading)	Speaking Skills. (Barriers of speaking skills and strategies of effective communication through speaking)	Writing Skills. (Barriers of writing skills and strategies of effective communication through writing)	Encouraging the students to share a few of their favourite lines from any sources they have read or sharing a few lines from

	Communication Develop and Demonstrate Effective Non-Verbal Communication Skills	Identifying common reading problems in students after making them read a few passages.	Explaining the usage of the Oxford Learner's Dictionary to learn phonetics of the words at the fundamental level.	Explaining various forms of writing with examples.	paditthadhilpiditthadhu.
SLO-2	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.
	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	Identify the key arguments in a passage -introductory point, lead point,	Practicing how to avoid common errors.	Teaching effective writing by learning to avoid common errors in concord, preposition, conjunction, relative	Reading of the third letter -Mr. Mathrubootham is fully supporting all new technologies

	Language through TED TALKS.	supportive argument statement, concluding point and the common connecting word between all the key words in the passage.		pronouns, question tags.	
	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 how to speak in short time and how to speak effectively.	Practicing effective writing by learning to avoid common errors in concord, preposition, conjunction, relative pronouns, question tags.	Mathrubootham's frustration over the failure of technologies and the language 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	Cross check with misunderstanding if	Spur of the moment speech.:	Selecting any news article and	Talk about their favourite letter from

	listening and reflecting the complete audio listening practice and speaking.	any and rectify- match the question and answers.		learning the writing style in it.	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 from the books they have read.

Resources					
1	Horizon-EnglishText Book –Compiled and Edited by the Faculty of English Departement, FSH, SRMIST, 2023	5	TheArtofPublicSpeakingbyStephen E. Lucas-2019		
2	The Creative Writing Coursebook: Forty Authors Share Advice and Exercises for Fictionand Poetry by Julia Bell and Paul Magrs- 2001	6	Talk Like TED: 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 forCollege StudentsbyRonaldJ.Weber1994		
4	The Writing Life: Writers of How They Thinkand Work edited by Marie Arana-2003	8	How to Write a Simple Book Review: It's easier than you think! By Allyson R.Abbott2013		

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	-	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	

*Theevaluation canbedoneon theone or more parameters that include, (i) Seminars, (ii)Mini-Project, (iii) Case-Studies, (iv) MOOC Certification, (v) Publication of Article, (vi)Presentation ofResearch Work in Conferences

Strategies			
Technology	Pedagogy/ Andragogy	Sustainable Development	
Simulations	Clarification/Pauses	☐ GoodHealth&Well Being	☐
PresentationTools	☐ Group Discussion	☐ QualityEducation	☐
Learning Management System	☐ Hands-onPractice	☐ GenderEquality	☐
	Debate	☐	
	InteractiveLecture	☐	
	Brainstorming	☐	

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 Sampath kumar, Assistant Professor, Department of English, FSH, SRMIST
		2 Dr. K.S. Antonysamy Loyola College Chennai antonysamyks@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 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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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
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 Thinking,	Communication Skills, Collaborating	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																	
CLO	At the end of this course, learners will be able to:																	
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	✓	✓	-	-	2	85	80	3	2	3	2	-	-	2	3	-	-
CLO-2	Learn and master a set of practical skills such as time management, self-management, handling conflicts, team leadership	✓	✓	✓	-	3	85	80	2	2	1	2	2	1	2	3	-	-
CLO-3	Understand the basics of entrepreneurship and develop business plan	✓	✓	✓	✓	3	85	80	2	3	3	3	-	3	2	3	-	-
CLO-4	Apply the design thinking approach for leadership	✓	✓	✓	✓	3	85	80	-	3	2	-	2	2	1	1	-	-
CLO-5	Appreciate the importance of ethics and moral values for making of a balanced personality & be an integral human being	✓	✓	✓	✓	3	85	80	3	3	2	2	2	2	2	3	-	-

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 &	Innovative leadership – Concept of	Entrepreneurship

			Manager traits	emotional and social intelligence	
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										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 (%)	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
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	-	-
		Internal Experts
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		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	UCS24D01J	Course Title	Software Engineering	Category	D	Discipline Core/ Elective 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									
CLR-1	Familiarize the software life cycle models and software development process	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand the various techniques for requirements, planning and Testing																	
CLR-3	Examine the basic methodologies for software design, development, testing																	
CLR-4	Manage user expectations and software development team																	
CLR-5	Acquire the latest industry knowledge like agile for development																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Communication Skills, Collaborative Skills	Problem Solving, Critical Thinking	Communication Skills, Independent Thinking	Leadership Qualities, Digital Technology Skills	Value Incultation, Multicultural Understanding	Environmental Action, Entrepreneurial Risk Taking	PSO-1	PSO-2		
CLO-1	Identify the process of project life cycle model and process	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Analyze and specify software requirements through a productive working Relationship Customers.	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Design the system based on Functional Oriented and Object-Oriented Approach for Software Design.	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Develop the correct and robust code for the software products	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Perform by applying the test plan and various testing techniques	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	The Evolving Role of Software Engineering Definition	Computer-Based Systems The System Engineering Hierarchy – System Modeling	Project Management Spectrum, Four P's	Principles of Testing Introduction-Testing Definition	Integration testing Top-down Integration testing
SLO-2	Software Characteristics Software Applications and A Crisis	System Simulation Comparison of various Software Development	Role of People Process and the Project	Phases of software Error, Fault, Bug-Failure of the system –Comparison of the terms	Bottom-up Integration testing Bi-Directional Integration
SLO-3	Software Myths Types of Myths, Software Engineering: Layered Technology	Business Process Engineering: An Overview Requirements Engineering process	The project Planning process Resources	Types of testing- Quality assurance, Quality Control	System Integration System Acceptance Testing Functional Testing

SLO 4 - 6	Laboratory1: Identifying Project Objective and Scope	Laboratory4: Project Planning	Laboratory 7: Function Oriented Diagram	Laboratory10: Test Case design for unit testing	Laboratory 13: Preparation of Timeline charts and Tracking the Scheduling
SLO-7	Software Process Software Process Models	Characteristics of Good Requirements Types of Requirements	Risk Management Re active and Proactive Risk Strategies	Testing verification and validation White Box Testing	Non-Functional testing Functional Vs Non-Functional Testing
SLO-8	Linear Sequential Model Advantages And Disadvantages	Requirements Elicitation Requirements Analysis and Negotiation	Software Risks, Risk Identification and Risk Projection	Techniques of White Box Testing Black box testing	System Testing Design and Architectural Verification
SLO-9	Prototyping Model Advantages And Disadvantages Rapid Application Development Model	Requirement Documentation Requirement Specification and Analysis, Software Requirement Specification and System Requirement Specifications Drawing E-R Diagram for any project	Risk Refinement, Risk Mitigation Risk Monitoring and Management	Techniques of Black box testing Static Testing, Dynamic Testing	Deployment Testing Beta Testing Certification, Standards
SLO 10 - 12	Laboratory 2: Selection of Suitable software process Model of the suggested system	Laboratory 5: Performing Various Requirement Analysis	Laboratory 8: User's View Analysis	Laboratory 11: Test Case design for Integration testing	Laboratory 14: Estimation of Effort and Risk Identification
SLO-13	Evolutionary Process Models Incremental Model	Characteristics of Good SRS Document Requirement Management	Quality Concepts SQA Activities	Challenges in white box testing Black Box Testing	Testing for Compliance Scalability Testing
SLO-14	Spiral Model, WIN WIN Model Advantages and Disadvantages	Software Prototyping Selecting the prototyping approach	Software Reviews and FTR Statistical Quality Assurance	Techniques of Black Box Testing, Structural testing	Reliability testing Stress testing
SLO-15	Concurrent Development Model Component Based Development, Comparison of Process models	Specification Principles, Representation Specification Review,	The software Configuration Management SCM Repository	Static testing Verification & Validation Techniques, Cyclomatic complexity, Control flow graph	Acceptance Testing Acceptance Criteria
SLO 16 - 18	Laboratory 3: Problem Statement Preparation	Laboratory 6: Develop Software Requirement Specification Sheet (SRS)	Laboratory 9: Structure view diagram	Laboratory12: Performing Testing and Debugging for a sample code	Laboratory 15: Software Quality Assurance Components.

Resources					
1	Behrouz A. Forouzan, (2010), "Data Communications and Networking", 5th Edition	5	Todd Lammle, (2011), "CCNA Study Guide", Seventh Edition		
2	William Stallings, (2010), "Data and Computer Communications", Ninth Edition	6	https://www.netacad.com/courses/packet-tracer		

3	AS Tanenbaum, DJ Wetherall, Computer Networks, 5th Ed., Prentice-Hall, 2010	7	JF Kurose, KW Ross, Computer Networking: A Top-Down Approach, 5th Ed., Addison-Wesley, 2009.
4	Peterson and Davie, Computer Networks: A Systems Approach, Larry Peterson and Bruce Davie, 2019	8	James D. McCabe, Network Analysis, Architecture, and Design (The Morgan Kaufmann Series in Networking) 3rd Edition, Morgan Kaufmann, 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*				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						

Course Code	UCS24D02J	Course Title	Computer Networks and Data Communication				Category	D	Discipline Core/ Elective 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									
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																	
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																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Communication Skills, Problem Solving, Critical Thinking, Analytical Skills, Leadership Qualities, Digital Technology Skills, Value Inculturation, Multicultural Understanding, Entrepreneurial Risk Taking	PSO-1	PSO-2							
CLO-1	Understand the need for Network and various layers of OSI and TCP/IP reference model	✓	✓	-	-	2	85	75	1	-	-	3	3	-	2	2	3	
CLO-2	Explain various Data Communications media	✓	✓	✓	-	2	85	75	1	2	3	-	3	3	-	1	2	3
CLO-3	Identify the different types of network topologies and Switching methods	✓	✓	✓	✓	3	85	75	1	3	3	-	3	3	-	1	1	3
CLO-4	Identify the different types of network devices and their functions within a network	✓	✓	✓	✓	3	85	75	1	3	3	-	3	3	-	2	3	3
CLO-5	Analyze and Interpret various Network and Transport Layer protocols.	✓	✓	✓	✓	3	85	75	1	3	3	-	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Evolution of Computer Networks, The Internet	Data Link Layer, Functionalities	Network Layer, Functionalities	Transport Layer, Functionalities	Physical Layer – Functionalities, Transmission Terminology
SLO-2	The Internet today, Computer Network Architecture	MAC Addressing, Framing	Network Addressing, Classfull Addressing	Port Numnber, TCP	Frequency, Spectrum, And Bandwidth, Data and Signals
SLO-3	Categories of Networks (LAM, WAN, MAN), A data Communications Model-Networks	Data Link Control, Line Discipline	Routers and Their Functions, Routing Metrics	TCP Functionalities, UDP	Analog And Digital Transmission, Transmission Impairments
SLO 4 - 6	Practice: Basic Network Commands and their functionalities	Practice: Construct N/W using bus topology, Star topology	Practice: Multi-routing connection with static router	Practice: Implementing a simple application using UCP	Practice: Analyse the Working of a DNS

