RCS – 2023

NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University)

(Reaccredited with "A+" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified,

Recognized by UGC with 2(f) & 12(B), Under Star College Scheme by DBT, Govt. of India)

Nehru Gardens, T. M. Palayam, Coimbatore - 641 105, Tamil Nadu

REGULATIONS, CURRICULAM & SYLLABUS

B.Sc. ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Effective from 2023 - 2024

Programme Specific Outcomes (PSO)

PSO1	Obtain ability to specify, design, develop, test and maintain usable software systems that behave reliably and efficiently and satisfy all the requirements that customers have defined for them.
PSO2	Gain skill to develop software systems that would perform tasks related to Research, Education and Training and/or E-governance.
PSO3	Expertise in determining and optimizing the performance of a given algorithm on a given platform.
PSO4	Acquire capability to anticipate the changing direction of information technology and evaluate and communicate the likely utility of new technologies to an individual or organization.
PSO5	Make the students capable in decision making at personal and professional level.

Programme Outcomes (PO)

PO1	**Critical Thinking**	Develop a systematic, critical approach to problem solving at all levels and apply the domain specific knowledge to form conclusions based on quantitative information to meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO2	**Usage of Technology**	Equip the students to meet the industrial needs by utilizing tools and technologies for Peer Communication, Data Interpretation and Problem-Solving aspects.
PO3	**Effective Communication**	Develop language competence and be proficient in oral and written communication with a focus on LSRW.
PO4	**Environment and Sustainability**	Understand the consequential responsibilities to analyze and realize the interactions between social and environmental sustainability procedures and create processes.
PO5	**Individual and Team Work**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings and manifest the best outcomes.
PO6	**Ethics and Values**	Acquire life skills to become a better human being and apply ethical principles and commit to professional ethics and responsibilities.
PO7	**Social Interactions**	Participate actively in initiatives that encourage equity and growth for all and to act with an informed awareness of local, regional, national and global needs.
PO8	**Life Long Learning**	Engage in lifelong learning and Work on career enhancement and adapt to changing personal, professional and societal needs.

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Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu, India.
E-mail: nascoffice@nehrucolleges.com. Web Site: www.nehrucolleges.net.

Scheme of Examination
B. Sc. Artificial Intelligence and Machine Learning
Programme Code : UAM
(Applicable to the students admitted during the year 2023 -2024 onwards)

Semester	Part	Sub. Code	Name of the Subject	Instruction hours / week	Duration of Examination	Examination Marks			Credits
						CIA	ESE	Total	
I	I	23U1TAM101/ 23U1HIN101 / 23U1MAL101/ 23U1FRN101	Elanthamizh Rachnathmak Hindi Kadhayum Samskaaravum Le Francais Fondamental -I	4	3	20	55	75	3
	II	23U2ENG101	Professional English I	4	3	20	55	75	3
	III	23U3CKC101	Core Paper I: Python Programming	5	3	25	75	100	4
		23U3CJC102	Core Paper II: Data Structures	5	3	25	75	100	4
		23U3AMP101	Core Paper III: Practical in Python Programming	4	3	40	60	100	4
		23U3MKA101	Allied Paper I: Statistics for Computer Science	5	3	25	75	100	4
	IV	21U4ENV101	@ Ability Enhancement Compulsory Course: Environmental Studies	2	3	50	-	50	2
		22U4HVY201	Value Education: Human Values and Yoga Practice	1	-	-	-	-	-
				30				**600**	**24**
II	I	23U1TAM202/ 23U1HIN202/ 23U1MAL202/ 23U1FRN202	Pynthamizh Sanchar Hindi Novalum Bhashaapadanavum Le Francais Fondamental -II	4	3	20	55	75	3
	II	23U2ENG202	Professional English II	4	3	20	55	75	3
	III	23U3AMC202	Core Paper IV: Fundamentals of Artificial Intelligence	5	3	25	75	100	4
		23U3AMC203	Core Paper V: Relational Database Management Systems	5	3	25	75	100	4
		23U3AMP204	Core Paper VI: Practical in SQL and PL/SQL	4	3	40	60	100	4
		23U3MIA202	Allied Paper II: Discrete Mathematics	5	3	25	75	100	4

	IV	21U4HRC202	@ Ability Enhancement Compulsory Course: Human Rights and Constitution of India	2	3	50	-	50	2
		22U4HVY201	@ Value Education: Human Values and Yoga Practice	1	2	50	-	50	2
				30				**650**	**26**
III	I	23U1TAM303/ 23U1HIN303 / 23U1MAL303/ 23U1FRN303	Arunthamizh Sahityak Hindi Kavithayum Smarannayum Le Français General - III	4	3	20	55	75	3
	II	23U2ENG303	Communicative English - I	4	3	20	55	75	3
	III	23U3CJC304	Core Paper VII: Computer Networks	4	3	20	55	75	3
		23U3CKC306	Core Paper VIII: Java Programming	4	3	20	55	75	3
		23U3AMP305	Core Paper IX: Practical in Java and Network Programming	3	3	20	30	50	2
		23U3MIA303	Allied Paper III: Operations Research	4	3	25	75	100	4
	IV	23U4AMZ301	Skill Based Paper I: Practical in Object Oriented Programming	3	3	30	45	75	3
		22U4NM3BT1 / 22U4NM3AT1 / 22U4NM3CAF / 22U4NM3GST / 22U4NM3WRT	# @Basic Tamil I/ ##Advanced Tamil I / * NME: Consumer Affairs / Gender Sensitization / Women's Rights	2	3	50		50	2
		SBOEC	Skill Based Open Elective Course – Extra Departmental Course	2	3	-	50	50	2
		23U4AMVALC	Skill Enhancement: Value Added course - Institute Industry Linkage	-	-	-	-	-	-
				30				**625**	**25**
IV	I	23U1TAM404/ 23U1HIN404 / 23U1MAL404/ 23U1FRN404/	Muthamizh Prayogik Hindi Drisyakalaa Saahithyam Le Français General - IV	4	3	20	55	75	3
	II	23U2ENG404	Communicative English-II	4	3	20	55	75	3
	III	23U3AMC406	Core Paper X: Operating System	4	3	20	55	75	3
		23U3CKC408	Core Paper XI: R Programming	4	3	20	55	75	3
		23U3AMP407	Core Paper XII: Practical in R Programming	3	3	20	30	50	2
		23U3MIA404	Allied Paper – IV : Linear Algebra and Differential Equations	4	3	20	55	75	3
		22U4AMZ402	Skill Based Paper II: Capstone Project Work – I	3	3	30	45	75	3

