ACADEMIC CURRICULA

UNDERGRADUATE DEGREE PROGRAMME

Bachelor of Computer Applications

(B.C.A)

Three Years

Learning Outcomes Based Curriculum Framework (LOCF)

Choice Based Flexible Credit System

Academic Year

2020 - 2021

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

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

Kattankulathur, Kancheepuram District 603203, Tamil Nadu, India

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Department of Computer Applications

1.	**Department Vision Statement**
Stmt - 1	*Creating the most conducive environment for imparting quality education in Computer Applications*
Stmt - 2	*Contributing effectively to produce globally competent quality professionals in the field of IT*
Stmt - 3	*Contributing towards preparing young minds to serve community*

2.	**Department Mission Statement**
Stmt - 1	*Impart student's essential knowledge and skills required for a successful career in Information Technology*
Stmt - 2	*Instill confidence in the students to take up new challenges by grooming them appropriately*
Stmt - 3	*Inculcate in the students a sense of commitment to professional ethics, moral values with emphasis on team work and leadership qualities*
Stmt - 4	*Instill the students with a clear awareness of environmental issues and their relevance to their profession*
Stmt - 5	*Impress upon the students the impact of their work on the nation's economic and social progress*

3.	**Program Education Objectives (PEO)**
PEO - 1	*Offer the students those skill sets and domain knowledge based on needs of IT and dynamic business environment*
PEO - 2	*Provide the students with the capabilities in the areas of analysis, design, development and testing*
PEO - 3	*Kindle the minds of students to take up research and development in Computer Applications with missionary zeal*
PEO - 4	*Train the students to become effective communicators in professional as well as general aspects of life*
PEO - 5	*Prepare the students into balanced individuals who are keen to leave a mark by excelling in their profession*

4.	**Program Specific Outcomes (PSO)**
PSO - 1	*Graduates will acquire a comprehensive knowledge and sound understanding of fundamentals of IT.*
PSO - 2	*Graduates will develop practical, analytical and programming skills.*
PSO - 3	*Graduates will be prepared to acquire a range of general skills, to solve problems, to evaluate information, to develop software tools, to communicate with society effectively and learn independently.*

5.	**Consistency of PEO's with Mission of the Department**				
	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. - 3	Mission Stmt. - 4	Mission Stmt. - 5
PEO - 1	H	H	M	H	M
PEO - 2	H	M	H	H	H
PEO - 3	M	H	M	H	H
PEO - 4	H	H	H	L	M
PEO - 5	L	H	M	H	H

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

6. Consistency of PEO's with Program Learning Outcomes (PLO)

	Program Learning Outcomes (PLO)														
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
PEO - 1	H	H	H	H	H	L	M	L	M	M	H	H	M	H	H
PEO - 2	H	H	H	H	H	L	M	L	M	H	M	M	H	H	M
PEO - 3	H	H	H	H	H	M	H	M	M	M	H	H	H	M	M
PEO - 4	H	M	M	H	H	H	M	H	H	H	H	L	M	M	H
PEO - 5	M	M	H	H	M	H	M	H	H	H	M	M	H	M	M

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

7. Programme Structure- B.Sc in Defense and Strategic Studies

1. Professional Core Courses (C)
(24 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
USA20101J	Programming for Problem Solving	4	0	4	6
USA20102J	Digital Logic Fundamentals	4	0	2	5
USA20201J	Object Oriented Programming	4	0	4	6
USA20202J	Data Structures and Algorithms	4	0	2	5
USA20301J	Programming in Java	4	0	4	6
USA20302J	Operating Systems	4	0	4	6
UCA20401J	Windows Programming using VB.NET	4	0	4	6
USA20401J	Database Systems	4	0	4	6
UMS20402T	Resource Management Techniques	4	0	0	4
USA20501J	Web Programming	4	0	4	6
USA20502J	Computer Networks	4	0	2	5
USA20503J	Software Engineering and Testing	4	0	2	5
USA20601J	Python Programming	4	0	4	6
Total Learning Credits					**72**

2. Discipline Specific Elective Courses (D)
(5 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
UCA20D01J	Web development using Node JS and Mongo	4	0	4	6
UCA20D02J	Web development using React JS and Mongo				
UCA20D03J	Web development using Angular JS and Mongo				
UCA20D04J	Multimedia and Animation	4	0	4	6
UCA20D05J	Data Analysis using R				
UCA20D06J	Artificial Intelligence				
UCA20D07J	Multimedia Design Principles and Applications	4	0	4	6
UCA20D08J	Object Oriented Analysis and Design				
UCA20D09J	Internet of Things				
UCA20D10J	Project Work	0	2	12	6
Total Learning Credits					**24**

3. Generic Elective Courses (G)
(5 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
ULT20G01J	Tamil-I	2	0	2	3
ULH20G01J	Hindi-I				
ULF20G01J	French-I				
ULT20G01J	Tamil-II	2	0	2	3
ULH20G01J	Hindi-II				
ULF20G01J	French –II				
UMS20G01T	Discrete Mathematical Structures	3	1	0	4
UMS20G02T	Mathematical Foundation	3	1	0	4
UMS20G03T	Statistical Methods	3	1	0	4
Total Learning Credits					**18**

4. Ability Enhancement Courses (AE)
(3 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
ULE20AE1T	English	4	0	0	4
UES20AE1T	Environmental Studies	3	0	0	3
Total Learning Credits					**7**

5. Skill Enhancement Courses(S)
(6 Courses+ My India Project)

Course Code	Course Title	Hours/ Week L	T	P	C
UCA20S01T	Introduction to IT	2	0	0	2
UCA20S02J	Go Programming	1	0	1	2
UCA20S03L	Lua Programming	0	0	2	1
UCA20S04L	Statistical Package for Social Sciences	0	0	2	1
UMI20S01L	My India Project	0	0	0	1
UCD20S01L	Soft Skills	0	0	2	1
UCD20S02L	Quantitative Aptitude and Reasoning	0	0	2	1
Total Learning Credits					**15**

6. Extension Activity (NS/NC/NO/YG)
(Any 1 Course)

Course Code	Course Title	Hours/ Week L	T	P	C
UNS20201L	NSS	0	0	0	0
UNC20201L	NCC				
UNO20201L	NSO				
UYG20201L	YOGA				
Total Learning Credits					**0**

7. Life Skill Courses (JK)
(4 Courses)

Course Code	Course Title	Hours/ Week L	T	P	C
UJK20201L	Communication Skills	0	0	4	2
UJK20301T	Universal Human Values	2	0	0	2
UJK20401T	Professional Skills	2	0	0	2
UJK20501T	Leadership and Management Skills	2	0	0	2
Total Learning Credits					**8**

Total Learning Credits : 138

As SRMIST strongly encourages the use of SWAYAM (Study Web of Active Learning by Learning by Young and Aspiring Minds) platform, the students are encouraged to choose at least one core/ elective course from SWAYAM on the recommendation of the faculty advisor and the credits will be transferred

8. Course Structures

Semester	Compulsory Core Courses (CC)	Discipline Specific Electives (DSE)	Generic Electives(GE)	Life Skill (Jeevan Kaushal)	Skill Enhancement Courses (SEC)	Ability Enhancement Courses (AEC)	Extension Activity	Total Credits	No. of Periods
Sem I	CC-1(6) CC-2 (5)	-	GE-1 (3)-Tamil-I GE-2(4)- Disc. Mathematics		SEC 1 (2)- Intr.IT SEC 2 (1)-Soft skills	AECC-English(4)		**25**	**30**
Sem II	CC-3(6) CC-4 (5)	-	GE-3 (3)-Tamil-II GE-4(4)- Math. Found	JK1(2)-Com.Skills	SEC 3 (2)-Go Prog. SEC 4(1)-Quantitative Aptitude & Reasoning		NSS/NCC/NSO /Yoga(0)	**23**	**30**
Sem III	CC-5(6) CC-6 (6)	DSE-1(6)	GE-4(4)-Stat.Method	JK2(2)-UHV	SEC- 5 (1) My India Project			**25**	**30**
Sem IV	CC-7(6) CC-8 (6) CC-9(4)	DSE-2(6)	-	JK3(2)-Prof..Skills				**24**	**30**
Sem V	CC-10(6) CC-11(5) CC-12 (5)		-	JK4(2)-Leadership & Management Skills	SEC- 6 (1) Lua Prog. SEC- 7 (1) SPSS	AECC-EVS(3)		**23**	**30**
Sem VI	CC-13 (6)	DSE-3 (6) DSE-4 (6)-Project						**18**	**30**
Total Credits	**72**	**24**	**18**	**8**	**8**	**8**	**0**	**138**	**180**

9. Implementation Plan

Semester – I					
Course Code	Course Title	Hours/ Week			C
		L	T	P	
ULT20G01J	Tamil-I	2	0	2	3
ULH20G01J	Hindi-I				
ULF20G01J	French-I				
ULE20AE1T	English	4	0	0	4
USA20101J	Programming for Problem Solving	4	0	4	6
USA20102J	Digital Logic Fundamentals	4	0	2	5
UMS20G01T	Discrete Mathematical Structures	3	1	0	4
UCA20S01T	Introduction to IT	2	0	0	2
UCD20S01L	Soft Skills	0	0	2	1
Total Learning Credits		19	1	10	25
Total number of hours/Week					30

Semester – II					
Course Code	Course Title	Hours/ Week			C
		L	T	P	
ULT20G02J	Tamil-II	2	0	2	3
ULH20G02J	Hindi-II				
ULF20G02J	French-II				
USA20201J	Object Oriented Programming	4	0	4	6
USA20202J	Data Structures and Algorithms	4	0	2	5
UMS20G02T	Mathematical Foundation	3	1	0	4
UCA20S02J	Go Programming	1	0	1	2
UCD20S02L	Quantitative Aptitude and Reasoning	0	0	2	1
UJK20201L	Communication Skills	0	0	4	2
UNS20201L	NSS	0	0	0	0
UNC20201L	NCC				
UNO20201L	NSO				
UYG20201L	YOGA				
Total Learning Credits		14	1	15	23
Total number of hours/Week					30

Semester – III					
Course Code	Course Title	Hours/ Week			C
		L	T	P	
USA20301J	Programming in Java	4	0	4	6
USA20302J	Operating Systems	4	0	4	6
UCA20D01J	Web development using Node JS and Mongo	4	0	4	6
UCA20D02J	Web development using React JS and Mongo				
UCA20D03J	Web development using Angular JS and Mongo				
UMS20G03T	Statistical Methods	3	1	0	4
UMI20S01L	My India Project	0	0	0	1
UJK20301T	Universal Human Values	2	0	0	2
Total Learning Credits		17	1	12	25
Total number of hours/Week					30

Semester - IV					
Code	Course Title	Hours/ Week			C
		L	T	P	
UCA20401J	Windows Programming using VB.NET	4	0	4	6
USA20401J	Database Systems	4	0	4	6
UMS20402T	Resource Management Techniques	4	0	0	4
UCA20D04J	Multimedia and Animation	4	0	4	6
UCA20D05J	Data Analysis using R				
UCA20D06J	Artificial Intelligence				
UJK20401T	Professional Skills	2	0	0	2
Total Learning Credits		18	0	12	24
Total number of hours/Week					30

Semester –V					
Course Code	Course Title	Hours/ Week			C
		L	T	P	
USA20501J	Web Programming	4	0	4	6
USA20502J	Computer Networks	4	0	2	5
USA20503J	Software Engineering and Testing	4	0	2	5
UCA20S03L	Lua Programming	0	0	2	1
UCA20S04L	Statistical Package for Social Sciences	0	0	2	1
UES20AE1T	Environmental Studies	3	0	0	3
UJK20501T	Leadership and Management Skills	2	0	0	2
Total Learning Credits		17	0	12	23
Total number of hours/Week					29

Semester - VI					
Course Code	Course Title	Hours/ Week			C
		L	T	P	
USA20601J	Python Programming	4	0	4	6
UCA20D07J	Multimedia Design Principles and Applications	4	0	4	6
UCA20D08J	Object Oriented Analysis and Design				
UCA20D09J	Internet of Things				
UCA20D10J	Project Work	0	2	12	6
Total Learning Credits		8	2	20	18
Total number of hours/Week					30

Total Learning Credits: 138

10. Program Articulation Matrix

Course Code	Course Name	Programme Learning Outcomes														
		Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
USA20101J	Programming for Problem Solving	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20102J	Digital Logic Fundamentals	H	H	M	M	M	L	L	L	L	L	L	H	M	M	M
USA20201J	Object Oriented Programming	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20202J	Data Structures and Algorithms	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20301J	Programming in Java	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20302J	Operating Systems	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
UCA20401J	Windows Programming using VB.NET	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20401J	Database Systems	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UMS20402T	Resource Management Techniques	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20501J	Web Programming	H	H	H	H	M	L	L	L	M	M	M	M	L	L	L
USA20502J	Computer Networks	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20503J	Software Engineering and Testing	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
USA20601J	Python Programming	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
UCA20D01J	Web development using Node JS and Mongo	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UCA20D02J	Web development using React JS and Mongo	H	H	M	H	M	L	L	L	M	M	M	H	M	M	H
UCA20D03J	Web development using Angular JS and Mongo	H	H	M	H	M	L	L	L	M	M	M	H	M	M	H
UCA20D04J	Multimedia and Animation	H	H	M	M	H	H	H	M	M	M	L	H	H	M	M
UCA20D05J	Data Analysis using R	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
UCA20D06J	Artificial Intelligence	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UCA20D07J	Multimedia Design Principles and Applications	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
UCA20D08J	Object Oriented Analysis and Design	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
UCA20D09J	Internet of Things	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
UCA20D10J	Project Work	H	H	M	M	H	H	H	M	M	M	L	H	H	M	M
ULT20G01J	Tamil-I	H	H	M	M	M	L	L	L	L	L	L	H	M	M	M
ULH20G01J	Hindi-I	H	H	M	M	M	L	M	M	L	M	L	H	M	M	L
ULF20G01J	French-I	H	M	M	M	M	L	M	L	M	M	L	H	H	H	H
ULT20G02J	Tamil-II	H	M	M	M	M	L	M	L	M	M	M	H	H	H	H
ULH20G02J	Hindi-II	H	H	M	M	M	L	L	L	M	M	M	M	M	M	M
ULF20G02J	French –II	H	H	H	H	M	L	L	L	M	L	M	H	L	H	L
UMS20G01T	Discrete Mathematical Structures	H	H	M	H	M	L	M	M	L	L	M	H	M	L	M
UMS20G02T	Mathematical Foundation	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
UMS20G03T	Statistical Methods	H	H	M	M	H	H	H	M	M	M	L	H	H	M	M
ULE20AE1T	English	H	H	M	M	L	L	L	L	L	L	L	H	M	M	M
UES20AE1T	Environmental Studies	H	H	M	M	M	L	M	M	L	M	L	H	M	M	L
UCA20S01T	Introduction to IT	H	M	M	M	M	L	M	L	M	M	L	H	H	H	H
UCA20S02J	Go Programming	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UCA20S03L	Lua Programming	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UCA20S04L	Statistical Package for Social Sciences	H	H	M	H	H	H	L	L	L	H	L	H	M	M	M
UMI20S01L	My India Project	H	H	M	H	M	L	M	M	L	L	M	H	M	L	M
UCD20S01L	Soft Skills	H	H	M	H	M	L	L	L	M	M	M	H	M	M	M
UCD20S02L	Quantitative Aptitude and Reasoning	H	H	M	M	H	H	H	M	M	M	L	H	H	M	M

UNS20201L	*NSS*	*H*	*H*	*M*	*M*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*H*	*M*	*M*	*M*
UNC20201L	*NCC*	*H*	*H*	*M*	*M*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*H*	*M*	*M*	*M*
UNO20201L	*NSO*	*H*	*H*	*M*	*M*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*H*	*M*	*M*	*M*
UYG20201L	*YOGA*	*H*	*H*	*M*	*M*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*H*	*M*	*M*	*M*
UJK20201L	*Communication Skills*	*H*	*H*	*H*	*H*	*M*	*L*	*L*	*L*	*M*	*L*	*M*	*H*	*L*	*H*	*L*
UJK20301T	*Universal Human Values*	*H*	*H*	*M*	*H*	*M*	*L*	*M*	*M*	*L*	*L*	*M*	*H*	*M*	*L*	*M*
UJK20401T	*Professional Skills*	*H*	*H*	*H*	*H*	*M*	*L*	*L*	*L*	*M*	*M*	*M*	*M*	*L*	*L*	*L*
UJK20501T	*Leadership and Management Skills*	*H*	*H*	*H*	*H*	*M*	*L*	*L*	*L*	*H*	*L*	*M*	*H*	*H*	*H*	*L*
	Program Average	*H*	*H*	*M*	*H*	*M*	*L*	*L*	*L*	*M*	*M*	*M*	*H*	*M*	*M*	*M*

SEMESTER – I

Course Code	ULT20G01J	Course Name	*Tamil-I*	Course Category	*G*	Generic Elective Course	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Tamil*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*To enable them to learn the nuances of modern poetry in Tamil*
CLR-2 :	To explore New historicism through the works of art written in Tamil to enlighten the students to understand the changes in the modern society
CLR-3 :	Inculcate Ways of life, moralities and ethical factors as an essential part of learning Tamil literature
CLR-4 :	Develop strategies of comprehension of texts of different origin
CLR-5 :	Strengthen the language of the students both in oral and written
CLR-6 :	Express their sentiments, emotions and opinions, reacting to information, situations

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*Extend and expand their savoir-faire through the acquisition of skills to cater the needs of the modern era.*	*2*	*75*	*60*
CLO-2 :	Enable the students to appreciate their mother tongue and to Enhance their thinking capacity	*2*	*80*	*70*
CLO-3 :	Make them learn the basic rules of Language and make them communicate better	*2*	*70*	*65*
CLO-4 :	Develop strategies of comprehension of texts based on different culture and life styles	*2*	*70*	*70*
CLO-5 :	Strengthen spoken and written skills of the student	*2*	*80*	*70*
CLO-6 :	*Will be able to clear government examinations*	*2*	*75*	*70*

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	*H*	*H*	-	*H*	*H*	*M*	*H*	*H*	-	*H*	*H*	*H*	*H*	*H*
H	*H*	-	*H*	-	-	*H*	-	-	*H*	*H*	-	*H*	*H*	*H*
H	*H*	*H*	*M*	-	-	*H*	-	-	*H*	*H*	-	*H*	*H*	*H*
H	-	*H*	*H*	*H*	-	*M*	-	-	*H*	*H*	-	*H*	*H*	*H*
-	*H*	-	*M*	-	*H*	*H*	-	-	*H*	*H*	-	*H*	*H*	*H*
H	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*

Duration (hour)		12	12	12	12	12
S-1	SLO-1	தமிழ் இலக்கியப் போக்குகள்	நவீன கவிதை தோற்றம்	தமிழரின் வீரமரபு	சிற்றிலக்கியத் தோற்றம்	மொழி வரலாறு
	SLO-2	இலக்கிய நுட்பங்கள்	நவீன கவிதை வரலாறு	போர் விழுமியங்கள்	சிற்றிலக்கிய வகைமை	மொழிப் பயிற்சி
S-2	SLO-1	தமிழ்க் கவிதை மரபு	நவீன கவிதை செல்நெறிகள்	பரணி அறிமுகம்	சிற்றிலக்கியங்கள்	தமிழும் அகராதியியலும்
	SLO-2	காலந்தோறும் கவிதை உள்ளடக்கம்	செல்நெறிகளில் கோட்பாடுகள்	பரணி இலக்கியங்கள்	முதன்மைச் சிற்றிலக்கியங்கள்	அகரவரிசைப்படுத்தல்
S-3	SLO-1	காலந்தோறும் கவிதை வடிவம் –	கவிதை மொழி	கலிங்கத்துப்பரணி (484)	புதுக்கவிதையும் இதழ்களும்	கலைச்சொல் அறிமுகம்
	SLO-2	தற்கால இலக்கியம்	நவீன கவி மொழியின் நுட்பங்கள்	தலைவனின் வீரம்	மணிக்கொடி இதழ்	கலைச்சொல் உருவாக்க நுட்பங்கள்
S-4	SLO-1	புதுக்கவிதை உருவாக்கம்	நவீன கவி ஆளுமைகள்	தமிழ் இலக்கிய மரபில் தூது	எழுத்து இதழ்	தமிழில் கலைச்சொற்கள்
	SLO-2	புதுக்கவிதை	நவீன கவி	தூது இலக்கியங்கள்	வானம்பாடி இதழ்	நிலைபெற்ற

		செல்நெறிகள்	ஆளுமைகளின் கவித்துவம்			கலைச்சொற்கள்
S-5	SLO-1	பாரதியார் – காலத்தின் அடையாளம்	விளிம்புநிலை மனிதர்கள்	அழகர் கிள்ளைவிடு தூது (கண்ணிகள்)	சிறுகதை தோற்றம்	மரபுத்தொடர்
	SLO-2	பாரதியார் -பன்முக ஆளுமை	விளிம்புநிலை இலக்கியம்	தூது மரபில் கிளியும் பாராட்டும்	சிறுகதை வளர்ச்சி	தமிழில் மரபுத்தொடர்கள்
S-6	SLO-1	பாரதியார் - கண்ணன் என் சேவகன்	ராஜா சந்திரசேகரரின் கைவிடப்பட்ட குழந்தை	செய்யுள் மரபில் கலம்பகம்	சிறுகதை – வரலாறு	நாட்டார் வழக்காறுகள்
	SLO-2	கண்ணன் என் சேவகன் கவிதை சொல்லும் வாழ்வியல்	புறக்கணிப்பும் வாழ்வியலும்	கலம்பக இலக்கியங்கள்	சிறுகதை ஆசிரியர்கள்	பழமொழி அறிமுகம்
S-7	SLO-1	20 ஆம் நூற்றாண்டுக் கவிதை மரபில் பாரதிதாசன்	புலம்பெயர்தல்	நந்திக் கலம்பகம் (77)	புதினம் தோற்றம்	தமிழில் பழமொழிகள்
	SLO-2	பாரதிதாசனும் தமிழும்	புலம்பெயர் வாழ்வியல்	மகள் மறுத்தலில் வீரம்	புதினம் வளர்ச்சி	பழமொழியும் பயன்பாடும்
S-8	SLO-1	பாரதிதாசன் – தமிழினி இனிமை,	அனார் - மேலும் சில இரத்தக் குறிப்புகள்	குறவஞ்சி அறிமுகம்	புதினத்தின் வகைமை	தமிழ் இலக்கண நுட்பங்கள்
	SLO-2	தமிழின் பெருமையும் வளமையும்	உள்நாட்டுப் போர்ச்சூழலும் பெண் உளவியலும்	குறவஞ்சி இலக்கியங்கள்	புதின ஆசிரியர்கள்	இலக்கணமும் பயன்பாடும்
S-9	SLO-1	வானம்பாடியில் அப்துல்ரகுமான்	காலந்தோறும் பெண்	குற்றாலக் குறவஞ்சி (9)	அச்சு ஊடக வரலாறு	தமிழில் சொல் வகைகள்
	SLO-2	அப்துல்ரகுமான் கவிதையின் தனித்தன்மைகள்	பெண் இலக்கியம்	மலையும் வாழ்வும்	அச்சு ஊடகமும் தமிழும்	சொல்லும் பயன்பாடும்
S-10	SLO-1	அப்துல்ரகுமான் - அவதாரம்	சுகிர்தராணியின் அம்மா	காப்பிய இலக்கணம்	அச்சு ஊடகமும் உரைநடை வளர்ச்சியும்	பெயர்ச்சொற்கள்
	SLO-2	அவதாரம் - நம்பிக்கையும் வெற்றியின் பாதைகளும்	பெண்மையும் தாய்மையும்	காப்பிய வகைமைகள்	தமிழில் உரைநடை	பெயர்ச்சொற்கள் அறிதல்
S-11	SLO-1	சுற்றுச்சூழலியல்	சமத்துவம்	தமிழில் பௌத்த இலக்கியங்கள்	சுவடிகள்	வினைச்சொற்கள்
	SLO-2	தமிழ்க் கவிதையில் சுற்றுச்சூழலியல்	பாலியல் சமத்துவம்	மணிமேகலை	சிவதருமோத்திரச் சுவடி பெற்ற வரலாறு	வினைச்சொற்கள் அறிதல்
S-12	SLO-1	நரசிம்மன் – மகனே என்னை மன்னித்து விடு	நா. முத்துக்குமாரின் தூர் கவிதை	பெண் சாபமும் காயசண்டிகையும்	புழங்குபொருள் பண்பாடும் தமிழர் வாழ்வியலும்	தமிழில் பெயரடை, வினையடை
	SLO-2	நவீன வாழ்வும் சுற்றுச்சூழலியல்	தூர் கவிதை முன்வைக்கும் பெண்	பெண் வரலாற்றில் சாபங்களின் கதைகள்	கூஜாவின் கோபம்	பெயரடை, வினையடை அறிதல்

		அறிதலும்	சமத்துவம்			

Learning Resources	1. **குறிஞ்சித்தேன், தொகுப்பும் பதிப்பும் - தமிழ்த்துறை ஆசிரியர்கள், எஸ்.ஆர்.எம். அறிவியல் மற்றும் தொழில்நுட்பக் கல்விநிறுவனம், காட்டாங்குளத்தூர், 603203, 2020** 2. **வல்லிக்கண்ணன், புதுக்கவிதை தோற்றமும் வளர்ச்சியும், ஆழி பதிப்பகம், சென்னை, 2018** 3. **கா. சிவத்தம்பி, தமிழில் சிறுகதை தோற்றமும் வளர்ச்சியும், என்.சி.பி.எச்., சென்னை, 2013** 4. **தமிழ் இணையக் கல்விக்கழகம் -** http://www.tamilvu.org/ 5. **மதுரை தமிழ் இலக்கிய மின் தொகுப்புத் திட்டம் -** https://www.projectmadurai.org/

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	30%	30%	30%	30%	30%	30%	30%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	20%	20%	20%	20%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Expert from Higher Technical Institutions	Internal Experts
1. Dr. R..Srinivasan Associate Professor, Department of Tamil, Presidency College, Chennai,	*1. B.Jaiganesh, Assistant Professor & Head, FSH, SRMIST*
	2. T.R.Hebzibah Beulah Suganthi, Assistant Professor, FSH, SRMIST
	3.S.Saraswathy, Assistant Professor, FSH, SRMIST

Course Code	ULH20G01J	Course Name	*HINDI-I*	Course Category	*G*	Generic Elective Course	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*HINDI*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*To be able to converse well in the Hindi Language*
CLR-2 :	*To read and write and clarity*
CLR-3 :	*To be willing listeners and translators –where need be*
CLR-4 :	*To acquire the values/thought contents of the writers and practice in it in life.*
CLR-5 :	*To find motivation through the various forms of literature and learn to overcome any challenges of life.*
CLR-6 :	*To discover the importance of the language in making education as a means of growth in life and not mere literacy.*

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*To appreciate the Hindi language in its various forms.*	*2*	*75*	*60*	*H*	*H*	*H*	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 :	*To understand the philosophy of life and living through stories.*	*2*	*80*	*70*	-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-
CLO-3 :	*To help the students learn and develop the fundamentals of life, through One-Act plays.*	*2*	*70*	*65*	*H*	-	-	*H*	-	-	-	-	-	-	-	-	-	-	-
CLO-4 :	*To share the richness of thought and content presented in the Hindi language, into other languages so that the readers would stand to gain.*	*2*	*70*	*70*	*H*	-	*H*	*H*	*H*	-	-	-	-	-	*H*	-	-	-	-
CLO-5 :	*To guide the students in the learning of the technical aspect of the Hindi language, this would help them in the field of administration.*	*2*	*80*	*70*	-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-
CLO-6 :	*To encourage the students to communicate with the public, on a large scale with the medium of Main stream and Documentary films.*	*2*	*75*	*70*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Duration (hour)		12	12	12	12	12
S-1	SLO-1	Kahani kya Hai	Ekanki aur Natak kya hai	Patrkarita ka arambh	Film Samiksha	Takniki Shabdavali
	SLO-2	Jivan ka anubhav	Vidhyarthiyon dono ke antar ko smajhkar apne dwara use prastut kar sakta hai	Vidhyarthiyon ka apne samaj ke prti jagrukta	Film ka prabhav ko smajhna	Vaignik tarike se bhashaon ka avishkaar karna
S-2	SLO-1	Kahani ke Tatva	EKANKI KA ARTH	Aazdi aur Patrkarita ka daiytava	SAMIKSHA KYA HAI	ARTH
	SLO-2	Vishleshan karne ki Kshmta	Vidhyarthi ke bhitar vishkleshan ki kshamta jagrit	Vidhyarthiyon ko patrkarita ka itihas smajkar samaj nirman ke liye sahyog dena	Tarkik vishleshan kshmta paida karta hai	Vidhyarthi uske arth dwara hi uske mahtav smjhenge
S-3	SLO-1	Vo Tera Ghar Ye Mera Ghar Parivar me Buzargon ke Mahtav ko Samjhana	PARIBHASHA	PATRKARITA KA MAHTAVA	SAMIKSHA KE PRAKAR	PARIBHASHA
	SLO-2	Bhartiya Sanskriti Se Vidhyarthiyon ko Jodna	Vidvano ke mat se parichay	Patrkarita se bhut se sawal ka smadhan ho jata hai	Vidhyarthiyon ka un prkaro ka adhyaan karna jisse vidhyarthi us	Vibhinn vidwano dwara di gai paribhasha se us baat ko smjhenge

					samiksha ko tayaar kar payenge	vidhyathi
S-4	SLO-1	Mithaiwala Pyar Bantne se dukh kam hota hai	SWAROOP	PTRAKARITA KA ARTH	SAMIKSHA KA UDDESHYA	SHABDAVALI KI AVSHYAKTA
	SLO-2	Manavata ka Path	Vidhyarthiyon me iski samajh se lekhan kshmata badegi	Vibhinn vidhvono ko padhne se vidhyarthiyon ki tarkik kshmta badhti hai ,	Vidhyarthi ke andar smaj ke prati Kartavya bodh paida hoga	Vaignikon ka awiskar kitna mahtavpurn
S-5	SLO-1	Bechadri Pal Chatro me Utsah Vardhan Karna	PATHYA VACHAN	PTRAKARITA KI PARIBHASHA	FILM KA SAMAJIK MAHTAVA	BHASHA VAIGYANIK
	SLO-2	Beta-beti ek saman ke mahtav ko smjhana.	idhyarthiyon ka path kaushal bdhega	K vidhvaono ki ukti ek smadhan bhi hota hai	Samajik uttar daiytav ko smjhana	Bhasha vaignikon ki jankari
S-6	SLO-1	Nadi aur Jeevan Paryavaran ke mahtav se awagat karana.	PRASTUTI	PRAMUKH SAMACHAR PATR	FILM KA VISHLESHAN	KARYALYIN SHABD
	SLO-2	Manav Jeevan me nadi ki upyogita aur Mahtav.	latak khelne par bahut si takniki bate samajhenge	Vidhyarthiyon ki jankari badhegi	Vidhyarthi tarkik vishleshan sikhega	Shabd kaise tayar kiye jate hain vidhyorthiyon ko jankari
S-7	SLO-1	Pachees chauka Ded Sau Jamindari Pratha se awagat karana	MAHTVA	TV.PATRKARITA	DRISTIKON NIRMAN	ANGREZI SE HINDI ANUVAD
	SLO-2	Asprishya Vicharao ke Prati Sakaratamak Bnana.	latak ka mahtav ko smajhkr samaj ke hito ke sath judna.	TV patrkar ke daiytav ko smajkar idhyarthi ise apne rozgar se jod sakta hai	Vidhyarthi ka drishtikon nirmit hoga	Hindi adhikarai aur anuvadak ke pad ke liye tayaar karna
S-8	SLO-1	Kahani ka Uddeshya	PRASHAN-ABHYAS	PHOTO PATRKARITA	DOCUMENTRY FILM	HINDI SE ANGREZI ANUVAD
	SLO-2	Vidhyarthiyon ko Samaj se Jode rakhna	Vidhyarthiyon ka lekhan kshmata Badhna	Vidhyarthiyon me photo patrkarita ke mahtav ka smajh paida hona	Vidhyarthi samajik dharatal ki kathinai ko smajhkar desh se judega	Hindi adhikari aur anuvadak ke pad ke liye tayaar karna.
S-9	SLO-1	Kahani Lekhan	UDDESHYA	PRASTUTIKARAN	MAIN STREAM FILM	EK DIN EK SHABD
	SLO-2	Vidhyarthi Ko likhne ki aur Prerit karna	Vidhyarthi ko smaj upyog hito ki jankari dena	Vifhyarthi apni baat rakhne ki kshmta vikstit karta hai	Vidhyarthion ko jivan ke anchue pahluon se bhi sakshaktkar	Vidhyarthiyon ko rozgaar se jodna
S-10	SLO-1	Seminar	PARICHARCHA	BHASHA-SHAILI	FILM KE DARSHAK	ATI MAHTVAPURN SHABD
	SLO-2	Vidhyarthiyon dwara Prastuti karan	Vidhyarthi me vak-kaushal bdhana	Vidhyarthi ko apni report me bhasha-shaili ko sikh kar ek badhiya reporter ban sakta hai	Vidhyarthiyon ka samajik gyan	Shabdon ke mahtav ko smajhkar use yaad karna
S-11	SLO-1	Prashan Abhyas	BHASHA SHAILI	PATRKARITA KE NIYAM	FILM AUR BAZAAR	SAMANYA SHABD AUR PARIBHASHIK SHABDAVALI ME ANTAR
	SLO-2	Vidhyarthiyon me Lekhn Kaushal ki kshmata Viksit karna.	Vidhyarthiyon ko bhasha ka mahtav smjhna	Vidhyarthi ise sikh kar ek nyay priya patrkar ban sakta hai	Vidhyarthiyon ko rozgaar se jodna	Vidhyarthiyon ko vaighniko dwara tayaar ki gai bhasha ki samaj
S-12	SLO-1	Path-Punravarti	EKANKI AUR RANGMANCH	PATRKAR KA DAIYTVA	FILM DARSHAK KA MAHTAVA	PARIBHASHIK SHABDAVALI KA MAHTAV
	SLO-2	Pariksha ke liye Saksham	Vidhyarthi isse rangmanch ke mahtav ko smajhenge	Vidhyarthiyon ko patrkar ka daityva sikhkar smaj ke uttar daityva ko nibhana hai	Vidhyarthiyon ko darshak ki ruchiyon se awagat karvana	Rozgaar se vidhyarthiyon ko jodnaw

Learning Resources	***The Prescribe Text Book Compiled and Edited by Department of Hindi*** www.gadyakosh.com www.shabdkosh.com

Learning Assessment											
Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	30%	30%	30%	30%	30%	30%	30%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	20%	20%	20%	20%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers	
Expert from Higher Technical Institutions	Internal Experts
1. Prof.(Dr.) S.Narayan Raju, Head, Department of Hindi,CUTN, Tamilnadu	*1. Dr.S Preeti. Associate Professor & Head, SRMIST*
	2. Dr. Md.S. Islam Assistant Professor, SRMIST
	3 Dr. S. Razia Begum, Assistant Professor, SRM IST

Course Code	ULF20G01J	Course Name	*French-I*	Course Category	*G*	Generic Elective Course	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*French*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*Extend and expand their savoir-faire through the acquisition of current scenario*
CLR-2 :	Enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French
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
CLR-6 :	Express their sentiments, emotions and opinions, reacting to information, situations

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*To acquire knowledge about French language*	*2*	*75*	*60*
CLO-2 :	*To strengthen the knowledge on concept, culture, civilization and translation of French*	*2*	*80*	*70*
CLO-3 :	*To develop content using the features in French language*	*2*	*85*	*75*
CLO-4 :	*To interpret the French language into other language*	*2*	*70*	*80*
CLO-5 :	*To improve the communication, intercultural elements in French language*	*2*	*80*	*70*

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*H*	*H*	*H*	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 :	-	*H*	-	*H*	-	*H*	-	-	-	-	*M*	-	-	-	-
CLO-3 :	*H*	-	-	*H*	-	*H*	-	-	-	-	*M*	-	-	-	-
CLO-4 :	*H*	-	*H*	*H*	*H*	-	-	-	-	-	*H*	-	-	-	-
CLO-5 :	-	*H*	-	*H*	-	-	-	-	-	-	*H*	-	-	-	-

Duration (hour)		12	12	12	12	12
S-1	SLO-1	**Bonjour, ça va ?**	**Salut ! Je m'appelle Agnès**	**Qui est –ce ?**	**Dans mon sac, j'ai…**	**Il est comment ?**
	SLO-2	**Salut**	**Paul, Valérie, Manish**	**Les exemples**	**Da ns ton sac**	**Les objectifs**
S-2	SLO-1	Les pays	Les pronoms personnels sujets	Les professions	La formation du féminin (3)	L'aspect physique
	SLO-2	Les nationalités	Je, Tu, Il/Elle Nous, vous, Ils/Elles	Les exemples	Les féminins	Le corps
S-3	SLO-1	Les animaux domestiques	Les verbes être et avoir	Quelques objets	La phrase interrogative	Le caractère
	SLO-2	Les animaux	Les verbes auxiliaires	Objets	Les interrogatives	Les exemples
S-4	SLO-1	Les jours de la semaine	Les articles définis et indéfinis	La fiche d'identité	*qu'est – ce que.. ?*	Les prépositions de lieu (1)
	SLO-2	Les mois de l'année	Les exemples	La carte d'identité	*Les exemples*	Dans, sur, sous etc..,
S-5	SLO-1	Les nombres de 0 à 69	La formation du féminine (1)	La liaison	*Qu'est – ce que C'est*	Les nombre à partir de 70
	SLO-2	Les nombres	Les féminins	Les activités	*Les objets*	Les exemples
S-6	SLO-1	La famille (1)	La formation du pluriel (1)	L'élision	*Qui est – ce ?*	**Allo ?**
	SLO-2	Ses parents	Les exemples	Les activités	*Les personnes*	**Portable**
S-7	SLO-1	L'accent	Les adjectifs possessifs	Intonation descendre	*la phrase négative*	La formation du féminin(3)
	SLO-2	L'accent tonique	Les exemples	Les descendre	*La négation*	Les exemples
S-8	SLO-1	Les articles définis	Entrer en contact : salut	Intonation montante	*C'est*	Les articles contractés
	SLO-2	Les articles indéfinis	Entrer en contact : demander	Les montantes	*Il est*	Les articles partitifs
S-9	SLO-1	Bonjour, - Salut !	Dire comment ça va	Dans mon sac	*Les verbes du premier group*	Les pronoms personnels toniques

	SLO-2	Ca va	Comment allez-vous ?	Des objets	*Les exemples*	Les pronoms
S-10	**SLO-1**	Je m'appelle Agnès	Se présenter	Les Mots	Les verbes *aller*	Les adverbes interrogatifs
	SLO-2	Quel est votre nom	Présenter quelqu'un	Les expressions	Le verbe venir	Les interrogatifs
S-11	**SLO-1**	Les Mots	*Demander*	Demander poliment	Demander et répondre poliment	Les verbes du deuxième group
	SLO-2	Les Expressions	*Demander le temps*	Répondre poliment	Les exemples	Les exemples
S-12	**SLO-1**	Entrer en contact	Demander la date	Demander des informations personnelles	Demander des informations personnelles	Décrire l'aspect physique
	SLO-2	Se présenter.	Dire la date	Les exemples	Les activités	Décrire le caractère

Learning Resources	***Theory:*** ***1.*** "**Génération-AI"** Méthode de français, Marie-Noëlle COCTON, P.DAUDA, L.GIACHINO, C.BARACCO, Les éditions Didier, Paris, 2018. ***2. Cahier d'activités avec deux discs compacts.***

Learning Assessment

Level	**Bloom's Level of Thinking**	**Continuous Learning Assessment (50% weightage)**								**Final Examination (50% weightage)**	
		CLA – 1 (10%)		**CLA – 2 (10%)**		**CLA – 3 (20%)**		**CLA – 4 (10%) #**			
		Theory	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**
Level 1	Remember	30%	30%	30%	30%	20%	20%	20%	20%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	30%	30%	30%	30%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Expert from Higher Technical Institutions	**Internal Experts**
1. Dr. C.Thirumurugan Associate Professor, Department of French, Pondicherry University	*1. Kumaravel K. Assistant Professor & Head, SRMIST*
	2. Ponrajadurai M Assistant Professor, SRMIST

Course Code	ULE20AE1T	Course Name	*English*	Course Category	*AE*	Ability Enhancement Course	L	T	P	C
							4	0	0	4

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*English*		Data Book / Codes/Standards	*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*Extend and expand the integrity in an individual which shall never allow him/her to compromise upon a noble way of living*
CLR-2 :	Enable the students to overcome the fear of speaking a foreign language and enable them to think through a foreign language.
CLR-3 :	Make them communicate an unbiassed way of thinking in a better manner
CLR-4 :	Develop strategies of comprehension of texts based on different culture and life styles
CLR-5 :	Strengthen spoken and written skills of the student in English
CLR-6 :	Help them express their sentiments, emotions and opinions, and reactions to information and situations in a civilized, cultured and humane manner.