SLO-7	Protocols, Elements of Protocol	Flow Control – Stop and Wait, Sliding Window	Routing Table, Routing Algorithms	UDP Functionalities, TCP Vs UDP	Analog to Digital and Digital to Analog Conversion
SLO-8	Network Topologies, Transmission Modes in a Network	Error Control – Stop and Wait, Go back N	Distance Vector Routing, Distance Vector Routing with an Example	Application Layer Functionalities, HTTP	Noise in transmission Attenuation, Twisted Pair-Physical Description-Applications-Unshielded And Shielded Twisted Pair
SLO-9	N/W Layered Architecture, OSI Reference Model	Error Control – Selective Reject	Link State Routing	: HTTP Messages	Coaxial Cable and Optical Fiber Physical Description-Applications-Transmission Characteristics
SLO 10-12	Practice: Introduction to CISCO Packet Tracer (CPT)	Practice: Construct N/W using Ring topology, Mesh topology	Practice: Connecting 2 LANS Using Dynamic Routing	Practice: Analyzing the Working of RIP	Practice: Implementing a simple web server
SLO-13	Functions of the Various Layers of OSI reference model, TCP/IP Reference Model	Errors in Transmission – Types	Switching in N/W, Electronic Mail, Circuit-Switching	DNS, Electronic mail	Compare the various features of Guided Transmission media, Radio Waves -Applications-Transmission Characteristics
SLO-14	Functionalities of the Various layers of the TCP/IP reference model Comparison of the OSI and TCP/IP Reference Models	Error Detection – Parity, Checksum Error Detection - CRC	Circuit-Switching Advantages Packet-Switching Principles	Basic Electronic Mail Operation SMTP & MIME	Micro Waves Applications-Transmission Characteristics Infrared Waves Characteristics-Application
SLO-15	Comparison of Layers Comparison of the services	Error Correction -Types Hamming Code	Advantage of Packet Switching Compare Circuit and Packet Switching	SMTP Overview-Connection Setup- Mail Transfer	Satellite Communication Compare Feature of Guided Vs UnGuided Transmission Media
SLO 16-18	Practice: Build a Peer-to-Peer N/W using Hub and Switch. Analyse the difference between the working of a Hub and a Switch	Practice: Connecting two LANS using router with static Router	Practice: Implementing a simple application using TCP	Practice: ARP simulation in CPT	Practice: Emulate Working of a complete N/W using CPT

Resources					
1	Behrouz A. Forouzan, (2010), "Data Communications and Networking", 5th Edition	5	Todd Lammle, (2011), "CCNA Study Guide", Seventh Edition		
2	William Stallings, (2010), "Data and Computer Communications", Ninth Edition	6	https://www.netacad.com/courses/packet-tracer		
3	AS Tanenbaum, DJ Wetherall, Computer Networks, 5th Ed., Prentice-Hall, 2010	7	JF Kurose, KW Ross, Computer Networking: A Top-Down Approach, 5th Ed., Addison-Wesley, 2009.		
4	Peterson and Davie, Computer Networks: A Systems Approach, Larry Peterson and Bruce Davie, 2019	8	James D. McCabe, Network Analysis, Architecture, and Design (The Morgan Kaufmann Series in Networking) 3rd Edition, Morgan Kaufmann, 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*				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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai			1	Dr. Neela Narayanan V, Professor, VIT chennai			1	Dr. B. Mahalakshmi, Assistant Professor, FSH, SRMIST		

Course Code	USC24D01J	Course Title	Penetration Testing				Category	D	Discipline Core / Elective Course	L	T	P	C
										3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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		PLO									
CLR-1	Have an overview of penetration testing									1	2	3	4	5	6	7	8	9	10
CLR-2	Understand different types of penetration testing																		
CLR-3	Understand about tools and methods used in penetration testing.																		
CLR-4	Understand the duties of penetration tester																		
CLR-5	Understand to write Penetration Testing reports																		
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	Analysis	Research Skills	Collaborating Skills
CLO-1	Identify different classification of penetration testing and duties of penetration tester					✓	✓	-	-	2	85	75	2	3	-	-	2	3	-
CLO-2	Apply penetration testing tools to exploit and investigate vulnerable systems.					✓	✓	✓	-	2	85	75	2	3	3	-	2	3	-
CLO-3	Analyze the outcomes of vulnerability assessments in the form of penetration testing					✓	✓	✓	✓	3	85	75	3	3	2	-	3	2	-
CLO-4	Examine intensive assessments required to effectively identify and mitigate risks to the information security of the infrastructure					✓	✓	✓	✓	3	85	75	3	3	-	-	3	2	2
CLO-5	Analyze the various regulatory compliances related to penetration testing					✓	✓	✓	✓	3	85	75	2	2	1	-	2	3	2

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to Penetration Testing	Introduction to Duties of a Licensed Penetration Tester: Duties of a Licensed Penetration Tester	Introduction to Pre-Penetration Testing: Checklist, Pre- penetration Testing Steps	Vulnerability Analysis: Vulnerability Assessment Steps	Introduction to Penetration Testing Deliverable: Penetration Testing Report, Summary of Test Execution
SLO-2	Penetration Testing Basics	LPT-Audited Logos, Standards and Compliance	Types of penetration Testing	Vulnerability Classification	Scope of the Project, Results Analysis
SLO-3	Common Penetration Testing Techniques, Penetration Testing Process	Laws, Rules of Engagement (ROE)	Firewall penetration testing	Types of Vulnerability Assessment	Recommendations, Appendices

SLO-4-6	Lab 1: Setting up a Virtual Lab Environment: Setting up virtual machines with vulnerable operating systems and applications, as well as testing tools such as Metasploit, Nmap and Wireshark.	Lab 4: Vulnerability Scanning: System vulnerability scanning, Identification of vulnerabilities	Lab 7: System Exploitation: Exploitation of Windows 7 system using known vulnerabilities	Lab 10: XSS vulnerabilities identification: Identification of XSS vulnerabilities in the websites and the way they could be exploited	Lab 13: Manual SQLInjection: Demonstration of manual SQLInjection attacks
SLO-7	Announced Testing/Unannounced Testing, Types of Penetration Testing	Penetration Testing Planning and Scheduling: Purpose of a Test Plan, Building a Penetration Test Plan	social engineering and Password cracking penetration testing	Vulnerability Assessment Phases	Client-Side Test Reports
SLO-8	Strategies of Penetration Testing	Setting Up a Test Goal, IEEE Standards	Introduction to Information Gathering and Social Engineering: Penetration Testing,	Vulnerability Assessment Reports	Introduction to Post-Testing Actions: Prioritize Recommendations
SLO-9	Operational Strategies for Security Testing	Test-Plan Identifier, Test Deliverables	Social Engineering	Tutorial: Vulnerability Assessment Tools	Tutorial: Develop an Action Plan, Minimizing
SLO-10-12	Lab 2: Introduction to Nmap: Basic commands of Nmap, System scanning using Nmap, interpretation of gathered information using Nmap	Lab 5: Introduction to Metasploit: Introduction to the tool, basic commands for searching, selection, parameter configurations and deployment of exploits	Lab 8: Spoofing: Exploiting systems using IP Spoofing and Mac Spoofing	Lab 11: XSS Exploitation: Exploitation of XSS vulnerabilities using Javascript	Lab 14: Password Cracking: This exercise involves using tools like John the Ripper and Hashcat to crack password hashes
SLO-13	Identifying Benefits of Each Test Type	Penetration Test, Planning Phases	Requirements of Social Engineering	Internal Penetration testing and External Penetration testing	Apply Updates and Patches, Capture Lessons Learned and Best Practices
SLO-14	Prioritizing the Systems for Testing	Defining the Scope, Staffing	Steps Preceding a Social Engineering	Internal Testing, Steps for conducting Internal Penetration Testing	Security Policies, Conduct Training
SLO-15	Phases of Penetration testing	Tutorial: Developing the Project Plan, Meeting with the Client	Tutorial: Steps in Conducting a Social Engineering Penetration Test	Tutorial: External Penetration Testing, Steps for conducting External Penetration Testing,	Tutorial: Social Engineering Class, Destroy the Penetration Testing Report
SLO-16-18	Lab 3: Information Gathering: This exercise involves using tools like Nmap and Google Dorking to collect information about a target system, such as open ports, operating system, and application versions.	Lab 6: System Exploitation: Exploitation of Windows XP system using known vulnerabilities	Lab 9: Cross Site Scripting (XSS): Introduction to cross site scripting, identification of websites vulnerable to cross site scripting	Lab 12: SQLInjection: Introduction to SQLInjection, Automated SQLInjection using SQLmap	Lab 15: Track keystrokes of victim machine using Ardamax Keylogger

Resources

1	The Penetration Testing Procedures and Methodologies, Ec-Council, Cengage Learning	3	Kali Linux Wireless Penetration Testing Beginner's Guide by Vivek Ramachandran, Cameron Buchanan, 2015 Packt Publishing
2	Patrick Engebretson, "The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made easy", Elsevier, 2011	4	James S. Tiller —The Ethical Hack: A Framework for Business Value Penetration Testing, Auerbach Publications, 2004.

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. Navarathinamani P, Co-Founder/COO Datayaan Solutions Pvt. Ltd. Chennai		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Mrs.T. Kanimozhi, FSH, SRMIST, RMP

Course Code	USC24D02J	Course Title	Social Media Cyber Security	Category	D	Discipline Core Elective Course	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	Prerequisite 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	To Understand Various types of cyber-attacks and cyber-crimes	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand The Fundamentals of social media	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Modern Tool Usage	Society Culture	Environment Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO-1	PSO-2
CLR-3	To Understand Cloud Security, Web Security, Wireless Security																	
CLR-4	To understand the concept of network security management.																	
CLR-5	To prepare to acquire data from a suspect's drive and discusses available Linux and GUI acquisition tools.																	
CLO	At the end of this course, learners will be able to																	
CLO-1	Analyze cyber-attacks, types of cybercrimes, cyberlaw and so how to protect themselves and ultimately the entire Internet community from such attacks.	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Understand security and privacy challenges in any social media platform	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Understand Cloud Security, WebSecurity, WirelessSecurity	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Identify And Explore the Authentication mechanisms over internet	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Identify The International and National Cyber Crime strategy.	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Understanding Science of Social Media	Data Collection APIs, BoW Model	Classifications of Cyber Crimes	Need For Security	Cyber Strategy, National Security Strategy
SLO-2	Goals for using Social Media	Social Media Content Analysis	Tools and Methods, Password	Concept of CyberSpace, Cyber	Cyber Security Strategy,

			Cracking	Crimes and Cyberattack	Organized Crime Strategy
SLO-3	Tutorial: Goals for using Social Media, Social Media Audience and Influencers	Tutorial: TF-IDF, Network Analysis-Node Centrality Measures	Tutorial: Keyloggers, Spywares	Tutorial: Fundamental Security Principles	Tutorial: Cyber Crime Strategy, Policy Cyber Crime
SLO-4-6	Practice: Caesarchipper-LAB	Practice: Dictionary Attack Algorithm-LAB	Practice: Installation Tcpdump-LAB	Practice: Sniff Traffic using ARP Poisoning-LAB.	Practice: Demonstrate Secure data transmission-LAB
SLO-7	DigitalPR Detection of various cyber-attacks using Wireshark.	Degree Distribution, Average Path Length, Clustering Coefficient	SQL Injection, Network Access Control	Fundamental security principles, Threats	International Response, National Cyber Security Structure
SLO-8	Promoting Social media Pages, Linking Social Media Accounts	Attachment Model, Security Issues In SocialMedia	CloudSecurity	Attack And Vulnerability, Key Security triad	Strategic Policy Requirements
SLO-9	Tutorial: Linking Social Media Accounts, TheVirallImpac to fSocial Media	Tutorial: Review of Machine Learning, Identity Theft	Tutorial: Wireless Security	Tutorial: Confidentiality, Integrity and Availability.	Tutorial: Police and Crime Commissioners
SLO-10-12	Practice: Rail Fence column and row Transformation-LAB	Practice: Bruteforce Algorithm-LAB	Practice: Client Server Communication–UDP/TCP-LAB	Practice: Demonstrate Intrusion Detection System Using Any Tool	Practice: Case study-1-LAB
SLO-13	Layers of Security, Internet Governance, Challenges and Constraints	Profile Cloning, SocialPhishing	Cloud Computing, Cluster Computing	Digital Signature	Forms of CyberCrime
SLO-14	Motive of attackers	Sybil Accounts and Their Behavior	Grid Computing	Transport LayerSecurity	NetworkForensics
SLO-15	Tutorial: Software Attacks, Hardwareattacks	Tutorial: Spamming, Fake, Compromised	Tutorial: Comparison With Traditional computing architecture(client/server)	Tutorial: NetworkThreatModel	Tutorial: Mobile Forensics-Data Extraction & Analysis
SLO-16-18	Practice: Diffie Hellman key exchange algorithm-LAB	Practice: Installation of WireShark-LAB	Practice: Installation of Rootkits-LAB	Practice: Demonstrate how to provide secure datastorage, securedata transmission and for creating digital signatures LAB	Practice: CaseStudy-2-LAB