	IV	22U4NM4BT2 / 22U4NM4AT2 / 22U4NM4GEN	# @Basic Tamil-II / ##Advanced Tamil -II / General Awareness	2	3	50		50	2
		VBOEC	Value based Open Elective Courses- Intra School Course	2	3	-	50	50	2
		23U4AMVALC	Skill Enhancement: Add on course - Institute Industry Linkage	-	-	-	-	-	Grade
				30				**600**	**24**
		23U3AMC508	Core Paper XIII: Machine Learning Techniques	5	3	20	55	75	3
V	III	23U3AMC509	Core Paper XIV: Natural Language Processing	5	3	20	55	75	3
		23U3AMC510	Core Paper XV: Cloud Computing	5	3	20	55	75	3
		23U3AMP511	Core Paper XVI: Practical in Natural Language Processing	5	3	30	45	75	3
		23U3AME501/ 23U3AME502/ 23U3AME503/ 23U3CKE504	Discipline Specific Elective Paper I	6	3	25	75	100	4
		22U3AMV513	In-plant Training	-	-	50	-	50	2
	IV	22U4AMZ503	Skill Based Paper III: Practical in Data Visualization	4	3	30	45	75	3
				30				**525**	**21**
VI	III	23U3AMC612	Core Paper XVII: Internet of Things	4	3	20	55	75	3
		23U3CJC608	Core Paper XVIII: Deep Learning	4	3	20	55	75	3
		23U3AMP613	Core Paper XIX: Practical in Internet of Things	3	3	20	30	50	2
		23U3AME605/ 23U3AME606/ 23U3AME607/ 23U3AME608	Discipline Specific Elective Paper II	6	3	25	75	100	4
		23U3AME609/ 23U3AME610/ 23U3AME611/ 23U3AME612	Discipline Specific Elective Paper III	6	3	25	75	100	4
		22U3AMV617	Project and Viva Voce	4	3	30	45	75	3
	IV	22U3AMZ604	Skill Based Paper IV: Practical in Deep Learning	3	3	30	45	75	3
	V	22U5EXT601	Extension Activities	-	-	50	-	50	2
				30				**600**	**24**
Total								**3600**	**144**
Additional Credit (Optional)			Semester II-VI					$10^{\$}$	

Basic Tamil -Students who have not studied Tamil up to 12th standard.

##**Advanced Tamil** – Students who have studied Tamil language up to 12th standard and chosen other languages under part I of the UG programme but would like to advance their Tamil language skills.

*** NME** – Student shall choose any one course out of three courses.
@ No End Semester Examinations. Only Continuous Internal Assessment (CIA)
$ - Not included in Total marks and CGPA Calculation

LIST OF DISCIPLINE SPECIFIC ELECTIVE PAPERS:

ElectivePapers	Course Code	Name of the Course
Elective Paper I	23U3AME501	Fundamentals of Robotics
	23U3AME502	Social Network Analysis
	23U3AME503	Healthcare Analytics
	23U3CKE504	Big Data Analytics
Elective Paper II	23U3AME605	Ethical Hacking
	23U3AME606	Ethics and Social Implications of AI
	23U3AME607	Introduction to Neural Networks and Fuzzy Logic
	23U3AME608	Cyber Threat Intelligence
Elective Paper III	23U3AME609	Augmented Reality and Virtual Reality
	23U3AME610	Pattern Recognition
	23U3AME611	Web Application Security
	23U3AME612	Computational Intelligence

Extra Departmental Course offered by the Department to other Department Students

S. No.	Semester	Course Code	Course Title
1	III	23U4CS3ED1	Introduction to IoT

- Students need to opt a Course other than the Course offered by their Department.

Intra School Course offered by the Department to other Department Students (within the School)

S. No	Course Code	Name of the Course
1	22U4VBOE01	Design Ecosystem
2	22U4VBOE02	Design Thinking
3	22U4VBOE03	Disaster Management
4	22U4VBOE04	Environmental Pollution and Waste Management (EMS)
5	22U4VBOE05	History of Ancient India
6	22U4VBOE06	Indian Knowledge System
7	22U4VBOE07	Principles of Intellectual Property Rights
8	22U4VBOE08	Science, Society and Culture
9	22U4VBOE09	Community Engagement
10	22U4VBOE10	Emotional Intelligence
11	22U4VBOE11	Fundamentals of Tourism
12	22U4VBOE12	Health Education
13	22U4VBOE13	Media and Politics
14	22U4VBOE14	Positive Psychology and Work Life
15	22U4VBOE15	Professional Ethics
16	22U4VBOE16	The Science of Happiness
17	NCC	

- NCC – Students who qualify NCC B Certificate Examination need not appear for these openElectives. The Credits shall be transferred.
- Students shall opt any course within their Schools.