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*To acquire knowledge of becoming better beings through the tools of Language and Literature*	*2*	*75*	*60*
CLO-2 :	*To acquire a strong knowledge on concept, culture, civilization through English Literature*	*2*	*80*	*70*
CLO-3 :	*To develop own content and to be able to translate using the features in English Language*	*2*	*70*	*65*
CLO-4 :	*To interpret the contents in the texts presented in English Language*	*2*	*70*	*70*
CLO-5 :	*To present an improved and healthier communication and intercultural elements acquired through English Literature*	*2*	*80*	*70*
CLO-6 :	*To participate in any level of conversation and discussion presented in English with both proficiency in the language and positive caliber in the content of speech*	*2*	*75*	*70*

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	*H*	*H*	-	-	*H*	-	*H*	-	*H*	*H*	*H*	-	-	-
-	*H*	-	*H*	-	*H*	-	*H*	-	-	*H*	*H*	-	-	-
H	-	-	*H*	-	*H*	-	*H*	-	-	*H*	*H*	-	-	-
H	-	*H*	*H*	*H*	*H*	-	*H*	-	-	*H*	-	-	-	-
-	*H*	-	*H*	-	*H*	-	*H*	-	-	*H*	-	-	-	-
H	*H*	-	*H*	*M*	*H*	*M*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*

Duration (hour)		12	12	12	12	12
S-1	SLO-1	*Introduction to the art of poetry writing will be done*	*Post-colonial impacts in India as observed in their language and culture will be discussed.*	*Story through images is explained to the students*	*The definition and purpose of monologue is explained*	Homophones and Homonyms are to be explained in the class along with examples of usage.
	SLO-2	*The rationale behind this unit will be discussed.*	*The students will be encouraged to impart their views*	*The students are asked to create their own stories from those images*	*the sample monologues are to be provided to the learners*	How where and when these as vocabulary can be used is to be explained
S-2	SLO-1	*Feminism through Kamaladas' poem' In Kindergarten' is explained*	*Mathraboothan and the mother tongue influence in English – a discussion*	*Every day the students are made to bring their own cartoons to tell stories related to social issues and political issues.*	*The learners are made to create their own monologue contents.*	*Cross word puzzles are to be given to the students to make them understand the differences and usage of homophones and homonyms*

	SLO-2	*feminist critique's stand through poets like Meena Kandasamy is discussed*	*Students from different regions are asked to talk. The peculiarity in their pronunciation is to be identified by them*	*How to identify irony and sarcasm is taught*	*The contents are assessed and the lacuna is informed*	*The students are evaluated by making them use homophones and homonyms on their own*
S-3	**SLO-1**	*The writer Meena Kandasamy is invited to read her poems on women.*	*Enjoywithinlimits, says Mr Mathruboothamistaught and discussed*	*International Political memes to be created in the class*	*Discuss the contents created by the students and reiterate the idea that a monologue should mimic a story and has to have a proper beginning middle and an end.*	*How exactly to decide a proper word at a given situation is to be practically explained in the class.*
	SLO-2	*Questions on her perspectives are to be posed by the students*	*Everymistakefound in the textisanalysed*	*Memes on popular issues to be created in the class*	*The created monologues are to be assessed by the students themselves*	*Mundane situations are to be given to the students to check their ability to use those words*
S-4	**SLO-1**	*Gender inequality is discussed through A K Ramanujam and his poetry*	*The structure of sentence in English and the distorsion of the sentence isverified*	*Autobiography and biography differences are explained*	*To ask the students to bringnewspaper to class and makethem select a column and readitloudly.*	*To give all the parts of speech not according to the grammar book order but according to a method which would easily make one understand correlation of one with the other. For instance – Noun, Pronoun, Adjective, Verb, Adverb… will have to be the order*
	SLO-2	*Different legal situations where both the genders suffer is explained in the class*	*Diffèrent sentences are given and tested*	*Certain Classic autobiographies and biographies are presented*	*No meaningis to beexplained. Just the flow is to bechecked.*	*The students are made to use as many adjectives as possible for describing their friends*
S-5	**SLO-1**	*Kalki the poetisinvited to conduct a guets lecture on herownpoem.*	*Nobel? What Nobel, asks MrMathrubootham is discussed*	*How to give voice to an inanimate object.*	*Another reading loud session of the same passages are to be conducted along with dictionary checking for meanings are to be done.*	*The parts of speech must beused in different sentences*
	SLO-2	*Questions on her perspectives are to be posed by the students*	*The attitudes of people in a ludicrous manner is discussed*	*Different objects are given to the students and they are asked to give autobiographical notes to them*	*The new meanings that the students get must be compared with the given word and the distance between the meanings are to be explained*	*the teacherought to use the board to draw a situation to make one understandeachpart's usage.*
S-6	**SLO-1**	*Seminar to generate discussion to enhance gender sensitivity is conducted*	*The Text is analyzed in detail*	*Practically test the students in class by giving them different concrete objects.*	*To make them compare and realize how they had overcome their fear for English*	*Along with parts of speech particularly when Verb is being taught Tenses ought to be taught with same methodology mentioned above.*
	SLO-2	*Case studies are to be incorporated by the students in their seminar*	*More insights into Indian English is given*	*Ask the students to evaluate each other's autobiography on concrete objects*	*The comprehensive techniques are taught*	*The students are asked to create a lighter vein situation and asked to use all the tenses*
S-7	**SLO-1**	Human interest columns in news papers - tragedies on women men and transgender documented is read aloud and discussed in the class room.	*Neutral accent is taught along with right pronunciation*	*Caption writing is taught*	*To develop the ability to pick up a conversation istaugh*	*The rules of Tenses are taught with live examples in the classes.*

	SLO-2	. how much are the students able to relate with or able to feel emotionally for those situations is to be checked and analysed	*Test is to be conducted to check how far a student is able to understand neutral accent*	*The purpose of the caption writing is to be instilled*	*to engage in conversations and be able to interupt and end conversation appropriatelywilllbetaught*	*Ability to use all the rules in tenses is taught.*
S-8	**SLO-1**	*Case studies to be given to the students to document their reactions*	*Mr Mathruboothamisfullysupporting all new technologies – discussion*	*Different examples for captions are given*	*Different situations to be given to the students to engage in a conversation.*	*The basic way to pick an error is by already knowing the rules of grammar thoroughly.*
	SLO-2	*Find out if there is any student finding it hard to emote or is insensitive toward the moment*	*Humor and sarcasmisskimmedfrom the text*	*The studenst are asked to create captions similar to the ones shown in the class*	*The students are asked to find errors in each others' monologue*	*Hence all the rules are to be brushed up*
S-9	**SLO-1**	*Students are to made to createtheirownenactable content on the prevailinggenderinequalities*	*How to write a statement and question is to be taught with reference to the text.*	*The students are made to give captions different news articles, products and situations*	*To test how much one is able to use ironyhumor and sarcasm in one's conversation*	*Excercises on all sorts of possible errors are given to the students and asked to rectify.*
	SLO-2	*The students are asked to improvise on dialogue on theirown*	*The way sentences are constructed according to the regional impact is discussed*	*The best is appreciated for its qualities of being best*	*Natural usage of punisexplained*	*Mathrabootham's passages are given to the studentsagain to check the errors.*
S-10	**SLO-1**	*Feminism vs Gender inequality a test for the students to chart out the existing gulf*	*Pizza maavu : Welcome to Mr Mathruboothamfoodrecipiewebsiteisd iscussed*	*Public Speakingexamplessince Julius Caesar to Martin Luther isgiven*	*To teachdifferentkinds of reading. -skimming scanning and intensive reading extensive reading is taught*	*Definesynonym and antonym. Ask the sudents to identifysynonyms and antonyms in text.*
	SLO-2	*False allegations and Legal situations sometimes created by women to corner men only degrades the freedom struggle of women – discuss*	*The students are made to explain the textthemselves*	*The techniques used by different leaders sinceagesisdiscussed*	*Teh students are practicallyasked to use thosemethodology to understand a text*	*Demonstartetheriunderstanding of synonyms and antonyms in active learning. Introduce thesaurus reference.*
S-11	**SLO-1**	*A detailed discussion on the 4 poets is done in the class through comparative method*	*Identify the errors and make students to rewrite first two texts*	*The Ted X talks are played in the class, different political leader's canvasing is presented*	*The students are made to read the passages loudly*	*Demeonstrateunderstanding of words by relatingthem to their opposites (antonyms)*
	SLO-2	*While comparison the students are able to get a deeper analytical way of thinking and are able to present an all encompassed points*	*Check if they are able to retain the humor in the text after correcting the sentences*	*What makes a talk impressive is identified and discussed*	*The students are asked questions from the passages to check their retention capacity*	*Demonstrateunderstanding of wordswithsimilar but not identicalmeanings (synonyms)*
S-12	**SLO-1**	*The comprehension and retention and application of all the acquired knowledge of the student is checked by initiating an informal discussion in the class.*	*Identify the errors and make the students to rewrite the last two texts*	*The students are givendifferent topics to give impromptu*	*The learner is made to select phrases and words from the given passages and is asked to use it in own sentences*	*With the studentsbrainstormshortlist of commonlyusedwords*
	SLO-2	*The overall development in the student's EQ pertaining to gender oriented issues will be sensible and objective.*	*Check if they are able to retain the humor in the text after correcting the sentences. Explain the result to them*	*The best talk isrecorded and made available for other'srefferences*	*The ability to converse with humor sarcasm or deep thoughts and with the capacity to emote the desired emotion in the other is checked*	*Askthem to rapidlygivesynonyms and antonyms to thosewords*

Learning Resources	***Theory:*** ***1.*** Horizon- English Text Book – Compiled and Edited by the Faculty of English Department, FSH, SRMIST, 2020 ***2. English Gramar in Use by Raymond Murphy***

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	-	30%	-	30%	-	30%	-	30%	-
	Understand										
Level 2	Apply	30%	-	30%	-	30%	-	30%	-	30%	-
	Analyze										
Level 3	Evaluate	40%	-	40%	-	40%	-	40%	-	40%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
	1. Prof. Daniel David, Prof & Head, Department of English, MCC, Chennai	*1. Dr. Shanthichitra, Associate Professor, & Head, Department of English, FSH, SRMIST*
		2. Dr K B Geetha, Assistant Professor, Department of English, FSH, SRMIST

Course Code	USA20101J	Course Name	PROGRAMMING FOR PROBLEM SOLVING	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1 :	Think and evolve logically	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-2 :	Write application code for specfic purpose																		
CLR-3 :	Understand the effectiveness of programming																		
CLR-4 :	Customizing functions and procedures to encourage reusability																		
CLR-5 :	Establish interaction between stored files and the application code																		
CLR-6 :	Solve mathematical, scientific and engineering problems with reduced complexity																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	Apply the features of programming language	2	85	80	H	H	H	H	H	H	-	M	M	L	-	H	-	M	H
CLO-2 :	Choose operators, control structures to solve the problem optimally	3	85	80	L	H	H	H	H	H	-	M	M	L	-	H	-	M	H
CLO-3 :	Analyse the problem thoroughly and choose the prebuilt functions/ customize functions to solve the problem	3	85	80	L	H	H	H	H	H	-	M	M	L	-	H	-	M	H
CLO-4 :	Able to use dynamic memory allocation concepts for problems that demand	3	85	80	L	H	H	H	H	H	-	M	M	L	-	H	-	M	H
CLO-5 :	Defend the need for files storage and the access previledge modes	3	85	80	L	H	H	H	H	H	-	M	M	L	-	H	-	M	H
CLO-6 :	Talk on the data flow	3	85	80	L	H	H	H	H	H	-	M	M	L	-	H	-	M	H

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Evolution of Programming Languages	Relational and logical Operators	Understanding contiguous memory allocation	Formal and Actual Parameters	File Types: text and binary
	SLO-2	Problem solving through programming	Character and Numbers: Manipulation	Array : Advantages and Limitations	Functions: Returning values	File operations:basics
S-2	SLO-1	Writing algorithms/pseudo codes	Expressions with pre / post increment operator	String Basics	Advantages of using Functions	File permissions and access privileges
	SLO-2	Drawing flowcharts	Expression with conditional and assignment operators	String Declaration and Initialization	Passing Array to Function	Changing permissions
S-3	SLO-1	Evolution of C language	Ternary operator	Understanding String Functions: gets(), puts(), getchar(), putchar(), printf()	Call by Value	Writing contents to file
	SLO-2	Program structure	L value and Rvalue in expression	String Functions: atoi, strlen, strcat, strcmp	Call by Reference (An introduction on pointers shall be effective)	Reading file contents
S-4	SLO-1	Need for file header files	Operator precedence	String Functions: sprint, sscanf, strrev, strcpy, strstr, strtok	Nested functions	Appending an existing file
	SLO-2	Need for linkers and loaders	Type conversion	Need for tokenization	Functions: advantages and	Difference: Append and write

					limitations	
S 5-8	SLO-1 SLO-2	Lab 1: Algorithm, Flow Chart, Pseudo code	Lab 4: Operators and Expressions	Lab 7: Arrays : Multi dimensional	Lab 10: Functions	Lab 13: File: reading and writing
S-9	SLO-1	Input and output statements: scanf,printf	Control Statements : sequential, branching, looping and jump	Need for user-defined data types	Pointers and address operator	fscanf(),fprintf()
	SLO-2	Variables and identifiers	If, if ..else, else if ladder	Stuctures	sizeof Pointer Variable and Pointer Operator	fseek(),ftell()
S-10	SLO-1	Expressions	nested if, switch case	Unions	Pointer Declaration and dereferencing pointers	fputc(),fgetc()
	SLO-2	Single line and multiline comments	for loop	Accessing members of the structure	void Pointers and sizeof void Pointers	fputs(),fgets()
S-11	SLO-1	Constants, Keywords	while loop	Accessing members of the structure	Function and call by reference	fputw(),fgetw()
	SLO-2	Literals	do while	Structure and arrays	Functions and Returning array(use of pointers)	End_of_file in file handling
S-12	SLO-1	Scope and lifetime of variables	goto, break, continue, exit: Jump statements	Structure and arrays	Structures and pointers :dynamic creation of data structures(list)	feof(), remove()
	SLO-2	Storage clauses	Understanding jump statements with branch and iterative statements	Nested structures	Incrementing Pointers	ferror()
S 13-16	SLO-1 SLO-2	Lab 2: Input and Output Statements	Lab 5: Control Statements	Lab 8: Strings, structures and union	Lab 11: Pointers	Lab 14: File Handling fputw(),fgetw(), remove();
S-17	SLO-1	Data types classification:Basic,derived,user-defined	Array Basic	Functions declaration and definition	Constant Pointers	Processor Directives
	SLO-2	Numeric Data types: int, float, long, double	Array Declaration, Initialization	Prebuilt and user defined functions	Pointers and strings	Include
S-18	SLO-1	Non-Numeric Data types: char and string	Types	Function prototypes	Function Pointers	Predefined macros and macros
	SLO-2	Arithmetic operators	Manipulating one dimensional arrays with indices	Defining and calling functions	Array of Function Pointers	
S-19	SLO-1	Increment and decrement operator	Methods: sort, append, reverse, traverse	Multiple functions	Null Pointers	conditional compilation
	SLO-2	Bitwise and sizeof operator	Manipulating two dimensional arrays with indices	Recursion , recursive Functions	Using sizeof(),malloc,calloc()	#pragma
S-20	SLO-1	Using Boolean	Problems: matrix manipulations	Scope of variables across functions	File Handling	Creating include and macros
	SLO-2	Comma, Arrow and Assignment operator	Manipulating more than two dimensions in arrays	Sharing Global variables	Open(),close()	
S 21-24	SLO-1 SLO-2	Lab 3: Data Types	Lab 6: Arrays – One Dimensional	Lab 9: Functions	Lab 12: Pointers	Lab 15: Creating Macros

Learning Resources	1. Zed A Shaw, (2015), "Learn C the Hard Way: Practical Exercises on the Computational Subjects You Keep Avoiding (Like C)", Addison Wesley 2. W. Kernighan, Dennis M. Ritchie, (1996), "The C Programming Language", 2nd Edition. PrenticeHall of India	3. ebook: Bharat Kinariwala, TepDobry, Programming in C, 4. http://www.c4learn.com/learn-c-programming-language/

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

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

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	Mrs. S. Usha, SRM IST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Dr. P.J.Arul Leena Rose, SRM IST

Course Code	USA20102J	Course Name	DIGITAL LOGIC FUNDAMENTALS	Course Category	C	Professional Core Course	L	T	P	C
							4	0	2	5

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning
CLR-1 :	*To learn the concepts of basics of Digital Logics*	1
CLR-2 :	*To impart in-depth knowledge of Logic Gates*	
CLR-3 :	*Understand the principles of boolean algebra*	
CLR-4 :	*Basic knowledge of Combinational circuits and it applications*	
CLR-5 :	*Basic knowledge of sequential circuits and it applications*	
CLR-6 :	*Design principles of counters*	

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Program Learning Outcomes (PLO)														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Have a thorough Understanding of the Fundamentals of Digital Logic and it Fundamentals*	*3*	*80*	*70*	*H*	*H*	*M*	-	-	-	-	-	*H*	*H*	-	-	*M*	*H*	*H*
CLO-2 :	*Understand the concepts of logic gates and its uses*	*3*	*85*	*75*	*H*	*H*	*H*	*H*	*H*	-	*M*	-	*H*	*H*	-	-	*M*	*H*	*H*
CLO-3 :	*Real time applications of boolean algebra*	*3*	*75*	*70*	*H*	*H*	*M*	*H*	*H*	-	*M*	-	*H*	*H*	-	-	*M*	*H*	*H*
CLO-4 :	*Design and implementation knowledge of Combinational circuits*	*3*	*85*	*80*	*H*	*H*	*H*	-	-	-	-	-	*H*	*M*	-	-	*M*	*H*	*H*
CLO-5 :	*Design and implementation knowledge of sequential circuits*	*3*	*85*	*75*	*H*	*M*	*M*	*M*	*M*	*M*	*M*	-	*H*	*H*	-	*M*	*M*	*H*	*H*
CLO-6 :	*Real time application of Conters*	*3*	*80*	*70*	*H*	*H*	*M*	-	-	-	-	-	*H*	*H*	-	-	*M*	*H*	*H*

Duration (hour)		18	18	18	18	18
S-1	SLO-1	Number System and its types	Minterms and Maxterms	Combinational Logic - Introduction	Sequential Circuit - Introduction	Counters – Introduction
	SLO-2	Base conversions	Sum of Products	Designing of a Logic Circuit Diagram	Latches	A Basic Design Counter
S-2	SLO-1	Binary codes and its types	Product of Sums methods	Adders : Quarter, Half and Full Adders	Flip Flops - Introduction	Classification of Counters
	SLO-2	Code conversions	Conversions of SOP to POS	Subtractors:Half, Full Subtractors	RS Flip Flop	Asynchronous Counters
S-3	SLO-1	Basics of Logic Gates and Derived Gates	Simplifying Boolean Expressions using theorems	Design of Adder Circuits	JK Flip Flop	Synchronous Counters
	SLO-2					
S-4	SLO-1	Truth Tables	Derivation of a Boolean Functions	Design of Subtractor Circuits	D Flip Flop	Syn Vs Asyn Counters
	SLO-2					
S 5-6	SLO-1	Laboratory1 : Verification of Basic Gates and Derived Gates	Laboratory 4: Verifications of Distributive Law	Laboratory 7: Half Adder and Full Adder	Laboratory 10: Implementation of DeMultiplexer	Laboratory 13: Ring Counters
	SLO-2					
S-7	SLO-1	Universality of NAND Gate	Karnaugh Map - Introduction and its uses	Multiplexer	T - Flip Flop	Ripple Counters

	SLO-2	Universality of NOR Gate	Types of K-Map	Implementation of a Boolean expression using a Multiplexer	Edge Triggered	MOD Counters
S-8	SLO-1	Duality of Logic Gate Representation	Rules for constructing K-Map	De Multiplexer	Master Slave Flip Flop	UP DOWN Counters
	SLO-2					
S-9	SLO-1	Boolean Algebra - Introduction	Two and Three Variable K-Map	Encoder	Registers Architecture	Ring Counter
	SLO-2					
S-10	SLO-1	Logical Operations AND OR NOT	Four Variable K-Map	Decoder	Shift Registers	Shift Counters
	SLO-2					
S 11-12	SLO-1	Laboratory2: NAND as Universal Gate. NOR as Universal Gate	Laboratory 5-Simplifying Boolean Expressions using theorems	Laboratory 8:Half Subtractor and Full Subtractor	Laboratory 11: Implementation of Shift Registers and Serial Transfer	Laboratory 14: Implementation of DOWN Counter
	SLO-2					
S-13	SLO-1	Evaluating Logic Circuits	Don't Care conditions	Parity Generator	Four-bit Serial in Serial Out Shift register	Memory – Introduction
	SLO-2	Implementing Circuits from Boolean Expressions	Determination Prime Implicant Method	Parity Checker	Shift Registers Operations	Basic terms and ideas
S-14	SLO-1	Boolean Functions	Boolean Arithmetic - Introduction	Checksum	Serial-to-Parallel Shift Register	Magnetic Memories
	SLO-2	Duality Principle, Complements	Binary Addition	Code Conversions	Design of Serial to Parallel	Memory Addressing
S-15	SLO-1	Laws and Theorems	Binary Subtractions	Programmable Array Logic	Parallel-to-Serial Shift Register	Types of ROM
	SLO-2					
S-16	SLO-1	Laws of Intersection, Union, Absorption, Involution, Demorgan's Theorems	Various Representation of Binary Numbers	Programmable Logic Array	Design of Parallel to serial	Types of RAM
	SLO-2					
S 17-18	SLO-1	Laboratory 3:Laws of Boolean Expressions	Laboratory 6: Implementation fo Binary Addition and Subtraction	Laboratory 9: Implementation of Multiplexer	Laboratory 12: Four Bit Binary Shift Counters	Laboratory 15: Implementation of DOWN Counter
	SLO-2					

Learning Resources	1. *AnanthiSheshasaayee, J.G. Sheshasaayee,(2005)," Digital Logic Fundamentals, Margham Publications* 2. *Vijayendran. V, (2003), "Digital Fundamentals", S.V. Publishers*	3. *Leach.D.P&Malvino.A.P, (2002), "Digital Principles and Applications", FifthEdition, TMH* 4. *MorisMano.M,(2001),"Digital Logic and Computer Design", Fourth Edition,Pearson*

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	Mr. M. Ramesh, SRM IST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Mrs. P.Yogalakshmi, SRM IST

Course Code	UMS20G01T	Course Name	*DISCRETE MATHEMATICAL STRUCTURES*	Course Category	*G*	Generic Elective Course	L	T	P	C
							3	1	0	4

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Mathematics and Statistics*	Data Book / Codes/Standards	*Nil*		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	To provide a strong foundations 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			
CLR-6 :	To provide a strong foundations in discrete mathematics			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Problem solving in sets and relations. Gaining knowledge, solving the simple problems using elementary concepts.	*3*	*85*	*80*	*M*	*M*	*L*	*M*	*L*	-	-	-	*L*	*M*	*H*	*M*	-	-	-
CLO-2 :	*Understand the concepts of* Graphs terminology Sub graphs, Acyclic, Euler path, Hamiltonian Path	*3*	*80*	*75*	*M*	*M*	*M*	*M*	*M*	-	-	-	*M*	*M*	*H*	*M*	-	-	-
CLO-3 :	Logical knowledge through the Statements, connectives, arguments, validity of arguments and Normal forms using truth tables	*3*	*85*	*80*	*H*	*H*	*M*	*H*	*M*	-	-	-	*M*	*M*	*H*	*H*	-	-	-
CLO-4 :	Gain the knowledge about Trees , Labeled Trees, Binary trees ,Rooted Trees , Spanning Trees Minimal Spanning Trees	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*M*	-	-	-	*M*	*M*	*H*	*H*	-	-	-
CLO-5 :	Apply the concepts of Boolean Algebra in real world problems related to Computer Science	*3*	*85*	*80*	*M*	*M*	*M*	*M*	*M*	-	-	-	*M*	*M*	*H*	*M*	-	-	-
CLO-6 :	Gaining knowledge in Boolean arithmetic to solve problems using logic gates	*3*	*75*	*80*	*M*	*M*	*M*	*M*	*M*	-	-	-	*M*	*M*	*H*	*M*	-	-	-

		Learning Unit / Module 1	Learning Unit / Module 2	Learning Unit / Module 3	Learning Unit / Module 4	Learning Unit / Module 5
Duration (hour)		12	12	12	12	12
S-1	SLO-1	Introduction to Sets – simple examples.	Logic	Graphs and Their Representation-	Trees	Sets concepts
	SLO-2	Properties of sets Types of sets	Basic explanation	Basic Graph terminology	Basic Definitions	Partition of a set
S-2	SLO-1	Venn diagram.	Statements- simple compound	Simple Problems	Basic properties of Trees	Relation concepts
	SLO-2	Problems using Venn diagrams	Symbolic representation	Drawings of Graphs	properties of Trees	matrix representation of relation
S-3	SLO-1	Relation definitions	Connectives explanation .	Special Families of Graphs	Labeled Trees	Simple problems
	SLO-2	Problems on Relations	conjunction, disjunction, negation	Simple Problems	Labeled Trees	Hasse diagrams for partial
S 4	SLO-1	Types of relation	Simple problems	Incidence graphs	Problems based on the concepts	More problems using Hasse diagrams
	SLO-2	Problems on relations	Problems using Truth Tables	Simple Problems	Undirected Trees	Lattices as posets

S-5	SLO-1	Equivalence relation-basic explanation	Tautology, contradiction	Adjacency Matrices	Simple Problems	Lattices as posets
	SLO-2	Simple problems	Problems using Truth tables	Problems using Adjacency Matrices	Binary trees	Definition of Lattices-
S 6	SLO-1	Reflexive basic explanation	logical equivalence,	vertex Degrees matrices	Rooted Trees and Branches	Properties of Lattices
	SLO-2	Simple problems	Simple truth table problems	Isomorphism of Graphs	Rooted Trees and Branches	Introduction to Boolean Algebra-basic definitions.
S-7	SLO-1	Symmetric, Transitive basic explanation	Tautological implications	Simple Problems	Spanning Trees	Axiomatic definition of boolean Algebra, logic gates.
	SLO-2	Simple problems	Simple problems	Sub graphs	Simple problems	Postulates of Boolean algebra.
S -8	SLO-1	Function	Arguments- validity of arguments	Acyclic Graphs	Spanning Trees	Postulates of Boolean algebra.
	SLO-2	Comparison of Relation and functions	Simple problems	Simple Problems	Simple problems	Problems using the postulates of Boolean Algebra
S -9	SLO-1	Types of functions	Normal forms	Digraphs	Minimal Spanning Trees	Problems using the basic concepts
	SLO-2	Simple problems	Minterms and maxterms	Problems using Digraphs	Simple Problems	Properties of Boolean algebra
S-10	SLO-1	One- one, injective, surjective, one to many, many to one functions with example	Maxterms with examples	Euler path and circuits	Problems based on Minimal Spanning Trees	Simple Boolean algebra problems
	SLO-2	Simple problems	Problems using Truth tables	Eulerian cycles	Kruskal's Algorithm	Expression of a Boolean function By Truth table method.
S-11	SLO-1	composite of two functions	Principal disjunctive normal form	Euler path and Circuits	Rooted Tree	Boolean function in canonical form by Truth table method.
	SLO-2	Simple problems	Problems using Truth tables	Hamiltonian Path and Circuits.	binary Tree and Simple Problems	DNF by Truth table method
S-12	SLO-1	composite of three functions	Principal conjunctive normal form	Problems using Hamiltonian Path	Expression of Trees	CNF by Truth table method
	SLO-2	Simple problems	Problems using Truth tables	Simple Problems	Simple Problems	Simple problems

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

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	-	30%	-	30%	-	30%	-	30%	-
	Understand										
Level 2	Apply	40%	-	40%	-	40%	-	40%	-	40%	-
	Analyze										
Level 3	Evaluate	30%	-	30%	-	30%	-	30%	-	30%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers	
Experts from Academic	**Internal Experts**
1.Dr.M.A.Baskar, Professor & Head, Dept. Of Mathematics, Loyola college, Chennai	1. L.Sivakami, Assistant Professor, SRMIST
2. Dr.P.Dhanavanthan, Professor & Head, Dept. Of statistics, Pondicherry University	*2. S.Suruthi*, Assistant Professor, *SRMIST*

Course Code	UCA20S01T	Course Name	INTRODUCTION TO IT	Course Category	S	Skill Enhancement Course	L	T	P	C
							2	0	0	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	Know about Computers
CLR-2 :	Learn about various Input and Output Devices
CLR-3 :	Learn the Features of Computers
CLR-4 :	Utilize the advantages of Office Automation Packages
CLR-5 :	Use and Learn about Data Processing and Handling
CLR-6 :	Utilize the File Management functions and Advances in Internet Technology

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Identify the various components of Computers and applications	2	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-2 :	Analyze the various devices for various purposes	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-3 :	Understand the need of Office Packages for Document Preparation with formatting options.	3	75	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-4 :	Know the importance of Calculations in Spreadsheets	3	85	80	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-5 :	Identity the application and advantages of Database Management	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-6 :	Know and understand the concepts of Internet and advancements in Information Technology	3	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		06	06	06	06	06
S-1	SLO-1	Introductory Concepts	Input Devices	Intro to Office Automation	Intro to Spread Sheet	Introduction to Internet
	SLO-2	History		Word Processing – Introduction	Mathematical Calculations in Spread sheet	History of Internet
S-2	SLO-1	Generation	Output Devices	Typing in Saving in Word	Addressing Modes in Spread Sheet	Features of Internet
	SLO-2	Classification		Formatting in Word	Using Conditions	Milestones of Internet
S-3	SLO-1	Block Diagram	Types of Printers, Plotter	Alignments, Taking Printouts	Logical and Statistical Calculations	Internet Applications
	SLO-2	AU, LU, CU		Advanced Features of Word	Spread sheet packages	Services of Internet
S-4	SLO-1	Memory Units	Software Categories	Intro to Presentation Software	Intro to Database Tools	ISP, URL
	SLO-2			Presentation Basics	Database Fundamentals	Web Browsers and Types
S-5	SLO-1	Auxiliary Storage Devices	Operating Systems	Making Presentations	Quality of Information	Features of Web Browsers
	SLO-2	Magnetic Disk & Magnetic Tape		Adding Sounds	DBMS and Types of DBMS, RDBMS	Search Engines
S-6	SLO-1	Compact Disk	DOS, UNIX, Windows	Making Automated Presentation	Relational Data Structure	Websites
	SLO-2	Components of Computer		Usage of Templates	Integrity and Manipulation	E-Mail Creation

Learning Resources	1. Alexis Leon and Mathews Leon, (1999), "Fundamentals of Information Technology", Vikas, 2. Alexis Leon & Mathews Leon , "Computers Today" 3. V Rajaraman, (2010), "Fundamentals of Computers", V Edition, PHI Publications.	3. Peter Norton, "Introduction to Computers", Second Edition 4. Vitp Amato, "Cisco Systems Networking Academy: Ist Year Companion Guide", Techmedia Pub. 5. Alexis Leon and Mathews Leon , "Internet for everyone", Leon TechWorld Publication

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	-	30%	-	30%	-	30%	-	30%	-
	Understand										
Level 2	Apply	40%	-	40%	-	40%	-	40%	-	40%	-
	Analyze										
Level 3	Evaluate	30%	-	30%	-	30%	-	30%	-	30%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Dr.S.Albert Antony Raj, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mr.J.Venkata Subramanian, SRMIST*

Course Code	UCD20S01L	Course Name	Soft Skills	Course Category	S	Skill Enhancement Course	L	T	P	C
							0	0	2	1

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Career Development Centre	Data Book / Codes/Standards	-		

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	expose students to right attitudinal and behavioral aspects and to build the same through activities
CLR-2 :	develop and nurture interpersonal skills of the students through individual and group activities.
CLR-3 :	Increase efficiency and leadership skills and to improve team results.
CLR-4 :	acquire time management skills and develop creative skills
CLR-5 :	understand intercultural communication and etiquettes required in a professional environment
CLR-6 :	instill confidence in students and develop skills necessary to face the challenges of competitive exams and placements