Resources			
1	Perspectives, Wiley, NinaGodbole andSunitBelpure, CyberSecurity Understanding Cyber Crimes, Computer Forensics and Legal Cambridge University Press2014	2	CyberSecurity Essentials, James Graham, Richard Howard and RyanOtson, CRCPress. Bonzanini Marco. Mastering Social Media Mining. Packt Publishing,2016.
3	<William, Stallings.(2018).EffectiveCybersecurity:AGuidetoUsingBestPracticesandStandards, Addison-WesleyProfessionalPublishers,1stEdition.	4	

[illegible]

*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. Navarathinamani P, Co-Founder/COODatayaansolutionsPvt. Ltd.Chennai	1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr.V. Raja SRMIST, Vadapalani

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	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
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:																	
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., & ,Savarimuthu, X., (2017) 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		Sustainable Development	
Bloom's Level of Thinking		CLA – 1	CLA – 2	CLA– 3	CLA– 4 *	Final Assessment (50 %weightage)	Technology	Pedagogy / Andragogy		
		(10%)	(10%)	(20%)	(10%)		Presentation Tools	✓ Clarification/Pauses	✓ Good Health & Well Being	✓
		Theory (%)	Theory (%)	Theory (%)	Theory (%)		Learning Management System	✓ Group Discussion	✓ Quality Education	✓
		Theory (%)	Theory (%)	Theory (%)	Theory (%)			✓ 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
1	Dr. Arumugam Perumal, ARMATS BIOTEK Training and Research Institute, Chennai	1 Dr. N. Banu, Bharathi Women's College (Autonomous), Chennai
		Internal Experts
		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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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
		Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Communication Skills, Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills, Value Incultation, Multicultural Environmental Action, Community Entrepreneurial Risk Taking	PLO-9	PLO-10							
CLR-1	Develop resume building practice																	
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																	
CLO	At the end of this course, learners will be able to:																	
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	Power Point presentation–body language and stage etiquette –practice session	Sources of Career Information - Career Opportunities
SLO-4	Meaning and types of interviews (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

[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 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.dcgk.ktr@srmist.edu.in
			2
			Dr. Muthu Deepa, Assistant Professor, Department of Career Guidance, FSH, SRMIST, muthudem@srmist.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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CLR	The purpose of learning this course is to:	Depth				Attainment			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	Conceive Design Implement Operate Level of Thinking Expected Proficiency (%) Expected Attainment (%) Problem Solving, Critical Thinking, Analytical Skills, Communication Skills, Independent Thinking, Analytical Leadership Qualities, Digital Technology Skills Value Incultation, Multicultural Environmental Action, Entrepreneurial 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																	
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.

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	USC24D03J	Course Title	Security Threats and Principles				Category	C	Discipline Core Elective Courses	L	T	P	C
										3	0	3	4

Course Offering Department	Computer Science in Specialization with Cyber Security	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	To provide a strong foundations in discrete mathematics.	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	PLO-9	PLO-10
CLR-2	To learn the concepts of basics of Security Threats																	
CLR-3	To impart in-depth knowledge of Network Threats																	
CLR-4	Understand the principles of Spoofing																	
CLR-5	Basic knowledge of Threat Awareness																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Have athorough Understanding of Fundamentals of Security Threats	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Understand the concepts of Network Threats	✓	✓	-	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Realtime applications of Spoofing Analysis	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Design and implementation knowledge of crypto systems	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Design and implementation knowledge of MAC	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Security Threats	Threats to Network	Databases Architecture	Threats to Server security	Forensic Analysis
SLO-2	Sources of security threats	Prevention of network threats	Cryptography in Network Security	Block cipher design principles	Security threat correlation
SLO-3	Motives	Cybercrimes	Firewalls	Block cipher Modes	LAN –WAN Domain
SLO-4-6	Cyber Security Threats – Case Study	TCP / UDP connectivity using NetCat	Hill Cipher	Rail Fence	Network security attack LAB
SLO-7	Email id Creation	Network Threats: Active/Passive–	Demonstrate Port scanning	SDES	Vulnerability sources and assessment
SLO-8	E-mail threats - Web-threats	Interception–Impersonation	Backdoors–Bots	Block cipher Principles of DES	Vulnerability Assessment tools
SLO-9	Intruders and Hackers, Insider threats	Work station Domain	IP, Spoofing	Implement Windows and Linux Enumerations	ASYMMETRICKEY CIPHERS
SLO-10-12	TCP & Port Scanning using N Map	Caesar Cipher	Data Encryption Standards	Differential and linear	RSA Algorithm

				cryptanalysis LAB	
SLO-13	Security in Operating Systems	Spam's-Adware-Spy ware	ARP spoofing	Diffie Hellman key exchange	RSA Cryptosystem Introduction
SLO-14	Security in the Design of Operating Systems	Trojans and covert channels	LAN Domain LAB	Diffie Hellman key exchange – Advantages, Formula	Implement Windows and Linux Enumerations
SLO-15	To perform the Foot printing	Databases	Sabotage-Internal treats Environmental threats	Risk Assessment	Authorization and Authentication
SLO-16-18	To Demonstrate sniffing of router traffic by using the tool - Wireshark	Playfair Cipher	Advanced Encryption Standards	Diffiee-Hellman	Key distribution LAB

Resources					
1	Swiderski, FrankandSyndex,” Threat Modeling”, Microsoft Press, 2020.			5	William Stallings and Lawrie Brown, “Computer Security: Principles and Practice”, Prentice Hall, First Edition, 2022.
2	WilliamStallings, Cryptography and Network Security: Principles and Practice, PHI 8th Edition, 2023			6	Joseph MKizza, “Computer Network Security”, SpringerVerlag, Fourth Edition, 2022
3	Thomas Calabres and Tom Calabrese, “Information Security			7	Intelligence: Cryptographic Principles&Application”, Thomson Delmar Learning, 2022
4	Behrouz A. Ferouzan, “Cryptography & Network Security”,TataMc Graw Hill 3rd edition, 2015.			8	Charlie Kaufman and Radia Perlman, Mike Speciner, “Network Security, Second Edition, Private Communication in PublicWorld”, PHI 2016

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. Navarathinamani P, CoFounder/CEO Datayaan Solutions Pvt. Ltd. Chennai	1	Dr. Neelananarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr V Saravanan, SRMIST, RPM
				2.Dr GV ShriChandran, SRMIST, RPM

Course Code	USC24D04J	Course Title	Malware Analysis				Category	D	Discipline Core Elective Courses	L	T	P	C
										3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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 the fundamentals of static and dynamic analysis.																	
CLR-2	Gain knowledge about running malware in virtual environment.																	
CLR-3	Study about disassembly constructs and its structures.																	
CLR-4	Study about new processors and file types using the IDA SDK																	
CLR-5	Explore popular plug-ins that make writing IDA scripts easier, allow collaborative reverse engineering																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Gain knowledge about the different forms of malware	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Set up a safe virtual environment to analyze malware.	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Navigate, comment, and modify disassembly	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Use code graphing to quickly make sense of cross references and function calls	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Use IDA's built-in debugger to tackle hostile and obfuscated code.	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to Malware	PE Files with PEView	Introduction to Malware Analysis	Antivirus Scanning	Reverse Engineering
SLO-2	Types of Malware	Introduction to Virtual Machine	The Goals of Malware Analysis	Hashing	Anti- Reverse Engineering
SLO-3	General Aspect of Computer infection program	Types of Virtual Machine	Malware Analysis Techniques	Fingerprint for Malware	Reversing and Disassembly Tools.
SLO-4-6	Explore various Malware family using online repository	Dynamic Malware Analysis (Running Malware Safely)	Explore and setup Opensource Sandbox	Building an Automated Analysis Lab with Cuckoo Sandbox	Network Traffic Analysis using VMware

SLO-7	Non-Self Reproducing Malware	Antivirus Scanning	General Rules for Malware Analysis	Malware Behavior	IDA TIL Files
SLO-8	Operation of Virus	Hashing, Finding Strings	Types of Malware Analysis	Covert Malware Launch	Virtual Functions and Vtables
SLO-9	Classification of Malware	PE File Format, Linked Libraries & Functions, PE Header File & Section	Static Analysis	Data Encoding, Shellcode Analysis	Inheritance Relationships, C++ Reverse Engineering References
SLO-10-12	Install and setup Virtual Machine (VMware)	Memory Analysis with VMware Snapshots	Sandbox Experimentation Using VMware Snapshots	File System Monitoring using Cuckoo Sandbox	Network Traffic Analysis using Cuckoo sandbox
SLO-13	Virus Nomenclature	Malware Family & its categories	Dynamic Analysis	Debugging	IDA Data Displays
SLO-14	Wm Nomenclature	Malware Family overview	Hybrid Analysis	Kernel Debugging with WinDbg	IDA TIL Files, IDA Output Files and Patch Generation
SLO-15	Recent Malware Case Studies	Malware attacks & its types, obfuscation	API, API Calls	Malware Focused Network Signatures.	IDA Scripting, IDA Software Development Kit
SLO-16-18	Basic Static Malware Analysis on VM	Reversing Malware Code	Building an Automated Analysis Lab with VMware	Registry Analysis using Cuckoo Sandbox	API Call Analysis

Resources					
1	Michael Sikorski and Andrew Honig, Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software	3	Joshua Saxe and Hillary Sanders” Malware Data Science: Attack Detection and Attribution”		
2	Michael Ligh, Steven Adair, Blake Hartstein, and Matthew Richard,” Malware Analyst's Cookbook and DVD: Tools and Techniques for Fighting Malicious Code”				

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. Navarathinamani P, Co-Founder/COO Datayaan Solutions Pvt. Ltd. Chennai		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr.PM Kavitha, AP/FSH, SRMIST, RMP