Self-Study Paper offered by Department of Artificial Intelligence and Machine Learning

S. No.	Semester	Course code	Course Title
1	Semester II to V	23UCKSS01	Libre Office
2		23UCSSS02	Management Information System

Chairman
Board of Studies in Computer Applications
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Course Code	Title		
23U1TAM101	Part - I : Elanthamizh (இளந்தமிழ்)		
Semester: I	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Course Objective	மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்.		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	சங்க இலக்கியங்கள் வாயிலாக சமூகச் சீர்திருத்தச் சிந்தனைகள் பெறப்படும்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	அற இலக்கியங்களின் வழி தமிழர்களின் வாழ்வியல் பண்புகளைக் கற்று அறிதல்.	விரிவுரை	குழுத்திட்டம்
CO 3	பெண்ணியக் கவிஞர்களின் படைப்புத்திறனை மாணவர்களுக்கு உணர்த்துதல்	விரிவுரை/ காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	சிறுகதைகளின் வழி சமூக கருத்துகளை மாணவர்களுக்கு அறிவுறுத்தல்	விரிவுரை / குழு விவாதம்	ஒப்படைவு
CO 5	தமிழ் இலக்கிய வரலாற்றுத் திறனை வளர்த்தல்	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content : Elanthamizh (இளந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	சங்க இலக்கியம்	1. ஐங்குறுநூறு 2. பதிற்றுப்பத்து 3. பத்துப்பாட்டு - முல்லைப்பாட்டு 4. சிறுபாணாற்றுப்படை	கிள்ளைப்பத்து (281-290) பாடல்கள் இரண்டாம் பத்து (11-15 ஐந்து பாடல்கள்) முல்லைப்பாட்டு முழுவதும் (1-103 வரிகள்) சேரநாட்டின் வளமை
		Instructional Hours	**12 Hours**
Suggested Learning Methods: நாடக முறையில் கலந்துரையாடல்			
II	அற இலக்கியம் நீதிநூல்கள்	1. அறன் வலியுறுத்தல் 2. புகழ் 3. வாய்மை 4. நாலடியார்-பொருட்பால் 5. நான்மணிக்கடிகை	31 - 40 குறட்பாக்கள் 231 - 240 குறட்பாக்கள் 291 - 300 குறட்பாக்கள் 11 ஆவது அதிகாரம் (கூடா நட்பு 1-10) முதல் ஐந்து பாடல்கள்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : கலந்துரையாடல்			
III	பெண்ணியக் கவிதைகள்	1. ஆண்டாள் பிரியதர்ஷினி 2. கவிஞர் இளம்பிறை 3. சுகிர்தராணி 4. அ. வெண்ணிலா	பூச்சி வாழ்க்கை- சுயம் பேசும் கிளி தொட்டிச்செடி அம்மா நீரில் அலையும் முகம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : புதுக்கவிதை எழுதும் திறன் பெற்றமை			

IV	சிறுகதைகள்	1. குட்டி ரேவதி 2. ஜெயமோகன் 3. ச.தமிழ்ச்செல்வன் 4. வண்ணநிலவன் 5. உமாமகேஸ்வரி	நிறைய அறைகள் உள்ள வீடு யானை டாக்டர் வெயிலோடு போய் எஸ்தர் மரப்பாச்சி
		Instructional Hours	**12 Hours**
Suggested Learning Methods : சிறுகதை படைக்கும் திறன் பெற்றமை			
V	தமிழ் இலக்கிய வரலாறு	1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. சிறுகதையின் தோற்றமும் வளர்ச்சியும் 3. படிமம், குறியீடு பற்றிய – விளக்கம்	தமிழ் இலக்கிய வரலாறு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : குழு விவாதம்			
		Total Hours	**60 Hours**

Text Books	இளங்கலை முதலாம் ஆண்டுத்தமிழ் மாணவர்களுக்குரிய பாடநூல்"**இளந்தமிழ்"** தொகுப்பு: தமிழ்த்துறை ,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	சங்க இலக்கியம் - உரையாசிரியர் ஒளவை. துரைசாமிப்பிள்ளை, பதிப்பாசிரியர்கள் இரா.இளங்குமரனார், முனைவர்.பி.தமிழ்மகன், தமிழ்மண் அறக்கட்டளை, சென்னை.17. நிறைய அறைகள் உள்ள வீடு - குட்டிரேவதி எழுத்து பிரசுரம், 11மாடல் நகர், 10-ஆவது வீதி, சென்னை.
Web. URLs	https://youtu.be/2SMM5LvZYo0

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	-	H	H	M	H	L	M	H	M	M
CO2	-	-	M	-	H	L	H	H	H	L	H	M	M
CO3	-	-	L	-	M	M	H	H	M	M	M	H	H
CO4	-	-	**H**	-	**H**	**M**	**M**	**L**	H	M	L	H	M
CO5	-	-	**H**	-	**H**	**L**	**H**	**H**	L	H	M	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh kumar	Dr. A. Sridevi

Course Code			
23U1HIN101	Part - 1 - Rachnathmak Hindi (रचनात्मक हिंदी)		
Semester: I	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	हिंदी भाषा का अच्छा ज्ञान प्राप्त करने के लिए।		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Improves Accuracy & Quality, Improves Communication Skillls		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	नाटक से रचनात्मकता का विकास होता है। यह हमारे आसपास की दुनिया को समझने में भी मदद करता है।	Lecture / Video Methods	Assignment
CO 2	कहानियां छात्रों की कल्पना और जिज्ञासा को जगाने में मदद करती हैं।	Case Studies	Group Project
CO 3	व्याकरण हिंदी भाषा को सही ढंग से बोलने, लिखने और समझने में मदद करता है। विज्ञापन लेखन और कहानी लेखन छात्रों को उनके रचनात्मक लेखन और कल्पना शक्ति को विकसित करने में मदद करेगा।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सभी लोगों के बीच प्रभावी संचार को सक्षम बनाता है।	Lecture / Video Methods	Assignment
CO 5	गद्यांश लेखन लिखित पाठ के सार को समझने और संदर्भ के आधार पर आपके निष्कर्षों का अनुमान लगाने में आपकी बुद्धिमत्ता का आकलन करता है।	Lecture / Dumb Charades	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	नाटक लड़ाई - 1979 - सर्वेश्वर दयाल सक्सेना	1	All
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			
II	कहानी - 1. मजबूरी' - मन्नू भंडारी 2. ठाकुर का कुआँ - मुंशी प्रेमचंद 3. चीफ की दावत - भीष्म साहनी 4. भोलाराम का जीव -हरिशंकर परसाई	1	1 to 4
		Instructional Hours	12
Suggested Learning Methods : Auditory			
III	1. अनुप्रयुक्त व्याकरण - संज्ञा, सर्वनाम, क्रिया और विशेषण की पहचान करना। 2. विज्ञापन लेखन 3. दिए गए संकेतों से कहानी लेखन।	1	1,2,3