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	re-engineer their attitude and understand its influence on behavior	3	80	70	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H
CLO-2 :	acquire inter personal skills and be an effective goal oriented team player	3	80	70	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H
CLO-3 :	understand the importance of time management and creativity	3	85	75	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H
CLO-4 :	build confidence during any presentation	3	85	75	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H
CLO-5 :	develop interpretation skills and intercultural communication	3	85	75	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H
CLO-6 :	help the students succeed in competitive exams and placements	3	80	70	M	M	M	-	M	H	M	-	-	H	H	H	M	H	H

Duration (hour)		6	6	6	6	6
S-1	SLO-1	***IKIGAI***	***Interpersonal Skills***	*Creating brands – activity (posters, flyers, business cards)*	***Value of Time***	***Intercultural communication – beliefs, customs and attitude of people in different countries (US, UK, Japan, West Asia, China, Russia)***
	SLO-2	***IKIGAI***	*Emotional Intelligence*	*Creating brands – activity (posters, flyers, business cards)*	***Diagnosing Time Management***	***Social and cultural etiquettes***
S-2	SLO-1	***Attitude***	*Importance of Team Work*	*Causes of Stress and Its Impact*	***Weekly Planner, To do list, Prioritizing work***	***Communication etiquettes***
	SLO-2	***Factors influencing Attitude***	*Team Building Activity*	*How to Manage Stress and Distress?*	***Time management activity***	***Telephone etiquettes***
S-3	SLO-1	***SWOT Analysis***	*Leadership skills*	*Understanding the Circle of Control*	***Creativity – think out of the box***	***Dinning etiquettes***
	SLO-2	***Individual SWOT Analysis – activity***	*Leadership skills based Activity*	*Stress Busters*	***Creativity Activity***	***Grooming etiquettes***
S-4	SLO-1	***Extempore Practice Session***	***Networking skills***	*Conflicts in Human Relations – reasons*	***Creativity Assessment Activity***	***Ice breaking***

	SLO-2	***Extempore Practice Session***	***Networking skills based*** *Activity*	*Approaches to conflict resolution*	***Creativity Assessment Activity***	***Designing ice breaker games***
S-5	SLO-1	***Extempore Practice Session***	***Negotiation skills***	*Conflict resolution – case studies*	***Brainstorming, use of groups and individual brainstorming techniques to promote idea generation***	***Ice breaker activity***
	SLO-2	***Extempore Practice Session***	***Negotiation skills based*** *Activity*	*Conflict resolution – case studies*	***Brainstorming session activities***	***Ice breaker activity***
S-6	SLO-1	***Extempore Practice Session***	***Entrepreneurial Skills***	***Importance and necessity of Decision Making***	***Brainstorming session***	***Introduction to resume building***
	SLO-2	***Extempore Practice Session***	***Entrepreneurial knowledge, Focus, Investment, Risk tolerance, Resilience, Negotiation, Ethics, Networking***	***Process of Decision Making, Practical Way of Decision Making, Weighing Positives and Negatives***	***Brainstorming session***	***Introduction to resume building***

Learning Resources	*1. Jeff Butterfield, Soft Skills for Everyone, CENGAGE, India, 2015* *2. Dr. K. Alex, Soft Skills, S.Chand Publishing & Company, India, 2014* *3. Covey Sean, Seven habits of highly effective teens, Simon & Schuster, New York, 2014*	***4. Carnegie Dale, How to win friends and influence people, Simon and Schuster, New York, 2016*** ***5. Thomas A Harris, I am ok, you are ok, Arrow, London, 2012*** ***6. Daniel Coleman , Emotional Intelligence , Bloomsbury, India, 2016***

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)			
		CLA – 1 (20%)	CLA – 2 (20%)	CLA – 3 (30%)	CLA – 4 (30%) #
		Theory	Theory	Theory	Theory
Level 1	Remember	10%	10%	30%	15%
	Understand				
Level 2	Apply	50%	50%	40%	50%
	Analyze				
Level 3	Evaluate	40%	40%	30%	35%
	Create				
	Total	100 %	100 %	100 %	100 %

CLA-1, CLA-2 and CLA-3 can be from any combination of these: Online Aptitude Tests, Classroom Activities, Case Studies, Poster Presentations, Power-point Presentations, Mini Talks, Group Discussions, Mock interviews, etc.
CLA – 4 can be from any combination of these: Assignments, Seminars, Short Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Ajay Zener, Director, Career Launcher	-	*1. Mr Priyanand, Assistant Professor, CDC, E&T, SRMIST*
		2. Ms Sindhu Thomas, Head in charge, CDC, FSH, SRMIST
		3. Ms Mahalakshmi, Assistant Professor, CDC, FSH, SRMIST

SEMESTER II

Course Code	ULT20G02J	Course Name	*Tamil-II*	Course Category	*G*	Generic Elective Course	L	T	P	C

							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Tamil*		Data Book / Codes/Standards	*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning

CLR-1 :	*To generate in students a sensitivity to gender marginalization and Eco sensitivity.*
CLR-2 :	*An evolved consciousness in the minds to accommodate all is developed*
CLR-3 :	*The ability to accept all and to co- exist is initiated*
CLR-4 :	*To create community connectivity and interdependence is initiated*
CLR-5 :	*To instill language skills*
CLR-6 :	*To give them all the historical insights*

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*To acquire knowledge about Tamil Language*	2	75	60
CLO-2 :	*To strengthen the knowledge on concept, culture, civilization and translation of Tamil*	2	80	70
CLO-3 :	*To develop content using the features in Tamil language*	2	70	65
CLO-4 :	*To use Tamil Language and Literature to enhance their creativity*	2	70	70
CLO-5 :	*To improve communication and creative expression in Tamil language*	2	80	70
CLO-6 :	To enable the students to speak and write in chaste Tamil	2	75	70

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	*H*	*H*	-	-	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*
-	*H*	-	*H*	*H*	*H*	*H*	-	-	*H*	*H*	*H*	*H*	*H*	*H*
H	-	-	*H*	-	*H*	*H*	*H*	-	*H*	*H*	*H*	*H*	*H*	*H*
H	-	*H*	*M*	*H*	-	-	-	*H*	*H*	*H*	*H*	*H*	*H*	*H*
-	*H*	-	*H*	-	*H*	*H*	-	-	*H*	*H*	*H*	*H*	*H*	*H*
H	*H*	*H*	*H-*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*	*H*

Duration (hour)		12	12	12	12	12
S-1	SLO-1	தமிழில் காலந்தோறும் அகமரபு	களப்பிரர் காலம்	பல்லவர் காலம்	சங்ககால வரலாறு	தமிழ்ச் சிறுகதைப் போக்குகள்
	SLO-2	அக இலக்கியப் போக்குகள்	அறமும் வாழ்வியலும்	பல்லவர் கால இலக்கியம்	சங்ககால மக்களின் வாழ்வியல்	தமிழ்ச் சிறுகதையும் தமிழ்ச் சமூக வாழ்வியலும்
S-2	SLO-1	எட்டுத்தொகை நூல்களும் பெயர்களும்	திருக்குறள் - உலகப்பொதுமறை	பக்தியும் தமிழும்	முச்சங்கம் – அறிமுகம்	புதுமைப்பித்தன் - அகல்யை
	SLO-2	எட்டுத்தொகை யில் அக நூல்கள்	திருக்குறள் கட்டமைப்பு	பக்தி இலக்கியங்கள்	முச்சங்க வரலாறு	தொன்மம் – கட்டுடைப்பு
S-3	SLO-1	ஐங்குறுநூறு (203)	தமிழில் வினை	சைவ சமய இலக்கியங்கள்	செம்மொழி இலக்கியங்கள்	அகிலன் - ஒருவேளைச் சோறு
	SLO-2	தலைவனின் நாட்டுப் பெருமை	திருக்குறள் - வினைத்திட்பம் (67)	தேவார மூவர்	பாட்டும் தொகையும்	தொழிற்புரட்சியும் விவசாயமும்
S-4	SLO-1	குறுந்தொகை (130)	உழவும் தமிழர் வாழ்வும்	தேவாரம் – திருஞான சம்பந்தர் பாடல்	எட்டுத்தொகை உருவாக்கப் பின்புலம்	ஆண்டாள் பிரியதர்ஷினி – மாத்திரை

	SLO-2	அகவாழ்வில் நம்பிக்கை வேர்கள்	திருக்குறள் - உழவு (104)	தேவாரம் – திருநாவுக்கரசர் பாடல்	எட்டுத்தொகையும் தமிழர் வாழ்வியலும்	குடும்பம் – கட்டமைப்பு
S-5	SLO-1	பண்டைத் தமிழரின் வாழ்வியல்	சமண சமய இலக்கியங்கள்	திருவாசகம் அறிமுகம்	பத்துப்பாட்டு உருவாக்கப் பின்புலம்	பாரததேவி - மாப்பிள்ளை விருந்து
	SLO-2	பண்டைத் தமிழர் உணர்வியல்	நாலடியார்	மாணிக்கவாசகர் பாடல்	பத்துப்பாட்டும் தமிழர் வாழ்வியலும்	எளிய மனிதர்களின் கதை
S-6	SLO-1	அகநானூறு (44)	இலக்கியங்களில் நட்பு	வைணவ சமய வளர்ச்சிப் போக்கு	பதினெண் கீழ்க்கணக்கு நூல்கள்	சிங்கார வடிவேலு – தவிப்பு
	SLO-2	புறவாழ்வோடு கூடிய அகம்	நட்பில் பிழை பொறுத்தல் (221)	வைணவ சமய இலக்கியங்கள்	பதினெண் கீழ்க்கணக்கும் தமிழர் அற மரபும்	புறக்கணிப்பின் வலி
S-7	SLO-1	கற்றறிந்தார் ஏத்தும் கலி	தமிழர் மருத்துவம்	நாலாயிரத் திவ்யப் பிரபந்தம்	நீதி இலக்கியங்கள்	செய்தி அறிக்கை அறிமுகம்
	SLO-2	கலித்தொகை கட்டமைப்பு	நீதி இலக்கியத்தில் மருத்துவ நூல்கள்	பெரியாழ்வார் பாடல்	நீதி இலக்கியங்களின் பன்முகத் தன்மைகள்	செய்தி அறிக்கை தயாரித்தல்
S-8	SLO-1	கலித்தொகை (149)	திரிகடுகம்	ஆண்டாள் பாடல்	காப்பிய இலக்கணம்	விமர்சனம்
	SLO-2	வாழ்வியல் அறமும் அகமும்	செங்கோல் அரசு	தொண்டரடிப்பொடி ஆழ்வார் பாடல்	காப்பியப் போக்குகள்	இலக்கியம், கலை விமர்சனம்
S-9	SLO-1	தமிழர் புறமரபு	இனியவை நாற்பது அறிமுகம்	தமிழில் இஸ்லாமிய இலக்கியங்கள்	ஐம்பெருங்காப்பியங்கள்	நேர்காணல் அறிமுகம்
	SLO-2	புற இலக்கியங்கள்	இனியவை நாற்பதின் தனித்தன்மைகள்	இஸ்லாமிய இலக்கியங்களின் கொடை	ஐம்பெருங்காப்பியங்களின் சிறப்புகள்	நேர்காணல் – நுட்பங்கள்
S-10	SLO-1	புறநானூறு (235)	இனியவை நாற்பது (14)	சீறாப்புராணம்	தமிழ்ச் சமூகமும் சமயத் தத்துவங்களும்	நேர்காணல் கேள்வி தயாரிப்பு
	SLO-2	கையறுநிலை	இனிமையும் அழகும்	மானுக்குப் பிணைநின்ற படலம் (5 பாடல்கள்)	சமயத் தத்துவங்களும் வாழ்வியல் விழுமியங்களும்	நேர்காணல் பதிவும் எழுது முறையும்
S-11	SLO-1	ஆற்றுப்படை அறிமுகம்	பண்டைக்காலப் போரும் வாழ்வும்	கிறித்தவ சமய இலக்கியங்கள்	பன்னிரு திருமுறை – அறிமுகம்	பேச்சுக்கலை அறிமுகம்
	SLO-2	ஆற்றுப்படை மரபுகள்	போர் இலக்கியங்கள்	கிறித்தவ இலக்கியங்களின் கொடை	பன்னிரு திருமுறை – வரலாறு	தமிழரின் பேச்சுக்கலை
S-12	SLO-1	சிறுபாணாற்றுப்படை	களவழி நாற்பது (14)	ஆதிநந்தாவனப் பிரளயம்	நாலாயிரத் திவ்யப் பிரபந்தம் – அறிமுகம்	பேச்சுக்கலையின் வகைகள்
	SLO-2	நல்லியக்கோடனும்பாணர் வாழ்வியலும்	தமிழர் வீரம்	ஏதேன் தோட்ட வருணனை	பன்னிரு ஆழ்வார்கள் வரலாறு	பேச்சுப் பயிற்சி

Learning Resources	*1.* மௌவல், தொகுப்பும் பதிப்பும் - தமிழ்த்துறை ஆசிரியர்கள், தமிழ்த்துறை, எஸ்.ஆர்.எம். அறிவியல் மற்றும் தொழில்நுட்பக் கல்விநிறுவனம், காட்டாங்குளத்தூர், **603203, 2020.**

	2. தமிழண்ணல், புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், மதுரை, 2017 3. மு. அருணாசலம், தமிழ் இலக்கிய வரலாறு, நூற்றாண்டு முறை (9ஆம் நூ. முதல் 16 வரை), தி பார்க்கர், சென்னை, 2005 **4.** தமிழ் இணையக் கல்விக்கழகம் - **http://www.tamilvu.org/** 5. மதுரை தமிழ் இலக்கிய மின் தொகுப்புத் திட்டம் - **https://www.projectmadurai.org/**

Learning Assessment

	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	30%	30%	30%	30%	30%	30%	30%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	20%	20%	20%	20%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Expert from Higher Technical Institutions	Internal Experts
1. Dr. R..Srinivasan, Associate Professor, Department of Tamil, Presidency College, Chennai.	*1. B.Jaiganesh, Assistant Professor & Head, FSH, SRMIST*
	2. T.R.Hebzibah Beulah Suganthi, Assistant Professor, FSH, SRMIST
	3.S.Saraswathy, Assistant Professor, FSH, SRMIST

Course Code	ULH20G02J	Course Name	*HINDI-II*	Course Category	*G*	Generic Elective Course	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*HINDI*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*To be able to converse well in the Hindi Language*			
CLR-2 :	*To read and write and clarity*			
CLR-3 :	*To be willing listeners and translators –where need be*			
CLR-4 :	*To acquire the values/thought contents of the writers and practice in it in life.*			
CLR-5 :	*To find motivation through the various forms of literature and learn to overcome any challenges of life.*			
CLR-6 :	*To discover the importance of the language in making education as a means of growth in life and not mere literacy.*			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*To acquire knowledge about Medieval and Modern Poetry.*	*2*	*75*	*60*
CLO-2 :	*To consider the relevance of the present trends in Hindi and their contemporary relevance.*	*2*	*80*	*70*
CLO-3 :	*To help develop better understanding of the Hindi language by studying the stories with reference to current reality.*	*2*	*70*	*65*
CLO-4 :	*To understand the usage of the present Advertising trends and its creative angles with the varied skills of Hindi Language.*	*2*	*70*	*70*
CLO-5 :	*To make translation of good literature and any relevant document from the Hindi Language to English and Vice-versa.*	*2*	*80*	*70*
CLO-6 :	*To help the learner to tackle Administrative terminologies, help them use Idioms and Phrases in their daily life, with ease.*	*2*	*75*	*70*

Program Learning Outcomes (PLO)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	*H*	*H*	-	-	-	-	-	-	-	-	-	-	-	-
-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-
H	-	-	*H*	-	-	-	-	-	-	-	-	-	-	-
H	-	*H*	*H*	*H*	-	-	-	-	-	*H*	-	-	-	-
-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Duration (hour)		12	12	12	12	12
S-1	SLO-1	Kavye ke guno se awagat karana – Jaysi	Kahani Idkiyan	VIGYAPAN	ANUVAD	Takniki Shabdavali
	SLO-2	Ishk hakiki evam moksh bhava se awagat karana	Nari Shakti ki sarthakata	Srijnatamak kshmata jagrit karna	Vidhyarthiyon ko sikhaya jayega anuvad kitna upyogi hai	Vaignik tarike se bhashaon ka avishkaar karna
S-2	SLO-1	Surdas – Vatsalya ras se awagat karana	Kahani gunda Prem ki prakashtha se awagat karvana	VIGYAPAN KYA HAI	ARTH	ARTH
	SLO-2	Bhakti Bhavna se vidhyarthiyon ko jodna	Prtantr bharat ki samajik vyavstha se awagat karvana	Shabdavali evam chitratamakta se awagat karvana	Vidhyarthiyon dwara arth smajkar samaj ke liye mahtavpurn karya kar payenge	Vidhyarthi uske arth dwara hi uske mahtav smjhenge
S-3	SLO-1	Tulsidas-Manav mulyon ki prabal bhavna jagrit karna	KAHANI KE TATVA	VIGYAPAN KI BHASHA	PARIBHASHA	PARIBHASHA

	SLO-2	Dharmik Parvarti se awagat karana	Kahani ke tatva ki mahatta se awagat karvana	Bhasha ki abhivyakti ke pryog ko smjhana	Vibhinn vidwano dwara di gai paribhasha se us baat ko smjhenge vidhyathi	Vibhinn vidwano dwara di gai paribhasha se us baat ko smjhenge vidhyathi
S-4	**SLO-1**	Tiruvaluvaar – naitik mulyon ko jagrit karna	KAHANI KE AAYAM	VIGYAPAN KA PRBHAV	MAHATVA	SHABDAVALI KI AVSHYAKTA
	SLO-2	Vidhyarthiyon ko nitivaan bnana	Vidhyarthiyon ko kahani ke vidhinn ayam se awagat karvana	Shravaya-drishya samgri ke prbhav ki upyogita	Samijik jan-jeevan ke liye anuvad ke mahtav ko smjhana.	Vaignikon ka awiskar kitna mahtavpurn
S-5	**SLO-1**	Desh prem ki bhavna bharna	LEKHAK PARICHAY	VIGYAPAN AUR BAZAR	UDDESHYA	BHASHA VAIGYANIK
	SLO-2	Krantikari vicharon se Awagat karana	Lekhako ke jivan se awagat karvana	Vidhyarthioyon ko vigyapan se bazar me kaise sthapit kiya ja skata hai batana	Vidhyarthi anuvad ke uddeshya ko smajhkar samaj upyogi karya krne me apni sarthak bhumika nibhayenge	Bhasha vaignikon ki jankari
S-6	**SLO-1**	Badal Raag- Desh prem ki bhavna bhrna	KAHANI PATH	VIGYAPAN AUR ROZGAR	HINDI-ENGLISH	KARYALYIN SHABD
	SLO-2	Krantikari vicharo se awagat karana	Vidhyarthiyon ko kahani path ke dwara unka vak kausal majbut karna	Vidhyarthi savam ka ad-ajency bhi bna paye	Hindi adhikarai aur anuvadak ke pad ke liye tayaar karna	Shabd kaise tayar kiye jate hain vidhyorthiyon ko jankari
S-7	**SLO-1**	Pret ka Byaan -Bhukhmari evam akaal se awagat karana	KAHANI KA SARANSH	VIGYAPAN KI NIYAM	ENGLISH-HINDI	ANGREZI SE HINDI ANUVAD
	SLO-2	Samajik samanta banaye rkhne ki pravarti jagana	Lekhan kshmata ka vikas hona	Vigyapan ka ek hi niyam bhasha ka kashav jo vidhyarthiyon me viksit kiya jayega	Hindi adhikarai aur anuvadak ke pad ke liye tayaar karna	Hindi adhikarai aur anuvadak ke pad ke liye tayaar karna
S-8	**SLO-1**	Lahro se dark a nauka paar nhi hoti –chatro ko sahashi bnana	KAHANI KA UDDESHYA	VIGYAPAN KA MAHTVA	ANUVAD KI UPYOGITA	HINDI SE ANGREZI ANUVAD
	SLO-2	Karmaththa purn bhavna ko jagrit karna	Kahani ke uddeshy unke jiwan ke mahtav ko smjhne me sahayk banna	Vartman me uski prasangikta vidhyarthiyon ko smjhana	Vidhyarthiyon ko vibhin karyalayon me hindi adhikari pad ki jankari prapt	Iindi adhikari aur anuvadak ke pad ke liye tayaar karna.
S-9	**SLO-1**	Javani –rashtr prem ki bhavna jagrit karna	KAHANI KA VISHELESHAN	PRINT VIGYAPAN	ANUVADk KI BHUMIKA	EK DIN EK SHABD
	SLO-2	Vir ras evam virta ki pravati se awagat karana	Vishleshan kshmata viksit hota	Vidhyarthi iski bhasha sikhenge	Vidhyarthiyon ko anuvadak ki bhumika ka mahtav smajh aayega jiske adhar par vo kaam karenge	Vidhyarthiyon ko rozgaar se jodna
S-10	**SLO-1**	Dhool- saman vyavhar ki pravarti jagana	KAHANI PARICHARCHA	RADIO, TV.VIGYAPAN	SAHITYIK ANUVAD	PRYOJANMULAK SHABD KA MAHTAVA
	SLO-2	Satah se jude rahne ke prerna dena.	Vaad-vivad se vidhyarthiyon me apni baat ko rkhne ki yogyata banna	Vidhyarthiyon ko abhyas karvaya jayega	Vibhinn bhashaon ke sahitya ka anuvad kaise kiya jane ki chunouti ko samjajh payenge	Vidhyarthiyon ko vaighniko dwara tayaar ki gai bhasha ki samaj
S-11	**SLO-1**	KAVYA BIBM	KAHANI ANDOLAN	Ad agency	ANUVAD KE NIYAM	VIBHINN KSHETRO ME PRYOJANMULAK SHABDO KA MAHATAV
	SLO-2	Vidhyarthiyon ko naye-naye bibm ki jankari prapt hona	Vibhinn kahani andolan se bhi awagat karana	Ad agency aur swarozgaar se jodna	Anuvad ke niyamo ko vidhyarthi smajh payenge	Hindi adhikari pad par karyarat
S-12	**SLO-1**	SAMUHIK PARICHARCHA	KAHANI KA BADLTA SWAROOP	VIGYAPAN KA SWARUP	SHABDO KA MAHATAV	VAIGYANIK SHABDAVALI KI AVSHYAKATA
	SLO-2	Vidhyarthiyon ki bolne ki kaushal kshamta ko bdhana	Smay ke sath unke swarup ke bdlav ka bhi vidyarthi me samajh paida hona	Vidhyarthiyon ko vigyapan lekha ki barikayon ki samajh utpann hona	Shabda anuvad ke mahtva ko vidhyarthi smajhenge	Vidhyarthiyon ko shabdo ki vaignikta se jodna

Learning Resources	***The Prescribe Text Book Compiled and Edited by Department of Hindi*** *www.kavitakosh.org*

	www.shabdkosh.com

Learning Assessment											
	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	30%	30%	30%	20%	20%	20%	20%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	30%	30%	30%	30%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers	
Expert from Higher Technical Institutions	Internal Experts
1. Prof.(Dr.) S.Narayan Raju, Head, Department of Hindi,CUTN, Tamilnadu	*1. Dr.S Preeti. Associate Professor & Head, SRMIST*
	2. Dr. Md.S. Islam Assistant Professor, SRMIST
	3 Dr. S. Razia Begum, Assistant Professor, SRM IST

Course Code	ULF20G02J	Course Name	*French-II*	Course Category	*G*	Generic Elective Course	L	T	P	C
							2	0	2	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*French*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*

		Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	Strengthen the language of the students both in oral and written			
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			
CLR-6 :	*Extend and expand their savoir-faire through the acquisition of current scenario*			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*			
CLO-1 :	*To acquire knowledge about French language*	*2*	*75*	*60*
CLO-2 :	*To strengthen the knowledge on concept, culture, civilization and translation of French*	*2*	*80*	*70*
CLO-3 :	*To develop content using the features in French language*	*2*	*70*	*65*
CLO-4 :	*To interpret the French language into other language*	*2*	*70*	*70*
CLO-5 :	*To improve the communication, intercultural elements in French language*	*2*	*80*	*70*
CLO-6 :	To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French	*2*	*75*	*70*

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	*H*	*H*	-	-	-	-	-	-	-	-	-	-	-	-
-	*H*	-	*H*	-	-	-	-	-	-	*M*	-	-	-	-
H	-	-	*H*	-	-	-	-	-	-	*H*	-	-	-	-
H	-	*H*	*H*	*H*	-	-	-	-	-	*H*	-	-	-	-
-	*H*	-	*H*	-	-	-	-	-	-	*H*	-	-	-	-
H	-	*M-*	*H*	*H*	-	-	-	-	-	-	-	-	-	-

Duration (hour)		12	12	12	12	12
S-1	SLO-1	**Les loisirs**	**La routine**	**Où faire ses courses ?**	**Découvrez et dégustez**	**Tout le monde s'amuse**
	SLO-2	**Les activités**	**Les exemples**	**Les courses**	**Dégustez**	**Le monde**
S-2	SLO-1	Les activités quotidiennes	Les adjectifs interrogatifs	Les aliments	Les articles partitifs	Les sorties
	SLO-2	Les quotidiennes	Les trois formes	Les exemples	Du, De la, De l', Des	Les exemples
S-3	SLO-1	Les matières	Les nombres ordinaux	Les quantités	Le pronom en (la quantité)	Situer dans le temps
	SLO-2	Les exemples	Les nombres	Les exemples	Le bon quantité	Les activités
S-4	SLO-1	Le temps	L'heure	Les commerces	Très ?	Les vêtements
	SLO-2	L'heure	Quelle heure est-il ?	Les activités	Beaucoup ?	Les accessoires
S-5	SLO-1	Les fréquences	Le pronom personnel COD	Les commerçants	La phrase négative (2)	**Les ados au quotidien**
	SLO-2	Les activités	Les exemples	Les exemples	Les négations	**La vie quotidienne**
S-6	SLO-1	Les sons [u]	Les pronominaux	Demander le prix	C'est /Il est	Les adjectifs démonstratifs
	SLO-2	Les sons [y]	Se promener, se coucher etc…,	Dire le prix	Les activités	Ce, Cet, Cette, Ces

S-7	**SLO-1**	Les loisirs	Les verbes du premier groupe	Les services	L'impératif	La formation du féminin
	SLO-2	Les exemples	Parler, Demander, Poser	Les exemples	Les exemples	Les exemples
S-8	**SLO-1**	La routine	groupe en –e_er,é_er,-eler,-eter	Les moyens de paiement	Les verbes devoir, pouvoir	Le pronom indéfini on
	SLO-2	Les activités	Appeler, Jeter etc..,	La carte de crédits	Les verbes savoir, vouloir	Les activités
S-9	**SLO-1**	Les Mots	Le verbe prendre	les sons [ã]	Il faut	Le futur proche
	SLO-2	Les expressions	Les exemples	Les sons [an]	Le verbe impersonnel	S+Aller+Infinitif du verbe
S-10	**SLO-1**	Exprimer ses gouts	Parler de ses gouts	Découvrez !	Au restaurant : Commander et commenter	Le passe composé
	SLO-2	Les exemples	Des gouter	Dégustez !	Les restaurant	Les exemples
S-11	**SLO-1**	Exprimer ses préférences	Parler de ses préférences	Au restaurant : commander	Inviter à une invitation	Les verbes voir et sortir
	SLO-2	Les activités	Les exemples	Au restaurant : commenter	Répondre à une invitation	Décrire une tenue
S-12	**SLO-1**	Décrire sa journée	Décrire sa journée	Inviter à une invitation	Les Mots	écrire un message amical
	SLO-2	Les exemples	Les activités	Répondre à une invitation	Les expressions	Lire un message

Learning Resources	***Theory:*** 1. "**Génération-AI"** Méthode de français, Marie-Noëlle COCTON, P.DAUDA, L.GIACHINO, C.BARACCO, Les éditions Didier, Paris, 2018. ***2.Cahier d'activités avec deux discs compacts.***

Learning Assesment

	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	30%	30%	30%	20%	20%	20%	20%	30%	-
	Understand										
Level 2	Apply	40%	40%	50%	50%	50%	50%	50%	50%	50%	-
	Analyze										
Level 3	Evaluate	30%	30%	20%	20%	30%	30%	30%	30%	20%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Expert from Higher Technical Institutions	Internal Experts
1. Dr. C.Thirumurugan Associate Professor, Department of French, Pondicherry University	*1. Kumaravel K. Assistant Professor & Head, SRMIST*
	2. Ponrajadurai M Assistant Professor, SRMIST

Course Code	USA20201J	Course Name	OBJECT ORIENTED PROGRAMMING	Course Category	C	Professional Core Course	L	T	C	P
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-1 :	Utilize class and build domain model for real-time programs																		
CLR-2 :	Utilize method overloading and operator overloading for real-time application development programs																		
CLR-3 :	Utilize inline, friend and virtual functions and create application development programs																		
CLR-4 :	Utilize exceptional handling and collections for real-time object oriented programming applications																		
CLR-5 :	Create programs using object oriented approach and design methodologies for real-time application development																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	Identify the class and build domain model	3	80	70	H	H	M	-	-	-	-	-	H	H	-	-	M	H	H
CLO-2 :	Construct programs using method overloading and operator overloading	3	85	75	H	H	H	H	H	-	M	-	H	H	-	-	M	H	H
CLO-3 :	Create programs using inline, friend and virtual functions, construct programs using standard templates	3	75	70	H	H	M	H	H	-	M	-	H	H	-	-	M	H	H
CLO-4 :	Construct programs using exceptional handling and collections	3	85	80	H	H	H	-	-	-	-	-	H	M	-	-	M	H	H
CLO-5 :	Construct programs using object oriented concepts	3	85	75	H	M	M	M	M	M	M	-	H	H	-	M	M	H	H
CLO-6 :	Create applications based on real world scenarios	3	80	70	H	H	M	-	-	-	-	-	H	H	-	-	M	H	H

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Comparison of Procedural and Object Oriented Programming	Constructor Types: Default and Parameterized constructor	Inheritance and its types	Introduction to Files	Templates : Introduction
	SLO-2	List of OOPS languages and its features	Example Programs	Inheritance: Single	Classes For File Stream Operations	
S-2	SLO-1	Features: Classes, Objects, Inheritance, Polymorphism, Encapsulation	Constructor Types: Copy and Static, Private.	Inheritance: Multiple	Types of files	Types of templates
	SLO-2	Data Hiding, Message Passing, Reusability	Example Programs	Example program	Opening and Closing a File	
S-3	SLO-1	I/O Operations, Data Types	Destructor	Inheritance: Multilevel	Example Program	Class Templates
	SLO-2	Variables, Constants and Type Conversion	Static Data members	Example program	Detecting End Of File	Example for class templates
S4	SLO -1	Operators	Static member functions	Inheritance: Multiple	Example program	Function templates
	SLO -2	Special operators	Example program	Visibility of access specifier	Read and write functions- character and string	Example
S	SLO-1	Lab 1: I/O operations and operators	Lab 4: Parameterized Constructor and	*Lab 7: Inheritance*	Lab 10 : Simple file programs	Lab13 :Templates

5-8	SLO-2		Constructor Overloading			
S-9	SLO-1	Control Structures	Overloading Concept in OOP	Inheritance : Hierarchical	*File Open Modes*	Exceptional Handling: Types of exceptional handling
	SLO-2	Examples of Control Structures	Overloading types	*Example program*	*Example program*	Exceptional Handling :Try and Catch
S-10	SLO-1	Functions and types	Function Overloading: Different parameter with same data type	Inheritance : Hybrid	*Example Program*	Example program
	SLO-2	Function declaration and definition	Example Program	Example program	*File Pointer Manipulations*	Exceptional Handling : Standard exceptions
S-11	SLO-1	Passing arguments, returning values	Function Overloading: Different parameter with different argument types	Constructors and destructors in inheritance	*Example Program*	Example program
	SLO-2	default arguments, Constant arguments	Example Program	Example Program	*Sequential Input and Output Operations*	Exceptional Handling: Multilevel exceptional
S-12	SLO-1	Call by value , Call by reference	Function Overloading: Different parameter with different return values	Constructors and types of inheritance	*Functions to handle file pointer*	throw and throws
	SLO-2	Return by reference, Inline Functions	Example Program	Example program	*Example program*	Example program
S 13-16	SLO-1	Lab 2: Control structures and Functions	Lab 5 : Function Overloading	Lab 8 : Multiple ,Multilevel Inheritance	*Lab 11 : Working with files*	Lab 14 :Multilevel exceptional programs
	SLO-2					
S-17	SLO-1	Class and Objects	Operator Overloading Concept	Friend Function	Reading a class object	Exceptional Handling: finally
	SLO-2	Access specifier	Types of operator overloading	Virtual Base Classes	Example Program	User defined exceptions
S-18	SLO-1	Visibility of access specifier	Operator Overloading: Unary Operators	Example Program	Random Access –Updating a File	Programs for user defined exceptions
	SLO-2	Example program	Example program	Abstract Classes	Example program	Example program
S-19	SLO-1	Constructor	Operator Overloading: binary Operators	Example Program	Error Handling in File Operations	Exception Handling class
	SLO-2	Example program	Example program	Virtual Functions	Example program	Example program
S-20	SLO-1	Destructor	Operator Overloading: Assignment Operator	this pointer	Command Line Arguments	User defined exceptional class
	SLO-2	Example program	Example program	Inline functions	*Example Program*	Example Programs using CPP
S 21-24	SLO-1	Lab 3: Classes and Objects	Lab 6 : Operator Overloading	*Lab 9 : Abstract classes and Virtual Functions*	*Lab 12: command line arguments program*	Lab 15:User defined Exceptions and simple CPP application.
	SLO-2					

Learning Resources	1. *E Balagurusamy,(2017), "Object Oriented Programming in C++", 7th Edition, Tata McGraw Hill* 2. *ReemaThareja, (2015), "Object Oriented Programming with C++", 1st Edition, Oxford University Press* 3. *R S Salaria,(2016), "Mastering Object Oriented Systems Development Programming in C++", 6th Edition, Khanna Publishing*	4. Robert Lafore, (2008), "Object-Oriented Programming in C++", 4th Edition, SAMS Publishing 5. SouravSahay, (2017), "Object Oriented Programming with C++", 2nd Edition, Oxford University Press

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	Mrs. E. Sweety Bakyarani, SRM IST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Mr. M.R.Vinodh, SRM IST

Course Code	USA20202J	Course Name	DATA STRUCTURES AND ALGORITHMS	Course Category	C	Professional Core Course	L	T	P	C
							4	0	2	5

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	Utilize the different data types; Utilize searching and sorting algorithms			
CLR-2 :	Utilize linked list in developing applications			
CLR-3 :	Utilize stack and queues in processing data for real-time applications			
CLR-4 :	Utilize tree data storage structure for real-time applications			
CLR-5 :	Utilize algorithms to find shortest data search in graphs for real-time application development			
CLR-6 :	Utilize the different types of data structures and its operations for real-time programming applications			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Identify linear and non-linear data structures. Create algorithms for searching and sorting	2	80	70	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-
CLO-2 :	Create the different types of linked lists and evaluate its operations	2	85	75	M	H	L	M	L	-	-	-	M	L	-	H	-	-	-
CLO-3 :	Construct stack and queue data structures and evaluate its operations	2	75	70	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-4 :	Create tree data structures and evaluate its types and operations	2	85	80	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-5 :	Create graph data structure, evaluate its operations, implement algorithms to identify shortest path	2	85	75	H	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-6 :	Construct the different data structures and evaluate their types and operations	2	80	70	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-

Duration (hour)		18	18	18	18	18
S-1	SLO-1	Introduction to theory of data structures	Introduction to stack	Tree Traversals – Inorder, preorder	Introduction to sorting	Graph Terminology
	SLO-2	Data representation	Representation of stack through array	Tree Traversals - Postorder	Efficiency of algorithm	Representation of graph – Arrays
S-2	SLO-1	Abstract Data type	Representation of stack through linked list	Binary Search Tree	Time complexity and space complexity	Representation of graph – Linked list
	SLO-2	Classification of data types	Operations on stack	Threaded Binary Search Tree	Different types of sorting	Graph Traversal – BFS
S-3	SLO-1	Program design and algorithm	Disadvantages of Stack, Polish notations	Binary Search Tree :Construction	Bubble sort	Example
	SLO-2	Problem Solving using algorithm	Applications – Evaluation of expression	Binary Search Tree : Insertion	Example	Graph Traversal – DFS
S-4	SLO-1	Recursion	Infix to Postfix expression	Binary Search Tree : Searchimg	Insertion Sort	Example
	SLO-2	Example	Tower of Hanoi, Recursion	Example	Example	Topological Sorting
S 5-6	SLO-1 SLO-2	Lab 1: Recursion	Lab 4 : stack and its applications	Lab 7 : Tree Traversals	Lab 10 : Implementation of Bubble and Insertion sort	Lab 13: Implementation of Graph using Array
S-7	SLO-1	Asymptotic Notation	Queue	Applications of trees	Selection sort	Shortest Path Algorithm- Introduction
	SLO-2	Algorithm Analysis	Representation of Queue using Arrays and Linked list	Applications of BST	Example	Shortest Path Algorithm: Dijkstra