Course Code	USA24D07J	Course Title	Cloud Computing	Category	D	Discipline Core / Elective Coruses	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	Understand and analyze the cost metrics, handle the security threats and construct different cloud delivery design models																	
CLR-2	Understand the architecture of cloud																	
CLR-3	Understand the need for virtualization																	
CLR-4	The concepts behind scheduling and load balancing that is happening across heterogeneous resources in the environment																	
CLR-5	Justify the need for improved hardware and software infrastructures (servers, protocols, security algorithms)																	
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, Communication Skills, Independent Thinking, Analytical Reasoning, Leadership Qualities, Digital Technology, Value Incultation, Environmental Action, Entrepreneurial Risk	PSO-1	PSO-2							
CLO-1	Defend the need for cloud computing to run an online business	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Understand and figure out the necessities of middleware technologies	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Practically create a virtual environment (lab purpose using VMware)	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Implement crypto algorithms that may be used in the computing environment	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Know the commercial functioning of cloud computing	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to Networking	Roles and Boundaries, Cloud Characteristics	Data in Cloud, Data as a Service	Cloud Usage Monitor, Resource Replication, Ready-Made environment	Simulation Tools: Cloud Sim, Cloud Analyst
SLO-2	Data Communication	Cloud Delivery models, Cloud Deployment models	DaaS: Architecture, Advantages, Disadvantages	Load Balancer, SLA Monitor, Hypervisor, Resource Cluster	Cloud based Web Applications & Service Testing Tools

SLO-3	Introduction to Cloud computing	Cloud enabling technologies, Data center technologies, Web technologies, Multitenant technologies	Cloud Based data storage	Cloud Management Mechanisms: Remote Administration systems, SLA Management System	Cloud Applications and New Opportunity
SLO 4-6	Lab 1: Create a virtual machine	Lab 4: Create a drop box using Google APPs	Lab 7: Security mechanisms: Encryption: Hashing: Digital Signature	Lab 10: Create GAE Launcher	Lab 13: File: Create a Warehouse Application inn Salesforce.com
SLO-7	Origin of Cloud Computing	Operator precedence Type conversion	Security Risks and Best Practice, Security Cloud: CIA Concept	Platform as a Service, Evolution, Introduction, Service Providers	Advanced Cloud, Mobile Cloud, Green Cloud
SLO-8	Basic Concepts and Terminology	Hardware and Infrastructure, Client network	Types of Security Attacks	Service Quality Metrics, SLA Guidelines	Strategies for Resource Allocation
SLO-9	Goals and Benefits, Risks and Challenges	Web browsers, Cloud storage	Security Policy Implementation, Techniques to Secure Data	Software as a Services: Evolution, Advantages, Unification Technologies	Resource Allocation policies and Algorithms
SLO 10-12	Lab 2: Install virtual box	Lab 5: Transfer Data using Google APPs	Lab 8: Simple Experiments in Cloud Sim	Lab 11: Client Server communication between two virtual machine instances, execution of chat application	Lab 14: Create a Warehouse Application in Salesforce.com using Apex proLang
SLO-13	Download Linux	Cloud Storage Provider	Cloud Encryption, Symmetric Encryption	Integrated Products, Product Selection Criteria	Performance-based RAS, Importance of Cloud Computing
SLO-14	How to install Virtual box	Infrastructure services	Cloud Computing Security Architecture	Infrastructure as a Service: Architecture	Performance-based RAS, Importance of Cloud Computing
SLO-15	Install Linux using Virtual box	Client services	Cloud Security Alliance	IaaS Provider	Cost based RAS
SLO 16-18	Lab 3: Installing C environment	Lab 6: Arrays – upload and download using Google APPs	Lab 9: Encryption and Decryption of Text	Lab 12: Then run the communication between the terminals	Lab 15: Implementation of SOAP Web Services

Resources					
1	Thomas Erl, Zaigham Mahmood, RichardoPuttini, "Cloud Computing: Concepts, Technology& Architecture", Fourth Printing, Prentice Hall/PearsonPTR, 2014, ISBN: 780133387520.			3	K. Chandrasekaran, "Essentials of Cloud Computing", Chapman and Hall/CRC Press, 2014, ISBN 9781482205435.
2	ArshdeepBahga, Vijay Madiseti, "Cloud Computing: A Hands-On Approach", University Press, 2016, ISBN: 9780996025508.			4	Thomas Erl, Robert Cope, Amin Naserpour, "Cloud Computing Design P attens", Prentice Hall/Service Tech Press, Pearson, 2015, ISBN: 978-0133858563.

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) As

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	USC24601J	Course Title	Data Science using Python Programming				Category	D	Discipline Core / Elective Course	L	T	P	C
										3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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	Understand the techniques and processes of datascience																	
CLR-2	Learning and using the Python language's principles for datascience																	
CLR-3	Describe the core syntax and semantics of Pythonprogramminglanguage																	
CLR-4	Acquiring the concepts of user defined modules and packages in python																	
CLR-5	Understanding Matplotlib and Data Visualization for various applications																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of	Expected	Expected	Problem Solving	Critical Thinking	Creativity	Communication	Collaboration	Research Skills	Leadership	Learning to Learn	Entrepreneurship	Responsible
CLO-1	Learn the fundamentals of datascience and its methodologies	✓	✓	✓	✓	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Use built-in strings, lists,sets,tuples and dictionary in applications	✓	✓	✓	✓	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Implement the datascience concepts using python	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Apply powerful data manipulations using Pandas	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Explore the data using various visualization and Matplotlib	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Data science in a big data world, Benefits and uses of data science and big data	Learning Python in a Notebook Environment, Introduction to Notebooks	Data Science Libraries, NumPy	Interacting with DataFrame Data, Heads and Tails	Machine Learning Libraries, Popular Machine Learning Libraries
SLO-2	Facets of data, Structured data and Unstructured data	Running Python Statements, Jupyter Notebooks	Installing and Importing NumPy, Creating	Descriptive Statistics, Accessing Data	How Machine Learning Works, Transformations
SLO-3	Tutorial: Natural language and Machine- generated data, Graph-based or network data and Audio, image, and video, Streaming data	Tutorial: Google Colab, Colab Code Cells	Tutorial: Arrays, Indexing and Slicing	Tutorial: Bracket Syntax, Optimized Access by Label	Tutorial: Splitting Test and Training Data, Training and Testing
SLO-4-6	Practice: Perform Analysis on Simple Dataset I for Data Science	Practice: Execute python program in Notebook Environment	Practice: Manipulation of NumPy arrays- Indexing, Slicing, Reshaping, Joining and Splitting	Practice: Perform operations on Interactive Data Frames using Python	Practice: Perform data transformations using Scikit-learn
SLO-7	Overview of the data science process, defining research goals and creating a project charter	Fundamentals of Python, Basic Types in Python	SciPy, SciPy Overview	Pandas Boolean Operators, Manipulating DataFrames	Natural Language Toolkit
SLO-8	Retrieving data, Cleansing, integrating,	Performing Basic Math Operations,	The scipy. Misc Submodule, The scipy.	Manipulating Data, The replace Method	NLTK Tokenization, NLTK Stemming

	and transforming data	Sequences	special Submodule		
SLO-9	Tutorial: Combining data from different data sources, Transforming data	Tutorial: Shared Operations, List and Tuples	Tutorial: The scipy. statsSubmodule, Discrete Distributions	Tutorial: Interactive Display	Tutorial: NLTK Sample Texts, Frequency Distributions
SLO-10-12	Practice: Install Python IDE and perform basic python programs	Practice: List Methods for Inserting Elements	Practice: Perform SciPy operations	Practice: Manipulations on Data Frames using Python	Practice: Perform Text Processing using NLTK
SLO-13	Presenting findings and building applications on top of them, what is Data Analysis?	Other Data Structures, Dictionaries	Pandas	Visualization Libraries 1, matplotlib	Statistics Using Python, Illustrative Programs: Multiplying a Matrix by a Vector
SLO-14	Why Python for Data Analysis? Essential Python Libraries	Creating Dictionaries, Accessing, Adding, and Updating by Using Keys	About DataFrames	Styling Plots, Labeled Data	Illustrative Programs: Solving Linear System of Equations, Illustrative Programs: Using Pandas to Open CSV
SLO-15	Tutorial: Installation and Setup, Installing or Updating Python Packages	Tutorial: Removing Items from Dictionaries Dictionary Views Checking to See If a Dictionary Has a Key, Sets	Tutorial: Creating DataFrames, Creating a DataFrame from a Dictionary	Tutorial: Plotting Multiple Sets of Data, Object-Oriented Style	Tutorial: Illustrative Programs with Seaborn for data visualization, Illustrative Programs with Matplotlib for data visualization
SLO-16-18	Practice: Study of Basic Data Science Libraries in Python	Practice: Apply all basic python Dictionary and Sets	Practice: Implement Data Frame in Pandas	Practice: Import matplotlib and seaborn Explore a Sample Dataset with it	Practice: Implement Machine Learning using Python

Resources			
1	Cielen, D., &Meysman, A. (2016). Introducing Data Science, Manning Publications		3
2	“Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPy- thon”, O’Reilly, 2nd Edition,2018.		
			Frank Kane, Hands-On Data Science and Python Machine Learning _ Perform Data Mining and Machine Learning Efficiently Using Python and Spark, Packt Publishing., 2017 Wes McKinney

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
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Dr. J. JebamalarTamilselvi, SRMIST, RPM
					2 Dr V Saravanan, SRMIST, RPM

Course Code	UCS24P03L	Course Title	Project Work				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/Standard s	Nil
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CLR	The purpose of learning this course is to:	Depth				Attainment			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 knowledge learnt.																	
CLR-5	Applying the skills in problem solving																	
CLO	At the end of this course, learners will be able to:	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	Entrepreneurship, Autonomy, Accountability	Digital Technology Skills	Value Incultation, Multicultural inclusivity	Environmental Action, Community Engagement	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	To get an insight of an industry and organization/company	✓	✓	✓	✓	2	85	75	3	2	2	1	3	2	1	2	1	2
CLO-2	To gain valuable skills and knowledge	✓	✓	✓	✓	2	85	75	3	3	3	2	3	2	2	1	1	2
CLO-3	To make professional connections and enhance networking.	✓	✓	✓	✓	3	85	75	3	3	3	2	2	3	2	1	2	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	2	2	2	2	2	3
CLO-5	To get an inside view of an industry and organization/company	✓	✓	✓	✓	3	85	75	3	2	2	3	3	2	1	2	2	3

Students can choose problems of their own interest to develop software package using the programming languages/tools available. There will be two reviews conducted during the project period for all the students. At the end of the project, every student shall submit a structured project report and will take a Viva Voce examination.