		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	**अनुवाद : अंग्रेज़ी से हिंदी** (**अनुवाद अभ्यास** - 3) 1 - 10 **अनुच्छेद**	3	1,2
		Instructional Hours	12
Suggested Learning Methods : Auditory, Visual			
V	पारिभाषिक शब्दावली , गद्यांश लेखन	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. नाटक लड़ाई - 1979 - सर्वेश्वर दयाल सक्सेना 2. 2. कहानी संग्रह 3. अनुवाद अभ्यास - 3 दक्षिण भारत हिंदी प्रचार सभा , चेन्नई -17 4. Bharatdarshan.co.nz 5. भाषाशास्त्र का पारिभाषिक शब्द कोश - राजेंद्र द्विवेदी 6. श्री रामदेव , व्याकरण प्रदीप, लोक भारती प्रकाशन, इलाहाबाद
Reference Books	संदर्भ ग्रंथ 1. हिंदी नाटक और रंगमंच - डॉ राम कुमार वर्मा 2. हिन्दी अलोचना की परीभाषिक शब्दावली - पेपरबैंक 3. आधुनिक हिंदी व्याकरण और रचना - डॉ. वासुदेव नंदन प्रसाद
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	M	L			M	M	H	M	M
CO2	-	-	H	L	L	H			H	M	M	H	M
CO3	-	-	-	L	M	H			M	H	M	M	H
CO4	-	-	M	M	H	L			M	M	H	M	M
CO5	-	-	L	M	H	L			M	M	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code			
23U1MAL101	**Part - I : Kadhayum Samskaaravum (കഥയും സംസ്കാരവും)**		
Semester: I	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	ആധുനികകാലത്തെ മലയാളകഥകളെ കുറിച്ചും സംസ്കാരത്തെ കുറിച്ചും അവബോധം ഉണ്ടാക്കുന്നു
Course Category	Skill Development
Development Needs	Regional
Course Description	Improve accuracy & quality, improve communication

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	കഥയുടെ സംവേദനം ആസ്വാദകന്റെ അഭിരുചിയെ പൂർത്തിയാക്കുന്നു	Lecture / Video Methods	Assignment
CO 2	പ്രകൃതിയുമായി ബന്ധപ്പെടുന്ന കഥാപരിസരം	Case studies	Group Project
CO 3	ഭക്ഷണവും അതിന്റെ സംസ്കാരവും കൂട്ടായ്മ ഉണ്ടാക്കുന്നു	Lectures / Video Lessons	Seminar
CO 4	ഭക്ഷണത്തിന്റെ മൂല്യം അർത്ഥവത്താക്കുന്നു	Lecture / Video Methods	Assignment
CO 5	ആശയ വിപുലനം	Lecture / Dumb Charades	Seminar

Offered by | **Malayalam**

Course Content | **Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	ചെറുകഥകൾ - സമകാലിക കഥകൾ 1. പരുന്ത് - ഇ.സന്തോഷ്കുമാർ 2. പാലാഴിമഥനം - കെ.രേഖ 3. കുളവാഴ - വി .എം .ദേവദാസ് 4. മരണമുണ്ടാക്കിക്കളിക്കാം - പി .വി ഷാജികുമാർ 5. കക്കുകളി - ഫ്രാൻസിസ് നൊറോണ	1	1 to 5
	Instructional Hours		**12**
Suggested Learning Methods : Visual Learning			
II	നവോത്ഥാനകഥകൾ 1. വെള്ളപ്പൊക്കത്തിൽ - തകഴി 2. ബസു യാത്ര - കേശവദേവ് 3. മരപ്പാവകൾ - കാരൂർ 4. മാണിക്കൻ - ലളിതാംബിക അന്തർജനം 5. ജന്മദിനം - ബഷീർ	1	6 to 10
	Instructional Hours		**12**
Suggested Learning Methods : Auditory			
III	സംസ്കാര പഠനം - കേരളത്തിലെ രുചിഭേദങ്ങൾ 1. കാസർകോടും കന്നയാളവും ദൈവവിപ്ലവത്തിന്റെ കണ്ണൂരും	1	1,2,3

	2. സാമൂതിരി ,മുട്ടമാല ,എരന്ത് ,ബ്രാഹ്മണാൾ -(കോഴിക്കോട്) 3. മലപ്പുറം കേരളത്തിൻറെ അറേബ്യ		
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	സംസ്കാര പഠനം - കേരളത്തിലെ രുചിഭേദങ്ങൾ 1. ചേട്ടായിയെ ഇത് ശൂരാട്ടാ - തൃശ്ശൂർ 2. കരിമ്പനകളുടെ നാട്ടിൽ - പാലക്കാട്	1	4,5
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			
V	നവമാധ്യമങ്ങൾ - വിവർത്തനം	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. ചെറുകഥകൾ - (10 ചെറുകഥകൾ) 2. സംസ്കാര പഠനം - നാടൻ കേരള എക്സ്പ്രസ്സ് ഡോ.സി. ഗണേഷ്, ഗ്രീൻ ബുക്ക്സ് തൃശ്ശൂർ 3. നവമാധ്യമങ്ങൾ - ടി.കെ .സന്തോഷ്കുമാർ ഡി.സി.ബുക്ക്സ് കോട്ടയം
Reference Books	1. എം. അച്യുതൻ - ചെറുകഥ ഇന്നലെ ഇന്ന് - ഡി.സി.ബുക്സ് കോട്ടയം 2. ചെറുകഥയുടെ ഛന്ദസ്- വി. രാജകൃഷ്ണൻ മാതൃഭൂമി ബുക്സ് കോഴിക്കോട് 3. പുതിയ കഥ പുതിയ വായന - എഡി : ഡോ.ഷീബാ ദിവാകരൻ പുസ്തകലോകം പ്രസദ്ധീകരണം കോഴിക്കോട് 4. കേരള സംസ്കാരം - എ .ശ്രീധര മേനോൻ നാഷണൽ ബുക്ക്സ് കോട്ടയം 5. ന്യൂസ് റൂമിന്റെ അകവും പുറവും - ബി.ആർ .പി.ഭാസ്കർ ഗ്രീൻ ബുക്ക്സ് തൃശ്ശൂർ
Web. URLs	**http://www.keralaculture.org>literature**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	H	M	H	H	H	H	H	M	M	H	M
CO2	H	H	H	L	H	M	H	H	M	H	M	M	H
CO3	H	M	H	M	M	H	H	M	M	M	H	H	M
CO4	H	H	L	M	L	H	H	H	H	M	M	M	H
CO5	H	L	L	L	H	H	H	L	M	H	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms. N. RAJANI	Dr. SMITHA C. R.