S-8	SLO-1	Introduction to Data structures	Operations on Queue	Expression trees	Comparison of sorts	Minimum spanning tree – Prims
	SLO-2	Data Structures and its uses	Circular Queue	Example	Quick sort	Example
S-9	SLO-1	Linear and Non Linear Data Structures	Double ended Queue	AVL Tree	Example	Minimum Spanning Tree – Kruskals
	SLO-2	Operations on data structure	Priority Queue	AVL Tree Rotations	Merge sort	Example
S-10	SLO-1	Arrays and Pointers	Reversing a Queue using another queue	Example	Example	Network flow problem
	SLO-2	Structure and Pointers	Applications of Queue	Applications of AVL tree	Radix sort	Applications of Graph
S 11-12	SLO-1	Lab 2: Arrays, structure using pointers	Lab 5: Queue implementation using array and pointers	Lab 8: Implementation of BST	Lab 11 : Implementation of Qucik sort and merge sort	Lab 14 : Implementation of shortest path algorithm
	SLO-2					
S-13	SLO-1	Array types	Introduction to non linear data structures	Heap Data Structure	Shell sort	Define Hashing
	SLO-2	Array operations	Tree ADT and Terminologies	Minimum Heap Construction	Example	Hashing: Hash functions
S-14	SLO-1	Dynamic memory allocation	Tree Terminologies	Minimum Heap Deletion Construction	Heap Sort	Hashing : Collision avoidance
	SLO-2	Introduction to lists	Tree Representation	Example	Example	Hashing : Separate chaining
S-15	SLO-1	Linked list operations	Tree Types and Operations	Maximum Heap Construction	Linear search	Example
	SLO-2	Types of Linked Lists	Binary Tree Representation	Maximum Heap Deletion Construction	Binary search	Open addressing
S-16	SLO-1	Linked list vs. Arrays	Properties of binary tree	Example	Comparison of different search	Example
	SLO-2	Application of linked list		Applications of Heaps and AVL trees	Example	Advantages of Hashing
S 17-18	SLO-1	Lab 3 : Linked List	Lab 6: Implementation of binary tree using Arrays	Lab 9 :Heap Implementation	Lab 12: Linear search and Binary search	Lab 15 : Implementation of minimum spanning tree
	SLO-2					

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

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	Mr. D.Bakthavachalam, SRMIST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Dr.S.Sabeen, SRMIST

Course Code	UMS20G02T	Course Name	*MATHEMATICAL FOUNDATION*	Course Category	*G*	*Generic Elective Course*	L	T	P	C
							3	1	0	4

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Mathematics and Statistics*	Data Book / Codes/Standards	*Nil*		

Course Learning Rationale (CLR): *The purpose of learning this course is to:*

CLR-1 :	*To apply the basic concepts and theorems of matrices*
CLR-2 :	*To learn the concepts of polynomial equations, reciprocal equations and approximation of roots.*
CLR-3 :	*To learn the basic concepts of differentiation, successive differentiation and partial differentiation*
CLR-4 :	*To learn the basic concepts of integration and to apply Bernoulli's formula and reduction formula.*
CLR-5 :	*To understand how a function is transformed by Laplace and inverse Laplace methods and how they are related.*

Course Learning Outcomes (CLO): *At the end of this course, learners will be able to:*

Learning				Program Learning Outcomes (PLO)														
	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	1 Fundamental Knowledge	2 Application of Concepts	3 Link with Related Disciplines	4 Procedural Knowledge	5 Skills in Specialization	6 Ability to Utilize Knowledge	7 Skills in Modeling	8 Analyze, Interpret Data	9 Investigative Skills	10 Problem Solving Skills	11 Communication Skills	12 Analytical Skills	13 ICT Skills	14 Professional Behavior	15 Life Long Learning
CLO-1 : *Gaining knowledge in basic concepts of matrix method.*	*3*	*85*	*80*	*L*	*L*	*L*	*M*	*L*	-	-	-	*L*	*M*	*H*	*M*	-	-	-
CLO-2 : *Gaining knowledge in the concepts of polynomial equations and reciprocal equations and applying Horner's and Newton's methods for finding roots*	*3*	*80*	*75*	*M*	*M*	*M*	*M*	*M*	-	-	-	*M*	*M*	*H*	*M*	-	-	-
CLO-3 : *Understanding the concepts of differentiation and to solve the problems of Radius of curvature and Euler's theorem*	*3*	*85*	*80*	*H*	*H*	*M*	*H*	*M*	-	-	-	*M*	*M*	*H*	*H*	-	-	-
CLO-4 : *Understanding the concepts of integration and to evaluate reduction formula.*	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*M*	-	-	-	*M*	*M*	*H*	*H*	-	-	-
CLO-5 : *Getting the knowledge of Laplace and Inverse Laplace transformation and their application.*	*3*	*85*	*80*	*H*	*H*	*M*	*H*	*H*	-	-	-	*M*	*M*	*H*	*M*	-	-	-

		Learning Unit / Module 1	Learning Unit / Module 2	Learning Unit / Module 3	Learning Unit / Module 4	Learning Unit / Module 5
Duration (hour)		12	12	12	12	12
S-1	SLO-1	Definition and types of matrix	Introduction to algebraic equations	*Introduction to Differentiation*	Introduction to integration	Introduction to Laplace Transforms
	SLO-2	Examples of types of matrix.	Types of algebraic equations	*Solving basic problems*	Basic problems on integration	Basic properties
S-2	SLO-1	Symmetric matrix	*Relation between roots and coefficients of equation*	*More examples*	Integration of polynomial functions	Problems on Laplace Transforms
	SLO-2	Skew symmetric matrix	*Simple problems*	*More examples*	Integration of polynomial functions	Problems on Laplace Transforms
S-3	SLO-1	Hermitian matrix	Problems on irrational roots	*Minima of functions of single variable*	Integration of irrational functions	Solving problems of type $L[e^{at}f(t)]$
	SLO-2	Skew hermitian matrix	Problems on complex roots	*Maxima of functions of single variable*	Integration of irrational functions	Solving problems of type $L[e^{at}f(t)]$
S 4	SLO-1	Orthogonal matrix	Reciprocal equations-Definition	*Minima and maxima of functions of single variable*	Integration of irrational functions	Solving problems of type $L[tf(t)]$
	SLO-2	Unitary matrix	Solving Reciprocal equation of degree four with like and unlike signs for its coefficients-Type I	*Minima and maxima of functions of single variable*	Integration of irrational functions	Solving problems of type $L[tf(t)]$

S-5	SLO-1	Eigen values of a matrix	Solving reciprocal equation of odd degree with like signs for its coefficients-Type II	*More examples on maxima and minima*	Integration by the method of partial fractions	Solving problems of type $L[tf(t)]$
	SLO-2	Eigen values of a matrix	Solving reciprocal equation of odd degree with like signs for its coefficients-Type II	*More examples on maxima and minima*	Integration by the method of partial fractions	Solving problems of type $L[tf(t)]$
S-6	SLO-1	Eigen vectors of a matrix	Solving reciprocal equation of odd degree with unlike signs for its coefficients-Type III	*Introduction to curvature*	Integration by the method of partial fractions	Solving problems of type $L[e^{at}tf(t)]$
	SLO-2	Eigen vectors of a matrix	Solving reciprocal equation of odd degree with unlike signs for its coefficients-Type III	*Radius of curvature*	Integration by the method of partial fractions	Solving problems of type $L[e^{at}tf(t)]$
S -7	SLO-1	Eigen values and eigen vectors of a matrix	Solving reciprocal equation of even degree with unlike signs for its coefficients and the middle term is absent-Type IV	*Problems based on radius of curvature*	Integration by the method of partial fractions	Solving problems of type $L[e^{at}tf(t)]$
	SLO-2	Eigen values and eigen vectors of a matrix	Solving reciprocal equation of even degree with unlike signs for its coefficients and the middle term is absent-Type IV	*Problems based on radius of curvature*	Integration by the method of partial fractions	Solving problems of type $L[e^{at}tf(t)]$
S -8	SLO-1	Eigen values and eigen vectors of a matrix	Problems based on Type I and II	*Problems based on radius of curvature*	Bernoulli's formula	Solving problems of type $L\left[\frac{f(t)}{t}\right]$
	SLO-2	Eigen values and eigen vectors of a matrix	Problems based on Type III and IV	*Problems based on radius of curvature*	Simple problems	Solving problems of type $L\left[\frac{f(t)}{t}\right]$
S-9	SLO-1	Cayley Hamilton theorem	Newton-Raphson method.	*Partial differentiation-Introduction*	Reduction formula for $\int \sin^n x dx$	Introduction of Inverse Laplace transforms
	SLO-2	Problems based on Cayley Hamilton theorem	Problems on Newton-Raphson method.	*Simple problems*	Reduction formula for $\int \sin^n x dx$	Simple problems
S-10	*SLO-1*	Problems based on Cayley Hamilton theorem	Problems on Newton-Raphson method.	*Euler's theorem*	Reduction formula for $\int \cos^n x dx$	Basic problems on Inverse Laplace Transforms
	SLO-2	Problems based on Cayley Hamilton theorem	Problems on Newton-Raphson method.	*Problems on Euler's theorem*	Reduction formula for $\int \cos^n x dx$	Basic problems on Inverse Laplace Transforms
S-11	*SLO-1*	Cramer's rule	Horner's method	*Problems on Euler's theorem*	Reduction formula for $\int_0^{\frac{\pi}{2}} \sin^n x dx$	Finding inverse Laplace transforms by the method of partial fractions
	SLO-2	Problems based on Cramer's rule.	Problems on Horner's method	*Problems on Euler's theorem*	Reduction formula for $\int_0^{\frac{\pi}{2}} \sin^n x dx$	Finding inverse Laplace transforms by the method of partial fractions

S-12	*SLO-1*	Problems based on Cramer's rule.	Problems on Horner's method	*Problems on Euler's theorem*	Reduction formula for $\int_0^{\frac{\pi}{2}} \cos^n x dx$	Finding inverse Laplace transforms by the method of partial fractions
	SLO-2	Problems based on Cramer's rule.	Problems on Horner's method	*Problems on Euler's theorem*	Reduction formula for $\int_0^{\frac{\pi}{2}} \cos^n x dx$	Finding inverse Laplace transforms by the method of partial fractions

Learning Resources	*Theory:* *1. Dr.A.Singaravelu, Allied Mathematics, 7th edition, A.R.S.Publicatiions, 2015* *2. P.R.Vittal, <edition>, Margham Publications, <year of publication>*

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	**Remember**	**30%**	**-**	**30%**	**-**	**30%**	**-**	**30%**	**-**	**30%**	-
	Understand										
Level 2	Apply	40%	-	40%	-	40%	-	40%	-	40%	-
	Analyze										
Level 3	Evaluate	30%	-	30%	-	30%	-	30%	-	30%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Experts from Academic	Internal Experts
Dr.M.A.Baskar, Professor & Head, Dept. Of Mathematics, Loyola college, Chennai	L. Ananthi, Asst.Prof.,VDP,SRMIST
Dr.P.Dhanavanthan, Professor & Head, Dept. Of statistics, Pondicherry University	

Course Code	UCA20S02J	Course Name	GO PROGRAMMING	Course Category	S	Skill Enhancement Course	L	T	P	C
							1	0	1	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-1 :	Learn Go fundamentals and apply them in real world scenarios																		
CLR-2 :	Understand and develop your knowledge of programming fundamentals																		
CLR-3 :	Learn to handle the data with various data types.																		
CLR-4 :	*Learn the importance of interfaces*																		
CLR-5 :	*Learn the Concept of Server Programming*																		
CLR-6 :	Get to grip with advanced features like Channels and routines																		
Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*																		
CLO-1 :	*Understand the Programming concepts in free form environment*	*3*	*80*	*70*	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*-*	*L*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-2 :	*Know how to use the slices and maps*	*3*	*85*	*75*	*M*	*H*	*L*	*M*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-3 :	*Understand to handle the data using pointers*	*3*	*75*	*70*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-4 :	*Usage of Structs and Interfaces etc.,*	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-5 :	*Write basic applications in Go*	*3*	*85*	*75*	*H*	*H*	*M*	*H*	*L*	*-*	*-*	*-*	*M*	*L*	*-*	*H*	*-*	*-*	*-*
CLO-6 :	*Understand the concept of Concurrent Programming environment*	*3*	*80*	*70*	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*-*	*L*	*L*	*-*	*H*	*-*	*-*	*-*

Duration (hour)		06	06	06	06	06
S-1	SLO-1	Introduction to Go Programming	Arrays	Function Declaration, Recursion	Structs	File operations
	SLO-2	Understanding Program Structure		Returning Multiple Values		Writing Data into a File and Reading Data from a File
S-2	SLO-1	Hello World Program	Write a program to find sum, minimum and maximum of n numbers?	Write a recursive function to find factorial value of a number?	Write a program that illustrates how to create and access a struct?	Write a program to write a list of cities to a new file.
	SLO-2			Write a function that will accept 2 numbers and performs addition and subtraction and returns both values?		
S-3	SLO-1	Data Types, Variables & Constants	Slices	Variadic Functions,	Interfaces	Go routines
	SLO-2	Operators		Deferred Function Calls		
S-4	SLO-1	Write a program to display sum, difference, product and quotient of two numbers?	Write a program to create a slice using make function?	Write a function with one variadic parameter that finds the greatest number in a list of numbers?	Write a program that illustrates the concept interfaces?	Developing Concurrent Clock Server
	SLO-2					
S-5	SLO-1	Decision control statements – If, switch	Maps	Pointers	String Operations	Channels

	SLO-2	Iteration Statements – for, while		The * and & operators		
S-6	SLO-1	Write a program to get a number from console and check if it's between 1 and 10?	Write a program to illustrate how to create and initialize a map Using make() function?	Write a program that can swap two integers?	Write a program that inputs the string 'hello world' and slice it in two.	Send and receive data from a channel
	SLO-2	Write a program to calculate sum of first n numbers?				

Learning Resources	1. Caleb Doxsey, (2012), "An Introduction to Programming in Go" 2. *Mark Summerfield, (2012), "Programming in Go: Creating Applications for the 21st Century", Addison-Wesley Professional*	3. *Alan A. A. Donovan and Brian W. Kernighan, (2016), "The Go Programming Language" , Addison-Wesley Professional Computing Series*

Learning Assessment											
Level	**Bloom's Level of Thinking**	**Continuous Learning Assessment (50% weightage)**								**Final Examination (50% weightage)**	
		CLA – 1 (10%)		**CLA – 2 (10%)**		**CLA – 3 (20%)**		**CLA – 4 (10%) #**			
		Theory	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	-	30%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	-	40%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	-	30%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. S. Chandra Kala, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Dr. B. Rebecca Jayavadhanam, SRMIST*

Course Code	UCD20S02L	Course Name	*QUANTITATIVE APTITUDE AND REASONING*	Course Category	*S*	*Skill Enhancement Course*	L	T	P	C
							0	0	2	1

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Carrer Guidance and Development*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*
CLR-1 :	*Demonstrate various principles involved in solving mathematical concepts*
CLR-2 :	*Develop interest and awareness in students regarding profit/ loss, interest calculations and average*
CLR-3 :	*Critically evaluate basic mathematical concepts related to mixtures and alligations, permutation and combination, time and work*
CLR-4 :	*Provide students with skills necessary to generate and interpret data and concepts related to time, speed and distance and blood relation.*
CLR-5 :	*Enable students to understand reasoning skills*
CLR-6 :	*Create awareness in students regarding the various concepts in quantitative aptitude and reasoning skills and also its importance in various competitive exams*

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Understand, analyze and solve questions based on numbers, logarithms.*	*3*	*80*	*70*	*H*	*H*	*M*	*H*	*L*	*M*	*-*	*H*	*-*	*H*	*-*	*H*	*M*	*-*	*H*
CLO-2 :	*Create, solve, interpret and apply basic mathematical models which are applicable in our day to day life*	*3*	*80*	*75*	*M*	*H*	*M*	*H*	*-*	*M*	*-*	*H*	*-*	*H*	*-*	*H*	*M*	*-*	*H*
CLO-3 :	*Understand the concepts of mixtures and alligations, permutation and combinations, probability, time and work and to approach questions in a simpler and innovative method*	*3*	*85*	*70*	*M*	*H*	*M*	*H*	*-*	*M*	*-*	*H*	*-*	*H*	*-*	*H*	*M*	*-*	*H*
CLO-4 :	*Understand the concept in time ,speed and distance*	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*-*	*M*	*-*	*H*	*-*	*H*	*-*	*H*	*M*	*-*	*H*
CLO-5 :	*Ability to solve the problems on reasoning*	*3*	*85*	*75*	*M*	*H*	*M*	*H*	*-*	*M*	*-*	*H*	*-*	*H*	*-*	*H*	*M*	*-*	*H*
CLO-6 :	*Able to face different competitive exams*	*3*	*80*	*70*	*M*	*H*	*M*	*H*	*-*	*M*	*-*	*H*	*H*	*M*	*-*	*H*	*M*	*-*	*H*

Duration (hour)		6	6	6	6	6
S-1	SLO-1	Classification of numbers	Profit and Loss-Introduction	Mixtures and Alligations-Introduction	Time, Speed and Distance-Problems onTrains	Direction Sense-Introduction
	SLO-2	Test of divisibility	Profit and Loss- Basic Problems	Mixtures and Alligations-Problems	Time, Speed and Distance-Boats&Streams	Direction Sense-Problems
S-2	SLO-1	Unit digit	Statistics-Introduction	Permutation –Introduction& Basics	Data Interpretation – Bar chart	Number Series
	SLO-2	Tailed zeroes	Statistics-Mean,Median,Mode	Combination-Introduction& Basics	Data Interpretation – Pie chart	Word Series
S-3	SLO-1	HCF, LCM	Simple Interest-Introduction,Formulas &Problems	Probability-Introduction &Basics	Data Interpretation – Table	Seating Arrangements - Linear
	SLO-2	HCF, LCM - Solving problems	Compound Interest-Introduction,Formulas &Problems	Probability-Problems	Data Interpretation – Line graph	Seating Arrangements – Circular
S-4	SLO-1	Logarithm –Introduction of log rules	Word problems on Line equations-Introduction	Time and work-Introduction	Data sufficiency-Introduction and Basics	Puzzles-Concepts
	SLO-2	Logarithm –Applications of log rules	Word problems on Line equations-Basic problems	Time and work-Men and Work	Data sufficiency-Problems	Puzzles-Problems

S-5	SLO-1	Percentage -Introduction	Averages-Introduction & Basics	Time and work-Pipes &Cisterns(Introduction)	Blood relation-Introduction	Clocks-Concepts Discussion
	SLO-2	Percentage- Basic problems	Averages-Tricky Problems	Time and work-Pipes &Cisterns(Problems)	Blood relation-Problems	Clocks-Problems
S-6	SLO-1	Percentage-Increasing & Decreasing functions	Ratio and Proportions-Introduction	Time, Speed and Distance-Introduction	Coding – Decoding-Introduction	Calendars-Introduction of basic concept
	SLO-2	Percentage- Miscellaneous problems	Ratio and Proportions-Basics & problems	Time, Speed and Distance-Basic problems	Coding – Decoding-Different types	Calendars-Problems

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

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

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

Course Designers	
Experts from Industry	**Internal Experts**
1. Ajay Zener, Director, Career Launcher	*1. Dr P Madhusoodhanan, HoD, CDC, E&T, SRMIST*
	2. Dr M Snehalatha, Assistant. Professor, CDC, E&T, SRMIST

Course Code	UJK20201L	Course Name	COMMUNICATION SKILLS	Course Category	JK	Life Skill Course	L	T	P	C
							0	0	4	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	English	Data Book / Codes/Standards		Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	To make the students learn the native speakers' accent.
CLR-2 :	To educate them about word stress of English
CLR-3 :	The enable them to participate in group discussion and debates
CLR-4 :	To improve their participation and participation skills
CLR-5 :	To improve the listening and speaking abilities in English
CLR-6 :	LSRW skills all together is developed in every student

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Understand the native speakers' exact pronunciation	2	75	60
CLO-2 :	Master the sound systems of English	2	80	70
CLO-3 :	Have a better Word stress, Rhythm and Intonation	2	70	65
CLO-4 :	Develop Neutral Accent	2	70	70
CLO-5 :	Participate in any conversation with any native speaker	2	80	70
CLO-6 :	Clear any standardized tests conducted to measure the English language ability like IELTS and TOEFL	2	75	70

Program Learning Outcomes (PLO)															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning	
H	H	H	H	-	-	-	H	H	H	H	H	-	-	-	
H	H	H	-	-	-	-	H	H	H	H	H	-	-	-	
H	H	H	-	H	H	-	-	H	H	H	H	-	-	-	
H	H	H	-	H	-	-	-	-	-	H	H	-	-	-	
H	H	-	H	-	H	-	H	H	H	H	H	-	-	-	
H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	

Duration (hour)		12	12	12	12	12
S-1	SLO-1	Introduction to Digital language lab - helps in the listening skills by providing an interactive environment to the students	Learners are enabled to record their speech and listen to it in order to correct their lacuna	Reading software is used to facilitate reading exercises for the students	To enable the students to familiarize with word processor blogging	Students are enabled to learn and pronounce stressed and unstressed words
	SLO- 2	The students will be able to converse fluently	One will know himself where he/ she has gone wrong	Flow in reading will be improved	online publishing. Will be learnt by the students	The practice will lead them to acquire neutral accent and understand foreign accent
S-2	SLO-1	Students are exprossed to functionallanguage	Fluency and Pronunciation to be evaluated	The usage of phonetics will be mandated.	Enable the students in learning situational language	Common topics in IELTS speaking test and TOFEL will be provided to assess the students.
	SLO- 2	This exposure will help them pick up fluency	Their standard will measured	reading will be done in the class	Create imaginary situations and students are allowed to engage in conversations	Assessments will be provided for self scrutiny
S-3 –	SLO-1	Lab 1 In the wall of Pink Floyed to be played for the students	Lab 4 Students are given a situation, they need to write a respond for it by	Lab 7 Introduction to the conversation of a native speaker/ interview of a	Lab 10 learners are asked to describe some visual information(	Lab 13students will listen to a passage and they need to give a

S-4			*writing a letter requesting information or explaining the situation*	*native speaker*	table/charts/nature) in their own word	*suitable title*
	SLO- 2	*The students will be able to understand the isolation of a wall. It helps them to enhance their pronunciation*	*This will lead to understand the English letter conventions*	*Learners will prove the fluency by listening*	*They need to have a well organized thought of it using language accurately in a academic style.*	Assessment on their language competency and vocabulary
S-5	**SLO-1**	*They get familiarized with pronunciation styles*	*Learners to record and repeat new wordsagain and again*	*New words are to be referred in the reading passages and checked with the help of dictionaries*	*Familiarize the students with e-journals , e-guidance, e-magazines, e-Books, e-Library*	Listening topics in the IELTS listening test and TOFEL will be provided
	SLO- 2	*American and British styles are differentiated*	*Untill right prononciation isaquiredis not allowed to go to the Next session*	*Those new words are to be used in different contexts and sentences*	*Help students to access them as much as possible*	Assessment on their listening capacity is to be provided
S-6	**SLO-1**	*Listening to news bulletins and songswillbeenabled to help them to understand use of vocabulary*	*Learnerscanspeak English and compare the notes and exchange ideas*	*Comprehensive skills are enhanced and checked the level*	Enable the students to versatile writing	Reading topics in the IELTS reading test and TOFEL will be provided to assess the students.
	SLO- 2	*Will beenabled ti imitae the exact accent and prononciation*	*From the exchangedideascomprehensive questions willbeasked by the otherstudents*	*The levels are informed to the students and Icuna is explained*	Diffrerence in writing and readingisexplained	Assesment on their capacity is explained
S-7 – S-8	**SLO-1**	*Lab 2TedX will be played for the student*	*Lab 5 introduction to semi-formal/ neutral discursive essay will be taught.*	*Lab 8 television news will be broadcasted to them*	*Lab 11learners are given with a set of images where they need to write a story from it*	*Lab 14 students will listen to the great monologues of the time*
	SLO- 2	*It will help them to improve their fluency*	*It will teach them to write coherently and cohesively.*	*It will help them to understand the usage of words and the fluency of speaker*	*It helps them to keen on observation as well as to know their creativity.*	They will learn the importance of pronunciation, stress and pause in a speech
S-9	**SLO-1**	*To enable to listen to authentic sounds of the target language*	*Give different topics to debate to enable them talk fluently*	*The right pronunciation is checked with an access to articles fiction verses and speeches*	*Focus on writing is done*	writing topics in the IELTS writing test and TOFEL will be provided to assess the students.
	SLO- 2	*To enable them imitate the different sounds and accents and make them repeat it*	*To check the pace of their speech*	*Minute details and differences are marked and rectified*	*Conversational skills are enhanced*	Writing skills are assessed and tested
S-10	**SLO-1**	To enable to practice different accents focusing on intonation and voice modulation	*Dialogue delivery be checked by asking them to prepare for their own e- learning materials*	*Read and repeat passages*	Help in professionalwriting	Model IELTS and TOFEL test will be conducted for the students
	SLO- 2	The differences between intonation stress and modulations are explained	*Make the students speak and record*	*Check the ability to repeat the exact pronounciation*	Check and asses theirwritings	Assessment will be provided to the learners
S 11 - S 12	**SLO-1**	*Lab3 After listening to TedX, students need to jot down set of question.*	*Lab 6 learners will be taught to write a review for a film after watching*	*Lab 9 conversation between two people in every day context will be played for the studetns*	*Lab 12 students will listen to the writers note on publishing a novel/ short story*	*Lab 15 they will listen to grammar usage in the form of visual image and song*
	SLO- 2	This will help them to identify the key information in listening text.	*Leaner will need to think for the apt word. Through this language competency will be evaluated*	*It Will help them to understand the target language*	It will helps them to enhance their creativity also the language compétence	They will the foreign language easily and it enhances their competency of it

Learning Resources	***Theory:*** 1. Horizon- English Text Book – Compiled and Edited by the faculty of English Departement, FSH, SRMIST, 2020 2. ***English Grammar in Use by Raymond Murphy*** 3. *Raymond Murphy, Intermediate English Grammar, Cambridge University Press, 2007* 4. *R.P. Bhatnagar, English for Competitive Examinations, Trinity Press, 3rd Edition,2016* ***5.*** *http://www.aptitudetests.org/verbal-reasoning-test* ***6.*** *https://www.assessmentday.co.uk/aptitudetests_verbal.htm*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
	1. Prof. Daniel David, Prof & Head, Department of English, MCC, Chennai	*1. Dr. Shanthichitra, Associate Professor, & Head, Department of English, FSH, SRMIST*
		2. Dr K B Geetha, Assistant Professor, Department of English, FSH, SRMIST

Course Code	UNS20201L/ UNC20201L UNO20201L/ UYG20201L	Course Name	*NSS/NCC/NSO/YOGA*	Course Category	EA	Extension Activity	L	T	P	C
							0	0	0	0

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	NSS/NCC/NSO/YOGA	Data Book / Codes/Standards	*Nil*		

Assessment is Fully Internal

Learning Assessment	
Assessment Tools	**Marks**
Continuous Learning Assessment –I (CLA-I)	20 Marks
Continuous Learning Assessment –II (CLA-II)	30 Marks
Continuous Learning Assessment –III (CLA-III)	30 Marks
Continuous Learning Assessment –IV (CLA-IV)	20 Marks
Total Marks	100 Marks

SEMESTER III

Course Code	USA20301J	Course Name	PROGRAMMING IN JAVA	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-1 :	To understand the principles and concepts of Object Oriented Programming																		
CLR-2 :	To learn how to extend Java classes with inheritance and dynamic binding.																		
CLR-3 :	To learn how to produce robust programs in Java using Exception Handling																		
CLR-4 :	To achieve parallelism using threading concepts																		
CLR-5 :	To understand the basics of Graphical User Interface Programming																		
CLR-6 :	To design and program stand-alone Java applications.																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.	3	80	70	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-
CLO-2 :	Read and make elementary modifications to Java programs that solve real-world problems.	3	85	75	M	H	L	M	L	-	-	-	M	L	-	H	-	-	-
CLO-3 :	Validate input in a Java program	3	75	70	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-4 :	Identify and fix defects and common security issues in code.	3	85	80	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-5 :	To design reading and writing files in Java.	3	85	75	H	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-6 :	To develop various applications like banking, Inventory, etc	3	80	70	L	H	M	H	L	-	-	-	L	L	-	H	-	-	-

Duration (hour)		24	24	24	24	24
S-1	SLO-1	The Genesis of Java	Introducing classes	Inheritance Basics	Introduction to Java Thread model	Introduction to Event Handling
	SLO-2	How java changed the internet	Class fundamentals	Understanding Types of Inheritance: Single, Multilevel, Hierarchical Inheritance	Creating a Thread by Extending Thread Class	Understanding ActionEvent & ItemEvent
S-2	SLO-1	Java's magic: Byte Code	Declaring Objects	How does java support multiple inheritance?	Creating a Thread by implementing Runnable Interface.	Understanding KeyEvent &MouseEvent
	SLO-2	Introduction to Java Buzzword	Assigning object Reference variables	using Super keyword	Thread Class	TextEvent,WindowEvent,Component Event
S-3	SLO-1	Understanding Java Buzzwords - Simple, Object Oriented, Robust, Multithreaded, Architecture-Neutral, Interpreted and high performance, Distributed, Dynamic	Introducing method	What is Method Overriding?	Creating multiple threads	Introduction to Event Listener Interfaces
	SLO-2	Evolution of Java	What are Constructors? What are the Characteristics of constructors?	Understanding Dynamic method dispatch	Assigning Thread priorities	Working with ActionListener &, AdjustmentListener

S-4	SLO-1	*Introduction to Object Oriented Concepts of Java*	*Understanding Types of Constructors*	*Introduction to Abstract keyword*	*Applying Synchronization*	*Working with ContainerListener, ItemListener, ComponentListener*
	SLO-2	*Understanding Encapsulation, Polymorphism, Inheritance*	*Using this Keyword*	*Working with Abstract class and Method & Using final with inheritance*	*Inter-thread communication*	*Working with KeyListener & MouseListener*
S 5-8	SLO-1 SLO-2	*Lab1: Learning to work with Java IDE and Writing Simple Conversion Programs*	*Lab 4: Classes and Objects*	*Lab 7: Inheritance, Method Overriding, Abstract classes and methods*	*Lab 10: Multithreading*	*Lab 13: Event Handling*
S-9	SLO-1	*Introduction to Lexical Issues of Java*	*Introduction to Garbage Collection*	*Introduction to Package*	*Introduction to Legacy Classes*	*Introduction AWT Controls*
	SLO-2	*Understanding Whitespaces, Identifiers, Literals Comments, Separators, Keywords*	*Using Finalize() method*	*Creating a Package*	*Working with Vector class*	*Working with Label controls*
S-10	SLO-1	*Introduction to Data types of Java*	*Overloading methods*	*Understanding Access Protection*	*Examples using Vector class*	*Working with Buttons controls*
	SLO-2	*Understanding byte,short,int,long, float,double,chars,boolean*	*Overloading constructors*	*Importing packages*	*Understanding Stack class*	*Working with CheckBoxes*
S-11	SLO-1	*What is variable?, Declaring a variable, dynamic initialization of variables*	*Using objects as parameters*	*Introduction to Interfaces*	*Examples using Stack class*	*Working with CheckBoxGroup controls*
	SLO-2	*Scope and lifetime of variables*	*Argument Passing*	*Defining an interface*	*Introduction to Legacy Interfaces*	*Working with Choice controls*
S-12	SLO-1	*Introduction to Operators*	*Returning Objects*	*Implementing Interfaces*	*Understanding Enumeration Interface*	*Working with Lists controls*
	SLO-2	*Working with Arithmetic, Relational, Logical, Bitwise, Conditional, Assignment operators*	*Recursion*	*How Interfaces are extended?*	*Examples using Enumeration interface*	*Working with TextField controls*
S 13-16	SLO-1 SLO-2 SLO-3 SLO-4	*Lab2: Operators*	*Lab 4: Overloading Methods and Constructors, finalize() method*	*Lab 8: Packages and Interfaces*	*Lab 11: Legacy Classes and Interfaces*	*Lab 14: AWT Controls*
S-17	SLO-1	*What is Array?, Initialization of Arrays*	*Introducing Access Control*	*What is Exception?*	*Introduction to Utility classes*	*Introduction to Layout Manager*
	SLO-2	*Understanding Types of Arrays*	*Understanding Static variables and methods*	*Understanding Exception Types*	*Working with StringTokenizer*	*Understanding Flow Layout*
S-18	SLO-1	*Introduction to Control Statements*	*Understanding Final variables and methods*	*Introduction to Exception handling*	*Working with Date class*	*Understanding Border Layout*
	SLO-2	*Working with Selection Statements- All forms of if & Switch*	*Working with Nested Class*	*Working with try and catch*	*Working with Calendar*	*Understanding Grid Layout*
S-19	SLO-1	*Introduction to Iterative Statements*	*Understanding Inner Class*	*Using multiple catch clauses*	*Working with GregorianCalendar*	*Introduction to I/O Streams*
	SLO-2	*Working with while, do-while, for, for each statements*	*Introduction to String Class*	*Working with Finally, Throw and throws*	*Working with Random Class*	*Byte Streams classes*
S-20	SLO-1	*Introduction to Jump Statements*	*Working with String Handling Methods*	*Understanding Built-in Exceptions*	*Working with Scanner Class*	*Character Streams classes*
	SLO-2	*Working with break, continue and*	*Command Line arguments*	*Creating user defined Exceptions*	*Examples using utility classes*	*Examples using Byte and Character*

		return statements				*Streams*
S 21-24	SLO-1 SLO-2 SLO-3 SLO-4	*Lab 3: Arrays, Control Statements*	*Lab 6: String Class, Command Line Arguments*	*Lab 9: Exception Handling*	*Lab 12: Utility Classes*	*Lab 15: Layout Managers, Byte and Character Streams*

Learning Resources	1. *Herbert Schildt (2007), "Java: The Complete Reference", Seventh Edition, Tata McGraw publication.* 2. *Arnold and J.Gosling (2000), "The Java Programming Language", Second edition, Addision Wesley*	3. *Art Gittleman (2002), " Ultimate Java Programming", Wiley Publications*

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. A. Subashini, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. S. Chandrakala,SRMIST*

Course Code	*USA20302J*	Course Name	OPERATING SYSTEMS	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards		Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
CLR-1 :	Utilize operating systems based on its features and utility	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	Utilize the Process Management functions of an Operating system			
CLR-3 :	Utilize the features of Memory Management concepts of an Operating system			
CLR-4 :	Analyze how Device Management part of an Operating system functions			
CLR-5 :	Utilize the File Management functions of an Operating system			
CLR-6 :	Analyze the practical operating systems and evaluate their utility			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Identify functions of an operating system, analyze the process management functions	2	80	70
CLO-2 :	Analyze CPU scheduling and synchronization process of an operating system	3	85	75
CLO-3 :	Analyze the need of Memory management functions of an operating system	3	75	70
CLO-4 :	Identify the significance of device management and file management's role of an operating system	3	85	80
CLO-5 :	Identify the essentials of inter process communication in an operating system, evaluate hypervisors	3	85	75
CLO-6 :	Analyze how operating systems are constructed, analyze the features and aspects of different operating environments	3	80	70