Assessment Component	Expected outcome	Type	Evaluators	Criteria or basis	Marks
Review – 0 Internship	Internship letter Submission Proposed Project title to be described. Abstract of the project.	Internal	Supervisor / Guide & Project Coordinator	Feasibility Study of the project	5
Review – I Project Proposal	A short presentation about the Problem statement Literature Survey System Architecture Design Specifications	Internal	Supervisor/Guide	Clarity of the idea, Preliminary work done	10
Review – II	Presentation on Techniques, Model/Algorithm, Modules, coding Prototype of the project	Internal	Supervisor/Guide	Clarity of idea, Presentation	10
Review – III	Final presentation, Demonstration of Project.	Internal	Supervisor/Guide	Technical demonstration, Presentation	10
Report Submission	Submission of final project report	Internal	Supervisor/Guide/Project Coordinator	Regularity, Originality, Systematic progress	15
Project Report	Evaluation of Project Report	External	Examiner(s)/ Reviewer(s)	Presentation, Handling Q&A	30
Viva – Voce	Final Presentation	External	Examiner(s)/ Reviewer(s)	Presentation, Handling Q&A	20

The assessment method for the project work consists of in-semester and end semester evaluations as detailed below:

Assessment							
Project Work	Continuous Learning Assessment (CLA) (50% weightage)					Final Evaluation (50% weightage)	
	Review-0	Review-1	Review-2	Review-3	Report Submission	Project Report	Viva-Voce*
	5%	10%	10%	10%	15%	30 %	20 %

*Student has to be present for the viva voce for assessment. Otherwise, it will be treated as non-appearance for the examination with final grade as ‘Ab’

Course Code	UCD24V02T	Course Title	Universal Human Values					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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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	Help the students to understand need of value education, appreciate the essential complementarity between 'values' and 'skills' and to ensure sustained happiness and prosperity which are the core aspirations of all human beings,	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Help students initiate a process of dialog within themselves to know what they really want to be' in their life and profession.	Conceive	Design	Implement	Operate	Bloom's Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Thinking, Creativity	Communication Skills, Collaborating Skills	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	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.																	
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	✓	✓	-	-	2	85	75	-	1	1	2	-	3	2	-	-	-
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.	✓	✓	✓	-	2	85	75	-	-	1	2	-	3	2	-	-	-
CLO-3	Analyze the value of harmonious relationship based on trust and respect in their life and profession	✓	✓	✓	✓	3	85	75	-	1	1	2	-	3	2	-	-	-
CLO-4	Examine the role of a human being in ensuring harmony in society and nature.	✓	✓	✓	✓	3	85	75	-	-	1	2	-	3	2	-	-	-
CLO-5	Apply the understanding of ethical conduct to formulate the strategy for ethical life and profession.	✓	✓	✓	✓	3	85	75	-	-	1	2	-	3	2	-	-	-

Sessions	CLO 1	CLO 2	CLO 3	CLO 4	CLO 5
	6	6	6	6	6
SLO-1	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
SLO-2	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
SLO-3	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
SLO 4	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
SLO-5	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
SLO-6	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

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.	3	A Nagraj, 1998, Jeevan Vidya EkParichay, Divya Path Sansthan, Amarkantak.	
2	E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond & Briggs, Britain.	4	A N Tripathy, 2003, Human Values, New Age International Publishers.	

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	
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	Prof. Rajiv Kumar, Member Secretary, NCC-IP as member at AICTE	1	Mrs. V Sumathi, Associate Professor, Sri Sairam Engineering College, Chennai, Tamil Nadu	1	Dr. Supraja P, UHV University Coordinator, SRMIST
				2	Dr. Deepalakshmi S, HoD, Department of Career Guidance Cell, FSH, SRMIST
				3	Dr. Sweetly Bakyarani E, Department of Computer Science, FSH, SRMIST

SEMESTER – VII

Course Code	USC24D05J	Course Title	E - Commerce, Digital Payments and Security				Category	D	Discipline Core / Elective Course				L	T	P	C
													3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	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 the shifts that are occurring with regard to online payments	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand the major types of mobile payments.	Conceive Design Implement Operate	Level of Thinking Expected Proficiency Expected Attainment	Problem Solving, Communication Independent Thinking, Leadership Qualities, Digital Technology Value Incultation, Environmental Action, Entrepreneurial Risk PSO-1 PSO-2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CLR-3	Payment Revolution Critical factors that come into play in determining whether a particular method of e- payment achieves critical mass																	
CLR-4	The use of firewalls, antivirus software, and other security measures																	
CLR-5	Digital Payments and Security also important to understand the different types of data that need to be protected,																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Protect and defend computer systems and networks from Digital Payments and Security attacks	✓	✓	✓	✓	2	85	80	3	3	3	3	3	3	3	3	3	3
CLO-2	Diagnose and investigate Digital Payments and Security events or crimes related to computer systems and digital evidence	✓	✓	✓	✓	3	85	80	1	3	3	3	3	3	3	3	3	3
CLO-3	Effectively communicate in a professional setting to address information security issues.	✓	✓	✓	✓	3	85	80	1	3	3	3	3	3	3	3	3	3
CLO-4	Characterize privacy, legal and ethical issues of information security and Identify vulnerabilities critical of the informationas sets of an organization	✓	✓	✓	✓	3	85	80	1	3	3	3	3	3	3	3	3	3
CLO-5	Propose solutions including development, modification and execution of incident response plans	✓	✓	✓	✓	3	85	80	1	3	3	3	3	3	3	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	E-commerce and its Technological Aspects, Defining E-Commerce	Consumer Oriented E-Commerce, E-Retailing	Electronic Payment System, Overview of E-payment system	Electronic Data Interchange, Benefits of EDI	Issues in E-Commerce, Understanding Ethical
SLO-2	Overview of developments in Information Technology	Traditional retailing, Benefits of E-Retailing	Digital cash, properties, electronic check & benefits	EDI technology, EDI standards	Social issues in E-Commerce, Political issues in E-Commerce
SLO-3	Tutorial: The scope of Ecommerce, ElectronicMarket	Tutorial: Key success factors, Models of E-Retailing	Tutorial: Online creditcard system, Types of creditcard payments	Tutorial: EDI communications, EDI Implementation	Tutorial: A model for Organizing the issues, Organizational issues

SLO-4 - 6	Practice: ERP Introduction	Practice: Potential benefits of ERP	Practice: Major challenges Major challenges	Practice: To implement Validation TechniqueusingPHP	Practice: To implement Session Management.
SLO-7	Electronic Data Interchange, Internet Commerce	Features of E-Retailing, E-services	Debitcard & Point of scale (POS), Debitcard& E-benefit transfer	EDI Agreements, EDI Security	Marketing issues, Implementation issues
SLO-8	Benefits of E-Commerce, Limitations of E-Commerce	Categories of e-services, Web-enabled services	Secure electronic transactions, Electronic fund transfer	Security in ECommerce	Basic Ethical Concepts, Analyzing Ethical Dilemmas
SLO-9	Tutorial: Produce a generic framework for E-Commerce	Tutorial: Match making services	Tutorial: Need of Electronic Payment System	Tutorial: Threats in Computer Systems: Virus	Tutorial: Candidate Ethical principles Privacy and Information Rights
SLO10 - 12	Practice: Graphical View	Practice: ERP implementation approaches	Practice: Case Study of E-Commerce.	Practice: To implement Catalog Design	Practice: To study Hadoop Clusters on Ubuntu.
SLO-13	Architectural framework of Electronic Commerce	Information-selling on the web	Study and exam in the use of Electronic Payment system	Cyber Crime Network Security	Information collected at E-Commerce Websites
SLO-14	Webbased E-Commerce Architecture.	entertainment	Study Electronic Fund Transfer	Encryption	The Concept of Privacy
SLO-15	Tutorial: Brief history of Ecommerce	Tutorial: Auctions and other specialized services	Tutorial: Secure electronic transaction protocol for credit card payment.	Tutorial: Protecting Web server with a Firewall	Tutorial: Legal protections Intellectual Property Rights
SLO – 16 - 18	Practice: Example of ERP for student database	Practice: Major phases of ERP implementation	Practice: Home page Design of Website	Practice: To implement Access Control Mechanism.	Practice: Case Study on Business Models of PayPal.com

Resources					
1	Elias.M. Awad, "Electronic Commerce", Prentice-Hall of India Pvt Ltd	3	Ravi Kalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley		
2	Efraim Turban, Jae Lee, David King, H. Michael Chung, "Electronic Commerce-A Managerial Perspective", Addison-Wesley.	4	Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3 rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3 rd Edition, Pearson Education.		

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%)			
		Theor y (%)	Practice (%)	Theor y (%)	Practice (%)	Theor y (%)	Practice (%)	Theor y (%)	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	
1	Mr. Navarathinamani P, Co-Founder/COO Datayaan Solutions Pvt. Ltd. Chennai	1	Dr. Neelananarayanan, Professor, School of Computer Science and Engineering, VIT Chennai

Course Code		USC24D06J	Course Title	Cyber Security of Digital Devices				Category	D	Discipline Core Elective Courses				L	T	P	C									
														3	0	3	4									
Course Offering Department		Computer Science in specialization with Cyber Security	Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil		Data Book / Codes/Standards		Nil														
Rationale (CLR)		The purpose of learning this course is to:								Depth		Attainment		PLO												
CLR-1	Cyber security is an important part of any organization's operations.								1	2	3	4	1	2	3	4	5	6	7	8	9	10				
CLR-2	Cyber security is abroad field that covers a wide range of topics, from network security to application																									
CLR-3	The main objective of cybersecurity is to protect organizations from cyberthreats and ensure the confidentiality, integrity, and availabilityof																									
CLR-4	The use of firewalls, antivirus software, and other security measures																									
CLR-5	Cyber security also important to understand the different types of data that need to be protected,																									
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,	Communication	Independent Thinking,	Leadership Qualities,	Digital Technology	Value Incultation,	Environmental Action,	Entrepreneurial Risk	PSO-1	PSO-2
CLO-1	Protect and defend computer system sand networks from cybersecurity attacks								✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1	
CLO-2	Diagnose and investigate cybersecurity events or crimes related to computer systems and digital evidence								✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1	
CLO-3	Effectively communicate in a professional setting to address information security issues.								✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2	
CLO-4	Characterize privacy, legal and ethical issues of information security and identify vulnerabilities critical to the information assets of an organization								✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3	
CLO-5	Propose solutions including development, modification and execution of incident response plans								✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3	

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to Cybersecurity, Defining Cyberspace	Cybercrime and Cyberlaw, Classification of cybercrimes	Social Media Overview and Security, Introduction to Social networks	E-Commerce and Digital Payments, Definition of E-Commerce	Digital Devices security Tools, Tools for Cyber Security End Point device
SLO-2	Overview of Computer, Web-technology	Common cybercrimes, Cybercrime targeting computers	Types of social media, social media platforms	Main components of E-Commerce, Elements of E-Commerce security	Technologies for Cyber Security End Point device, Mobile phone security
SLO-3	Tutorial: Architecture of cyberspace, Communication and web technology	Tutorial: Cybercrime targeting mobiles, Cybercrime against women and children	Tutorial: Social media monitoring, Hashtag	Tutorial: E-Commerce threats, E-Commerce security best practices	Tutorial: Password policy, Security patch management
SLO-4 - 6	Practice: Installation and Demonstration of Wireshark	Practice: Capturing packets using Wireshark Network Analyzer tool.	Practice: Installation and demonstration of Tsharktool.	Practice: Capture packets and Perform various operations using	Practice: Encrypt the data using Tsharktool.