Course Code	Title		
23U1FRN101	Part - I : Le Français Fondamental - I		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	Acquisition of standard French through fundamental French grammar.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course has basic knowledge of the French grammar and aims to build a solid foundation in the acquisition of standard French through fundamental French grammar		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn basic French grammar along with French civilisation	Lecture	Assignment
CO 2	Knows the gender of nouns	Word game/ Lecture	Seminar
CO 3	Learn Negation, articles, and understand the usage of prepositions.	Lectures / Video Lessons	Quiz
CO 4	Learn Futur proche, Pronominal verb,	Tutorial / Case Studies	Assignment
CO 5	Know to self-introduce and translate simple sentences	Lecture /	Group project

Offered by	French

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Mes cinq sens en action	1	0
		Instructional Hours	12
Suggested Learning Methods: Worksheets , Reading practice			
II	S'ouvrir aux autres	1	1
		Instructional Hours	12
Suggested Learning Methods: Kahoot App, Worksheets			
III	Partager son lieu de vie	1	2
		Instructional Hours	12
Suggested Learning Methods : Audio & Visual, Speaking practice			
IV	Vivre au quotidien	1	3
		Instructional Hours	12
Suggested Learning Methods : Comprehensive Writing			

V	S'ouvrir à la culture	1	4
		Instructional Hours	**12**
Suggested Learning Methods: Translating simple sentences, comprehending the passage.			
		Total Hours	**60**
Text Books	Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 0 to 4)		
Reference books	A1 Echo Méthode de Français		
Web. URLs	Lingua.com, TV 5 app,		

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	L	M	M	L	M
CO2	-	-	H	L	H	M	-	-	M	L	M	M	M
CO3	-	-	-	M	M	H	-	-	L	M	M	M	M
CO4	-	-	L	M	L	H	-	-	M	L	L	M	M
CO5	-	-	L	-	H	-	-	-	L	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Ms. SUNITA. R	Ms. SUNITA. R

Course Code	Title		
23U2ENG101	Part – II : Professional English – I		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks

(Common to all UG Programmes)

Course Objective	To help students to imbibe, develop, practice and use the LSRW skills and fine tune their productive skills.
Course Category	Skill Development
Development Needs	Global
Course Description	SD: Helps to develop LSRW skill

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognize listening, and reading proficiency through the prose discourses.	Lecture/Tutorial	Assignment
CO 2	Use and interpret imaginative, and creative skills through the poetic genre.	Lecture/Tutorial	Assignment
CO 3	Enhance the students to use English effectively through short story.	Lecture/Tutorial	Speaking
CO 4	Execute and exercise grammatical skills in academics and career.	Lecture/Tutorial	Reading
CO 5	Evaluate the LSRW skills through literature.	Lecture/Tutorial	Writing

Offered by **Department of English**

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** Leigh Hunt – Getting Up On Cold Morning Rajagopalachari – Tree Speaks A.G. Gardiner – On the Rule of the Road **Listening Activity** – Comprehension practice from Prose.	1	1-3
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			
II	**Poetry** John Milton – On His Blindness Maya Angelou -Phenomenal Women A. K. Ramanujan – A River **Speaking Activity** – Group Discussion Forum	1	4-6
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			

III	**Short Stories** O. Henry – The Last Leaf R. K. Narayan – The Missing Mail Oscar Wilde - The Happy Prince **Reading Activity** – Pronunciation practice and enhancement from Short-stories	1	7-9
		Instructional Hours	**12**
Suggested Learning Methods : Tutorial			
IV	**Grammar** Parts of Speech Tenses Kinds of Sentences **Writing Activity** – Paragraph Writing using grammar Components	1	10-13
		Instructional Hours	**12**
Suggested Learning Methods : Tutorial			
V	**Writing Skills** Letter Writing (Formal & Informal) Notice, Writing Circular Memo, Advertisement Minutes of the Meeting	1	14-17
		Instructional Hours	**12**
Suggested Learning Methods : ABL			
		Total Hours	**60**

Text Books	Compiled by the Department of English, NASC.
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)
Web. URLs	https://www.youtube.com/watch?v=QrUPneyZNf0

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	M	M	H	M	H	H	M	H	M
CO2	M	L	H	L	H	M	H	M	H	H	M	H	M
CO3	M	L	H	L	H	H	H	H	H	H	M	H	M
CO4	M	L	H	L	H	L	H	H	H	H	M	H	H
CO5	H	M	H	L	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Mr. D. Pradeek	Dr. R. Malathi

Course Code	Title		
23U3CKC101	Core Paper I: Python Programming		
Semester: I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. IT / CS / AIML / BCA / DCFS / CS (DS))			
Course Objective	To develop algorithmic solutions to simple computational problems using Python		
Course Category	Employability		
Development Needs	Global		
Course Description	This course will provide a pragmatic and hands-on introduction to the Python programming. It helps to familiarize with different data types, operators, string methods and file operations.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Python and write simple python program.	Lecture	Assignment
CO 2	Develop Python programs with Control Statement and List method.	Demonstration	Seminar
CO 3	Apply Tuples, Functions and Set Iterators to develop simple applications	Demonstration	Quiz
CO 4	Apply Python Strings, Multithreading and Exceptions for problem solving.	Flipped Classroom	Program Execution
CO 5	Manipulate Files and perform Event Handling.	Lecture	Program Execution