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Introduction Operating Systems (OS):	Process concept : Introduction	Process Synchronization - Background	Deadlocks - System model	Memory management: introduction
	SLO-2	Operating System overview ,Operating system as a resource management	Process states : Process creation and process termination	The Critical section problem		
S-2	SLO-1	Operations, Assembler, Compiler, loader, linker	Process state transition diagram	Two process Solutions	Deadlock characterization - Necessary conditions	Logical Vs physical address space
	SLO-2	Evolution of Operating Systems ,serial processing and batch processing	Operation on process	Multi process Solutions		
S-3	SLO-1	Batch: Simple, Multiprogramming	Symmetric multiprocessing	Synchronization hardware solution	Resource Allocation Graph	Swapping
	SLO-2	Multiprocessor, Time Sharing, parallel systems			Methods for handling deadlocks	Organization : physical and logical organization
S-4	SLO-1	Distributed (client-server, peer-to-	Concurrent process	Semaphores – Usage	Deadlock Prevention - Mutual	Memory allocation method

		peer), Real-Time (hard, soft			exclusion, Hold and Wait	
	SLO-2	Clustering (symmetric, asymmetric, parallel)) , Network,)			No Preemption, Circular Wait	Single partition allocation
S 5-8	SLO-1	Lab 1: Comparison between various Operating Systems	Lab 4: Simulation of FCFS CPU scheduling algorithm	Lab 7: Write a procedure for timer interrupt handler	Lab 10: Program to implement Bankers Algorithm	Lab 13: multiple partition (dynamic)
	SLO-2					
S-9	SLO-1	Microkernel: Architecture, Kernel mode, user mode, Monolithic, differences	CPU Scheduling: Process Scheduler (long, short, medium term)	Semaphores –Implementation	Deadlock Avoidance - Safe state	Multiple partition memory management : contiguous (fixed, dynamic)
	SLO-2	System Call Types	Scheduling criteria	Binary semaphores	Resource Allocation Graph Algorithm	
S-10	SLO-1	((a) process control: fork(), exit(), wait()b)file manipulation: open(), read(), write(), close() (c)device mgt: ioctl(), read(), write()	CPU utilization, throughput, time: (a) turnaround (b) waiting (c) response Scheduling Types: FCFS, SJF	Classic Problems of Synchronization - The Bounded Buffer problem	Banker's Algorithm - Safety Algorithm	Contiguous Types: memory protection, allocation, fragmentation (c) partitioned
	SLO-2	b)file manipulation: open(), close()	Scheduling Types: FCFS, SJF	The Readers - Writers Problem		Compaction
S-11	SLO-1	read(), write()	Priority Scheduling: Preemptive, non-preemptive	The Dinning philosophers problem	Resource request algorithm	Paged memory management, Paging technique
	SLO-2					
S-12	SLO-1	Operating System services	Other Scheduling Types: Round Robin,	Critical Regions: Race condition and process synchronization	Examples	Segmentation
	SLO-2					Segmentation with paging
S 13-16	SLO-1	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
	SLO-2					
S-17	SLO-1	System Programs: file management, status info	multilevel queue	Implementation of Critical region	Deadlock Detection - Single instance of each resource type	Demand paging
	SLO-2		multilevel feedback queue	Mutual Exclusion Algorithm: Peterson , Monitors	Several instances of a Resource type	
S-18	SLO-1	File modification, language support Loading and execution, communications,	multiple processor Scheduling	Producer consumer problem	Recovery from deadlock	Page replacement algorithms
	SLO-2	Communications Threads: Single thread, Multi-thread			Process termination	Page Replacement - FIFO Page replacement
S-19	SLO-1	Operating System structure	Real time scheduling	IPC : Inter process communication	Resource preemption	Optimal
	SLO-2	Layered approach				
		Micro kernels				
S-20	SLO-1	Multithreading	Performance comparison	Message passing	Concurrency mechanism	LRU page replacement
	SLO-2	Symmetric multiprocessing		Bounded Buffer Problem	Comparison between deadlock and starvation	Thrashing
S 21-24	SLO-1	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
	SLO-2					

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

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	Mr.D.RajKumar
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Dr.P.Muthulakshmi

Course Code	UCA20D01J	Course Name	WEB DEVELOPMENT USING NODE JS AND MONGO	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	Full Stack Development using Node.js			
CLR-2 :	Design social media websites,music players and mini games via scripting			
CLR-3 :	Building own modules			
CLR-4 :	Understanding Node Package Manager			
CLR-5 :	Interface with Mongo DB			
CLR-6 :	Master NoSQL database			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Install Node.js	2	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-2 :	Create basic web applications using Node.js	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-3 :	Build HTTP server using core modules	3	75	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-4 :	Use stream IO to efficiently serve the web page	3	85	80	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-5 :	Create Modules to organize server	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-6 :	Quering and performing CRUD on Mongo DB	3	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Need of Scripting Language	Array Methods :indexOf, join, lasIndexOf, toString	Add HTTP header	Streams – Reading a Stream	Document with different types of values i)*Document with Scalar Values*
	SLO-2	Difference between client and server side scripting	Array Methods : reduce, reverse, slice, some, sort	Example programs	Stream – Writing to a stream	ii)*Document with Documents as values*
S-2	SLO-1	Script tag in HTML	Function Definition	Read the Query String	Piping the Stream	iii)*Document with Array as values*
	SLO-2	Java Script declaration	Function Parameters	Split the Query String	Chaining the Streams	CRUD operation :Insert Operation i)*insertOne() and ii)insertMany()* with examples
S-3	SLO-1	Output printing – document. Write, innerHTML	Calling a Function	Node.js URL Module	Node.js as a File Server	Perform Query Operation for the following situations *i)Query on nested documents*

						ii)Query an array
	SLO-2	window .alert, console.log	Return Statements	Node.js File Server	Create Files, Reading Files	*ii)Query an array of nested documents* *iv)Geospatial Queries* *Query Operation Examples*
S-4	SLO-1	Java script statements	Nested Functions	Node.js – NPM Package	Delete Files	Update Operation: *updateOne(), updateMany()*
	SLO-2	Comments and Variables	Example Programs	Downloading and Using a Package	Update and rename files	*replaceOne(), findAndModify()* Update operation :Examples
S 5-8	SLO-1 SLO-2	Lab 1 – Java Script Input and Output	Lab 4 – Functions	Lab 7 –Query String	Lab 10 – Streams and Files	*Lab :Working with CURD operations* Insert and Query
S-9	SLO-1	Java script Operators -Logical, Bitwise	Web stacks introduction	Callback – Blocking code example	Creating a Upload Form	Delete Operation: deleteMany(), deleteOne()
	SLO-2	Arithmetic and Assignment operators	LAMP, LEMP, MEAN, MERN	Callback – Non- Blocking code example	Parse the uploaded files	iii)findOneAndDelete() Delete operation Examples
S-10	SLO-1	Java Script Datatypes - numeric	Difference between php and java script	Event Driven Programming	Save the files	Operation on Mongodb Data: projection
	SLO-2	Java Script Datatypes – non numeric	Node introduction and evolution	Working of node Application	Display the uploaded files	Limiting Records Sorting Records
S-11	SLO-1	Conditional statements	Installing node.js and npm in windows	Node Even emitter class	Nodemailer Modules	Indexes in Mongodb, default _id index
	SLO-2	If else statements	Installing node.js and npm in Linux	add Listener(), on(), once()	Sending a email	Creating and Index createIndex method
S-12	SLO-1	Switch statements	Built in modules in node.js – http, https	removeListener(), removeAllListeners()	Multiple Receivers	Single Field, Compound, Multikey
	SLO-2	Iteration statements	Built in modules in node.js – querystring, readline	setMaxListemers(), listeners()	Sending HTML	Geospatial,text Index, Hashed Index
S 13-16	SLO-1 SLO-2	Lab 2 – Java Script Operators and Conditions	Lab 5 – Installing Node.js	Lab 8 – Event Driver classes	Lab 11 – Sending Mail	*Lab :Working with CRUD operations* Update and Delete
S-17	SLO-1	Loop Controls – for loop	Include modules	Creating Buffers, writing to buffers	Mongodb Datatypes: i)Integer ii)Boolean iii)Double iv)String v)Arrays vi)Object vii)Null viii)Regular expression ix)Timestamp x)Date xi)Object ID	Properties of Index i)Unique Indexes ii)Partial Indexes
	SLO-2	While loop	Writing first sample application	Reading from Buffers	Installing Mongo DB in Windows, Linux and Mac Operating Systems	iii)Sparse Indexes iv)TTL Indexes
S-18	SLO-1	Do while Loop	Creating own modules	Converting Buffer to JSON	Installing and Working with MongoDB interfaces: i)Mongo Shell, ii)Mongo Compass	Aggregation in Mongodb: i)aggregate() method Aggregate expressions: i) $sum ii) $avg iii) $min iv) $max

	SLO-2	For each loop	Including your own module	Concatenate Buffer	Introduction to entities of MongoDB: i)Databases i)Collections and iii)Documents	v) $push vi) $addToSet vii) $first viii) $last
S-19	SLO-1	Arrays Introduction and declaring	Node.js – REPL Terminal – Read, Eval	Compare, Copy Buffer	Database: i)*createDatabase()*method with example	*Mongodb Backup: Export/Import data backup using shell* i)mongodump ii)mongorestore
	SLO-2	Accessing arrays	Node.js – REPL Terminal – Print, Loop	Slice Buffer and Buffer Length	ii)*dropDatabase()* method with example	*Mongodb Backup: Export/Import data backup using Mongo Compass*
S-20	SLO-1	Array Properties : index, input length, prototype	Node.js as built in HTTP module	isEncoding(), isBuffer()	Collections: i)*createCollection()* method with example	Monitoring Deployment using Mongodb: i)*mongostat*, *mongotop*
	SLO-2	Array Methods :concat, every, forEach	Node.js as a Web Server	byteLength	ii)*dropCollection()* method with example	iii)serverStatus, dbStats, collStats
S 21-24	SLO-1 SLO-2	Lab 3 - Looping Statements	Lab 6 - Running sample application using node.js	Lab 9 - Buffers	Lab 12 – Working with MongoDB – create,drop,working with Collections	Lab: i)Creating different types of indexes ii)Aggregate data using different Aggregate expressions iii)Perform Mongodb data *Export* and *Import* using shell as well as mongo compass. iv)Working with mongo deployment commands

Learning Resources	**Online Official Documentation** 1. NodeJS v13.10.1 Docs: https://nodejs.org/latest-v13.x/api/documentation.html 2 . MongoDB: https://docs.mongodb.com/manual/tutorial/getting-started/

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. Ramla, SRM IST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. Anita Jasmine, SRM IST*

Course Code	UCA20D02J	Course Name	WEB DEVELOPMENT USING REACT JS AND MONGO	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil[[		

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	Learn about MVC architecture
CLR-2 :	Getting Introduced to React
CLR-3 :	Develop a proper understanding of Web Development Architecture
CLR-4 :	Create application using React components
CLR-5 :	Master NoSQL database
CLR-6 :	Handing Document Oriented Database

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Build effective React Applications	2	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-2 :	Install and Configure React	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-3 :	Understand NPM modules	3	75	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-4 :	Event Handling	3	85	80	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-5 :	Understand life cycle components	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-6 :	JSX and its usecase	3	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Need of Scripting Language	Array Methods :indexOf, join, lasIndexOf, toString	Arrow Functions return value by Default	Adding Events	Document with different types of values i)*Document with Scalar Values*
	SLO-2	Difference between client and server side scripting	Array Methods : reduce, reverse, slice, some, sort	Arrow Functions with Parameters	Event Handler	ii)*Document with Documents as values*
S-2	SLO-1	Script tag in HTML	Function Definition	Arrow Function without Parentheses	React Event Object	iii)*Document with Array as values*
	SLO-2	Java Script declaration	Function Parameters	React Render HTML	Adding Forms in REACT	CRUD operation :Insert Operation i)*insertOne() and ii)insertMany()* with examples
S-3	SLO-1	Output printing – document. Write, innerHTML	Calling a Function	Render Function	Handling Forms	Perform Query Operation for the following situations *i)Query on nested documents ii)Query an array*

	SLO-2	window .alert, console.log	Return Statements	HTML and root node	Conditional Rendering	*ii)Query an array of nested documents* *iv)Geospatial Queries* *Query Operation Examples*
S-4	SLO-1	Java script statements	Nested Functions	REACT JSX	Submitting Forms	Update Operation: *updateOne(), updateMany()*
	SLO-2	Comments and Variables	Example Programs	Coding and expressions in JSX	Multiple Input Fields	*replaceOne(), findAndModify()* Update operation :Examples
S 5-8	SLO-1 SLO-2	Lab 1 – Java Script Input and Output	Lab 4 – Functions	Lab 7 – Working with JSX	Lab 10 – Handling Events	*Lab :Working with CURD operations* Insert and Query
S-9	SLO-1	Java script Operators -Logical, Bitwise	Web stacks introduction	Inserting a Large Block of HTML	Validating Form Input	Delete Operation: deleteMany(), deleteOne()
	SLO-2	Arithmetic and Assignment operators	LAMP and LEMP	Example Programs	Running Validation form	iii)findOneAndDelete() Delete operation Examples
S-10	SLO-1	Java Script Datatypes - numeric	Difference between php and java script	REACT Components	Adding Error messages	Operation on Mongodb Data:projection
	SLO-2	Java Script Datatypes – non numeric	MEAN, MERN	Creating a Class Component	Textarea, select	Limiting RecordsSorting Records
S-11	SLO-1	Conditional statements	REACT Environment set up - windows	Creating a Function Component	REACT CSS	Indexes in Mongodb, default _id index
	SLO-2	If else statements	Creating a Sample REACT Program	Component Constructor	Inline Styling	Creating and Index createIndex method
S-12	SLO-1	Switch statements	Creating a REACT APP	Components in Components	CSS Style sheet	Single Field, Compound, Multikey
	SLO-2	Iteration statements	Running the REACT Application	Components in Files	CSS Modules	Geospatial,text Index, Hashed Index
S 13-16	SLO-1 SLO-2	Lab 2 – Java Script Operators and Conditions	Lab 5 –Simple React Application	Lab 8 – Working with React Components	Lab 11 – Style react with css	*Lab :Working with CURD operations* Update and Delete
S-17	SLO-1	Loop Controls – for loop	REACT Directly in HTML	REACT Props	Mongodb Datatypes: i)Integer ii)Boolean iii)Double iv)String v)Arrays vi)Object vii)Null viii)Regular expression ix)Timestamp x)Date xi)Object ID	Properties of Index i)Unique Indexes ii)Partial Indexes
	SLO-2	While loop	Running and Modifying REACT Application	Pass Data , Props Constructor	Installing Mongo DB in Windows, Linux and Mac Operating Systems	iii)Sparse Indexes iv)TTL Indexes
S-18	SLO-1	Do while Loop	ECMA Script 6 – ES6	REACT state object	Installing and Working with MongoDB interfaces: i)Mongo Shell, ii)Mongo Compass	Aggregation in Mongodb: i)aggregate() method Aggregate expressions: i) $sum ii) $avg iii) $min iv) $max
	SLO-2	For each loop	Versions of ECMA	Using the state object	Introduction to entities of MongoDB: i)Databases i)Collections and iii)Documents	v) $push vi) $addToSet vii) $first viii) $last
S-19	SLO-1	Arrays Introduction and declaring	Classes	Changing the state object	Database: i)*createDatabase()*method with	*Mongodb Backup: Export/Import data backup using shell*

					example	i)mongodump ii)mongorestore
	SLO-2	Accessing arrays	Methods in Class	Life cycle components – Mounting	ii)*dropDatabase()* method with example	*Mongodb Backup:* *Export/Import data backup using Mongo Compass*
S-20	SLO-1	Array Properties : index, input length, prototype	Class Inheritance	Life cycle components – Updating	Collections: i)*createCollection()* method with example	Monitoring Deployment using Mongodb: i)*mongostat*, *mongotop*
	SLO-2	Array Methods :concat, every, forEach	Arrow Functions	Life cycle components – UnMounting	ii)*dropCollection()* method with example	iii)serverStatus, dbStats, collStats
S 21-24	SLO-1 SLO-2	Lab 3 - Looping Statements	Lab 6 – Using concept of Class Inheritance	Lab 9 – Pass information to Components using Props	Lab 12 – Working with Collections	Lab: i)Creating different types of indexes ii)Aggregate data using different Aggregate expressions iii)Perform Mongodb data *Export* and *Import* using shell as well as mongo compass. iv)Working with mongo deployment commands

Learning Resources	Official Online Documentation: 1. React JS: https://reactjs.org/docs/getting-started.html 2. MongoDB: https://docs.mongodb.com/manual/tutorial/getting-started/

Learning Assessment

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

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

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. Anita Jasmine, SRM IST*

Course Code	*UCA20D03J*	Course Name	WEB DEVELOPMENT USING ANGULAR JS AND MONGO	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning
CLR-1 :	Master NoSQL database	
CLR-2 :	Handing Document Oriented Database	
CLR-3 :	Ability to derive the document based data model	
CLR-4 :	Getting Startled with Angular js	
CLR-5 :	Developing SPA	
CLR-6 :	Familiarizing with CSS , Bootstrap along with SPA	

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Program Learning Outcomes (PLO)														
					1 Fundamental Knowledge	2 Application of Concepts	3 Link with Related Disciplines	4 Procedural Knowledge	5 Skills in Specialization	6 Ability to Utilize Knowledge	7 Skills in Modeling	8 Analyze, Interpret Data	9 Investigative Skills	10 Problem Solving Skills	11 Communication Skills	12 Analytical Skills	13 ICT Skills	14 Professional Behavior	15 Life Long Learning
CLO-1 :	Understand Single Page Applications	2	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-2 :	MVC Layers of Application	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-3 :	Master expressions, filters and scopes	3	75	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-4 :	Write Angular JS Directives	3	85	80	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-5 :	Create attractive UI using Bootstrap	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-6 :	Validate and create model-driven forms	3	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Need of Scripting Language	Array Methods :indexOf, join, lasIndexOf, toString	Angular JS Arays	Angular JS Scope	Document with different types of values i)*Document with Scalar Values*
	SLO-2	Difference between client and server side scripting	Array Methods : reduce, reverse, slice, some, sort	Angular JS Expressions vs Java Script Expressions	Understanding the scope	ii)*Document with Documents as values*
S-2	SLO-1	Script tag in HTML	Function Definition	Angular JS Modules	Angular JS Filters	iii)*Document with Array as values*
	SLO-2	Java Script declaration	Function Parameters	Creating a Module	Adding Filters to Directives	CRUD operation :Insert Operation i)*insertOne() and ii)insertMany()* with examples
S-3	SLO-1	Output printing – document. Write, innerHTML	Calling a Function	Adding a Controller	The filter Filter	Perform Query Operation for the following situations *i)Query on nested documents*

						ii)Query an array
	SLO-2	window .alert, console.log	Return Statements	Adding a Directive	Filter an Array Based on User Input	*ii)Query an array of nested documents* *iv)Geospatial Queries* *Query Operation Examples*
S-4	SLO-1	Java script statements	Nested Functions	Modules in Files	Sorting an Array based on Userinput	Update Operation: *updateOne(), updateMany()*
	SLO-2	Comments and Variables	Example Programs	Controllers in Files	Custom Filters	*replaceOne(), findAndModify()* Update operation :Examples
S 5-8	SLO-1 SLO-2	Lab 1 – Java Script Input and Output	Lab 4 – Functions	Lab 7 – Working with Angular js modules	Lab 10 – Apply Filters	*Lab :Working with CRUD operations* Insert and Query
S-9	SLO-1	Java script Operators -Logical, Bitwise	Web stacks introduction	Angular JS Directives	Angular Service $http Service, $timeout Service, $interval service	Delete Operation: deleteMany(), deleteOne()
	SLO-2	Arithmetic and Assignment operators	LAMP and LEMP	Data Binding	Creating own services	iii)findOneAndDelete() Delete operation Examples
S-10	SLO-1	Java Script Datatypes - numeric	Difference between php and java script	Repeating HTML Elements	Angular JS $http and methods	Operation on Mongodb Data: projection
	SLO-2	Java Script Datatypes – non numeric	MEAN, MERN	ng-app directive	Angular JS $http and Properties	Limiting Records Sorting Records
S-11	SLO-1	Conditional statements	Angular Environment set up - windows	ng-init directive	Displaying Data in a Table	Indexes in Mongodb, default _id index
	SLO-2	If else statements	Angular JS Framework	Ng-model directive	Displaying with CSS Style	Creating and Index createIndex method
S-12	SLO-1	Switch statements	Angular JS with HTML	Create new directives	Angular JS Select Box	Single Field, Compound, Multikey
	SLO-2	Iteration statements	Angular ng directives	Restrictions	Data Source as Object	Geospatial,text Index, Hashed Index
S 13-16	SLO-1 SLO-2	Lab 2 – Java Script Operators and Conditions	Lab 5 – Working with Angular js and HTML	Lab 8 –Work with Directives	Lab 11 – Using http methods and properties	*Lab :Working with CRUD operations* Update and Delete
S-17	SLO-1	Loop Controls – for loop	Angular directives	Angular JS ng-model directive	Mongodb Datatypes: i)Integer ii)Boolean iii)Double iv)String v)Arrays vi)Object vii)Null viii)Regular expression ix)Timestamp x)Date xi)Object ID	Properties of Index i)Unique Indexes ii)Partial Indexes
	SLO-2	While loop	Angular JS Expressions	Ng-model directive	Installing Mongo DB in Windows, Linux and Mac Operating Systems	iii)Sparse Indexes iv)TTL Indexes
S-18	SLO-1	Do while Loop	Angular JS Applications	Two-way binding	Installing and Working with MongoDB interfaces: i)Mongo Shell, ii)Mongo Compass	Aggregation in Mongodb: i)aggregate() method Aggregate expressions: i) $sum ii) $avg iii) $min iv) $max

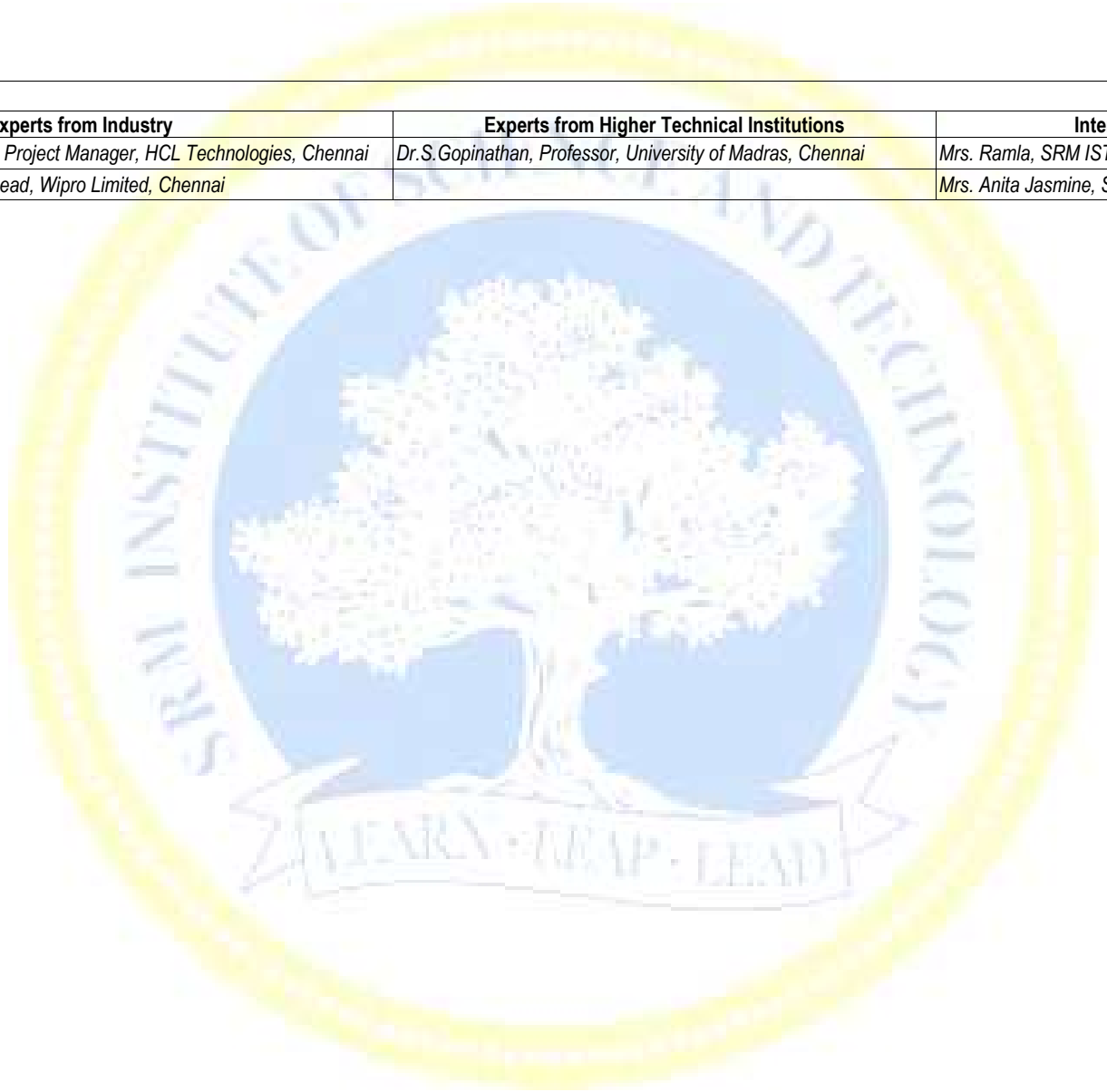
	SLO-2	For each loop	Angular JS Module	Validating use input	Introduction to entities of MongoDB: i)Databases i)Collections and iii)Documents	v) $push vi) $addToSet vii) $first viii) $last
S-19	SLO-1	Arrays Introduction and declaring	Angular JS Controller	Angularjs Data Binding – Data Model	Database: i)*createDatabase()*method with example	*Mongodb Backup: Export/Import data backup using shell* i)mongodump ii)mongorestore
	SLO-2	Accessing arrays	Angular JS Numbers	Angularjs Data Binding – ng Model	ii)*dropDatabase()* method with example	*Mongodb Backup: Export/Import data backup using Mongo Compass*
S-20	SLO-1	Array Properties : index, input length, prototype	Angular JS Strings	AngularJS Controller	Collections: i)*createCollection()* method with example	Monitoring Deployment using Mongodb: i)*mongostat*, *mongotop*
	SLO-2	Array Methods :concat, every, forEach	Angular JS Objects	Controller Methods	ii)*dropCollection()* method with example	iii)serverStatus, dbStats, collStats
S 21-24	SLO-1 SLO-2	Lab 3 - Looping Statements	Lab 6 – Work with numbers, strings and objects	Lab 9 – Validating User input for a GUI	Lab 12 – Create and manipulate database	Lab: i)Creating different types of indexes ii)Aggregate data using different Aggregate expressions iii)Perform Mongodb data *Export* and *Import* using shell as well as mongo compass. iv)Working with mongo deployment commands

Learning Resources	Official Online Documentation: 1. AngularJS: https://angular.io/docs 2. MongoDB: https://docs.mongodb.com/manual/tutorial/getting-started/

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. Ramla, SRM IST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. Anita Jasmine, SRM IST*



Course Code	UMS20G03T	Course Name	STATISTICAL METHODS	Course Category	G	Generic Elective Course	L	T	P	C
							3	1	0	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Mathematics and Statistics	Data Book / Codes/Standards		Graph sheet needed; t, F and χ^2 table is needed	

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	To provide foundations in Bio Statistics
CLR-2 :	To provide a strong foundations 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.
CLR-6 :	To analyze the sample data in order to estimate or predict characteristics of the larger population from which the sample is drawn.

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
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;	3	85	80
CLO-2 :	To calculate and apply measures of central tendency - grouped and ungrouped data cases.	3	80	75
CLO-3 :	To understand and apply measures of dispersion - grouped and ungrouped data cases.	3	85	80
CLO-4 :	Find the relationship between two or more variables using correlation and regression.	3	85	80
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	80
CLO-6 :	Perform the Analysis of Variance - One way Classifications.	3	75	80

Learning	Program Learning Outcomes (PLO)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	L	L	L	M	L	-	-	-	L	M	H	M	-	-	-
CLO-2 :	M	M	M	M	M	-	-	-	M	M	H	M	-	-	-
CLO-3 :	H	H	M	H	M	-	-	-	M	M	H	H	-	-	-
CLO-4 :	M	H	M	H	M	-	-	-	M	M	H	H	-	-	-
CLO-5 :	H	H	M	H	H	-	-	-	M	M	H	M	-	-	-
CLO-6 :	H	H	M	H	M	-	-	-	M	M	H	M	-	-	-

		Learning Unit / Module 1	Learning Unit / Module 2	Learning Unit / Module 3	Learning Unit / Module 4	Learning Unit / Module 5
Duration (hour)		12	12	12	12	12
S-1	SLO-1	Nature and scope of statistical methods Definition of statistics Numerical Data	Measures of Central tendency i. Definition ii. Functions of average iii. Characteristics of a typical average	Measures of Dispersion,	Correlation Analysis: Correlation - Definition and uses Types of correlation	Testing of Hypotheses -Testing Procedures
	SLO-2	Nature of statistics	Arithmetic mean Individual series	Range –Individual, Discrete series and Continuous series	Methods for Finding Correlation Coefficient, Properties of correlation coefficient	Definition of test statistic t and its uses
S-2	SLO-1	Importance of statistics	Arithmetic mean Discrete series	Quartile Deviation - Individual and Discrete series	Karl Pearson's Correlation Co-efficient	t-test Small Sample tests
	SLO-2	Functions of statistics	Arithmetic mean	Quartile Deviation - Individual and	Karl Pearson's Correlation Co-	Testing Procedure

			Continuous series	*Discrete series*	*efficient*	
S-3	SLO-1	*Limitations*	*Arithmetic mean* *Continuous series*	*Quartile Deviation - Continuous series*	Spearman's Rank Correlation Coefficient with non-repeated Ranks	t-test - Test for Single Mean
	SLO-2	Distrust of Statistics	*Arithmetic mean* *Cumulative series*	*Quartile Deviation - Continuous series*	Spearman's Rank Correlation Coefficient with non-repeated Ranks	t-test - Test for Single Mean
S 4	SLO-1	*Classification i)* Meanings *ii)* Objects iii) Rules of classification	*Arithmetic mean* *Meritsand Demerits*	*Mean Deviation about Mean – Individual Series*	Spearman's Rank Correlation Coefficient with repeated Ranks	t-test -Test for two Sample Means
	SLO-2	*Classification* *i.* Types of classification *ii.* Characteristics of good classification	*Median* *Individual series*	*Mean Deviation about Mean – Discrete series*	Spearman's Rank Correlation Coefficient with repeated Ranks	t-test -Test for two Sample Means
S-5	SLO-1	*Tabulation:* *i.* Parts of Tabulation *ii.* Rules of Tabulation	*Median* *Discrete series*	*Mean Deviation about Mean – Continuous 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-2	Types of tables Objective of Tabulation	*Median* *Continuous series*	*Mean Deviation about Median – Individual series*	Problems on finding the best pair of judgements	t-test - t Test Statistic, when sample standard deviations are not known, but Population Standard Deviations are known
S-6	SLO-1	Components of Good Table Rules of construction of the table.	*Median* *Continuous series*	*Mean Deviation about Median – Discrete series*	Bivariate Distribution	*Chi-Square distribution* - Definition and its Uses
	SLO-2	Difference between classification and tabulation.	*Median* *Merits and Demerits*	*Mean Deviation about Median– Continuous series*	Bivariate Distribution	Chi-Square test - Testing Procedure
S -7	SLO-1	*Diagrammatic representation of various types of statistical data :* Bar Diagram	*Mode* *Individual series*	*Standard Deviation – Individual and Discrete Series*	Regression Analysis: Regression - Definition and Uses	Test based on Goodness of fit
	SLO-2	Types of Bar diagram	*Mode* *Discrete series*	*Standard Deviation – Individual and Discrete Series*	Regression Coefficients	Test based on Goodness of fit
S -8	SLO-1	One dimensional Diagrams	*Mode* *Continuous Series*	*Standard Deviation-Continuous Series*	Regression Equations	Testing the Independence of Attributes using *Chi-Square*
	SLO-2	Two dimensional Diagrams	*Mode* *Continuous Series*	*Standard Deviation-Continuous Series*	Types of Regression Equations	Testing the Independence of Attributes using *Chi-Square*
S-9	SLO-1	Pie chart	*Mode* *Continuous series*	*Coefficient of Variation*	Regression Equation of X on Y and Regression Equation of Y on X	F-test - Test Statistic of F-test

	SLO-2	Histogram	*Mode* *Meritsand Demerits*	*Coefficient of Variation*	Regression Equation of X on Y and Regression Equation of Y on X	Uses and testing Procedures
S-10	*SLO-1*	*Frequency Polygon*	Empirical Relation	*Graphical solution of Dispersion* *Lorenz curve*	Regression Equation of X on Y and Regression Equation of Y on X	*Testing the equality of variance using F distribution*
	SLO-2	Frequency Curve	Empirical Relation	*Graphical solution of Dispersion* *Lorenz curve*	Regression Equation of X on Y and Regression Equation of Y on X	*Testing the equality of variance using F distribution*
S-11	*SLO-1*	*Less than O gives*	*Graphical solution of Median*	*Skewness* *Bowley's coefficient of Skewness*	Relationship between Correlation and Regression Coefficients	Analysis of Variance – Definition and Uses
	SLO-2	*More than O gives*	*Graphical solution of Median*	*Skewness* *Bowley's coefficient of Skewness*	Problems on the Relationship between the Coefficients	Analysis of Variance – testing procedure
S-12	*SLO-1*	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
	SLO-2	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

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

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	30%	-	30%	-	30%	-	30%	-	30%	-
	Understand										
Level 2	Apply	40%	-	40%	-	40%	-	40%	-	40%	-
	Analyze										
Level 3	Evaluate	30%	-	30%	-	30%	-	30%	-	30%	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers	
Experts from Academic	**Internal Experts**
Dr.M.A.Baskar, Professor & Head, Dept. Of Mathematics, Loyola college, Chennai	S. Suruthi, Assistant Professor, Dept. Mathematics and Statistics, FSH, SRMIST

Dr.P.Dhanavanthan, Professor & Head, Dept. Of statistics, Pondicherry University	

Course Code	UMI20S01L	Course Name	My India Project	Course Category	S	Skill Enhancement course	L	T	P	C
							0	0	0	1

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department		*Computer Applications*	Data Book / Codes/Standards	*Nil*	

(Assessment Method – Fully Internal)

Assessment Tools	Marks
Review – I (Activities)	50
Review – II (Project report and Presentation)	50
Total	100

Course Code	UJK20301T	Course Name	UNIVERSAL HUMAN VALUES	Course Category	JK	Life Skill Course	L	T	P	C
							2	0	0	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	English	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	To generate in students a sensitivity to current regional and national issues such as gender marginalization Eco sensitivity, vision for the Nation and general humanness
CLR-2 :	An expanded consciousness with a mind to accommodate all is developed
CLR-3 :	The ability to accept all and to co- exist is initiated
CLR-4 :	To create community connectivity and interdependence
CLR-5 :	To instill intrinsic link between freedom and responsibility for both individuals and communities
CLR-6 :	Make them learn the basic nature of human beings

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Become sensitive toward every living life and be able to respect every religion recognizing the universal values	2	75	60	H	H	H	H	-	-	-	H	H	H	H	H	-	H	H
CLO-2 :	Every way of life and culture will kindle the curiosity in them to know them and will be able appreciate the beauty in it	2	80	70	H	H	H	H	-	-	-	H	H	H	H	H	-	H	H
CLO-3 :	The presumptuous or prejudiced mentality will be overcome by them	2	70	65	H	H	H	H		-	-	-	-	-	-	-	-	-	-
CLO-4 :	Critical thinking and accommodative nature will become so natural way of thinking for them	2	70	70	H	H	H	H	H	-	-	-	-	-	H	-	-	-	-
CLO-5 :	They will become aware of the social inequalities and justice	2	80	70	H	H	-	H	-	-	-	-	-	-	-	-	-	-	-
CLO-6 :	Will be able to explore their own emotions, hopes & fear and be able to describe them verbally	2	75	70	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

Duration (hour)		06	06	06	06	06
S-1	SLO-1	What is love? Forms of love. For self, parents, family, friends, spouse, community, nation, humanity and other beings, both for living and non living	*Love compassion empathy sympathy and non violence*	*Narratives and anecdotes from history, literature including local folklore*	*What will learners lose if they don't practice love and compassion?*	*Sharing learners' individual and/ or group experiences*
	SLO-2	Love and Compassion inter relatedness	*Individuals who are remembered in history for practicing compassion and love*	*Practicing Love and Compassion: what will they gain if they practice compassion?*	*Simulated situations*	Case studies

S-2	**SLO-1**	*What is Truth ?*	*Universal truth, truth as value, as fact,*	*Veracity, sincerity, honesty among others*	Individuals who are remembered in the history who have practiced these values	Practicing truths
	SLO-2	*: what will they gain if they practice truth*	*What will learners lose if they don't practice truth?*	*Sharing learners' individual and/ or group experiences*	*Simulated situations*	Case studies
S-3	**SLO-1**	*What is non violence – its need, love compassion,*	*empathy sympathy for others as pre- requisites for non- violence*	**Ahimsa as non violence and non killing**	*Individuals and their organizations which are known for their commitment for non violence*	Narratives and anecdotes about non violence from history and literature including local folklore
	SLO-2	Practicing non violence	*What will they gain if they practice non violence*	*What will learners lose if they don't practice non violence?*	*Simulated situations*	Case studies
S-4	**SLO-1**	*What is righteousness ?*	*Righteousness and Dharma*	*Righteousness and priority*	Individuals who are remembered in the history who have practicing righteousness.	Narratives and anecdotes about Righteousness from history and literature including local folklore
	SLO-2	Practicing *Righteousness*	*: Sharing learners' individual and/ or group experiences*	*what will learners lose if they don't practice Righteousness*	*Simulated situations*	Case studies
S-5	**SLO-1**	*What is peace?*	*Need of peace in Relation with harmony and balance*	Narratives and anecdotes about peace from history and literature including local folklore	Individuals who are remembered in the history who have practicing peace	Practicing peace
	SLO-2	*What will they gain if they practice peace*	*what will learners lose if they don't practice peace*	*Sharing learners' individual and/ or group experiences*	*Simulated situations*	Case studies
S-6	**SLO-1**	What is service and renunciation	*Forms of service , & renunciation Individuals who have recommended service in history*	*Practicing service and renunciation*	Narratives and anecdotes about Service & renunciation from history and literature including local folklore	Individuals who are remembered in the history who have practicing renunciation
	SLO-2	*Sharing learners' individual and/ or group experiences on renunciation*	*Sharing learners' individual and/ or group experiences on service*	*what will learners lose or gain if they do/don't practice Renunciation and service*	*Simulated situations*	Case studies

Learning Resources	***Theory:*** 1. "Universal Human Values: Text Book"– Compiled and Edited by the Faculty of Science and Humanites, SRMIST, 2020.