	Network Analyzertool.			Tsharktool.	
SLO-7	Internet, Worldwideweb	Financial frauds, social engineering attacks	Viral content, Socialmedia marketing	Introduction to digital payments, Components of digital payment	Data backup, Downloading of third party software
SLO-8	Adven to fininternet, Internet infrastructure	Malware attacks, Ransomware attacks	Socialmedia privacy, Challenges	Components of digital stakeholders, Modes of digital payments	Management of third party software, Device security policy
SLO-9	Tutorial: data transfer and governance, Internet society	Tutorial: zero day and zero click attacks, Cyber criminal's modus-operandi	Tutorial: Opportunities in online social Network, Pitfalls in online social network	Tutorial: Banking Cards, Unified Payment Interface (UPI)	Tutorial: Cyber Security bestpractices, Significance of host firewall
SLO-10 - 12	Practice: To demonstrate the use of Wire shark network analyzer	Practice: Applying filters using Wireshark Network Analyzer tool.	Practice: Find network devices available using Tsharktool.	Practice: Perform TCP handshakeusingTshark.	Practice: Tracing the Network traffic using Tsharktool.
SLO-13	Regulation of cyberspace, Concep to fcybersecurity	Reporting of cybercrimes, Remedial measures	Security issues related to socialmedia, Flagging of in appropriate content	e-Wallets, Unstructured Supplementary Service Data (USSD)	Significance of host Ant-virus
SLO-14	Issues of cybersecurity, challenges of cybersecurity	Mitigation measures, Legal perspective of cybercrime	Reporting of inappropriate content, Laws regarding posting of Inappropriate content	Aadhar enabled payments, Digital payments related common Frauds	Management of host firewall
SLO-15	Tutorial: Cyber security terminologies, CyberSecurity of Digital Devices	Tutorial: IT Act2000 and its amendments Cybercrime and offences	Tutorial: Best practices for the use of Socialmedia, Darknet and Socialmedia	Tutorial: Digital payments related preventive measures, RBI guidelines on digital payments	Tutorial: Management of host Anti-virus, Wi-Fisecurity
SLO-16 - 18	Practice: To demonstrate the use of Wire shark network analyzer	Practice: Building TCP Streams using Wireshark Network Analyzer tool.	Practice: Installation and demonstration of Wireshark Network Analyzer tool	Practice: Installation and demonstration of Wireshark Network Analyzer tool	Practice: Network TroubleShooting using Tsharktool,

Resources					
1	Digital Devices Security Tools and Technologies for Cyber Security, Empowering cyber security by LAP Lamber Academic Publishing.			2	Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC 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

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.N. Revathi, SRM – IST Ramapuram Campus, revathin3@srmist.edu.in

Course Code	USC24D07J	Course Title	Cyber Security Plan and Crisis Management	Category	D	Discipline Core / Elective Courses	L	T	P	C
							3	0	3	4

Course Offering Department	Computer Science in specialization with Cyber Security	Pre-requisite Courses	Cyber Security	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	Present an overview of the Standard of Good Practice for Information Security	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Explain the concept of security governance and how it differs from																	
CLR-3	Outline the idea of security during cybercrisis																	
CLR-4	Understand the Cyber risks in an organization																	
CLR-5	Understand the various techniques to communicate and manage a cybercrisis																	
CLO	At the end of this course, learners will be able to:																	
CLO-1	Explain the value of the Center for Internet Security (CIS) Critical Security Controls	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Explain the roles and responsibilities that are part of security governance.	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Analyze the causes for crisis in an organization and communicates with	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Find the crisis may happen during normal operations	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Understand the crisis management plan	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Session	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Defining Cyberspace, Defining Cybersecurity	Information security governance, Security Governance and Security Management	Human factors in the management of cyber crisis, Cyber crisis response	Reaction at tactical operational level, Restart of process and IT system	Cyber crisis prevention, Starting with an analogy-danger recognized
SLO-2	The Value of Standards and Best Practices Documents, The Standard of Good Practice for Information Security-The ISO/IEC 27000 Suite of	Security Governance Principles and Desired Outcomes, Desired Outcomes	Response at strategy level, Response at strategy level	Restart critical business process, Restart IT system and data	Stake holder and issue Management, Risk communications and its pitfalls

	Information Security				
SLO-3	Tutorial: NIST Cybersecurity Framework and Security Documents-NIST Cybersecurity Framework, The CIS Critical Security Controls for Effective Cyber Defence	Tutorial: Security Governance Components, Organizational Structure	Tutorial: Crisis communication, Rule of thumb for crisis communication	Tutorial: Cyber security incident response, Cybersecurity incident response procedure	Tutorial: Assets management and structural analysis, Information and IT security management
SLO-4-6	Practice: Lab1: case Study for Payment Card Industry Data Security Standard (PCIDSS)	Practice: Lab4: Prepare password policy for computer and mobile device.	Practice: Lab 7: List out security controls for computer and implement technical security controls in the personal computer.	Practice: Lab10: Creating Incident Response Plan	Practice: Lab13: Practice with simulation tools for cybersecurity
SLO-7	Risk Assessment for User Authentication-Authenticator Assurance Levels, Selecting an AAL	Role sand Responsibilities, Integration with Enterprise Architecture	WQuestions of Cybercrisis communication	Rules of thumb for Cyber Security incident response, Cyber crisis preparation	Cyber risk management, Preliminary work
SLO-8	Choosing an Authentication Method, Access Control-various access control methods	Security Governance Approach, Security Direction	From Bloggers, youtuber sand journalists, Strategies inacute cybercrisis	The rescue team-CMT, The organizational framework for CMT-meaning of CMT	Risk assessment
SLO-9	Tutorial: Customer Access, SystemAccessBestPractices	Tutorial: Responsible, Accountable, Consulted, and Informed (RACI) Charts,	Tutorial: Victim care above all, Attack is the best defence	Tutorial: Who would be a member of CMT, Situation centre	Tutorial: Risk treatment, Acceptanceofrisks
SLO-10-12	Practice: Lab2 Simple program for User authentication-	Practice: Lab5: List out security controls for mobile phone and implement technical security controls in the personal mobile phone	Practice: Lab8: Prepare password policy for computer and mobiledevice.	Practice: Lab 11: Practice of simplehacking codes in python or any other programming language	Practice: Lab14: Preparation of Cyber Crisis Management Plan of the Bank
SLO-13	Cloud Security - Security Considerations for CloudComputing,	Security Governance BestPractices, Security governance components	Strategies inacute cybercrisis, We ourselves are also victims	Communications staff-Emergency bodies, Infrastructure tools	Audits, Post crisis followup
SLO-14	Risk Evaluation, APPLICATION SECURITY	Information Risk Assessment-Risk Assessment Concepts, Risk Assessment Challenges	Putting the cards on the table, Getting out of the line of fire	Logistics ensure sustainability, Preparing for crisis communications	Humanfactor – altering and Escalation, Interaction between the levels of emergency and crisis organization
SLO-15	Tutorial: Best Practices, Cloud Service Agreement	Tutorial: Risk Management, ISO27005, Information Security Risk Management-Asset Identification-Threat Identification	Tutorial: Swapping in ascape goat for an identification figure, when wear eblack mailed	Tutorial: Training sand exercises, create conditions for continuation of business operations-creating a framework for cyber security incidence response	Tutorial: Strategiclevel-operationallevel-technicallevel-crisis communication, Seven deadly sins of crisis management

SLO-16-18	Practice: Lab 3: Program for biometric authentication	Practice: Lab6: Case study submission for: Verizon Data Breach Investigations Report, Trustwave Global Security Report-ENISA	Practice: Lab9: How Microsoft identifies malware and potentially unwanted applications	Practice: Lab12: DDoS attacks imulation and prevention	Practice: Lab 15: Comparison of Cybercrisis recoveries followed in IT industries
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Resources					
1	Effective Cybersecurity Understanding and Using Standard sand Best Practices, William Stallings, Addison Wesley (Units-1and2)	2	Cyber Crisis Management- The Practical Handbook on Crisis Management and Crisis Communication-Holger Kaschner -Springer-2021 (Units 3-4-5).		

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%)			
		Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	Theor y (%)	Practic e (%)	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	
1	Mr. S. Karthik, IT Analyst, Tata Consultancy Services		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT, Chennai
2			2	Dr.J. Dhilipan, SRMIST, RPM

Course Code	USC24D08J	Course Title	Cyber Crimes	Category	D	Discipline Core / Elective Coruses	L 3	T 0	P 3	C 4
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Course Offering Department	Computer Science in specialization with Cyber Security	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			PLO									
		1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-1	Understand the evolution of Cybercrime and Information Security																	
CLR-2	Understand the Cyber Offenses: How Criminals Plan for Cyber Attacks																	
CLR-3	Understand the Cybercrime: Mobile and Wireless Devices																	
CLR-4	Understand the Tools and Methods used in Cybercrime																	
CLR-5	Understand the various methods and techniques of Phishing and Identity Theft																	
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	Communication Skills	Independent Thinking	Leadership Qualities	Digital Technology	Value Incultation	Environmental Action	Entrepreneurial Risk	PSO-1	PSO-2
CLO-1	Acquire the basics of Cybercrime and Information Security	✓	✓	-	-	2	85	75	1	-	-	-	1	-	1	-	-	-
CLO-2	Acquire the knowledge of various Cybercrime Attacks, Social Engineering and Cloud Computing	✓	✓	✓	-	2	85	75	1	-	-	-	2	-	1	-	-	-
CLO-3	Get the information about Cybercrime: Mobile and Wireless Devices	✓	✓	✓	✓	3	85	75	2	2	3	3	3	-	-	2	2	-
CLO-4	Find the Tools and Methods used in Cybercrime	✓	✓	✓	✓	3	85	75	2	2	3	3	3	-	-	-	2	-
CLO-5	Understand the Phishing and Identity Theft	✓	✓	✓	✓	3	85	75	1	2	3	3	3	-	2	-	2	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	18	18	18	18	18
SLO-1	Introduction to Cybercrime, Cybercrime: Definition and Origins of the World	Cyber Offenses: How Criminals Plan Them, Categories of Cybercrime	Cybercrime: Mobile and Wireless Devices, Proliferation of Mobile and Wireless Devices	Tools and Methods used in Cybercrime, Proxy Servers and Anonymizers	Phishing and Identity Theft, Methods of Phishing
SLO-2	Cybercrime and Information Security, Who are Cybercriminals?	How Criminals Plan the Attacks? Reconnaissance	Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era	Phishing and How it works? Password Cracking	Phishing Techniques, Spear Phishing
SLO-3	Tutorial: Classification of Cybercrimes, E-Mail Spoofing	Tutorial: Passive Attacks, Active Attacks	Tutorial: Types and Techniques of Credit Card Frauds, Security Challenges Posed by Mobile Devices	Tutorial: Online Attacks and Offline Attacks, Strong, Weak and Random Passwords	Tutorial: Types of Phishing Scams, Phishing Toolkits and Spy Phishing