Offered by	Information Technology
Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Fundamentals of Python Programming:** Introduction – Features – Applications – Installation-Sample Program-Python Virtual Machine- Memory management in Python-Comparison between C, Java and Python- Keywords, Identifiers, Statements, Indentation. Syntax and Styles: Data Types – Literals – Variables-Operators and Expressions-Evaluation of Expression-Sample Programs.	1	1,2
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures about the basics of Python Programming			
II	**Control Flow:** If – While – For – Break – Continue-Pass-Entry Controlled Loop - Exit Controlled Loop – Counter Controlled Loop - Condition Controlled Loop - Nested Loop - Sample Programs. Arrays-Sequences - Python Lists: Read a List type from a Keyboard-Accessing Elements of a List- Modifying Elements of a List – Basic Operations - Built-in Functions – Python List Methods.	1,2	3,4,5,9
		Instructional Hours	15
Suggested Learning Methods: Practice using Flow Charts			
III	Tuples - Need of a Tuple -Sequence of Unpacking – Methods – Sample programs. Dictionaries: Making a Dictionary-Basic Operations-Dictionary Operations – Sets- Iterators and Generators	1	6,7,8

	– Sample Programs. Functions: Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments - Default Arguments-Required Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions- Scope of Local and Global Variables.		
		Instructional Hours	15
Suggested Learning Methods: Develop small programmes using tuples			
IV	**Strings in Python:** Reading – Accessing – Modifying – Finding - Iterating through a String - Build-in String Functions. Errors and Exceptions – Multithreading	2	8
		Instructional Hours	
Suggested Learning Methods: Develop small applications			
V	**Files and Directory Access:** Files and Streams - Opening a File - Reading/Writing Operations in a File - Other operations in a File - Iterating through a File - Splitting Words - Serialization and Deserialization. Events: Event Objects - Binding callbacks to events - Event names - Keyboard events - Mouse Events - Sample Programs	1	13,17
		Instructional Hours	15
Suggested Learning Methods: Laboratory practice			
		Total Hours	**75Hrs**

Text Books	1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, **"Python Programming",** University Press Pvt. Ltd.2018. 2. Dr.S.A.Kulkarni, "**Problem Solving and Python Programming",** 2nd Edition, Yesdee Publishing,2018
Reference Books	1. Allen B. Downey, **"Think Python: How to Think Like a Computer Scientist"**, 2nd edition, Updated for Python 3, Shroff /O'Reilly Publishers,2016 2. Guido van Rossum and Fred L. Drake Jr, **"An Introduction to Python"** Revised and updated for Python 3.2, Network Theory Ltd.,2011.
Web. URLs	https://www.w3schools.com/python/

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	-	-	M	H	H	M	M
CO2	M	M	M	M	H	M	-	-	H	H	H	M	H
CO3	H	L	M	H	M	M	-	-	M	H	H	M	M
CO4	M	H	L	M	L	L	-	-	H	M	H	H	M
CO5	M	M	H	H	M	H	-	-	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. D. Suryaprabha	Dr. J. Maria Shyla

Course Code	Title		
23U3CJC102	**Core Paper II: Data Structures**		
Semester: I	**Credits: 4**	**CIA: 25 Marks**	**ESE: 75 Marks**
Common to B.Sc. CS(DS)/AIML			
Course Objective	To enable the students to understand about the various techniques such as Linked list, Searching and Sorting, apply them to solve complex programs.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the concept of Arrays, Stacks , and Queues, Linked list, searching and sorting and apply to solve real world problem using appropriate Data Structure		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Understand the representation of Arrays, Stacks and Queues.	Lecture	Group Discussion
CO 2	Solve the problems using Queues and List.	Demonstration	Quiz
CO 3	Demonstrate different types of Tree representation and Graph.	Lectures	Seminar
CO 4	Design Algorithm to perform different types of Sorting.	Tutorial	Seminar
CO 5	Illustrate Symbol, hash and File organization, apply to solve real world problem using appropriate Data Structure.	Lecture	Assignment

Offered by	**Computer Science**

Course Content	**Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapters
I	**Introduction:** Overview - Create Programs - Analyze Programs. **Arrays:** Axiomatization - Sparse Matrices - Representation of Arrays. **Stacks & Queues:** Fundamentals - Evaluation of Expressions - Multiple Stacks and Queues.	**1**	**1,2,3**
		Instructional Hours	**15**
Suggested Learning Methods : Write Algorithms for Real time Scenario			
II	**Recursion:** Recursive definition and process - recursion in C - Writing Recursive program - simulating Recursion - efficiency of recursion. **Queues and List:** The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure.	2	3,4
		Instructional Hours	15
Suggested Learning Methods : Write Algorithms for Real time Scenario			
III	**Trees:** Binary Tree - Binary Tree representation - the Huffman algorithm - representing list as Binary - Trees and their applications - Game trees.	2	5,8

	Graphs: A Flow problem - The linked representation of Graph - Graph traversal and spanning forests		
		Instructional Hours	15
Suggested Learning Methods : Group Discussion			
IV	**Internal Sorting:** Insertion Sort - Quick Sort - 2-Way Merge Sort - Heap Sort - Shell Sort. **External Sorting:** Storage Devices - K-Way Merging- **Sorting With Tapes:** Balanced Merge Sorts - Polyphase Merge.	1	7, 8
		Instructional Hours	15
Suggested Learning Methods : Group Discussion			
V	**Symbol Table:** Static Tree Tables - Dynamic Tree Tables - **HashTables:** Hashing Functions- Overflow Handling. **Files:** Files, Queries and Sequential Organizations- Index Techniques - **File Organization:** Sequential Organization- Random Organization- Linked Organization.	1	9,10
		Instructional Hours	15
Suggested Learning Methods : Video Presentation2			
		Total Hours	75 Hrs

Text Books	1. Ellis Horowitz &SartajSahni, "**Fundamentals of Data Structures"**, Galgotia Publication. 2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J.Augenstein, "**Data Structure using C"**, Pearson Education, 2009.
Reference Books	1. Ellis Horowitz, Sartaj Sahni & Sanguthevar Rajasekaran, "**Fundamentals of Computer Algorithms"**, Galgotia Publications Pvt Ltd, 1999. 2. Jean-Paul Tremblay and Paul G.Sorenson, "**An Introduction to Data Structures with Applications"**, Second Edition, Tata MaGraw Hill,2008 3. Mark Allen Weiss, "**Data Structures and Algorithm Analysis in C"**, Florida International University, Pearson Education, Second Edition, 1997.
Web. URLs	https://www.tutorialspoint.com/data_structures_algorithms/index.htm