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

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

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
	1. Prof. Daniel David, Prof & Head, Department of English, MCC, Chennai	*1. Dr. Shanthichitra, Associate Professor, & Head, Department of English, FSH,SRMIST*
		2. Dr K B Geetha, Assistant Professor, Department of English, FSH, SRMIST

SEMESTER IV

Course Code	UCA20401J	Course Name	WINDOWS PROGRAMMING USING VB.NET	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning		
		1	2	3
CLR-1 :	*Understand the basic structure of VB.Net and features of IDE*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	*Understand .NET framework and can realize some of the major enhancements in the new version of VB*			
CLR-3 :	*Develop programs using primitives and constructs in VB .NET*			
CLR-4 :	*Handle controls in Forms(message Box, InputBox), Windows MDI forms and Controls (Textbox, Creating MultiLine,Word Wrap textboxes)*			
CLR-5 :	*Understand various controls in VB.NET and able to develop programs using controls*			
CLR-6 :	*Connect database by using ADO.NET and manipulate the database*			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning		
CLO-1 :	Design/develop programs with GUI interfaces	*3*	*80*	*70*
CLO-2 :	*Assemble multiple forms, modules, and menus into working VB.NET solutions*	*3*	*85*	*75*
CLO-3 :	*Develop menu based program for text manipulation*	*3*	*75*	*70*
CLO-4 :	*Implement lists and loops with VB.NET controls and iteration*	*3*	*85*	*80*
CLO-5 :	*Understand ADO .NET and develop database applications*	*3*	*85*	*75*
CLO-6 :	*Develop the applications using DataGrid for displaying records*	*3*	*80*	*70*

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
L	*H*	-	*H*	*L*	-	-	-	*L*	*L*	-	*H*	-	-	*H*
M	*H*	*L*	*M*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	*H*
M	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	*H*
M	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	*H*
H	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	*H*
L	*H*	*M*	*H*	*L*	-	-	-	*L*	*L*	-	*H*	-	-	*H*

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Evolution of the .NET Framework	*Control Statements*	*Inheritance*	*Exception Handling*	*Single Document Interface(SDI)*
	SLO-2	Overview of the .Net Framework	*If Statement*	*Polymorphism*	*Default Exception Handing Mechanism*	*Multiple Document Interface (MDI)*
S-2	SLO-1	*Components of .NET Framework*	*Radio Button Control*	*Virtual Methods*	*User Defined Exception Handling Mechanism*	*Implementation for SDI and MDI*
	SLO-2	*Common Language Runtime (CLR)*	*Check Box Control*	*Abstract classes*	*Implementation for Default and User Defined Exception Handling*	*Dialog Boxes*
S-3	SLO-1	*Common Type System(CTS)*	*List Box Control*	*Abstract Methods*	*The Throw Statement*	*Modal Dialog Box*
	SLO-2	*Common Language Specification (CLS)*	*Group Box Control*	*Sealed Classes*	*Implementation for Throw Statement*	*Modeless Dialog Box*
S-4	SLO-1	Framework Class Library (FCL)	*Checked List Box Control*	*Interfaces - Definition of an Interface*	*Custom Exception*	*Implementation for Modal and*

						Modeless Dialog Boxes
	SLO-2	*Base Class Library*	*Combo Box Control*	*Declaration of an Interface*	*Implementation for Custom Exception*	*Built-in Dialog Boxes*
S 5-8	SLO-1 SLO-2 SLO-3 SLO-4	*Lab1:Understanding the IDE of Visual Studio, Changing background and foreground color using toolbox controls*	*Lab 4: String Handling Functions, Applications using group box, list box, checked list box, combo box*	*Lab 7: Connecting to URL using Link Label, Paint Brush Application, Application for Implementing the cohcept Abstract class and abstract methods*	*Lab 10: Application using default and User Defined Exception Handling Mechanism*	*Lab 13: Develop applications using SDI and MDI*
S-9	SLO-1	*AJAX*	*Select … Case Statement*	*Usage of Interface*	*Multithreading*	*Implementation for Dialog Boxes*
	SLO-2	*Windows Forms*	*While Statement*	*Implementation of an Interface*	*Usage of Threads*	*ToolBar Control*
S-10	SLO-1	*ASP.Net*	*Do Statement*	*Multiple Implementation of an Interface*	*Thread Class*	*Implementation for ToolBar Control*
	SLO-2	*ADO.Net*	*For Statement*	*Interface Inheritance*	*Start(), Abort() Methods*	*StatusBar Control*
S-11	SLO-1	*Benefits of .Net*	*Methods*	*Namespaces*	*Join() and Sleep() Methods*	*Implementation for StatusBar Control*
	SLO-2	*VB.NET Language*	*Types of methods*	*Implementation of an Namespace*	*Suspend() Method*	*Database Connectivity – Introduction*
S-12	SLO-1	*Development of Simple VB.Net Program*	*Arrays, One-dimensional Array*	*Components*	*Resume() Method*	*Advantages of ADO.NET*
	SLO-2	*Variable declaration and Initialization*	*Multidimensional Array*	*Creation of a Component*	*Implementation for Thread Class*	*Managed Data Providers*
S 13-16	SLO-1 SLO-2 SLO-3 SLO-4	*Lab2: Computing area of rectangle, circle, square , Designing Math Calculator*	*Lab 5: Digital clock using Timer control, Design of Animation application*	*Lab 8: Application using ImageList, Loading pictures into picture box, Application using Interface, Components*	*Lab 11: Application using Thread class, Multithreading*	*Lab 14: Textpad Application using Dialog control, Toolbar Application, Notepad Editor*
S-17	SLO-1	*Value Data Types*	*Jagged Array*	*Access Modifiers*	*Thread Priority*	*Developing a Simple ADO.NET Based Application*
	SLO-2	*Reference Data Types*	*Definition of Class*	*Implementation for Public Access Modifier*	*Synchronization*	*Creation of a Data Table*
S-18	SLO-1	*Boxing*	*Usage of Class*	*Implementation for Private Access Modifier*	*I/O Streams*	*Retrieving Data from Tables*
	SLO-2	*UnBoxing*	*Constructor Overloading*	*Implementation for Protected Access Modifier*	*Binary Data Files*	*Table Updating*
S-19	SLO-1	*Arithmetic Operators*	*Copy Constructor*	*Implementation for Friend Access Modifier*	*Text Files*	*Disconnected Data Access Through Dataset Object*
	SLO-2	*Text Box Control*	*Instance Class Members*	*Implementation for Protected Friend Access Modifier*	*Data Files*	*Object Model Data set Class*
S-20	SLO-1	*Label Control*	*Shared Class Members*	*Implementation for Polymorphism*	*FileInfo classes*	*SQL Provider*
	SLO-2	*Button Control*	*Shared Constructors*	*Implementation for Abstract Class and Abstract Methods*	*DirectoryInfo Classes*	*OLEDB Provider*
S 21-24	SLO-1 SLO-2 SLO-3 SLO-4	*Lab 3: Shopping Cart Application, Student Marksheet, Application using text box control, Label and Button control*	*Lab 6: Sorting array in ascending and descending order, Implementing Constructor, Copy Constructor and Shared Constructor*	*Lab 9: Application using Sealed Class, Polymorphism, Access Modifiers*	Lab 12: Application for implementing Thread priority, Synchronization, and files	*Lab 15: Employee Database design with coding, Retrieving data using Grid control, Marksheet preparation using ADO.Net*

Learning Resources	1. *Muthu.C (2008), "Visual Basic.Net", 2nd Ed, Vijay Nicole Imprints Pvt., Ltd,* 2. *Jeffrey R.Shaprio (2002), "Visual Basic .NET The Complete Reference", Mac Graw Hill*	3. *Michael Halvorson (2010), "Visual Basic 2010 Step by Step", Microsoft Press.* 4. *Harold Davis (2002), "Visual Basic.NET Programming", Sybex.*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. Dayana, SRM IST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. A. Subashini, SRM IST*

Course Code	USA20401J	Course Name	DATABASE SYSTEMS	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

		Learning			Program Learning Outcomes (PLO)														
Course Learning Rationale (CLR):	The purpose of learning this course is to:	1	2	3	1	2	3	4	5	6	7	8	9	100	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLR-1 :	Understand the fundamentals of Database Management Systems, Architecture and Languages																		
CLR-2 :	Conceive the database design process through ER Model and Relational Model																		
CLR-3:	Design Logical Database Schema and mapping it to implementation level schema through Database Language Features																		
CLR-4 :	Familiarize queries using Structure Query Language (SQL) and PL/SQL																		
CLR:5	Familiarize the Improvement of the database design using normalization criteria and optimize																		
CLR-6 :	Understand the practical problems of concurrency control and gain knowledge about failures and																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	Acquire the knowledge on DBMS Architecture and Languages	3	80	70	H	M	L	L	-	-	-	-	L	L	L	H	-	-	H
CLO-2 :	Apply the fundamentals of data models to model an application's data requirements using conceptual modeling tools like ER diagrams	3	85	75	H	H	H	H	H	-	-	-	H	H	H	H	-	-	H
CLO-3 :	Apply the method to convert the ER model to a database schemas based on the conceptual relational model	3	75	70	H	H	H	H	H	-	-	-	H	H	H	H	-	-	H
CLO-4 :	Apply the knowledge to create, store and retrieve data using Structure Query Language (SQL) and PL/SQL	3	85	80	H	H	H	H	H	-	-	-	H	H	H	H	-	-	H
CLO-5 :	Apply the knowledge to improve database design using various normalization criteria and optimize queries	3	85	75	H	H	L	M	L	-	-	-	M	M	M	L	-	-	H
CLO-6 :	Appreciate the fundamental concepts of transaction processing- concurrency control techniques and recovery procedures.	3	85	75	H	L	L	L	L	-	-	-	H	L	L	L	-	-	H

Duration (hour)		24	24	24	24	24
S-1	SLO-1	What is Database Management System	Data base models	Basics of SQL-DDL,DML,DCL,TCL	Decomposition using FD-dependency preservation,	Serializability, Recoverability, Transaction support in SQL
	SLO-2	Advantage of DBMS over File Processing System	Design process	Structure Creation, alternation		
S-2	SLO-1	Introduction and applications of DBMS	Entity Relation Model	Defining Constraints-Primary Key, Foreign Key, Unique, not null, check, IN operator	Codd Rules	Concurrent Executions
	SLO-2	Purpose of database system				Concurrency control
S-3	SLO-1	Views of data	ER diagram	Functions-aggregation functions	Normalization – 1Nf, 2NF, 3NF,	Concurrency Control : Lock based Protocols

	SLO-2		Case study for ER Diagram	Built-in Functions-numeric, date, string functions, String functions, Set operations,	BCNF, 4NF and 5NF	Two Phase Ccontrol Commit Protocol
S-4	SLO-1	SQL : Data Definition Commands	Design Issues in ER Model	SQL : Joins	PI/SQL Introduction	PL/SQL : Query Precessing and Stored Procedure
	SLO-2		SQL : Aggregate Functions		PL/SQL : variable declaration and icontrol structures	
S 5-8	SLO-1	Lab 1: SQL Data Definition Language Commands on sample exercise	Lab4 Inbuilt functions in SQL on sample Exercise.	Lab 7 : Join Queries on sample exercise. * Frame and execute the appropriate DDL,DML,DCL,TCL for the project	Lab 10: PL/SQL Conditional and Iterative Statements	Lab 13: PL/SQL Query Processing , stored procedure
	SLO-2					
S-9	SLO-1	Database system Architecture	Keys , Attributes and Constraints	Sub Queries,	Domain Constraints, Referential Integrity	Concurrency Control : Time Stamp based Validation based
	SLO-2				Secondary Storage Devices	
S-10	SLO-1	Overview of SQL	Mapping Cardinality	Correlated sub queries	Buffering of blocks File organization	MultiGranularity, Deadlocking, Deadlock Prevention protocol
	SLO-2					
S-11	SLO-1	*SQL : Data Manipulation Commands*	*Extended ER - Aggregation*	*Nested Queries, Views and its Types*	*Indexing Methods – Primary , Secondary , Multilevel Indices*	*Recovery Concepts, Deferred update technique, Immediate update technique, Shadow paging,*
	SLO-2		*Generalizaion and Specialization*			
S-12	SLO-1	*SQL : Set Operations*	*SQL : Views in SQL*	*Transaction Control Commands*	*ISAM, B-trees Introduction*	*PL/SQL : Exceptional Handling*
	SLO-2		*SQL Queries in SQL*	*Commit, Rollback, Save point*		*PL/SQL: Trigger*
S 13-16	SLO-1	*Lab 2: SQL Data Manipulation Language Commands * Identification of project Modules and functionality*	*Lab 5: Simple Queries in SQL*	*Lab 8: Sub Queries*	*Lab 11: PL/SQL Functions * Frame and execute the appropriate Set Operators & Views for the project*	*Lab 14: PL/SQL Trigger, Exceptional Handling * Frame and execute the appropriate PL/SQL Cursors and Exceptional Handling for the project*
	SLO-2					
S-17	SLO-1	*Data Independence*	*ER Diagram Issues*	*Relational Algebra – Fundamental Operators and syntax, relational algebra queries*	*Transaction Management Transaction Concept*	*Database security and Authorization Need forf Database security*
	SLO-2					
S-18	SLO-1	*The evolution of Data Models*	*Weak Entity*	*Pitfalls in Relational database*	*Transaction States*	*Mandatory Access control and Multilevel Security*
	SLO-2					
S-19	SLO-1	*Comparision of Data Models*	*Conversion of ER to Relational Table*	*Functional Dependency – definition,*	*ACID Properties*	*Database Users and DBA Statistical database security*
	SLO-2					

S-20	SLO-1	*SQL : Data Control Commads*	*SQL : Nested Queries*	*trivial and non-trivial FD*	*PL/SQL Cursor*	
	SLO-2	SQL:Transaction Control Commands			*PL/SQL : Functions and statements to handle Cursor,*	*PL/SQL : Application Programs*
S 21-24	SLO-1 SLO-2	*Lab 3: SQL Data Control Language Commands and Transaction control commands to the sample exercises* ** Identify the issues that can arise in a business perspective for the application*	*Lab 6: Nested Queries on sample exercise* ** Construction of Relational Table from the ER Diagram*	*Lab9: Correlated Subqueries*	*Lab 12: PL/SQL Cursors* ** Frame and execute the appropriate PL/SQL Conditional and Iterative Statements for the project*	*Lab 15 Student Progress report Generation* *Employee payslip generation*

Learning Resources	*1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, (2011),"Database System Concepts", Sixth Edition, Tata McGraw Hill* *2. RamezElmasri, Shamkant B. Navathe,(2011), "Fundamentals of Database Systems", Sixth Edition, Pearson Education* *3. CJ Date,AKannan,SSwamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education* *4. Rajesh Narang, (2011),"Database Management Systems",Second Edition, PHI*	*5. Martin Gruber, (1990), "Understanding SQL", Sybex* *6. SharadMaheshwari, (2016), "Introduction to SQLandPL/SQL", Second Edition, Laxmi Publications* *7. RaghuramaKrishnan,JohannesGehrke, (2003), Database Management Systems, Third Edition, McGrawHill Education*

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	1. Mrs.E.Aarthi, SRM IST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		2. Mrs.A.Pavithra, SRM IST

Course Code	UMS20402T	Course Name	RESOURCE MANAGEMENT TECHNIQUES	Course Category	C	Professional Core Course	L	T	P	C
							4	0	0	4

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Mathematics and Statistics		Data Book / Codes/Standards	Graph sheet needed	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	To provide foundations in Operations Research			
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			
CLR-6 :	To have a proper understanding of decision making problems			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	To recognize the scope and models of Operations research methods for decision making process.	3	85	80	L	L	L	M	L	-	-	-	L	M	H	M	-	-	-
CLO-2 :	To apply Operations research techniques for solving real life problems	3	80	75	M	M	M	M	M	-	-	-	M	M	H	M	-	-	-
CLO-3 :	To know optimization through various transportation and assignment problems	3	85	80	H	H	M	H	M	-	-	-	M	M	H	H	-	-	-
CLO-4 :	To schedule jobs through machines using the prescribed algorithm	3	85	80	M	H	M	H	M	-	-	-	M	M	H	H	-	-	-
CLO-5 :	To calculate saddle point, strategy and value of the game by various methods	3	85	80	H	H	M	H	H	-	-	-	M	M	H	M	-	-	-
CLO-6 :	To deal with optimization problems in real life situation	3	75	80	H	H	M	H	M	-	-	-	M	M	H	M	-	-	-

		Learning Unit / Module 1	Learning Unit / Module 2	Learning Unit / Module 3	Learning Unit / Module 4	Learning Unit / Module 5
Duration (hour)		12	12	12	12	12
S-1	SLO-1	Introduction to Operations Research(O.R)	Introduction to Linear Programming Problem (LPP)	Transportation Problems(TP) - Examples, Definitions – decision variables, supply and demand constraints	Sequencing Problems: Introduction	Game theory: Definitions, Examples
	SLO-2	Scope of O.R	Mathematical formulation of LPP	Mathematical formulation of TP	Assumptions made while solving Sequencing problem	Characteristics of Game theory
S-2	SLO-1	Some O.R. Models	Basic assumptions to formulate LPP	Balanced and Unbalanced TP	Total elapsed time, Idle time, No passing Rule	Pure Strategies: Maximin -Minimax Principle
	SLO-2	Iconic Models, Analogue Models	Procédure for forming a LPP model	Methods for finding Initial basic feasible solution	Procedure for sequencing n jobs on 2 machines	Saddle point and value of the game
S-3	SLO-	Mathematical Models	Formulation of LPP Model	North West Corner Rule	Sequencing n jobs on 2 machines	Mixed Strategies: Games without

	1					saddle points
	SLO-2	Static Models ,Dynamic Models	Formulation of LPP Model	North West Corner Rule	Sequencing n jobs on 2 machines	Solving 2x2 games
S 4	SLO-1	Deterministic Models, Stochastic Models	Graphic method of solving LPP	Row Minima Method	Sequencing n jobs on 2 machines	Solving 2x2 games
	SLO-2	Classification of Models	Graphic method Special Cases: Infeasibility	Column Minima Method	Procedure for sequencing n jobs on 3 machines	Matrix oddment method for 3x3 games
S-5	SLO-1	Characteristics of O.R.	Graphic method Special Cases: Unboundedness	Least Cost Method	Sequencing n jobs on 3 machines	Matrix oddment method for nxn games
	SLO-2	Principles of Modelling	Graphic method Special Cases: Redundancy	Least Cost Method	Sequencing n jobs on 3 machines	Matrix oddment method for nxn games
S-6	SLO-1	General methods for solving O.R. Models	Graphic method Special Cases	Vogel's Approximation Method(VAM)	Procedure for sequencing n jobs on m machines	Dominance property
	SLO-2	Main phases of O.R: Formulation of the problems:	Graphic method Special Cases	VAM Computational details	Sequencing n jobs on m machines	Dominance property: Computational details
S-7	SLO-1	Main phases of O.R: Formulation of the problems:	Graphic method Special Cases	VAM Computational details	Sequencing n jobs on m machines	Dominance property: Computational details
	SLO-2	Construction of a mathematical model	Advantages of LPP	VAM Computational details	Sequencing n jobs on m machines	Dominance property: Computational details
S-8	SLO-1	Construction of a mathematical model	Advantages of LPP	VAM Computational details	Sequencing n jobs on m machines	Dominance property: Computational details
	SLO-2	Solving the model constructed	Limitations of LPP	Unbalanced Transportation Problem	Sequencing n jobs on m machines: computational details	Dominance property: Computational details
S 9	SLO-1	Controlling and updating	General Linear Programming Problem	Unbalanced Transportation Problem	Sequencing n jobs on m machines: computational details	Graphical method for 2x3 games
	SLO-2	Testing the model and its solution, Implementation	Types of Solutions	Maximization case in Transportation Problem	Processing of 2 jobs on n machines	Graphical method for 2xn games
S 10	SLO-1	Role of O.R in industry	Canonical form of LPP	Assignment Problem(AP): Examples, Definitions – decision variables, supply and demand constraints	Processing of 2 jobs on n machines: Computational details	Graphical method for 2xn games
	SLO-2	Role of O.R. in Various fields	Standard form of LPP	Mathematical formulation of AP, Balanced and Unbalanced AP	Processing of 2 jobs on n machines: Computational details	Graphical method for 3x2 games
S-11	SLO-1	O.R and decision making	Simplex Algorithm Introduction	Assignment Algorithm: Hungarian Method	Processing of 2 jobs on n machines: Computational details	Graphical method for mx2 games
	SLO-2	Role of computers in O.R.	Simplex method: non-degenerate basic solution, degenerate basic solution	Hungarian Method: Computation details	Processing of 2 jobs on n machines: Computational details	Graphical method for mx2 games
S-12	SLO-1	Role of computers in O.R.	Simplex method: basic feasible solution	Solving Unbalanced AP	Processing of 2 jobs on n machines: Computational details	Graphical method for 2xn and mx2 games

	SLO-2	Limitations of O.R.	Simplex Algorithm: Computational details	Maximization case in AP	Graphical method	Limitations of game theory

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

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	*30%*	-	*30%*	-	*30%*	-	*30%*	-	*30%*	-
	Understand										
Level 2	Apply	*40%*	-	*40%*	-	*40%*	-	*40%*	-	*40%*	-
	Analyze										
Level 3	Evaluate	*30%*	-	*30%*	-	*30%*	-	*30%*	-	*30%*	-
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers	
Experts from Academic	**Internal Experts**
Dr.M.A.Baskar, Professor & Head, Dept. Of Mathematics, Loyola college, Chennai	J.Madhumitha, SRMIST
Dr.P.Dhanavanthan, Professor & Head, Dept. Of statistics, Pondicherry University	

Course Code	UCA20D04J	Course Name	MULTIMEDIA AND ANIMATION	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
CLR-1 :	*Formulate a working definition of interactive multimedia*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	*Demonstrate competence in using the authoring program Hyper Studio*			
CLR-3 :	*Demonstrate the use of animation, digitized sound, video control, and scanned images*			
CLR-4 :	*Demonstrate the use of Netscape to access the Course Home Page and Tips and Tricks*			
CLR-5 :	*Use basic instructional design principles in the development of stacks*			
CLR-6 :	*Will develop conceptual maps of content and process for interactive multimedia instructional programs*			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Program Learning Outcomes (PLO)														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Understand Multimedia works*	2	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-2 :	*Create a multimedia component using various tools and techniques*	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-3 :	*Import graphics and textures created on other applications into a multimedia software program*	3	75	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-4 :	*Create a movie using simple animation*	3	85	80	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-5 :	*Create an effective interactive site for use on the internet*	3	85	75	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M
CLO-6 :	*Do simple scripting for a file*	3	80	70	H	H	H	H	H	M	L	M	H	M	-	H	H	H	M

Duration (hour)		24	24	24	24	24
S-1	SLO-1	*What Is Multimedia*	*Photoshop Introduction*	*Adjustments*	*Flash – Introduction*	*Introduction to Action Sciript*
	SLO-2	*Interactive Multimedia*	*Importance and Fundamentals*	*Retouching*	*Animation*	*Actions – Button*
S-2	SLO-1	*Advantages Of Interactive Multimedia*	*Opening Images*	*Tonal Adjustment*	*Interacting*	*Button Actions*
	SLO-2	*Where To Use Multimedia*	*Importing Images*	*Color Adjustment*	*Basic Concepts*	*Frame Action*
S-3	SLO-1	*Text ,Graphics*	*Resolution*	*Retouch by hand*	*Drawing Lines*	*Action scene*
	SLO-2	*Audio, Film, Video*	*Pixels*	*Smudge Tool*	*Shapes*	*Movie Clip*
S-4	SLO-1	*Understanding Text*	*Colour Models*	*Effects*	*Strokes*	*Symbols*
	SLO-2	*Typeface or Fonts*	*Colour Spaces*	*Filters*	*Fill*	*Browsers*
S 5-8	SLO-1 SLO-2 SLO-3 SLO-4	*Lab1:Understanding Photoshop Environment, Learning the usage of tools in tool bar with sample images*	*Lab 4: Testing Lab Mode, Multichannel color mode, Edge Mask*	*Lab 7: Using Retouching Tools in a Image , Adjusting color and tone for a Image*	*Lab 10: Drawing spokes on a wheel and allow the wheel to rotate, Motion Tweening, Bouncing Ball*	*Lab 13: Automatic Slide show presentation and presentation with action script*
S-9	SLO-1	*Types of Fonts*	*Layers,Layer Properties*	*Blurring*	*Shapes and Brushes*	*Networks*
	SLO-2	*COMPUTER GRAPHICS*	*Layer Palette Menu*	*Sharpening*	*Selection*	*Beyond the Basic Actions*

S-10	SLO-1	*2D Computer Graphics*	*Painting Pixels*	*Special Effects*	*Transformation*	*Flash MX275: Introduction*
	SLO-2	*3D Computer Graphics*	*The Painting Tools*	*Distortion*	*Reshaping*	*Home Page*
S-11	SLO-1	*API*	*Paint Bucket, Gradient Tool*	*Merge layer*	*Importing Art Work*	*Usage of Tools*
	SLO-2	*UNDERSTANDING SOUND: Basic Sound Concept*	*Erasers :Normal*	*Guide Layer*	*Manipulating*	*Interface Elements*
S-12	SLO-1	*Audio Formats*	*Background Eraser*	*Effects*	*Images : Animation*	*Panels*
	SLO-2	*Quality Levels*	*Magic Eraser*	*Filters*	*Frame Animation*	*Tools*
S 13-16	SLO-1 SLO-2 SLO-3 SLO-4	*Lab2: Understanding the usage of selection Tools: Marquee Selections and Lasso Selections*	*Lab 5: Clone an Image, Captain Kirk's Myophia Effect*	*Lab 8: Apply readymade effects to image using Filter menu*	Lab 11: Text and Shape Tweening, Moving a bus from one end to other end of stage	*Lab 14: Masking Effect and Water Masking*
S-17	SLO-1	*AIF Format*	*Fills and its Types*	*Layer Palette*	*Animating One Frame at a time*	*Layer Folders*
	SLO-2	*AU Format*	*Selection and allied operations*	*Layer effects*	*Motion Tweening*	*Layer Accessibility*
S-18	SLO-1	*EA Format*	*Marquee selection*	*Layer Sequence*	*Object,Text*	*Masking Layer*
	SLO-2	*MIDI Format*	*cropping*	*Masking Effect*	*Symbols*	*Video*
S-19	SLO-1	*Mp3 Format*	*Lasso selections-Paths*	*Layer styles*	*Instances*	*User Interface Components*
	SLO-2	*UNDERSTANDING VIDEO*	*Combining*	*Background layer*	*Shape Tweening, Sound*	*Changing the Appearance of Component*
S-20	SLO-1	*Digital Video*	*Transforming*	*Adding image to background Layer*	*Bouncing Ball with Star shape*	*Transforming view*
	SLO-2	*Analog Video*	*Selections*	*Filters*	*Moving a Truck with wheel*	*Transition*
S 21-24	SLO-1 SLO-2 SLO-3 SLO-4	*Lab 3: Adjusting Brightness and Contrast, Isolating image from complex image*	*Lab 6: Apply antique framing for photo, Apply various transformations for the selection*	*Lab 9: Designing ID Card and Invitation Card using Layer and Layer effects, Gradients*	Lab 12: Moving an object and text along a curved path	*Lab 15: Creating buttons using action script, States of button*

Learning Resources	1. *Vishnu Priya Singh (2006), "A Text Book of Multimedia", 1st Ed., Computech Pub. Ltd , New Delhi.* 2. *Nigel Chapman and Jenny Chapman, " Practical Multimedia ", 2nd Ed., Wiley – DreamTech Pvt. Ltd.*

Learning Assessment

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

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs.A.Jenita Mary, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs.D.S.Dayana, SRMIST*

Course Code	UCA20D05J	Course Name	DATA ANALYSIS USING R	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*Learn in-depth concepts, methods and applications of data mining*			
CLR-2 :	*Learn how to start looking at data from the perspective of the data scientist*			
CLR-3 :	*Experimenting with different data mining techniques for knowledge discovery*			
CLR-4 :	*Use R software for data import and export, data exploration and visualization, and for data analysis tasks*			
CLR-5 :	*Demonstration on how to perform classification and clustering data mining tasks on real time datasets*			
CLR-6 :	*Build an effective model and perform model evaluation based on performance metrics*			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Understand Data Mining and its various tasks*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-2 :	*Perform Linear Regression and Logistic Regression on a dataset*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	*Extract interesting rules from dataset using Association Rule Mining*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	*Apply various Classification Algorithms in data mining*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	*Perform unsupervised learning using various Clustering Techniques*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	*Effectively use R programming constructs and packages to perform mining on different datasets*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Why Data Mining? Evolution of Information Technology	Simple Linear Regression	Introduction to Association Rules	Basic Concepts-What is Classification>	What is Cluster Analysis?
	SLO-2	What is data mining?	Estimating the Coefficients	What is an Association Rule?	General Approach to Classification	Overview of Basic Clustering Approaches
S-2	SLO-1	What is Data Warehouse?	Assessing the accuracy of the Coefficient estimate	Methods to discover Association Rules	Decision Tree Induction	Requirements for Cluster Analysis
	SLO-2	DW Architecture	Assessing the accuracy of the Model	Market Basket Analysis: A motivational Example	Attribute Selection Methods	Clustering Paradigms
S-3	SLO-1	OLAP	Multiple Linear regression	Basic Concepts: Frequent Item Sets, Closed Item Sets	Decision Tree Classifier- Using Entropy	Similarity and Distance Metrics
	SLO-2	Warehouse Schema	Multiple Linear Regression- Continued	Frequent Item Set Mining- Apriori Algorithm	Decision Tree Classifier- Using Gini Index	Characteristics of Clustering Algorithms

S-4	SLO-1	Data Mining Goals	Estimating the Regression Coefficients	Candidate Generation	Tree Pruning Techniques	Partitioning Algorithms
	SLO-2	KDD Vs Data Mining	Other Considerations in Regression Model	Generating Frequent Item Sets-Example	Rule Based Classifier	k-Means Clustering- Centroid Based Technique
S 5-8	SLO-1	Lab1: Installing R and RStudio, RStudio Using Functions e	Lab: 4 Package RODBC to ODBC connect databases Analyze correlation between variables in Australian CPI dataset.	Lab 7: Association rule mining using APRIORI algorithm for titanic dataset	Lab 10: Build a decision tree for the iris data with package party,rpart	Lab 13:k-means clustering of iris data
	SLO-2					
S-9	SLO-1	Steps in KDD Process	Multiple Linear regression	Apriori Algorithm-Examples	Using IF-THEN rules for Classification	Partitioning Method: k-Means Clustering-Example
	SLO-2	What kind of data can be mined?	Estimating the Regression Coeficients	Improving the Efficiency of Apriori	Rule Extraction from Decision Tree	k-Medoids Algorithms
S-10	SLO-1	Data Mining Techniques	K-Nearest Neighbour	A Pattern Growth Approach for Mining Frequent Item Sets	Bayes Classification Methods	Example: k-Medoids
	SLO-2	Data Mining Techniques - Continued	K-NN Demonstration with example	FP-Growth Algorithm – Basic Idea	Bayes Theorem	Hierarchical Methods
S-11	SLO-1	What kind of patterns can be mined?	Compare LR with k-NN	FP-Growth Algorithm with example	Naïve Bayes Classifier	Agglomerative and Divisive Methods
	SLO-2	Are all patterns interesting?	Evaluation for regression	FP-Growth Algorithm –Examples	Naïve Bayes –Example	Distance Measures in Algorithmic Methods
S-12	SLO-1	Data Objects and Attribute Types	Model selection and over-fitting	Mining Closed and Max Patterns	Model Evaluation and Selection	Dendogram
	SLO-2	Nominal, Binary, Ordinal, Numeric, Discrete data types	Logistic regression	Mining Frequent Item Sets Using Vertical Data format	Techniques to improve Classification Accuracy	Density Based Methods: DBSCAN
S 13-16	SLO-1	Lab2: Overview -Working in the Console • Arithmetic Operators • Logical Operations	Lab 5: Prediction with Simple Linear Regression	Lab 8: Inspection of Association rules	Lab 11: Classification using Naïve Bayes classifier	Lab 14: Implementation of DBSCAN algorithm using iris data
	SLO-2					
S-17	SLO-1	What technologies are used?	The Logistic Model	Which Patterns are Interesting?	Ensemble Techniques-Bagging	DBScan Algorithm
	SLO-2	Data exploration and visualization	Estimating the Regression Coefficients	Strong Rules are not Necessarily Interesting	Boosting	Evaluation of Clustering
S-18	SLO-1	Data Visualization Techniques	Making Predictions	Interestingness Measure-Support, Confidence	Artificial Neural Network-Introduction	Measuring Clustering Quality
	SLO-2	Visualizing Complex data and relations	Multiple Logistic Regression	Generalization of Association Patterns	Defining the Network Topology	Determining the number of Clusters
S-19	SLO-1	Issues and Challenges in Data mining	Linear Discriminant Analysis	Pattern Evaluation Methods	Multi Layer Feed Forward Neural Network	Scalable Clustering Algorithms
	SLO-2	Applications of Data Mining	LDA Continued	From Association anlaysis to correlation analysis	Back Propagation	Applications of Data Mining in Finance
S-20	SLO-1	Case Study: Weather Data	LDA for p=1	Comparison of Pattern Evaluation Measures	Inside the Black Box- Back Propagation	Applications of Data Mining in Business
	SLO-2	Case Study – Discussion	LDA for p>1	Discussion on Different Algorithms	Neural Network –Perceptron Example	Applications of Data Mining in Social Networks
S 21-	SLO-1	Lab:3 Getting Help in R and Quitting	Lab 6: Predict the probability of occurrence with logistic regression.	Lab 9: Visualize association rules, including scatter plot, balloon plot,	Lab 12: Classification using Perceptron	Lab 15: Demonstrate hierarchical clustering on iris data
	SLO-2					

24		RStudio		graph		Stock Market Prediction

Learning Resources	1. *Arun K Pujari, "Data Mining Techniques", Univeristy Press* 2. *J Han and M Kamber, "Data Mining : Concepts and Techniques", Third Edition, Morgan Kaufmann Publishers*	3. *Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani,(2013), "An Introduction to Statistical Learning with Applications in R", Springer* 4. *Yanchang Zhao, "R and Data Mining: Examples and Case Studies" yanchang@rdatamining.com, http://www.RDataMining.com*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	Dr.S.Gopinathan, Professor, University of Madras, Chennai	1. Mrs.Anita Jasmine, SRM IST
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		2. Mrs. Ramla, SRM IST

Course Code	*UCA20D06J*	Course Name	**ARTIFICIAL INTELLIGENCE**	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*Discover problems that are agreeable to solution by AI methods.*			
CLR-2 :	*Study the basics of designing intelligent agents that can solve general purpose problems*			
CLR-3 :	*Discover appropriate AI methods to solve a given problem*			
CLR-4 :	*Perform intellectual task as decision making, problem solving, perception, understanding*			
CLR-5 :	*Formalize a given problem using different AI methods*			
CLR-6 :	*Provides adaptive learning*			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Demonstrate fundamental understanding of the history of artificial intelligence and its foundations*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-2 :	*Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	*Identify systems with Artificial Intelligence. evaluation of different algorithms on a problem formalization*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	*Use classical Artificial Intelligence techniques, such as search algorithms,*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	*Ability to apply Artificial Intelligence techniques for problem solving.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	*Ability to learn the current Artificial Intelligence techniques.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Introduction to Artificial Intelligence	Logical Reasoning-Introduction	Planning: designing programs to search for data or solutions to problems	Uncertain Knowledge and reasoning	Learning
	SLO-2	History of AI- AI Techniques	Knowledge Representation	Forward search and backward search	Quantifying uncertainty	Learning agents
S-2	SLO-1	Problem Solving with AI- AI models	Logical Agents: Knowledge based Agents	state-space search	Probability Theory: Uncertain Knowledge	Classification of learning
	SLO-2	Data Acquisition and Learning Aspects in AI	The Wumpus World & Logic	Represent the current state and goal state	Axioms of probability	Learning elements