SLO-4-6	Practice: Lab 1: Case Study on various Cybercrime Tools and Usage	Practice: Lab4: How to File a Complaint on National Cyber Crime Reporting Portal	Practice: Lab7: How to make the forensic image of the hard drive using En Case Forensics.	Practice: Lab10: Bitlevel Forensic Analysis of evidential image using FTK, Encase and ProDiscover Tools.	Practice: Lab 13: Live Forensics Case Investigation using Autops
SLO-7	Internet Time Theft, Salami Attack/Salami Technique	Social Engineering, Classification of Social Engineering	Cryptographic Security for Mobile Devices, LDAP Security for Hand held Mobile Computing Devices	Antikeylogger, Spywares	Personally Identifiable Information (PII), Types of Identity Theft
SLO-8	Data Diddling, Forgery, Web Jacking	Cyberstalking, Types of Stalkers	RAS Security for Mobile Devices, Media Player Control Security	Virus and Worms, Types of Viruses	Techniques of ID Theft, Identity Theft: Counter measures
SLO-9	Tutorial: Newsgroup Spam/Crimes Emanating from Use net Newsgroup, Industrial Spying/IndustrialEspionage	Tutorial: Cases Reported on Cyberstalking, How Stalking Works?	Tutorial: Networking API Security for Mobile Devices, Attacks on MobilePhone	Tutorial: Trojan Horses and Backdoors, How to Protect from Trojan Horses and Backdoors	Tutorial: How to Efface Your Online Identity, Cyber crime and Cyber security: The Legal Perspectives
SLO-10-12	Practice: Lab2: Performing a check on Spam mail and non-Spam mail	Practice: Lab5: Report Crime related to Women/Child	Practice: Lab8: How to Restoring the Evidence Image using En Case Forensics	Practice: Lab11: Hash code generation, comparison of files using tools like Hash Calc etc.	Practice: Lab 14: Analysis different SocialMedia Cybercrime
SLO-13	Pornographic Offenses, Software Piracy	Botnets: The Fuel of Cybercrime, Botnet	Mishing, Vishing, Smishing, Hacking Bluetooth	Classification of DoS Attacks, Levels of DoS Attacks	Why do we need Cyberlaws: The Indian Context, The Indian IT Act
SLO-14	Computer Sabotage, E-Mail Bombing/Mail Bombs	Attack Vector, Cloud Computing	Mobile Devices: Security Implications for Organizations, Managing Diversity and Proliferation of Hand-held Device	Tools used to Launch DoS Attack, How to Protect from DoS and DDoS Attack	Positive Aspects of the ITA 2000, Weak Areas of the ITA2000
SLO-15	Tutorial: Usenet Newsgroup as the Source of Cybercrimes, Computer Network Intrusions	Tutorial: Why Cloud Computing? Types of Services	Tutorial: Unconventional/ Steal the Storage Devices, Threats through Lost and Stolen Device	Tutorial: SQL Injection: Steps for SQL Injection Attack, How to Prevent SQL Injection Attacks	Tutorial: Challenges to Indian Law and Cybercrime Scenario in India, Digital Signatures and Indian IT Act
SLO-16-18	Practice: Lab3: Case Study on Banking frauds. What type of information would be considered as evidence while filing my complaint related to cybercrime?	Practice: Lab6: How to use Online Cybercrime Tools: Kali Linux, Ophcrack, EnCase, Data dumper and Md5sum	Practice: Lab9: How to Collect Email Evidence in Victim PC? How to Extracting Browser Artifacts	Practice: Lab12: Study Online Scams: Cheque Cashing Scam, Bomb Scam, Charity Scam, Malware Scam, Rent Scam, Fake Job Offers Scam	Practice: Lab15: Case Study on various Cybercrime Law and Punishments in India

Resources

- 1 | Nina Godbole and Sunit Belapore, "CyberSecurity: Understanding CyberCrimes, Computer Forensics and Legal Perspectives", Wiley Publications, 2011.

[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, ITAnalyst, Tata Consultancy Services		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 DrJDhilipan, SRMIST, RPMDr (Mrs). K, Sutha, SRMIST, RPM

Code	UCS24D13J	Course Title	Big Data Analytics	Category	D	Discipline Core / Elective Courses	L	T	P	C
							3	0	2	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	Understand the evolution of computer networks using the layered network architecture																	
CLR-2	Understand the addressing concepts and learn networks devices																	
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																	
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, Analytical	Leadership Qualities,	Digital Technology Skills	Value Incultation, Multicultural	Environmental Action, Community	Entrepreneurial Risk Taking	PSO-1	PSO-2
CLO-1	Acquire the basics of computer network and its architecture	✓	✓	-	-	2	85	75	-	-	1	-	3	-	2	2	1	
CLO-2	Acquire the knowledge of various networks devices and addressing methods	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Design the network routing methods	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Find the error type that may happen during data transportation	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Understand the physical layer functions and components	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	15	15	15	15	15
SLO-1	Introduction to Big Data platform	Null and Alternative Hypotheses. Type-I and Type-II ErrorCriticalRegion and Level of Significance	History of Hadoop, The Hadoop Distributed File System	Setting up a Hadoop Cluster - Cluster specification -	Applications on Big Data
SLO-2	Challenges of Conventional Systems	One tailed and two tailed tests, Critical values of significant values	Components of Hadoop	Cluster Setup Installation	Data processing operators in Pig
SLO-3	Intelligent data Analysis	Tutorial: Tests of Significance for Large Samples	Analyzing the Data with Hadoop	Cluster Installation	Hive QL, Tables
SLO-4&5	Practice 1: Practice elementary mathematical operations and control statements	Practice 4: Creating Various types of plot/charts from various data source	Practice 7: Implementation of Linear regression with multiple regression	Practice 10: Implementation of classifier problem	Practice 13: Implementation of decision tree
SLO-6	Nature of data	Test of Significance for Single Proportion	Scaling Out- Hadoop Streaming	Hadoop Configuration	Structure of Hbase
SLO-7	Analytic process and tools, Analysis Vs Reporting,	Test of Significance for Difference of Proportions, Test of Significance for Single Mean,	Java interfaces to HDFS	Security in Hadoop	Hbase QL
SLO-8	Modern Data analytic tools	Chi-Square Distribution	How Map Reduce Works	Administering Hadoop	Comparing base with Relational Database
SLO-9&10	Practice 2: Operations on Matrices and Vector	Practice 5: Create subplots and color plots	Practice 8: Implementation of Data preprocessing methods, Correlation matrix	Practice 11: Implementation of K-Mean Clustering	Practice 14: Implementation of Random Forest
SLO-11	Parameter and Statistic, Sampling Distribution	Test of Significance for Difference of Means. To test the goodness of fit- To test the independence of Attributes. Student's "t" - "t" Distribution- To test for Single Mean- To test for Difference of Means	Anatomy of a Map Reduce Job run - Failures	Administering Hadoop - HDFS	Structure of Zoo Keeper
SLO-12	Meaning-Standard Error and its uses.	F-Distribution- Definition- To Test for Equality of Two Population variances.	Job scheduling shuffle and sort - Task Execution –Map read and Map write anatomy	Monitoring	The Zoo keeper services
SLO-13	Tests of Significance	Meaning of Resampling and its uses, Prediction Error and its uses.	Map reduce features	Maintenance	Zoo keeper Case study
SLO-14&15	Practice 3: Vectorized operation on simple matrix operations	Practice 6: Implement Linear regression problem	Practice 9: Implementation of spam and non-spam classification problem.	Practice12: Implementation of K-Mean Clustering	Practice 15: Implementation of CART

Resources											
1	Michael Berthold, David J. Hand, (2007), “Intelligent Data Analysis”, Springer.						4	RSN Pillai, Bagavathi, “Statistics Theory and Practice”, S. Chand			
2	Tom White (2012), “Hadoop: The Definitive Guide” Third Edition, O’reilly Media						5	Anand Rajaraman and Jeffrey David Ullman, (2012) “Mining of Massive Datasets”, Cambridge University Press.			
3	Viktor Mayer, Schonberger, Kenneth Cukier, “Big Data: A Revolution That Will Transform How We Live, Work and Think”										

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%)			
		Theo ry (%)	Practi ce (%)	Theo ry (%)	Practi ce (%)	Theo ry (%)	Practi ce (%)	Theo ry (%)	Practi ce (%)	Theory (%)	Practice (%)
1	Rememb er	15	15	15	15	10	10	10	10	15	15
2	Understa nd	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, VITChennai	1	Dr.T. Nathiya, Assistant Professor, FSH, SRMIST

Course Code	UCS24D14J	Course Title	Cryptography and Network Security				Category	D	Disciplinary Core/ Elective Course	L	T	P	C
										3	0	2	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									
CLR-1	Understand cryptography basics, algorithms and mathematical background for cryptography.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Analyze the important cryptographic algorithms																	
CLR-3	Understand the Basic knowledge of Networksecurity.																	
CLR-4	Understand the various IPSECURITY concepts.																	
CLR-5	To impart knowledge on Advanced Encryption Standard																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Communication Skills, Collaborative Skills, Problem Solving, Critical Thinking, Independent Thinking, Leadership Qualities, Digital Technology Skills, Value Incultation, Environmental Action, Entrepreneurial Risk Taking, PSO-1, PSO-2									
CLO-1	Understand the Overview of Cryptography	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	-	-
CLO-2	Do research in the emerging areas of cryptography and network security.	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	-	-
CLO-3	Implement various Network Security Algorithm.	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	-	-
CLO-4	Gain knowledge on IP Security Architecture	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	-	-
CLO-5	Understand the Overview on System Security	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	-	-

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	15	15	15	15	15
SLO-1	Overview on Symmetric Cipher Model	Overview on Block ciphers and the data encryption standard	Basic knowledge of Network security – Authentication Application	IP Security Overview	Overview on System Security
SLO-2	Overview on Classical Encryption Techniques	Block Cipher Principles	Kerberos	IP Security Architecture	Intruders
SLO-3	Brief on Symmetric Cipher Model	The Data Encryption Standard	Kerberos Authentication Service	Authentication Header	Intrusion Detection

SLO 4&5	Laboratory: Perform encryption, decryption using the following substitution techniques i) Ceaser cipher	Laboratory VigenereCiphers	Laboratory: Apply DES algorithm for practical applications	Laboratory: Implement the SIGNATURE SCHEME-Digital Signature Standard.	Laboratory: Apply AES algorithm for practical applications
SLO-6	Techniques involved in-Cryptography	Describe the procedure of DES Encryption	Overview on Electronic Mail Security	Encapsulating Security Payload	Password Management
SLO-7	Techniques involved in-Crypt analysis	Describe the procedure of DES Decryption	Operational Description	Combining Security Associations	Discuss on Malicious Software
SLO-8	Substitution Techniques-Caesar Cipher	The strength of DES	Cryptographic Keys and Key Rings	KeyManagement	Viruses and Related Threats
SLO 9&10	Laboratory: play fair cipher	Laboratory: Perform encryption and decryption using following transposition techniques. Rail fence	Laboratory: Example on DES	Laboratory1: Apply RSA algorithm for practical Applications.	Laboratory: Apply password management
SLO-11	Mon alphabetic Ciphers Play fair Cipher	Differential and Linear Crypt analysis	Public-Key Management	Overview on WebSecurity	Virus Counter measures
SLO-12	Hill Cipher Polyalphabetic Ciphers	Block Cipher Design Principles	S/MIME (Secure/Multipurpose Internet Mail Extension)	WebSecurity Considerations	Overview on Firewall
SLO-13	Overview of Transposition Techniques	Principles of Public-Key Crypto systems	S/MIME Functionality	Secure Socket Layer and Transport Layer Security	Firewall Design Principles
SLO 4&15	Laboratory: Hill cypher	Laboratory: Block cypher	Laboratory8: Example on AES	Laboratory: Web security analysis	Laboratory: Check firewall management

Resources				
1	AndersonB.H., DursatonandPoole, M: Thesisand assignmentwriting, WileyEastern 1997	4	Walpole, R.A., Myers, R.H., Myers, S.L. andYe, King: Probability and Statistics for Engineers and Scientists, Pearson Prentice Hall, Pearson EducationInc.,2012	
2	Bordens, K.S. andAbbott, B.B: ResearchdesignandMethods, McGrawHill,2008	5	Kothari, C.K. [2004],2. e, Research Methodology-Methods and Technique3s [New Age International, New Delhi]	
3	Leedy, P.: PracticalResearch-Planninganddesign, NinthEdition, Pearson, 2010			

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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai					1	Dr. Neela Narayanan V, Professor, VIT chennai					1	Dr.D. Elangovan Assistant Professor, FSH, SRMIST				

SEMESTER – VIII

Course Code	USA24D20J	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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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
CLR-1	Grasp the core principles of blockchain technology, including distributed ledger systems, decentralization, consensus mechanisms, and cryptography	1	2	3	4	1	2	3	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.	Conceive	Design	Implement	Operate	Level of Thinking	Expected	Expected	Problem Solving	Communication	Independent	Leadership	Digital Technology	Value Incultation,	Environmental	Entrepreneurial Risk	PSO-1	PSO-2
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																	
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: Creating ERC20 token	Practice: Java Code to implement peer-	Practice: Creating and Building Up	Practice: Creating a Business Network

			to-peer using block chain	Crypto Token	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 (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			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	Mr. S. Karthik, IT Analyst, Tata Consultancy Services	1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai
		1	Dr.K. Sutha, SRMIST, suthak@srmist.edu.in