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	-	M	M	-	M	H	H	H	H	M	M
CO2	H	H	-	M	M	-	M	H	H	H	H	M	M
CO3	H	H	-	M	M	-	M	H	H	H	H	H	H
CO4	H	H	-	M	M	-	M	H	H	H	H	H	H
CO5	H	H	-	M	M	-	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. Juliet Rozario	Dr. N. Kavitha

Course Code	Title		
23U3AMP101	Core Paper III: Practical in Python Programming		
Semester: I	Credits: 4	CIA: 40 Marks	ESE: 60 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To introduce the concepts of python programming constructs.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To development skill set in python programming and apply the concepts to develop applications in order to meet the Local and Global needs.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop simple Python programs.	Program Demonstration, Projects	Program Creativity
CO 2	Understand and apply the concept of control statements.	Program Demonstration	Debugging
CO 3	Apply the concept of looping constructs and functions for solving basic programs.	Laboratory Practice,	Application of Logic
CO 4	Develop programs for sorting of Strings,Lists, Tuples and File handler.	Constructivist learning, Code review	Program Development
CO 5	Create programs using Linear and Binary Search Techniques	Demonstration, Projects	Program Development

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 4

Unit	List of Practical
1	Write a python program that displays the following information: Your name, Full Address Mobile,number, College name, Course subjects.
2	Write a python program to find the largest three integers using if-else and conditional operator.
3	Write a python program that asks the user to enter a series of positive numbers (The user should enter a negative number to signal the end of the series) and the program should display the numbers inorder and their sum.
4	Write a python program to find the product of two matrices.
5	Write recursive functions for GCD of two integers.
6	Write recursive functions for the factorial of positive integer.
7	Write recursive functions for Fibonacci Sequence up to given number n.
8	Write recursive functions to display prime number from 2 to n.
9	Write a python program that writes a series of random numbers to a file from1 to n and display.

10	Write a python program to sort a given sequence: String, List and Tuple.
11	Write a python program to make a simple calculator.
12	Write a python program for Linear Search and Binary Search.
13	Write python program in which a function (with single string parameter)is defined and calling thatfunction prints the string parameters given to function.
14	Write python program in which a class is define, the n create object of that class and call simple printfunction define in class.

Total Hours	**60**
Suggested Learning Methods: Solving Case studies, Program development, Code Review and Peer Coding	**10**

Tools for Assessment (40 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	10	10	5	40

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	-	M	H	-	M	H	H	H	H	M	M
CO2	H	H	-	M	H	-	M	H	H	H	H	M	M
CO3	H	H	-	M	H	-	M	H	H	H	H	H	H
CO4	H	H	-	M	H	-	M	H	H	H	H	H	H
CO5	H	H	-	M	H	-	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3MKA101	Allied paper I :Statistics for Computer Science		
Semester : I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B.Sc. AIML /CS(DS))			
Course Objective	To enable the students to learn and visualize the fundamental ideas of Statistical methods.		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Statistics play an intrinsic role in computer science and vice versa. Statistics is used for data mining, speech recognition, vision and image analysis, data compression, artificial intelligence, and network and traffic modelling		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Implement the basic concepts of measures of Central tendency and dispersion	Lecture / Peer Teaching	Assignment
CO 2	Understand the concepts of Correlation and Regression	Group learning/Lecture	Problem solving Skill
CO 3	Calculate probability using Baye's theorem	Lectures / Video Lecture	Seminar
CO 4	Know various techniques about random variables	Group Learning / Lecture	Assignment
CO 5	Analyse the properties of Binomial, Poisson and Normal.	Lecture /Tutorial	Quiz

Offered by	Mathematics

Course Content	Instructional Hours/Week:5

Unit	Description	Text Book	Chapters
I	Statistics – Introduction–Measures of Central tendency-Arithmetic mean- Median - Mode Measures of dispersion – Range-Standard deviation –Quartile deviation- Coefficient of variation	1	9
		Instructional Hours	15
Suggested Learning Methods: Group Discussion & Quiz			02 Hrs
II	Correlation: Definition – Scatter diagram-Karl Pearson's correlation co-efficient-Rank correlation co-efficient –Properties. Regression: Introduction – Construction of regression equations – Properties.	1	12, 13
		Instructional Hours	15
Suggested Learning Methods : Problem solving Practice			02 Hrs
III	Probability: Introduction- Axioms of probability- Conditional probability- Addition theorem- Multiplication theorem- Independent event - Conditional probability -Total probability - Baye's theorem.	2	1
		Instructional Hours	15
Suggested Learning Methods : Class Test &https://youtu.be/CVvCvYFoCmM			02 Hrs

IV	Random variables – Discrete random variables- Probability mass function- Continuous random variables – Probability density function - Mathematical Expectation – Properties and simple problems on PMF and PDF.	2	2
		Instructional Hours	**15**
Suggested Learning Methods : Problem solving Practice			**02 Hrs**
V	Discrete Probability Distributions-Binomial, Poisson, Normal - Simple Problems only.	1	19
		Instructional Hours	**15**
		Suggested Learning Methods : Practice Tests	**02 Hrs**
		Total Hours	**75 Hrs**

Text Books	1. R. S. N. Pillai and Bagavathi, "**Statistics Theory and Practice"**, S. Chand & Company Pvt. Ltd, New Delhi Unit I : Chapter 9, Page No: 124 – 139, 146 – 154, 166-172, 244-250, 259-281. Unit II : Chapter 12 & 13, Page No : 396-410, 417-420, 465 – 480 Unit V : Chapter 19, Page No: 769 – 802. 2. P. Kandasamy , K. Thilagavathi& K. Gunavathi, "**Probability Statistics and Queuing Theory"**, S. Chand & Company Ltd, New Delhi. Unit III : Chapter 1, Sec 1.1 – 1.4, Page No: 1 – 45. Unit IV : Chapter 2., Sec 2.1 - 2.5, Page No : 56-84, 97 – 103.
Reference Books	1. S.C. Guptha and V.K. Kapoor , "**Fundamentals of Mathematical Statistics"**, S. Chand and Sons, Reprint, 2009. 2. S P Gupta, "**Statistical methods",** S. Chand and Sons, Reprint, 2017.
Web. URLs	**https://youtu.be/CVvCvYFoCmM** **https://www.khanacademy.org/math/statistics-probability/random-variables-stats- library/random-variables-discrete/v/random-variables** **https://www.simplilearn.com/tutorials/statistics-tutorial/probability-density-function**