S-3	SLO-1	Problem-Solving Process	Propositional logic	Problems to solve: Water Jug Problem	Bayes Theorem	Inductive Learning methods
	SLO-2	Formulating Problems	Propositional logic: Syntax & Syntax grammar	State representation: Initial, operator, goal state	Bayes' Rules & uses	Learning decision tree
S-4	SLO-1	Problem Types and Characteristics	Inference	Train travel problem	probabilistic Reasoning	Attribute based representation
	SLO-2	Problem Analysis and Representation	Implication by inference Types of reasoning	State representation: Initial, operator, goal state	Uncertainty: Causes of uncertainty:	Choosing an attributes
S 5-8	SLO-1	Lab1: program showing the various possibilities involved in solving a water jug problem.	La43: program for Tic Tac Toe game played by Single player against automated Computer player.	Lab7: Program for building a magic square of Odd number of Rows and columns.	Lab10: Program for solving A* shortest path algorithm.	Lab13: Program which demonstrate the precedence properties of operators in C language.
	SLO-2					
S-9	SLO-1	Agents- Examples of Agents	First-Order logic	partial-order planning	Probability	Decision tree learning
	SLO-2	Types of agents	Syntax of First-Order logic	Basic representation Operator representation	Probability of occurrence\	Hypothesis Spaces
S-10	SLO-1	General Search algorithm Uniformed Search Methods	Basic elements of First order logic Reducing first-order inference	planning graphs	Conditional probability	Information theory
	SLO-2	Heuristic Search Techniques	Quantifiers in First-order logic	Planning graph of feeding	Probability occurrence for the problem	Information gain
S-11	SLO-1	BFS, Uniform Cost Search	Inference in first order logic and Generalized rules for FOL	Uses of planning graph	Bayesian networks	Explanation based learning
	SLO-2	Depth First search , Depth Limited search (DLS)	FOL inference rules for quantifier	Planning graph example	Types of Bayesian Network	Hypothesis
S-12	SLO-1	Iterative Deepening search algorithm	Forward chaining	Graph plan algorithm	Building model op Bayesian Network	Statistical Learning methods
	SLO-2	Iterative Deepening search for DFS	Properties of forward chaining	Using planning graphs for heuristics	Directed Acyclic Graph	Naïve Bayes
S 13-16	SLO-1	Lab2: Program for solving a water jug problem using Breadth first search and Depth first search	Lab5: program for Tic Tac Toe game played by two different human players.	Lab8: Program for building a magic square of Even number of Rows and columns.	Lab11: Program which demonstrates Best First Search.	Lab14:program to calculate factorial of a number
	SLO-2					
S-17	SLO-1	Informed Search-Introduction	Fast conversion of forward chaining	planning and acting in the real world	Conditional probability	Instance base learning
	SLO-2	General tree search: Evaluation function	Properties of forward chaining Examples for forward chaining	Basic Planning	Bayesian Network Graph	Neural Networks
S-18	SLO-1	General graph search: Evaluation function	Backward Chaining	Real world: JOB shop scheduling	Inferences in Bayesian networks	Reinforcement Learning
	SLO-2	Generate and Test BFS	Properties of Backward chaining Examples for Backward chaining	Critical path method	Components of Bayesian Network	Elements of reinforce learning
S-19	SLO-1	Generate and Test A* algorithm	Unification	Forward march	Temporal models	Reinforcement learning problem
	SLO-2	Generate and Test AO* algorithm	Conditions for Unification & Unification algorithm	Backward march	Inference in temporal models	Agent environment interface
S-20	SLO-1	constraint satisfaction	Resolution for inference rule	Limited resources	Hidden Markov models	Steps for Reinforcement learning
	SLO-2	Perform the task for given CSP:	Steps for Resolution	Hierarchical Planning	HMM components	Problem solving methods for RL
S	SLO-1	Lab3: program to find out route	Lab6:program to implement Tower	Lab 9:program to implement five	Lab12:program to solve 8-Queens	Lab15:program to implement five

21-24	SLO-2	distance between two cities	of Hanoi	House logic puzzle problem	problem	House logic puzzle problem

Learning Resources	Russel.SandNorvig.P, (2003), "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education

Learning Assessment

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

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

Course Designers

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Dr. R. Jayashree, SRM IST*

Course Code	UJK20401T	Course Name	PROFESSIONAL SKILLS	Course Category	JK	Life Skill Course	L	T	P	C
							2	0	0	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Career Development Centre	Data Book / Codes/Standards	-		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	expose students to the requirements of job market			
CLR-2 :	develop resume building practice			
CLR-3 :	increase efficiency in speaking during group discussions			
CLR-4 :	prepare students for job interviews			
CLR-5 :	instill confidence in students and develop skills necessary to face audience			
CLR-6 :	develop speaking and presentation skills in students			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:				Program Learning Outcomes (PLO)														
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	understand the importance of resume preparation and build resume	3	80	70	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H
CLO-2 :	acquire group discussion skills	3	85	75	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H
CLO-3 :	face interviews confidently	3	85	80	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H
CLO-4 :	Ask appropriate questions during an interview	3	85	80	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H
CLO-5 :	understand various types of presentation and use presentation skills in projects	3	85	80	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H
CLO-6 :	build confidence during any presentation	3	85	80	M	M	L	L	M	H	-	-	-	M	H	L	H	H	H

Duration (hour)		6	6	6	6	6
S-1	SLO-1	***Introduction of resume and its importance***	***Meaning and methods of group discussion***	***Meaning and types of interview (face to face, telephonic, video)***	***Types - Informative, Instructional, Arousing, Persuasive, Decision-making***	***PowerPoint presentation–body language and stage etiquettes***
	SLO-2	***Difference between a CV, Resume and Bio Data***	*Procedure of group discussion*	*Dress code, background research*	***Structure of a presentation – Introduction of the event, Introducing the speaker, vote of thanks***	***PowerPoint presentation–body language and stage etiquettes***
S-2	SLO-1	***Essential components of a good resume, common errors people make while preparing a resume***	*Group discussion – simulation*	*STAR Technique (situation, task, approach and response) for facing an interview*	***Working with audience – ice-breaking, Creating a 'Plan B',***	***PowerPoint presentation–practice session***
	SLO-2	***Resume building format***	*Group discussion – common errors*	*Interview procedure (opening, listening skills, closure, asking questions)*	***Getting the audience in the mood, working with emotions,***	***PowerPoint presentation– practice session***

S-3	SLO-1	***Resume building using templates***	***Group discussion – types – Topic based***	*Important questions generally asked in an interview*	***Improvisation and unprepared presentations, man-woman view, feedback – appreciation and critique***	***PowerPoint presentation–practice session***
	SLO-2	***Resume building using templates***	***Group discussion – types – Case study based***	*Important questions generally asked in an interview*	***Improvisation and unprepared presentations, man-woman view, feedback – appreciation and critique***	***PowerPoint presentation– practice session***
S-4	SLO-1	***Resume building activity***	***Group discussion – practice session- Topic based***	*Mock interview – face to face*	***Power point presentation, skit, drama, dance, mime, short films and documentary – Dos and Don'ts***	***PowerPoint presentation–practice session***
	SLO-2	***Resume building activity - Feedback***	***Group discussion - Feedback***	*Mock interview- Feedback*	***Power point presentation, skit, drama, dance, mime, short films and documentary – Dos and Don'ts***	***PowerPoint presentation– practice session***
S-5	SLO-1	***Video resume – Tips and tricks***	***Group discussion – practice session- Topic based***	*Mock interview - face to face*	***PowerPoint presentation – content preparation***	***PowerPoint presentation–practice session***
	SLO-2	***Video resume – Do's and Don'ts***	***Group discussion - Feedback***	*Mock interview - Feedback*	***PowerPoint presentation–logical arrangement of content***	***PowerPoint presentation– practice session***
S-6	SLO-1	***Video resume – Templates***	***Group discussion – practice session- Case study based***	*Mock interview - face to face*	***PowerPoint presentation–using internet source, citations, bibliography***	***PowerPoint presentation–practice session***
	SLO-2	***Video resume – Templates***	***Group discussion - Feedback***	*Mock interview- Feedback*	***PowerPoint presentation–using internet source, citations, bibliography***	***PowerPoint presentation– practice session***

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

Learning Assessment					
Level	Bloom's Level of Thinking	Continuous Learning Assessment (100% weightage)			
		CLA-1 (20%)	CLA-2 (20%)	CLA-3 (30%)	CLA-4 (30%) ##
		Theory	Theory	Theory	Theory
Level 1	Remember	10%	10%	30%	15%
	Understand				
Level 2	Apply	50%	50%	40%	50%
	Analyze				
Level 3	Evaluate	40%	40%	30%	35%
	Create				
	Total	**100 %**	**100 %**	**100 %**	**100 %**

CLA-1, CLA-2 and CLA-3 can be from any combination of these: Online Aptitude Tests, Classroom Activities, Case Studies, Poster Presentations, Power-point Presentations, Mini Talks, Group Discussions, Mock interviews, etc.

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

Course Designers		
Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
1. Ajay Zener, Director, Career Launcher	-	*1. Mr Priyanand, Assistant Professor, CDC, E&T, SRMIST*
		2. Ms Sindhu Thomas, Head in charge, CDC, FSH, SRMIST
		3. Ms Mahalakshmi, Assistant Professor, CDC, FSH, SRMIST

SEMESTER V

Course Code	*USA20501J*	Course Name	**WEB PROGRAMMING**	Course Category	C	*Professional Core Course*	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*To gain knowledge about Open Source Software*			
CLR-2 :	*To Learn basic file and directory commands in Linux*			
CLR-3 :	*To develop simple PHP programs*			
CLR-4 :	*To understand working with arrays and functions*			
CLR-5 :	*To learn various MySQL queries*			
CLR-6 :	*To create database-driven applications*			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*Create files using Vi editor*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H
CLO-2 :	Write PHP scripts to handle HTML forms.	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H
CLO-3 :	*Write regular expressions including modifiers, operators, and metacharacters.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H
CLO-4 :	*Create PHP programs that use various PHP library functions, and that manipulate files and directories*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H
CLO-5 :	*Analyze and solve various database tasks using the PHP language*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H
CLO-6 :	*Analyze and solve common Web application tasks by writing PHP programs.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	H

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Introduction to Linux	What Does PHP Do?	Introduction to Function	Introduction to Arrays	Introduction to MySQL Database
	SLO-2	Features of Linux	A Brief History of PHP	Calling a Function	Indexed Versus Associative Arrays	Connecting to and disconnecting from the server
S-2	SLO-1	Introduction to Linux Distributions	Language Basics	Defining a Function	Identifying Elements of an Array	Creating and using a database
	SLO-2	Widely used Linux distros	Lexical Structure	Variable scope	Storing Data in Arrays	Selecting a database
S-3	SLO-1	Open Source software	Introduction to Data Types	Passing parameters by value	Multidimensional Arrays	Creating a table
	SLO-2	Benefits of Open Source software	Scalar Types	Passing parameters by reference	Extracting Multiple Values	Loading data into a table

S-4	SLO-1	Linux Files	Compound Types	Default Parameters	Converting Between Arrays and Variables	Retrieving information from a table
	SLO-2	The File Structure	Special Types	Variable Parameters	Traversing Arrays	Selecting all data
S 5-8	SLO-1 SLO-2	Lab1: Learning to work with linux server	Lab 4: Writing Simple PHP Programs	Lab 7: Passing parameters to a function	Lab 10: Arrays	Lab 13: Creating Database, tables
S-9	SLO-1	Listing files	Defining Variables	Missing Parameters	Sorting	Selecting particular rows
	SLO-2	Working with ls command	Variable Scope	Return Values	Reversing an array	Selecting particular columns
S-10	SLO-1	Displaying Files	Introduction to Expressions and Operators	Variable Functions	Introduction to Object	Sorting rows
	SLO-2	Working with cat, more, less command	Arithmetic operators, Comparison operators, Bitwise operators	Anonymous Functions	Creating an Object	Date Calculation
S-11	SLO-1	Printing Files	Logical operators, Casting operators & Miscellaneous Operators	Introduction to Strings	Accessing Properties and Methods	Working with Null values
	SLO-2	Working with lpr	Operator precedence	Quoting String Constants	Declaring a Class	Pattern Matchin
S-12	SLO-1	Managing Directories	Introduction to Flow-Control Statements	Variable Interpolation	Declaring methods and properties	Counting Rows
	SLO-2	Working with mkdir, rmdir, cd and pwd commands	Working with If & Switch	Printing Strings	Declaring constant	Using more than one table
S 13-16	SLO-1 SLO-2	Lab2: Working with files and directory commands	Lab 5: Operators & Control Statements	Lab 8: Functions & Strings	Lab 11: Arrays & Objects	Lab 14: Working with various MySQL Queries
S-17	SLO-1	Listing directories	Working with While, for, foreach,	Accessing Individual Characters	Inheritance	Introduction to Working with MySQl Database using PHP
	SLO-2	ls command	Using exit, return, goto statements	Cleaning Strings	Interfaces	Connecting to MySQL database
S-18	SLO-1	File and directory operations	Including Code form another module	Encoding and Escaping	Traits	Querying database
	SLO-2	find, cp, mv, rm and ln commands	Working with include and require construct	Comparing Strings	Abstract Methods	Retrieving and displaying the results
S-19	SLO-1	Controlling Access to directories and files	Embedding PHP in Web Pages	Manipulating and Searching Strings	Constructors	Modifying data
	SLO-2	Working with chmod command	Standard (XML) Style, SGML Style	Introduction to Regular expression	Destructors	Deleting data
S-20	SLO-1	Introduction to Vi editor	ASP Style	Pattern matching and substituting new text for matching text	Introduction to Introspection	Designing simple database application
	SLO-2	Working with Vi editor	Script Style	Splitting a string into an array of smaller chunks	Examining an Object	
S	SLO-1	Lab 3: Working with file commands,	Lab 6: Embedding PHP script in	Lab 9: String Manipulation	Lab 12:: Introspection and	Lab 15: Developing Simple

21-24	SLO-2	Creating and modifying files using Vi Editor	HTML		Serialization	Database Applications

Learning Resources	1. *Richard Petersen, (2006), " Linux : The Complete Reference" ,Sixth edition, McGraw Hill Professional.* 2. Rasmus Lerdorf, Kevin Tatroe, Bob Kaehms, Ric McGredy (2002), "Programming PHP", O'REILLY(SPD).	3. Lee Babin, Nathan A. Good, Frank M. Kromann, Jon Stephens (2005), "PHP 5 Recipes, A problem solution approach", après. 4. *Vikram Vaswani (2008), PHP: A BEGINNER'S GUIDE, McGraw-Hill.*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. S. Chandrakala, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. Surya, SRMIST*

Course Code	USA20502J	Course Name	COMPUTER NETWORKS	Course Category	C	Professional Core Course	L	T	P	C
							4	0	2	5

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1 :	*Understand the evolution of computer networks using the layered network architecture*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
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*																		
CLR-6 :	*Know the algorithms behind the protocols that helps data transfer*																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	*Acquire the basics of computer network and its architecture*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-2 :	*Acquire the knowledge of various networks devices and addressing methods*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	*Design the network routing methods*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	*Find the error type that may happen during data transportation*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	*Understand the physical layer functions and components*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	*Speak on the topology chosen for a architecting a network that an organization demands*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration (hour)		18	18	18	18	18
S-1	SLO-1	*Evolution of Computer Networks*	*Addressing Types*	*Network layer functionalities*	*Introduction- Error Types*	*Physical layer*
	SLO-2	*The Internet*	*Physical , Logical addresses*	*Delivery vs Forwarding*	*Types of Error*	*Overview of physical layer*
S-2	SLO-1	*The Internet today*	*Port, specific addresses*	*Unicast routing protocols*	*Error Control Mechanism*	*Functionalities*
	SLO-2	*Data communications*	*IPV4 addresses*	*Intra domain routing*	*Error Detection*	*Analog and Digital*
S-3	SLO-1	*Components*	*Notations*	*Inter domain routing*	*Error Correction*	*Data, signals*
	SLO-2	*Networks*	*Classful addressing*	*Multicast routing protocols*	*Error Detection vs Error Correction*	*Transmission impairment*
S-4	SLO-1	*Physical structures*	*Categories of Classful addressing*	*Application of Multicast routing*	*Parity*	*Attenuation*

				protocols		
	SLO-2	*Categories of Networks*	*Categories*	*Distance vector routing*	*Checksum*	*Distortion, Noise*
S 5-6	SLO-1	*Lab 1: Introduction of packet racer*	*Lab 4:IP addressing and subnetting(VLSM)*	*Lab 7: Implementation of static routing*	*Lab 10: Implementation of EIGRP configuration*	*Lab 13: Implementation of Single-Area OSPF link costs and interface*
	SLO-2					
S-6	SLO-1	*Network Models*	*Categories of addressing*	*Application of Distance vector routing*	*Hamming code*	*Performance metrics*
	SLO-2	*Protocols*	*Classless addressing*	*Node instability issues*	*Application of Hamming code*	*Bandwidth, Delay*
S-8	SLO-1	*Standards*	*Categories of Classless addressing*	*RIPv1*	*Correction vs Detection*	*Throughput, Jitter*
	SLO-2	*Standards Organizations*	*Prefix usage*	*RIPv2*	*Framing*	*Wireless 802.11*
S-9	SLO-1	*Layered Tasks*	*Network Address Translation (NAT)*	*Difference of RIPV1 and RIPV2*	*Flow control*	*Addressing mechanism*
	SLO-2	*Hierarchy*	*Types of NAT*	*Link state routing*	*Error control*	*Transmission Media*
S-10	SLO-1	*OSI Model*	*NAT Terminology*	*Principle of Link state routing*	*ARQ*	*Twisted pair*
	SLO-2	*Layered Approach*	*Translation table*	*Dijkstra's Algorithm*	*ARQ types*	*Coaxial*
S 11-12	SLO-1	*Lab 2: Implementation of various Topology creation*	*Lab 5: Configuring Interfaces*	*Lab 8: Implementation of Default routing*	*Lab 11:Implementation of EIGRP bandwidth and adjacencies*	*Lab 14:Implementation of Multi-Area OSPF with stub areas and authentication*
	SLO-2					
S-13	SLO-1	*Peer-Peer Approach*	*IPV6 addresses*	*Applications of Dijkstra's Algorithm*	*Random access*	*Fibre*
	SLO-2	*Layers in the OSI Model*	*Types, Notation*	*OSPF*	*ALOHA*	*Architecture of IEEE 802*
S-14	SLO-1	*OSI Reference Model*	*VLSM*	*EIGRP*	*CSMA*	*IEEE 802.15*
	SLO-2	*Comparison of Layers*	*Masking*	*Path vector routing*	*CSMA/CD*	*Architecture*
S-15	SLO-1	*TCP/IP Protocol Suite*	*CIDR*	*Applications of Path vector routing*	*CSMA/CA*	*IEEE 802.15.4*
	SLO-2	*TCP/IP Reference Model*	*Address Aggregation*	*Stabilized routing table creation for AS*	*Collision Detection VS Collision Avoidance*	*Architecture*
S-16	SLO-1	*Comparison with OSI Model*	*Networking devices*	*BGP*	*Controlled access*	*IEEE 802.16*
	SLO-2	*Comparison of the OSI and TCP/IP Reference Models*	*Router,Switch,Hub,Bridges*	*BGP sessions*	*Channelization*	*Architecture*
S 17-18	SLO-1	*Lab 3: Implement the categories of network(LAN,MAN,WAN)*	*Lab 6: Basic router configuration, creating passwords*	*Lab 9: Implementation of RIPv1,v2*	*Lab 12: Implementation of EIGRP authentication and timers*	*Lab 15: Redistribution Between EIGRP and OSPF*
	SLO-2					

Learning Resources	1. *BehrouzA.Forouzan,(2010), "Data Communications and Networking", 5th Edition* 2. *ToddLammle,(2011), "CCNA Study Guide", Seventh Edition*	3. *WilliamStallings,(2010), "Data and Computer Communications", Ninth Edition*

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

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

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		Dr.S.P.Angelin Claret

Course Code	USA20503J	Course Name	SOFTWARE ENGINEERING AND TESTING	Course Category	C	Professional Core Course	L	T	P	C
							4	0	2	5

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1 :	*Familiarize the software life cycle models and software development process*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
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*																		
CLR-6 :	*Usage of tools and comply the global standards for testing*																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	*Identify the process of project life cycle model and process*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-2 :	*Analyze and specify software requirements through a productive working Relationship Customers.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	*Design the system based on Functional Oriented and Object Oriented Approach for Software Design.*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	*Develop the correct and robust code for the software products*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	*Perform by applying the test plan and various testing techniques*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	*Analyze the key issues of Software maintenance*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration (hour)		18	18	18	18	18
S-1	SLO-1	The Evolving Role of Software	Computer-Based Systems	Principles of Testing	Integration testing	Performance Testing
	SLO-2	Software Engineering Definition	The System Engineering Hierarchy – System Modeling	Introduction-Testing Definition	Top down Integration testing	Factors of Governing
S-2	SLO-1	Software Characteristics	System Simulation	Phases of software	Bottom up Integration testing	Regression testing
	SLO-2	Software Applications and A Crisis	Comparison of various software Development	Error, Fault, Bug-Failure of the system –Comparison of the terms	Bi-Directional Integration	Types of regression testing
S-3	SLO-1	Software Myths	Business Process Engineering: An Overview	Types of testing-	System Integration	Software testing strategy
	SLO-2	Types Of Myths	Requirements Engineering process	Quality assurance	System Acceptance Testing	Best practice in regression testing
S-4	SLO-1	*Software Engineering : Layered Technology*	*Software requirements specification*	*Quality Control*	*Functional testing*	*Methodology for Performance Testing*

S 5-6	SLO-1	Lab :Problem Statement Preparation	Lab : Software Requirement Specification Document Preparation	Lab : Preparation of DFD of any Project	Lab : Test Case Design	Lab : Usage of Text
	SLO-2					
S-7	SLO-1	*Software Process*	*Characteristics of Good Requirements*	*Testing verification and validation*	*Non Functional testing*	*Tools for Performance Testing*
	SLO-2	*Software Process Models*	*Types of Requirements*	*White Box Testing*	*Functional Vs Non Functional Testing*	*Challenges for Performance Testing*
S-8	SLO-1	*Linear Sequential Model*	*Requirements Elicitation*	*Techniques of White Box Testing*	*System Testing*	*Performing Initial Test, Understanding the Criteria*
	SLO-2	*Advantages And Disadvantages*	*Requirements Analysis and Negotiation*	*Black box testing*	*Design and Architectural Verification*	*Classifying Test Cases.*
S-9	SLO-1	*Prototyping Model*	*Requirement Documentation*	*Techniques of Black box testing*	*Deployment Testing*	*Resetting the Test Cases*
	SLO-2	*Advantages And Disadvantages*	*Requirement Specification and Analysis*	*Static Testing*	*Beta Testing*	
S-10	SLO-1	*Rapid Application Development Model*	*Requirement Review, Validation*	*DYNAMIC Testing*	*Certification, Standards*	*Concluding the Results of Regression Testing*
	SLO-2		*Software Requirement Specification and System Requirement Specifications*			
S 11-12	SLO-1	*Lab :Problem Statement Preparation*	*Lab: Drawing E-R Diagram for any project*	*Lab : Preparation of DFD of any Project*	*Lab :Testing – Calculator*	*Lab : Testing – Sorting*
	SLO-2					
S-13	SLO-1	Evolutionary Process Models	Characteristics of Good SRS Document	Challenges in white box testing	Testing for Compliance	Configuration testing
	SLO-2	Incremental Model	Requirement Management	Black Box Testing	Scalability Testing	compatibility testing
S-14	SLO-1	Advantages and Disadvantages	Software Prototyping	Techniques of Black Box Testing	Reliability testing	Test plan with debugging
	SLO-2	Spiral Model, WIN WIN Model	Selecting the prototyping approach	Structural testing	Stress testing	Levels of testing
S-15	SLO-1	Concurrent Development Model	Specification Principles, Representation	Static testing	Acceptance Testing	Testing tools
	SLO-2	Component Based Development	Specification Review	Verification & Validation Techniques	Acceptance Criteria	Key Issues in Software maintenance
S-16	SLO-1	Comparison of Process models	Characteristics of Good E-R Diagrams	Cyclomatic complexity	Selecting Test Cases	Examples University Previous Question Papers Discussion
	SLO-2	Advantages and Disadvantages	SRS Document	Control flow graph	Executing Tests	
S 17-18	SLO-1	Lab : Software Requirement Specification Document Preparation	Lab: Drawing E-R Diagram for any project	Lab : Test Case Design	Lab : Testing – Mark sheet	Lab : Testing – Login Form
	SLO-2					

Learning Resources	1. *Roger S. Pressman, (2001), "Software Engineering ", Fifth edition, McGraw-Hill Higher Education - A Division of The McGraw-Hill Companies.* 2. *Srinivasan Desikan and Gopalasamy Ramesh, "Software Testing for Principles and Practices", Pearson Education.*	3. *William E. Perry (2006), "Effective Methods of Software Testing", 3rd Ed, Wiley India.* 4. *Renu Rajani, Pradeep Oak (2007), "Software* Testing", TMH

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

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

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. M. R. Sudha, SRMIST*

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
LEARN · LEAP · LEAD

Course Code	UCA20S03L	Course Name	LUA PROGRAMMING	Course Category	S	Skill Enhancement Course	L	T	P	C
							0	0	2	1

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	Learn the basics of working with Lua			
CLR-2 :	Learn String Manipulation using Lua			
CLR-3 :	Learn to work with decision control and looping statements			
CLR-4 :	Learn object-oriented programming concept in Lua			
CLR-5 :	Learn and use the concept of arrays			
CLR-6 :	Understand standard LUA libraries for math and file i/o			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Disciplinary Knowledge	Critical Thinking	Problem Solving	Analytical Reasoning	Research Skills	Team Work	Scientific Reasoning	Reflective Thinking	Self-Directed Learning	Multicultural Competence	Ethical Reasoning	Community Engagement	ICT Skills	Leadership Skills	Life Long Learning
CLO-1 :	Understand the basics of programming the Lua language	*3*	*80*	*70*	-	-	-	*H*	*L*	*H*	*H*	-	*L*	-	-	*H*	-	-	-
CLO-2 :	Understand how to use tables, the data structure that makes Lua so powerful	*3*	*85*	*75*	-	-	-	*M*	*L*	*M*	*M*	-	*M*	-	-	*H*	-	-	-
CLO-3 :	Apply Inheritance	*3*	*75*	*70*	-	-	-	*H*	*L*	*H*	*H*	-	*M*	-	-	*H*	-	-	-
CLO-4 :	*Perform String Manipulation*	*3*	*85*	*80*	-	-	-	*H*	*L*	*H*	*H*	-	*M*	-	-	*H*	-	-	-
CLO-5 :	*Use Lua Libraries*	*3*	*85*	*75*	-	-	-	*H*	*L*	*H*	*H*	-	*M*	-	-	*H*	-	-	-
CLO-6 :	*Write simple applications using Lua*	*3*	*80*	*70*	-	-	-	*H*	*L*	*H*	*H*	-	*L*	-	-	*H*	-	-	-

Duration (hour)		06	06	06	06	06
S-1	SLO-1	Introduction To Lua Programming	Functions	While Loops, Infinite Loops	Arrays	Inheritance
	SLO-2	Writing First Lua Program	Defining a Function, Calling a Function, Function Arguments, Any No of Arguments, Returning a value, Returning Multiple values	Breaking a Loop	Array constructors, Array are one based, Sparse array, The size of an array, Multidimensional array	Single and Multiple Inheritance
S-2	SLO-1	Basic Syntax	Define a function using variable no of arguments to sum all the argument passed.	Write a program to reverse a number	Write a program to add two matrix	Write a program to implement single and multiple inheritance
	SLO-2	Token, Comments, Identifiers, Keywords, Whitespaces				
S-3	SLO-1	Variables	Operators	Repeat until loop, for loop	Iterating	Math
	SLO-2	Basic Data Types	Arithmetic operators, Relational Operators, Logical Operators, Misc Operators, Operator Precedence	Nested Loop	Understanding pairs, Understanding ipairs, Closures, Iterative functions	Trigonometry, Changing Numbers, Comparing Numbers, Randomness
S-4	SLO-1	Developing Simple Programs	Write a program to perform simple arithmetic operations	Write a program to generate multiplication table	Write a program to illustrate the concept Iterators	Write a program to work with math library
	SLO-2					

S-5	SLO-1	String Types - String Literals/, String Length, Concatenate Strings, String Coercion, Escape Characters, Console input	Control Structures	Creating Tables, Storing Values	Objects	File IO
	SLO-2	Scope – Scope access, Global Access, Shadowing	If, elseif, else, Nesting if statements	Table Constructors, Tables are references	Classes, The : operator, Tables inside of objects	Opening a File, Reading Data, Writing Data, Closing a File
S-6	SLO-1	Write a program to perform various string manipulations	Write a Program that takes user input. If typed 'Hi" display "Welcome", If typed "Bye", Display "Good Bye"	Write a program to work with tables	Write a program using class and objects	Write a program to create a file
	SLO-2					

Learning Resources	1. *"Lua Programming, A Beginners Guide", 2019 Edition, The Definitive Lua Programming Guide, Lua Publishing*	2. *Gabor Szauer, (2018), " Lua Quick Start Guide", Packt Publishing*

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	-	30%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	-	40%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	-	30%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs.S.Chandrakala, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mr.J. Venkata Subramanian, SRM IST*

Course Code	UCA20S04L	Course Name	STATISTICAL PACKAGE FOR SOCIAL SCIENCES	Course Category	S	Skill Enhancement Course	L	T	P	C
							0	0	2	1

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning		
		1	2	3
E1CLR-1 :	To define a variety of statistical variables	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	To enter basic data into SPSS			
CLR-3 :	To learn basic SPSS functions and its tools			
CLR-4 :	To Present data using relevant tables, graphical displays and summary statistics.			
CLR-5 :	To conduct descriptive and basic inferential statistics			
CLR-6 :	To carry out statistical analysis that can test hypotheses			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Learning		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Understand the basic analyses workings of SPSS, and its tools	*3*	*80*	*70*
CLO-2 :	Summarize data using graphs and descriptive statistics,	*3*	*85*	*75*
CLO-3 :	Analyzing data to compare significance of difference between two or more groups: parametric and nonparametric methods.	*3*	*75*	*70*
CLO-4 :	Evaluating association between disease (outcome) and one or more exposures	*3*	*85*	*80*
CLO-5 :	Carry out inferential statistical analysis using SPSS	*3*	*85*	*75*
CLO-6 :	Use SPSS to produce scientifically sound research reports	*3*	*80*	*70*

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*H*	*L*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-2 :	*M*	*H*	*L*	*M*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-3 :	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-4 :	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-5 :	*H*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-6 :	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*H*	*L*	*L*	*-*	*H*	*-*	*-*	*H*

Duration (hour)		06	06	06	06	06
S-1	SLO-1	Introduction to SPSS	Introduction to Various Graphical representation of Data and Editing of Graphs	Introduction to Measures of Central Tendencies	Calculation of Regression Trend-Trend Line	Introduction to Non-Parametric Test
	SLO-2	Understanding Interface - Data View, Variable View and Output View				
S-2	SLO-1	Defining Variables in a New Data Set	Constructing Simple Bar diagram	Calculation of Mean, Median and Mode, Geometric mean	Introduction to Test of Significance for Single and two Sample	One –Way Chi-square test (test for Homogeneity)
	SLO-2	Entering Data in a New Data Set and Saving a New Data Set				
S-3	SLO-1	Sorting and filtering data	Constructing Multiple Bar Diagram	Introduction to Methods of	Understanding Large Sample Test	Two–Way Chi-square test (test for

	SLO-2	Replacing Missing Values		Dispersion	(Z-Test)	Attributes)
S-4	SLO-1	Creating a New Data Set From Other File Format	Constructing Sub divided Bar Diagram	Calculation of Standard Deviation, Quartiles, Skewness & Kurtosis	Test for Mean, Test for Proportion & Test for Standard Deviation for Z-test	Introduction to Test of Homogeneity of Means for more than 2 samples
	SLO-2	Opening a data file and viewing its contents				
S-5	SLO-1	Construction of Frequency tables	Constructing Histogram	Introduction to Correlation Coefficient:	Understanding Small Sample Test (t-Test, F-test)	One –Way ANOVA
	SLO-2	Univariate Frequency tables				
S-6	SLO-1	Bivariate Frequency tables	Constructing Pie Diagram	Calculation of Karl Pearson's Correlation Coefficient	Test of Mean & Test of Variances for Small sample	Two–Way ANOVA
	SLO-2	CrossTabulation		Calculation of Spearman's Rank Correlation Coefficient		

Learning Resources	1. Vijay Gupta, (1999), "SPSS for Beginners", VJBooks Inc.	2. Melanie C. Page, Sanford L. Braver and David P. MacKinnon, (2003), "Levine's Guide to SPSS for Analysis of Variance", 2nd Edition, Lawrence Erlbaum Associates Publishers.