Course Code	UCS24D18T	Course Title	Introduction to Cyber Physical Systems				Category	D	Discipline Core / Elective Courses	L	T	P	C
										4	0	0	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									
CLR-1	Obtain Physical Cyber Systems fundamentals and principles knowledge as building blocks to promote further design and implementation of more complex real time systems.	1	2	3	4	1	2	3	1	2	3	4	5	6	7	8	9	10
CLR-2	Understand Physical Cyber Systems design for synchronous model with specific case study for arm processor.	Conceive Design Implement Operate				Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Communication Skills, Independent Thinking, Leadership Qualities, Digital Technology Skills	Value Inculcation, Environmental Action, Entrepreneurial Risk	PSO-1	PSO-2						
CLR-3	Understand the necessity of Cyber physical systems to have optimal performance of asynchronous model																	
CLR-4	Comprehend the physical cyber systems design and implementation in dynamic models																	
CLR-5	Hybridization of Cyber physical systems which will help the students to anticipate upcoming technologies																	
CLO	At the end of this course, learners will be able to																	
CLO-1	Understand the Basics of Physical system	✓	✓	-	-	2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-2	Design synchronous models for Real Time applications	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Design Asynchronous models for real time applications	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Develop Deep Understanding on selection of hardware and software for designing dynamical systems.	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Come up with cost effective, reliable, robust and feasible designs for real world problems.	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	12	12	12	12	12
SLO-1	Introduction To Cyber-Physical Systems	Synchronous model overview, Reactive Components,	Asynchronous Process overview, States, Internal Actions, Executions, Extended State Machines,	Overview of dynamic systems	Introduction to Hybrid systems

SLO-2	Interoperability, Survivability	Variables, Valuations	Operations On Process	Continuous Time Model	Hybrid Dynamical Model,
SLO-3	Cyber-Physical System Requirements	Expression and Execution,	Blocking Vs Non-Blocking Synchronization	. Continuously Evolving Inputs and Outputs	Zeno Behavior
SLO-4	Interoperability, Survivability	Extended-State Machines,	Deadlocks	Models with Disturbance,	Designing Hybrid Systems
SLO-5	Real Time System, Internet of Things (IOT),	Properties of Components	Shared Memory,	Composing Components Stability	Automated Guided Vehicle,
SLO-6	Radio Frequency Identification Technology and its use in CPS,	Various Types of components,	Fairness Assumptions	Linear Systems Linearity	Obstacle with Multi Robot Coordination
SLO-7	Wireless Sensor Networks Technology and its application in CPS,	Task Graphs and Await Dependencies	Asynchronous Coordination Protocols	Solutions of Linear Differential Equations	Avoidance with Multi Robot Coordination
SLO-8	Application in CPS,	Composing Components	Leader Election,	Equations and stability,	Multi Hop Control Networks
SLO-9	Power line Communication	Output Hiding	Reliable Transmission	Designing Controllers	Linear Hybrid Automata,
SLO-10	Smart Cities and Internet of Everything	Synchronous Designs (Synchronous Circuits, Cruise Control Systems, Synchronous Networks).	Wait Free Consensus, Safety Specifications	Open Loop Vs Feedback Controller	Pursuit Game problem,
SLO-11	Ubiquitous Computing Fundamentals	Cruise Control Systems, Synchronous Networks).	Invariants Of Transition Systems,	PID Controllers, Analysis Techniques,	Timed Automata,
SLO-12	Autonomous Systems in Ubiquitous Computing	Case Study	Safety Monitors	Barrier Certificates	Model of Timed Automata

Resources					
1	Rajeev Alur, “Principles of Cyber Physical Systems”, 1 st Edition, MIT Press 2015			3	Raj Rajkumar, “Cyber Physical Systems”, 2 nd Edition Elsevier 2015
2	Edward D Lamie, “Computing Fundamentals of Cyber Physical Systems”, 2 nd Edition, Newnes Elsevier 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 (%)	Learning Management System	✓	Hands-on Practice	✓	Gender Equality	✓
1	Remember	15	-	15	-	10	-	10	-	15			Debate	✓		
2	Understand	15	-	15	-	10	-	10	-	15			Interactive Lecture	✓		
3	Apply	20	-	25	-	25	-	25	-	25			Brainstorming	✓		
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 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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai				1	Dr. Neela Narayanan V, Professor, VIT Chennai				1 Dr. Yoga Lakshmi. P

Course Code	UCS24D15J	Course Title	AI and Business Analytics				Category	D	Discipline Core / Elective Courses	L	T	P	C
										3	0	2	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	Understand the Foundations of Business Analytics and Artificial Intelligence																	
CLR-2	Understand the concepts of data processing and visualization																	
CLR-3	Understand the Statistical Analysis and Machine Learning Fundamentals																	
CLR-4	Familiarize the Advanced Machine Learning techniques and Responsible AI																	
CLR-5	Familiarize the Integration of Business Analytics and AI																	
CLO	At the end of this course, learners will be able to:	Conceive	Design	Implement	Operate	Level of Thinking			Problem Solving, Communication Skills, Independent Thinking, Analytical Reasoning, Leadership Qualities, Digital Technology, Value Incultation, Multidisciplinary, Environmental Action, Entrepreneurial Risk									
						2	85	75	3	-	-	1	-	3	-	2	2	1
CLO-1	Apply Data Handling and Preprocessing Techniques	✓	✓	-	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-2	Analyze Data Using Statistical Methods	✓	✓	✓	-	2	85	75	3	2	1	2	2	3	-	1	2	1
CLO-3	Visualize Data for Effective Communication and Develop Predictive Models for Business Forecasting	✓	✓	✓	✓	3	85	75	3	1	3	1	3	3	-	1	1	2
CLO-4	Apply AI Techniques to Solve Business Problems	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	2	3	3
CLO-5	Integrate Business Analytics and AI for Holistic Analysis	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

Sessions	CLO-1	CLO-2	CLO-3	CLO-4	CLO-5
	15	15	15	15	15
SLO-1	Introduction to Generative AI	Data Analytics using Python	Introduction of Power BI	Definition and Importance in Business Analytics	Key Concepts in ML: Data, Models, Algorithms
SLO-2	Prompt Engineering, ChatGPT	Introduction to Numpy	Business Intelligence with Power BI	Correlation and Regression	Supervised and Unsupervised Learning
SLO-3	Importance of business analytics	Working with Numpy	Power BI project	Full project in Regression	Techniques for implementing various learning
SLO 4-5	Lab 1: Prompt Engineering	Lab 4: Numpy	Lab 7: Working with Web APIs in python	Lab 10: linear Regression using python	Lab 13: File: Supervised learning using python

SLO-6	Python Fundamentals	Introduction of R Programming	Introduction of Extract Transform and Load	Popular Data Mining Techniques: Clustering, Classification, Association Rule Mining	Data Ethics
SLO-7	Python Installation	Data Analytics with R	Extract Transform and Load	Role of Data Mining in Decision Making	Examine ethics in ML and AI development
SLO-8	Applications of Generative AI in Business and Data Analytics	R programming project	ETL- a complete project	Data mining in business analytics	Modeling Optimization Problems:
SLO -9-10	Lab 2: Python Basics	Lab 5: Pandas	Lab 8: Data Visualization using Python	Lab 11: logistic Regression using python	Lab 14: Unsupervised learning using python
SLO-11	Basic Statistics	Introduction of Tableau	Data Visualization	Role of Data Mining in Decision Making	Mathematical optimizations
SLO-12	Python control statements	Data Visualization with Tableau	Statistical Analysis using Excel	Data classification in business analytics	fundamentals of optimization modeling
SLO-13	looping statements	Tableau – a complete project	Data Analysis using Excel- a practical outlook	Tools for Data classification in business analytics	Applications of Optimization in Machine Learning
SLO 14-15	Lab 3: Python control statements and looping statements	Lab 6: Working with CSV, EXCEL files in python	Lab 9: SciPy and Seaborn	Lab 12: Data classification using python (SVM)	Lab 15: Capstone project

Resources

1	Foster Provost, Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking 1st Edition, O'Reilly Media; 1st edition, 2013	3	Andrew Ng, Machine Learning Yearning
2	William McKinney, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd Edition, Shroff/O'Reilly; Second edition ,2017	4	Luiz Paulo Favero, Patricia Belfiore, Data Science for Business and Decision Making, Academic Press Inc ,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 (%) <td>Learning Management System</td> <td>✓</td> <td>Hands-on Practice</td> <td>✓</td> <td>Gender Equality</td> <td></td>	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						

*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. S SABEEN, Dept. of Computer Science, FSH, SRMIST		

Course Code	UAI24D17J	Course Title	Web Intelligence and Mining	Category	D	Discipline Core Elective Coruses	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	Nil	Data Book / Codes/Standards	Nil
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CLR	The purpose of learning this course is to:	Depth	Attainment	PLO									
CLR-1	To articulate the principles and techniques of web intelligence	1	2	3	4	1	2	3	1	2	3	4	5
CLR-2	To Analyze the use of Social Intelligence Design for various Applications								6	7	8	9	10
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												
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
CLO-1	To understand the fundamental concepts of Web Intelligence	✓	✓	✓	✓	2	85	75	3	2	2	1	1
CLO-2	To understand Social Intelligence Design for Web Intelligence	✓	✓	✓	✓	2	85	75	3	2	1	2	1
CLO-3	To understand the Data Mining Foundations	✓	✓	✓	✓	3	85	75	3	2	3	1	1
CLO-4	To understand and Perform analysis on web structure and its content	✓	✓	✓	✓	3	85	75	3	3	2	3	1
CLO-5	To understand Web Content Usage Mining methods	✓	✓	✓	✓	3	85	75	3	3	2	3	1

Sessions	CLO-1 15	CLO-2 15	CLO-3 15	CLO-4 15	CLO-5 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	Tutorial 5: Smart environment-based	Tutorial 8: Frequent Itemset Generation	Tutorial 11: Prepare inverted indexing	Tutorial 14: Session and Visitor

	social agents	approach		for the retrieved document	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				

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		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. Navarathnamani, Datayan Solutions (P) Ltd., Chennai		1	Dr. Neelanarayanan, Professor, School of Computer Science and Engineering, VIT Chennai	1 Mr. D. Siva, SRMIST, RMP, sivad@srmist.edu.in
					2

Course Code	UCS24P04L	Course Title	Research Project and Dissertation	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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CLR	The purpose of learning this course is to:	Depth				Attainment			PLO									
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	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								PSO-1	PSO-2
CLR-3	Cultivate leadershipability and responsibility to perform or execute the given task																	
CLR-4	Inculcate learners’ hands on practice within a real 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																	
CLO	At the end of this course, learners will be able to:																	
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 in iterative thinking and divergent thinking	✓	✓	✓	✓	3	85	75	3	3	2	3	3	3	-	3	3	3

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

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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CLR	The purpose of learning this course is to	Depth				Attainment			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	Conceive Design Implement Operate	Bloom' s Level of Thinking	Expected Proficiency (%)	Expected Attainment (%)	Problem Solving, Critical Communication Skills, Independent Thinking, Leadership Qualities, Digital Technology Skills Value Incultation, Multicultural Environmental Action, Entrepreneurial Risk Taking	PSO - 1	PSO - 2										
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																	
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 Committee

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