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%)#			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	-	30%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	-	40%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	-	30%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs.S.Chandrakala, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mr. J. Venkata Subramanian*

Course Code	UES20AE1T	Course Name	ENVIRONMENTAL STUDIES	Course Category	AE	Ability Enhancement Courses	L	T	P	C
							3	0	0	3

Pre-requisite Courses	*Nil*	Co-requisite Courses	*Nil*	Progressive Courses	*Nil*
Course Offering Department	*Computer Applications*	Data Book / Codes/Standards		*Nil*	

Course Learning Rationale (CLR): *The purpose of learning this course is to:*

		Learning		
		1	2	3
CLR-1 :	*To teach the importance of environment*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	*To impart the knowledge about ecosystem*			
CLR-3 :	*To teach about Biodiversity*			
CLR-4 :	*To create awareness about environmental pollution*			
CLR-5 :	*To understand about Environment Protection*			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	*To gain knowledge on the importance of natural resources and energy*	*2*	*75*	*60*	*H*	*H*	*H*	-	-	-	-	-	-	-	-	-	-	-	-
CLO-2 :	*To understand the structure and function of an ecosystem*	*2*	*80*	*70*	-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-
CLO-3 :	*To imbibe an aesthetic value with respect to biodiversity, understand the threats and its conservation and appreciate the concept of interdependence*	*2*	*70*	*65*	*H*	-	-		-	-	-	-	-	-	-	-	-	-	-
CLO-4 :	*To understand the causes of types of pollution and disaster management*	*2*	*70*	*70*	*H*	-	*H*	*H*	*H*	-	-	-	-	-	-	-	-	-	-
CLO-5 :	*To observe and discover the surrounding environment through field work*	*2*	*80*	*70*	-	*H*	-	*H*	-	-	-	-	-	-	-	-	-	-	-

Duration (hour)		9	9	9	9	9
S-1	SLO-1	*Environmental Studies- Concept*	*Concept of an ecosystem*	*Biodiversity at Global, National And Local Levels*	*Causes, Effects and Control Measures of Nuclear hazards*	*Need for equitable utilization*
	SLO-2	*Scope and Importance of Environmental Studies*	*Ecosystem degradation and Resource utilization*	*India as a Mega Diversity Nation*		*Equity – Disparity*
S-2	SLO-1	*Need for public awareness.*	*Structure and Functions of an ecosystem*	*Threats to biodiversity: habitat loss, poaching of wildlife*	*Solid Waste Management Causes, Effects and Control Measures of Urban and Industrial Waste*	*Urban – rural equity issues*
	SLO-2	*Institutions in Environment*	*Producers, consumers and decomposers*	*man-wildlife conflicts*		*The need for Gender Equity*
S-3	SLO-1	*People in Environment*	*Energy flow in the ecosystem*	*Endangered species of India*	*Role of Individuals In Pollution Prevention*	*Preserving resources for future generations*
	SLO-2	*Awareness about Environmental Studies*	*The water cycle , The Carbon cycle , The Oxygen cycle , The Nitrogen cycle , The energy cycle and, Integration of cycles in nature*	*Endemic species of India*		*The rights of animals*

S-4	**SLO-1**	*Introduction to natural resources- Associated Problems*	*Ecological succession*	*Environmental Pollution- Definition*	*Disaster management- Nature Floods, Earthquakes*	*The ethical basis of environment education and awareness*
	SLO-2	*Renewable and Nonrenewable resources*	*Food chains, Food webs and Ecological pyramids*			
S-5	**SLO-1**	*Forest resources*	*Ecosystem, Introduction, Types, Characteristic features, Structure and functions*	*Causes, Effects and Control Measures of Air Pollution*	*Cyclones Landslides*	*The conservation ethic and traditional value systems of India*
	SLO-2	*Water Resources*	*Forest ecosystem*			
S-6	**SLO-1**	*Mineral Resources*	*Grassland ecosystem*	*Causes, Effects and Control Measures of Water Pollution*	*Social Issues and the Environment From Unsustainable to Sustainable Development*	*Wasteland Reclamation*
	SLO-2	*Food Resources*	*Desert ecosystem*			
S-7	**SLO-1**	*Energy Resources*	*Aquatic ecosystems (ponds, lakes, streams)*	*Causes, Effects and Control Measures of Soil Pollution*	*Water Conservation*	*Climate change & Global warming*
	SLO-2	*Land Resources*	*Aquatic ecosystems (rivers, estuaries, oceans)*			
S-8	**SLO-1**	*Renewable and non-renewable resources- Wind*	*Value Of Biodiversity*	*Causes, Effects and Control Measures of Marine pollution*	*Rain Water Harvesting Watershed*	*Acid rain & Ozone layer depletion*
	SLO-2	*Renewable and non-renewable resources- geothermal*	*Consumptive Value And Productive Value*			
S-9	**SLO-1**	*Renewable and non-renewable resources- Solar*	*Social Value and Ethical Value*	*Causes, Effects and Control Measures of Noise Pollution*	*Environmental Ethics: Issues and Possible Solutions*	*Nuclear Accidents and Nuclear Holocaust*
	SLO-2	*Renewable and non-renewable resources- Biomass*	*Aesthetic Value and Option Value*	*Causes, Effects and Control Measures of Thermal Pollution*	*Resource consumption patterns*	

Learning Resources	**Theory:** 1. Bharucha Erach, (2013), Textbook of Environmental Studies for Undergraduate Courses (Second edition). Telangana, India: Orient BlackSwan. 2. Basu Mahua, Savarimuthu Xavier, (2017), SJ Fundamentals of Environmental Studies. Cambridge, United Kingdom: Cambridge University Press 3. Dr.R.Jeyalakshmi.2014.,Text book of Environmental Studies, Devi publications, Chennai 4. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India, Email:mapin@icenet.net (R)

Learning Assessment

Level	**Bloom's Level of Thinking**	**Continuous Learning Assessment (50% weightage)**								**Final Examination (50% weightage)**	
		CLA – 1 (10%)		**CLA – 2 (10%)**		**CLA – 3 (20%)**		**CLA – 4 (10%)#**			
		Theory	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**	**Theory**	**Practice**
Level 1	Remember Understand	40%	-	40%	-	40%	-	40%	-	40%	-
Level 2	Apply Analyze	30%	-	30%	-	30%	-	30%	-	30%	-
Level 3	Evaluate Create	30%	-	30%	-	30%	-	30%	-	30%	-
	Total	100 %		100 %		100 %		100 %		100 %	

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

Course Designers		
Experts from Industry	**Experts from Academic**	**Internal Experts**
1. Mr. Suresh S, Program Head, Hello FM	*1. Dr. G Balasubramania Raja, Prof & Head, Manonmaniam Sundranar University Mail- gbs_raja@yahoo.com*	*1. Dr. Rajesh R, Head, SRM IST*
		2.Dr.S.Albert Antony Raj, Associate Professor and Head, SRMIST

Course Code	UJK20501T	Course Name	Leadership and Management Skills	Course Category	JK	Life Skill Courses	L	T	P	C
							2	0	0	2

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Career Development Centre	Data Book / Codes/Standards	-		

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
CLR-1 :	help students to develop essential skills to influence and motivate others	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
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			
CLR-6 :	manage competency-mix at all levels for achieving excellence with ethics			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
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	3	80	75
CLO-2 :	learn and demonstrate a set of practical skills such as time management, self-management, handling conflicts, team leadership, etc	3	80	75
CLO-3 :	understand the basics of entrepreneurship and develop business plan	3	75	70
CLO-4 :	apply the design thinking approach for leadership	3	75	70
CLO-5 :	appreciate the importance of ethics and moral values for making of a balanced personality	3	75	70
CLO-6 :	be an integral human being	3	75	70

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	L	M	H	-	M	M	-	-	-	M	H	L	-	H	H
CLO-2 :	L	M	H	-	M	M	-	-	-	M	H	L	-	H	H
CLO-3 :	L	M	H	-	M	M	-	-	-	M	H	L	-	H	H
CLO-4 :	L	M	H	-	M	M	-	-	-	M	H	L	-	H	H
CLO-5 :	L	H	H	-	M	M	-	-	-	M	H	L	-	H	H
CLO-6 :	L	H	H	-	M	M	-	-	-	M	H	L	-	H	H

Duration (hour)		6	6	6	6	6
S-1	SLO-1	Leadership - definition	Team building	Management – definition	*Women in management*	*Entrepreneurship*
	SLO-2	Leadership – qualities	Team dynamics	Manager – traits	*Global gender perspective in business. Do women make good managers? - discussion*	*Entrepreneurship*
S-2	SLO-1	Leadership – styles	Work delegation	Scheduling work	*Confronting problems faced by women managers – case study*	*Successful Indian entrepreneurs – case study*
	SLO-2	Leadership – styles	Work delegation – activity	Scheduling work – activity	*Confronting problems faced by women managers – case study*	*Successful Indian entrepreneurs – case study*
S-3	SLO-1	*Difference between leader and boss*	Decision making	*Strategic planning*	*Successful women managers – documentary screening*	*Successful women entrepreneurs – case study*

	SLO-2	*Case study (based on leadership styles)*	Decision making - activity	*Strategic planning*	*Successful women managers – documentary screening*	*Successful women entrepreneurs – case study*
S-4	**SLO-1**	*Case study (based on leadership styles)*	Motivation	Change management	*Women labour force in work place*	*Ethics – definition*
	SLO-2	*Case study (based on leadership styles)*	Motivating for results	Change management – activity	*Problems faced by women labour force in work place - case study*	*Corporate ethics*
S-5	**SLO-1**	Leadership in diverse organizational structures, cultures and communications	Argumentation, Persuasion	*Energy management*	Sexual harassment of women at workplace (prevention, prohibition, and redressal) Act, 2013	*Essential elements of business ethics*
	SLO-2	Leadership in diverse organizational structures, cultures and communications	Negotiation , Networking	*Novel ways to manage energy in work place – activity*	Documentary screening - Sexual harassment of women at workplace	*Activity (students formulate ethical code of their business organization)*
S-6	**SLO-1**	Leading the organisation through stability and turbulence	Budget planning	*Work force management*	Transgender persons protection of rights act, 2019	*Ethical dilemma*
	SLO-2	Case study	Taking risk	*Grievance redressal policy in organisations*	Documentary screening –based on inclusiveness of the third gender in workplace	*Ethical dilemma - case study*

Learning Resources	1. *Craig E Johnson, Meeting the ethical challenges of leadership, Sage publications, 2018* 2. *Allan R Cohen, David L Bradford, Influence without authority, Wiley, 2018* 3. *T V Rao, Managers who make a difference: Sharpening your management skill, Random house India, 2016*	4. *Alexander Osterwalder, Business Model Generation,Wiley, 2013* 5. *Deborah Tannen, Talking from nine to five: Women and men in the workplace, Harper Collins publishers, 2010* 6. Amish Tandon, Law *of sexual harassment at workplace: Practice and procedure,Niyogi books, 2017* 7. *Rashmi Bansal, Connect the dots, Westland books, 2012*

Learning Assessment

Level	**Bloom's Level of Thinking**	**Continuous Learning Assessment (100% weightage)**			
		CLA-1 (20%)	**CLA-2 (20%)**	**CLA-3 (30%)**	**CLA-4 (30%) ##**
		Theory	**Theory**	**Theory**	**Theory**
Level 1	Remember	10%	10%	30%	15%
	Understand				
Level 2	Apply	50%	50%	40%	50%
	Analyze				
Level 3	Evaluate	40%	40%	30%	35%
	Create				
	Total	100 %	100 %	100 %	100 %

CLA-1, CLA-2 and CLA-3 can be from any combination of these: Online Aptitude Tests, Classroom Activities, Case Studies, Poster Presentations, Power-point Presentations, Mini Talks, Group Discussions, Mock interviews, etc.

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

Course Designers		
Experts from Industry	**Experts from Higher Technical Institutions**	**Internal Experts**
1. Ajay Zener, Director, Career Launcher	-	*1. Ms Sindhu Thomas B, Assistant Professor & Head in Charge, CDC, FSH, SRMIST*
		2. Mr Rajsekar, Assistant Professor, CDC, FOM, SRMIST

SEMESTER VI

Course Code	USA20601J	Course Name	PYTHON PROGRAMMING	Course Category	C	Professional Core Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	**Learning**		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*Describe the core syntax and semantics of Python programming language.*			
CLR-2 :	*Discover the need for working with the strings and functions.*			
CLR-3 :	*Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.*			
CLR-4 :	*Indicate the use of regular expressions and built-in functions to navigate the file system.*			
CLR-5 :	*Infer the Object-oriented Programming concepts in Python.*			
CLR-6 :	*Understand Event Driven Programming*			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*			
CLO-1 :	*Develop, document, and debug modular python programs to solve computational problems*	*3*	*80*	*70*
CLO-2 :	*Select a suitable programming construct and data structure for a situation.*	*3*	*85*	*75*
CLO-3 :	*Use built-in strings, lists, sets, tuples and dictionary in applications.*	*3*	*75*	*70*
CLO-4 :	*Define classes and use them in applications*	*3*	*85*	*80*
CLO-5 :	*Use files for I/O operations.*	*3*	*85*	*75*

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
L	*H*	-	*H*	*L*	-	-	*H*	*L*	*L*	-	*H*	-	-	*H*
M	*H*	*L*	*M*	*L*	-	-	*H*	*M*	*L*	-	*H*	-	-	*H*
M	*H*	*M*	*H*	*L*	-	-	*H*	*M*	*L*	-	*H*	-	-	*H*
M	*H*	*M*	*H*	*L*	-	-	*H*	*M*	*L*	-	*H*	-	-	*H*
H	*H*	*M*	*H*	*L*	-	-	*H*	*M*	*L*	-	*H*	-	-	*H*

Duration (hour)		24	24	24	24	24
S-1	SLO-1	*An introduction to python programming*	*The Structure of Strings*	Introduction to Lists	*Introduction to function*	*Introduction to classes*
	SLO-2	*Structure of a Python program*	*The Subscript Operator*	List literals	*Functions as Abstraction Mechanisms*	*Design with Classes*
S-2	SLO-1	*understanding Python interpreter*	Program using subscript operator	Basic list operators	*Functions Eliminate Redundancy*	*Objects and Classes*
	SLO-2	*understanding Python Shell*	*Slicing for Substrings*	*Replacing an Element in a List*	*Functions Hide Complexity*	*An example for class*
S-3	SLO-1	*Datatypes*	*Program for slicing substrings*	*Replacing an Element in a List*	*Functions Support General Methods with Systematic Variations*	*Docstrings*
	SLO-2	*Example program using all data types*	*Testing for a Substring with the in Operator*	*Example program to Replace an Element in a List*	*Functions Support the Division of Labor*	*Method Definitions*
S-4	SLO-1	*String literals*	*Program using substring*	*List Methods for Inserting Elements*	*Defining a Recursive Function*	*The init Method*
	SLO-2	*Escape Sequences*	*The Positional System for Representing Numbers*	*Program to List Methods for Inserting Elements*	*Tracing a Recursive Function*	*Instance Variables*

S 5-8	SLO-1 SLO-2	Lab 1: *Write a Python code to display system information usingpywhois*	Lab 4:Make a simple calculator	Lab 7: *Program to Transpose a Matrix* *Program to List Methods for Inserting Elements*	Lab 10: Program using recursive function	Lab 13: Program using classes and methods
S-9	SLO-1	*String Concatenation*	*Converting binary to decimal*	*List Methods for Removing Elements*	*Using Recursive Definitions to Construct Recursive Functions*	*The str Method*
	SLO-2	*Variables and the assignment statement*	*Program to convert binary to decimal*	*Searching a List*	*Recursion in Sentence Structure*	*Accessors*
S-10	SLO-1	*Example program using variables*	*Converting decimal to binary*	*Sorting a List*	*Infinite Recursion*	*Mutators*
	SLO-2	*Program Comments and Doc Strings*	*Program to convert decimal to binary*	*Mutator Methods*	*The Costs and Benefits of Recursion*	*The Lifetime of Objects*
S-11	SLO-1	*Numerical Datatypes*	*String Methods*	*Aliasing*	*Managing a Program's Namespace*	*Rules for Defining a Simple Class*
	SLO-2	*Character sets*	*Program using string method*	*Aliasing side effects*	*Module Variables, Parameters, and Temporary Variables*	*Rational Number Arithmetic and Operator Overloading*
S-12	SLO-1	*Arithmetic expressions*	*Octal and Hexadecimal Numbers*	*Equality: Object Identity*	*Scope*	*Comparison Methods*
	SLO-2	*Understanding error messages*	*Text Files and Their Format*	*Structural Equivalence*	*Lifetime*	*Equality and the eq Method*
S 13-16	SLO-1 SLO-2	*Lab 2: The Magic 8 Ball is a toy used for fortune-telling or seeking advice.*	*Lab 5: Find the Factorial of a Number* *Python Program to Convert Decimal to Binary, Octal and Hexadecimal*	Lab 8: *Using a List to Find the Median of a Set of Numbers* *Program using sorting and searching*	Lab 11: *Write the code for a mapping that generates a list of the absolute values of the numbers in a list named numbers.*	Lab 14: *Python Program for Operator overloading*
S-17	SLO-1	*Logical operators*	*Writing Text to a File*	Tuples	*Default (Keyword) Arguments*	*Using pickle for Permanent Storage of Objects*
	SLO-2	*Definite iteration : For loop*	*Writing Numbers to a File*	Creation of several tuples	*Functions as First-Class Data Objects*	*Input of Objects and the try-except Statement*
S-18	SLO-1	*Example program using for loop*	*Reading Text from a File*	*Dictionaries*	*Mapping*	*Inheritance Hierarchies and Modeling*
	SLO-2	*Formatting text for output*	*Reading Numbers from a File*	*Dictionary Literals*	*Filtering*	*Polymorphic Methods*
S-19	SLO-1	*Selection : if and if else statement*	*Example program to read and write text and numbers*	*Adding Keys and Replacing Values*	*Reducing*	*Abstract Classes*
	SLO-2	*Example program using if and if else*	*Accessing Files and Directories on Disk*	*Accessing Values*	*Using lambda to Create Anonymous Functions*	*The Costs and Benefits of Object-Oriented Programming*
S-20	SLO-1	*Conditional iteration :while loop*	*Manipulating Files and Directories on Disk*	*Removing Keys*	*Creating Jump Tables*	*Event-Driven Programming*
	SLO-2	*Example program using while loop*	*Example program to access and manipulate files*	*Traversing a Dictionary*	*Example program using functions*	*Example for Event-Driven Programming*
S 21-24	SLO-1 SLO-2	Lab 3: Check whether a number is prime or not, *Python Program to Generate a Random Number*	*Lab 6: Program to read and write text and numbers*	Lab 9: *When the user enters a statement, the program responds in one of two ways: 1 With a randomly chosen hedge, such as "Please tell me more." 2 By changing some key words in the user's input string and*	Lab 12: *Write the code for a filtering that generates a list of the positive numbers in a list named numbers. You should use a lambda to create the auxiliary function.*	Lab 15: Program using polymorphism, abstract classes

				appending this string to a randomly chosen qualifier. Thus, to "My teacher always plays favorites," the program might reply, "Why do you say that your teacher always plays favorites?"		

Learning Resources	*Kenneth A. Lambert, (2011), "The Fundamentals of Python: First Programs", Cengage Learning*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. Anita Jasmine, SRM IST*

Course Code	UCA20D07J	Course Name	Multimedia Design Principles and Applications	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	**Learning**		
		1	2	3
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-1 :	*Enable graduates to excel in multimedia technology by adapting to rapid advances in newer technologies.*			
CLR-2 :	*Provide graduates a proper foundation of multimedia fundamentals to solve real world problems.*			
CLR-3 :	*Teach the use of visually rich and dynamic graphics elements to enhance web pages and sites.*			
CLR-4 :	*Provide a basic knowledge about processing and editing of multimedia content with more emphasis on image and videos*			
CLR-5 :	*Train graduates with good scientific, multimedia technologies and solve real time problems*			
CLR-6 :	*Allow students to o projects and apply the multimedia principles of web design to their own sites*			

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	*Formulate a working definition of interactive multimedia*	3	80	70
CLO-2 :	*Demonstrate the use of animation, digitized sound, video control, and scanned images*	3	85	75
CLO-3 :	*Evaluate the role of multimedia technologies in the online and web environment;*	3	75	70
CLO-4 :	*Define the characteristics of each media type and describe their application*	3	85	80
CLO-5 :	*Create and design multimedia projects*	3	85	75
CLO-6 :	*Do graphics design and animation*	3	80	70

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1	*L*	*H*	-	*H*	*L*	-	-	-	*L*	*L*	-	*H*	-	-	-
CLO-2	*M*	*H*	*L*	*M*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	-
CLO-3	*M*	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	-
CLO-4	*M*	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	-
CLO-5	*H*	*H*	*M*	*H*	*L*	-	-	-	*M*	*L*	-	*H*	-	-	-
CLO-6	*L*	*H*	-	*H*	*L*	-	-	-	*L*	*L*	-	*H*	-	-	-

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Need to learn design	*Introduction to basic visual elements*	*Information to design*	*Introduction to Learning perspective drawing*	*Introduction to visual effects*
	SLO-2	Understand information architecture (IA), industrial design (ID), visual (or graphic) design, user experience design,	Understand the utility of visual elements	*Understand specific audiences in specific situations to meet defined objectives.*	Understand the horizon lines on paper	Understand the visual effects and usage
S-2	SLO-1	Human Factors	*Line shape, colour, texture, layout*	*interaction and sensorial design*	*Drawing for Animation*	*when and where to use visual effects*
	SLO-2	Understand the *products conform to the limitations of the human body, both physically and psychologically*	Characteristics of visual elements	*Understand the the sensory perceptions of a product,*	Understand the creatures, things to draw	special effects *used to give depth to the* visual *representation of the story*
S-3	SLO-1	*fundamentals of Human perception*	*motion, framing, surfaces*	*guidelines for user interface design*	*Gesture Drawing*	*examples of simple visual effects*
	SLO-2	Perception of design	Concepts of motion, framing and	Understand the visibility, user	Study about to *capturing the*	Unity cube, morphing face

			surfaces	control	*essence of the pose and line of action through quick sketching*	
S-4	SLO-1	Human skill level and behavior	visual hierarchy	dialogue design	Action Drawing,	fade-in/ fade-out, motion blur
	SLO-2	*Understating the human skill ability*	*Understand the arrangement of presentation*	*Understand the analytical approach*	*Human actions, sketch based actions*	*Learning to apply visual effect*
S 5-8	SLO-1 SLO-2	*Introduction to Design tool: Figma-UI and Desktop*	*Figma components*	*Working with frames*	*Layer blend in figma*	*Design a story board*
S-9	SLO-1	dialogues and tasks	typography Elements of composition ,Visual rhetoric	Cognitive Walkthrough	Line of action	Application Examples/ Case studies
	SLO-2	*Performance of task*	*Understand the visual structures*	*Examine the usability of the product*	*Understand the direction and motion of a characters body*	*Apply to grass wind, butterflies*
S-10	SLO-1	Learning and Learning Modes	organizing information	Different Android applications	Dynamic Poses	Need for design
	SLO-2	*Ability learn the learning models*	*Leaning the physical or conceptual organization of things*	*Understand the consistency of the platform*	*Creation of the posture in movement*	*Understand the importance for design for multimedia*
S-11	SLO-1	Cognitive Domain Learning	factors designers consider when creating illustration and visual design	Information Architecture	Action Sketches (Key Poses)	Design Specifics
	SLO-2	*Understand the domain learning*	*Understanding the geometry of the object*	*Understand the visual representation of the product*	*Action related sketch to create character*	*Learning to apply respective task*
S-12	SLO-1	Psychomotor Domain Learning	designing for screen	Definitions of Story	2D Design concepts	Scripts, Storyboards
	SLO-2	*Understand the psychomotor learning*	*Learn the graphical user interface*	*Understand the emotions of the character and plot*	*Understand the 2Ddesign principles*	*Learning to create story board*
S 13-16	SLO-1 SLO-2	*Frame Vs Slicing tool*	*Figma Constrains*	*Working with shapes*	*Blur effects in figma*	*Design a mood board*
S-17	SLO-1	Multimedia Modeling	Understand spatial relationships in the interface	Flowchart, scripts	Composition.	Advantages and Effectiveness of Story boards
	SLO-2	*Multimedia modeling concepts*	symbols and semiotics in the interface	*Understand the algorithm development and flow charts*	*Learning of composition of animation*	*Explore the created characters*
S-18	SLO-1	Multimedia Educational Software Modeling	Visual design methodology: Clarity	Story board.	Principles of Animation	Flowcharts, Writing a script, Screen Layout Designs
	SLO-2	*Understand the educational software modeling*	*Understand the design methodology*	*Understand the ideas through visual stories*	*Understand the principles of animation*	*Developing algorithm*
S-19	SLO-1	System Quality	Design consistency	Necessity of the pre-production documentations	Process of 2D Animation film making	Human Computer Interaction Different Android applications
	SLO-2	*Understand the system quality and quality measures*	*Understand to make the effective design*	*Understand the collage of information,* capture a feeling , theme, or design	Editing & Animators	*Develop the HCI*
S-20	SLO-1	Elements of user Interface	Appearance, visual coding layout principles	Interactive flowchart and storyboard	Input Sound- Sound Effects	Hypermedia & navigation
	SLO-2	*Usage of User interface*	*Understand the visual coding layout principles*	Examples and case studies	SoundRecording. Designing, Developing Characters (Realistic, Exaggerated & Stylized)	Understand the cognitive style, spatial orientation and computer expertise on hypertext *navigation* patterns

S 21-24	SLO-1	*Drawing vector shapes and pen tool*	*Shadows and other effects-Figma*	*Adding and formatting text*	*Creating prototypes*	*Design a graphics and Animation*
	SLO-2					

Learning Resources	1. David Benyon, "Designing Interactive Systems: People, Activities, Contexts, and Technologies" 2. Kevin Mullet and Darrell Sano, "Designing Visual Interfaces: Communication Oriented Techniques" 3. Andy Chong, "Basics Animation: Digital Animation"	4. Edward R. Tufte, "Envisioning Information" 5. Ellen Lupton, "Thinking with Type: A Primer for Designers: A Critical Guide for Designers, Writers, Editors, & Students" 6. David Lauer, Stephen Pentak, "Design Basics"

Learning Assessment

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

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

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mr. Venkata Subramanian, SRM IST*

Course Code	UCA20D08J	Course Name	OBJECT ORIENTED ANALYSIS AND DESIGN	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards	Nil		

Course Learning Rationale (CLR):	The purpose of learning this course is to,	Learning	Program Learning Outcomes (PLO)

		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CLR-1 :	*Build high quality reusable software*																		
CLR-2 :	*Apply UML for modeling problems*																		
CLR-3 :	*Understand Software Design Patterns*																		
CLR-4 :	*Develop reliable software systems*																		
CLR-5 :	*Apply Standardized testing approaches*																		
CLR-6 :	*Practical Approach for modeling simple real world applications*																		
Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:																		
CLO-1 :	*Master the vocabulary, use and idioms of the UML*	2	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-2 :	*Scope of Object Oriented Software Systems*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-3 :	*Understand and Apply UML*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-4 :	*Design UML Architecture for a system*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-5 :	*Develop Test Templates*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-
CLO-6 :	*Ensure Software Quality Assurance*	3	85	80	L	H	H	H	H	-	-	M	M	L	-	H	-	-	-

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Introduction to OOAD	Basics of Structural Modeling	Behavioral Modeling	Architectural Modeling	Patterns & frameworks
	SLO-2	OO Basics	Classes	Interactions	Component	Patterns & Architecture
S-2	SLO-1	Importance of Modelling	Class Diagram	Sequencing	Components and Interfaces	Frameworks
	SLO-2	Principles of Modelling	Common Modeling Techniques for classes	Interactions-Links And Associations	Simple and Extended Components	Mechanisms
S-3	SLO-1	Overview of UML	Relationships in classes	Objects Creation	Components And Classes	Modeling Design Patterns

	SLO-2	Where can UML be used?	Modeling Dependencies	Modeling Flow Control by Time	Components And Interfaces	Modeling Architecture Patterns
S-4	SLO-1	Overview of Conceptual Model of UML	Modeling Inheritance	Modeling Flow Control by Organization	Kinds Of Components	Black Board Architectural Patterns
	SLO-2	Building Blocks of UML-Things	Modeling Structural Relationship	Use case Diagrams	Organizing Components	Software Quality
S 5-8	SLO-1 SLO-2	Lab 1: Case Study: ATM System	Lab 4:Case Study: Student Information System	Lab 7: Case Study: Stock Maintenance System	Lab 10: Case Study: Exam Registration System	Lab 13: Case Study: Mark Analysis
S-9	SLO-1	UML Relationships	Extensibility Mechanisms in UML	Usecase	Component Diagrams	Software Testing
	SLO-2	UML Diagrams	Stereotypes	Actors	Modeling API using Components	Need for testing
S-10	SLO-1	Rules of UML	Tagged values	Use Case Scenario	Modeling Tables	Kinds of Error
	SLO-2	Common Mechanisms in UML	Constraints	Use Case and Collaborations	Modeling Files	Testing Standards
S-11	SLO-1	Architecture	Notes	Organizing Usecases	Modeling Documents	Develop Test Cases
	SLO-2	Object Oriented Methodologies	Standard Elements	Modeling Context using usecases	Modeling Source Code using Component Diagram	Develop test plans
S-12	SLO-1	SDLC	Other Adornments in UML	Modeling Requirements using usecases	Deployment	Issues in OO Testing
	SLO-2	SDLC Phases	Modeling New Building Blocks	Use case Diagram with relationships	Simple and Extended Nodes	Unit Testing
S 13-16	SLO-1 SLO-2	Lab:2 Case Study: Library Management System.	Lab 5: Case Study: Cellular Phone	Lab 8: Case Study:Passport Registration System	Lab 11: Case Study: Order Processing System	Lab 14: Case Study: Develop test template
S-17	SLO-1	Object Oriented Methodologies	Modeling Comments	Activity Diagram	Nodes and components	Integration Testing
	SLO-2	Object Oriented Analysis	Modeling new properties	Modeling operation using Activity Diagram	Organizing Nodes	Black Box Testing
S-18	SLO-1	Differentiate OOA & OOD	Modelling Group of Elements using Packages	State machine	Connections in Nodes	White Box Testing
	SLO-2	Features of OOP	Interfaces	Modeling the lifetime of an object	Deployment Diagrams	Impact of Object Orientation on Testing
S-19	SLO-1	OOPL	Object Diagrams	Statechart diagram	Modeling Processors	GUI Testing
	SLO-2	Grady Booch Methodology	Objects & Links	State chart Diagram Symbols	Modeling Devices	System Testing
S-20	SLO-1	Rambaugh Methodology	Modelling Anonymous Objects	Modeling State Machine	Modeling the Distribution of Components	Object Oriented metrics
	SLO-2	Jacobson Methodology	Modeling object structures	Modeling Reactive objects using state chart	Modeling Embedded System using Deployment Diagram	Testing Standards

S 21-24	SLO-1 SLO-2	Lab3: Case Study-Quiz System	Lab 6: Illustrate object diagram for Payroll Application	Lab:9: Case Study: Placement Registration System	Lab 12: Case Study: Air Line Reservation	Lab 15: Develop Test cases and Test plan for any system

Learning Resources	1. Grady Booch, James Rumbaugh and Ivar Jacobson (2004). "The Unified Modeling Language User Guide". Addison Wesley Longman Pvt. Ltd., Singapore, 2. Craig Larman, (2005), "Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development", Third Edition, Pearson Education	3. Ali Bahrami, (1999), " Object Oriented Systems Development", McGraw Hill International Edition

Learning Assessment

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

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Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. M. R. Ramla, SRMIST*

Course Code	UCA20D09J	Course Name	INTERNET OF THINGS	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	*The purpose of learning this course is to:*	Learning
CLR-1 :	Demonstrate the design, communication model and enabling technologies for IoT.	1
CLR-2 :	Explore the system management and domain for various applications of IoT	
CLR-3 :	Categorize the various protocols that are used for developing IoT applications.	
CLR-4 :	Deploy an IoT application and connect to the cloud.	
CLR-5 :	Develop IoT application for real time scenario	

Course Learning Outcomes (CLO):	*At the end of this course, learners will be able to:*	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Program Learning Outcomes (PLO) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		1	2	3	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Apply the knowledge/understanding of mathematics, science, to the solution of complex problems applicable to the discipline	*3*	*80*	*70*	*L*	*H*	*-*	*H*	*L*	*-*	*-*	*H*	*L*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-2 :	Design, implement, and evaluate a computer-based system, process, component, or program to meet desired solutions that meet the specified needs with suitable concern for the public health and safety, and the cultural, societal, and environmental considerations.	*3*	*85*	*75*	*M*	*H*	*L*	*M*	*L*	*-*	*-*	*M*	*M*	*L*	*-*	*H*	*-*	*-*	*M*
CLO-3 :	Create, select, and apply applicable techniques, resources, and modern engineering and IT tools to complex engineering activities with an understanding of the limitations.	*3*	*75*	*70*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-4 :	Function successfully as an individual, and as a member or leader in assorted teams, and in multidisciplinary settings.	*3*	*85*	*80*	*M*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*
CLO-5 :	Prove knowledge and understanding of the engineering and management principles and apply the same to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	*3*	*85*	*75*	*H*	*H*	*M*	*H*	*L*	*-*	*-*	*H*	*M*	*L*	*-*	*H*	*-*	*-*	*H*

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Introduction	Introduction	IoT Platforms Design Methodology	IoT Platforms	Introduction about RESTful API
	SLO-2	Definition& Characteristics of IoT	Communication Models in IoT	Introduction	IoT Logical Design with Python	Designing a RESTful Web API

S-2	SLO-1	Physical design of IoT	Device to Device Model	Purpose & Requirements, process model specification, domain model specification	Python Data types and Data Structures	Amazon Web Services
	SLO-2	Things in IoT	Device to Cloud Model	Information model specifications, service specifications, Iot level specifications	Control Flow statements	Amazon Web Services for IoT
S-3	SLO-1	IoT protocols	Device to Gateway Model	Functional view specifications, operational view specifications.	Classes	Creating a ID in Amazon
	SLO-2	IoT protocols	Back End Data Sharing Model	Device & component Integration, Application development	Python Packages for IoT	EC2
S-4	SLO-1	logical Design of IoT	M2M	IoT System for Weather Monitoring	JSON	Implementation of EC2
	SLO-2	IoT Functional Blocks	Differences between IoT and M2M	Purpose & Requirements, process model specification, domain model specification	XML	Autoscaling
S 5-8	SLO-1	Lab 8: Explain working of Raspberry Pi.	Lab 4:Demonstrate a smart object API gateway service reference implementation in IoT toolkit	Lab 7:Explain application framework and embedded software agents for IoT toolkit.	Lab 10:Reading Data from Internet using sensor	Lab 13: Smart Irrigation System
	SLO-2					
S-9	SLO-1	IoT Levels and Deployment Templates	M2M in IoT	Information model specifications, service specifications, Iot level specifications	HTTPLib	Implementation of Autoscaling
	SLO-2	Levels 0	Architecture of M2M	Functional view specifications, operational view specifications.	URLLib	S3
S-10	SLO-1	Levels 1	Software-DefinedNetworking (SDN) SDN	Device & component Integration, Application development	SMTPLib	Implementation of S3
	SLO-2	Levels 2	Architecture of SDN	IoT System for Agriculture	IoT Physical Devices	RDS
S-11	SLO-1	Levels 3	Network Function Virtualization(NFV)	Purpose & Requirements, process model specification, domain model specification	What is an IoT Device?	Implementation of RDS
	SLO-2	Level 4	Architecture of NFV	Information model specifications, service specifications, Iot level specifications	Basic Building Blocks of IoT device	DynamoDB
S-12	SLO-1	Level 5	NFV for IOT	Functional view specifications, operational view specifications.	Example Device: Raspberry Pi	Implementation of DynamoDB
	SLO-2	IoT Deployment Challenges	IoT System Management	Functional view specifications, operational view specifications	About the board	Kinesis
S 13-16	SLO-1	Lab 2: Controlling LED with Raspberry Pi	Lab 5: Write and explain working of an HTTP- to-CoAP semantic mapping proxy in IoT toolkit.	Introduction to Cloud Storage Models	Lab 11: Home Automation	Lab 14: Health care system
	SLO-2					
S-17	SLO-1	Domain Specific IoT	Advantages of IoT system management	Stages of IoT Architecture	Raspberry Pi Interfaces	Implementation of Kinesis
	SLO-2	Home	Need for IoT Systems Management	Sensors/Actuators	Serial	Case studies – Environment
S-18	SLO-1	Cities	Disadvantages of IoT system management	Devices	SPI	IoT systems for weather Reporting Bot

	SLO-2	Environment	NETCONF	Gateway	Serial	Air Pollution Monitoring System
S-19	SLO-1	Energy systems	YANG	Cloud	Introduction to Arduino	Forest Fire Detection
	SLO-2	Industry	IoT Systems Management with NETCONF-YANG	IoT Security and Interoperability	IoT hardware	Case studies - IoT system for Energy
S-20	SLO-1	Agriculture	IoT device Management with NETCONF-YANG	Risks and Attacks	Microprocessors & Microcontrollers	Smart grid
	SLO-2	Health and Lifestyle	NETOPEER	Tools for Security and Interoperability	Sensors	Renewable Energy Systems
S 21-24	SLO-1	Lab 3: Interfacing Light Sensor with Raspberry pi	Lab 6: Describe gateway as a service deployment in Iot toolkit	Lab 9: Arduino with ESP8266 explanation	Lab 12: Remote Surveillance system	Lab 15:Air Pollution Monitoring System
	SLO-2					

Learning Resources	1. *ArshdeepBahga and Vijay Madisetti, (2015), "Internet of Things - A Hands-on Approach", Universities Press* 2. *Dieter Uckelmann et.al, (2011), "Architecting the Internet of Things", Springer* 3. *CunoPfister, (2011), "Getting Started with the Internet of Things", O'Reilly,*	4. *Adrian McEwen, Hakim Cassimally, (2014), "Designing the Internet of Things", Wiley.* 5. *HonboZhou , (2012), "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press* 6. *Olivier Hersent, David Boswarthick, Omar Elloumi, (2012), "The Internet of Things – Key applications and Protocols", Wiley*

Learning Assessment

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

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

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
Mr.G.Muruganandam, Group Project Manager, HCL Technologies, Chennai	*Dr.S.Gopinathan, Professor, University of Madras, Chennai*	*Mrs. Anita Jasmine, SRMIST*
Mr.M. Hemachandar, Tech Lead, Wipro Limited, Chennai		*Mrs. M. Ramla. SRMIST*

Course Code	UCA20D10J	Course Name	PROJECT WORK	Course Category	D	Discipline Specific Elective Course	L	T	P	C
							0	2	12	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications	Data Book / Codes/Standards		Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning
CLR-1 :	To understand the basics of software development	1
CLR-2 :	To know about life cycle of the software development	
CLR-3 :	To explore risk and people management for software development	
CLR-4 :	To learn about different software tools for software development.	
CLR-5 :	To know about different techniques related to software development.	
CLR-6 :	To Learn About documentation process for software development	

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	To conceptualize a novel idea / technique into a product	3	80	70
CLO-2 :	To think in terms of multi-disciplinary environment	3	80	75
CLO-3 :	To understand the management techniques of implementing a project	3	85	70
CLO-4 :	To experience on the challenges of teamwork	3	85	80
CLO-5 :	To prepare a presentation in a professional manner	3	85	75
CLO-6 :	To prepare document all aspects of design work.	3	80	70

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	H	H	M	H	L	M	-	H	-	H	-	H	M	-	H
CLO-2 :	M	H	M	H	-	M	-	H	-	H	-	H	M	-	H
CLO-3 :	M	H	M	H	-	M	-	H	-	H	-	H	M	-	H
CLO-4 :	M	H	M	H	-	M	-	H	-	H	-	H	M	-	H
CLO-5 :	M	H	M	H	-	M	-	H	-	H	-	H	M	-	H
CLO-6 :	M	H	M	H	-	M	-	H	H	M	-	H	M	-	H

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.

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

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