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H	M	H	M	M	H	M	M	H
CO2	H	H	M	M	H	M	L	M	M	L	L	M	L
CO3	H	M	L	H	H	H	M	H	H	M	H	H	M
CO4	H	M	H	H	H	H	H	M	H	H	M	H	H
CO5	H	H	L	H	H	H	H	M	H	H	M	H	H

H-High; M-Medium ;L-Low

Course designed by	Verified by Chairman
Ms. S. Ruth Kethsial	Dr. T. Chandrapushpam

Course Code	Title	
21U4ENV101	Ability Enhancement Compulsory Course - Environmental Studies	
Semester : I	Credits : 2	CIA : 50 Marks
(Common to all UG Programmes)		
Course Objective	This course enables the students to recognize the interconnectedness of multiple factors in environmental challenges and communicate clearly and competently matters of environment concern.	
Course Category	Employability	
Development Needs	National & Global	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions	Lecture/ Video Lectures	Album Preparation
CO 2	Understand concepts and methods from ecological and physical sciences and their application in environmental problem solving.	Lecture/ Peer Teaching	Album Preparation
CO 3	Solve the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.	ABL/ Group Discussions	Group Discussions
CO 4	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.	Video Lessons/ Group discussions	Group Discussions
CO 5	Apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes.	Field visits	Field visit Report

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Natural Resources:** Forest resources, Water resources, Mineral resources, Food resources, Energy resources and Land resources.	1	2
		Instructional Hours	**6**
Suggested Learning Methods: Video lectures			
II	**Ecosystems:** Concept of an ecosystem, Structure and function; Introduction, types, characteristic features, structure and function of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). **Activity: Prepare an album on types of Ecosystem.**	1	3
		Instructional Hours	**6**
Suggested Learning Methods: Peer Teaching			
III	**Environmental Pollution:** Definition Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution and Noise pollution, Solid waste management. **Activity: Discuss the solutions for water pollution**	1	5
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			

IV	**Social Issues and the Environment:** Water conservation, rain water harvesting, watershed management, Environmental ethics - Issue summits' and possible solutions and Public awareness. **Activity: Identify and analyse a Social Issue and an Environment issue in your locality.**	1	6
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	**Disaster Management:** Floods, Earthquakes, Cyclones, Landslides: From management to mitigation of disasters: The main elements of a mitigation and measures of strategy: Floods, Earthquakes, Cyclones and Landslides	2	16
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
Field Work: Visit to local area to document Environmental assets (River / Forest / Grass land / Mountain), Visit to local polluted site (Urban / Rural /industrial / Agricultural), Study of common plants, insects, birds, Study of simple ecosystem: Pond, River, Hill slopes.			
		Total Hours	**30**

Text Book(s):	1. Shashi Chawla. A Text Book of Environmental Studies, Tata McGraw-Hill, 2012. 2. From UGC website: https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf
Reference Book(s):	1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd., Bikaner. 2. Jadhav, H &Bhosale, V.M. 1995 Environmental Protection and Laws Himalaya Pub.House, Delhi 284 p. 3. Mckinney, M.L. &Schoch R.M. 1996. Environmental Science systems & Solutions 4. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p 5. Rao MN &Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt. Ltd., 345 p.

Tools for Assessment (50 Marks)

Ecosystem Album Preparation	Field visit and report submission	Group discussions about issues related to their locality / about Disaster Management	CIA Test	Total
10	10	5	25	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	-	L	H	H	H	H	L	L	M	M	M	M
CO2	L	-	L	H	H	H	H	L	L	L	M	L	M
CO3	L	-	L	H	H	H	H	L	L	M	M	M	M
CO4	L	-	L	H	H	H	H	L	L	L	M	M	L
CO5	L	-	L	H	H	H	H	L	L	M	M	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. M. Thangavel	Dr. M. Thangavel

Course Code	Title		
23U1TAM202	Part - I : Pynthamizh (பைந்தமிழ்)		
Semester: II	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Course Objective	மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமை மிக்க மாணவர்களை உருவாக்குதல்.		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Global /Regional(உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	பக்தி இலக்கியங்கள் வழி வாழ்வியல் நெறிகளை மாணவர்களுக்கு எடுத்துரைத்தல்	விரிவுரை/காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	சிற்றிலக்கியங்களின் மூலம் தமிழர்களின் வாழ்க்கை கூறுகளை எடுத்துரைத்தல்	விரிவுரை	குழுத்திட்டம்
CO 3	தமிழ் நாவல்களின் வழி சமுதாயச் சிந்தனைகளைக் கூறுதல்	விரிவுரை/காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	இலக்கண அறிவை வளர்த்தல்	விரிவுரை	ஒப்படைவு
CO 5	தமிழ் இலக்கிய வரலாற்றுத்திறனை மேம்பாடு அடையச் செய்தல்	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content: Pynthamizh (பைந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description		Text Book & Chapters
I	பக்தி இலக்கியங்கள்	1. திருமந்திரம் - மூன்றாம் தந்திரம் (அதிகாரம் 2) 2. நாலாயிரத் திவ்வியப்பிரபந்தம்- பெரியாழ்வார் 3. மாணிக்கவாசகர்-எட்டாம் திருமுறை 4. திருநாவுக்கரசர்- திருவரங்கமாலை	அட்டமாசித்திகள் திருப்பல்லாண்டு அச்சோப்பதிகம் நான்காம் திருமுறை - தேவாரம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods: ஆன்மிக சிந்தனைத்திறன் பெற்றமை			
II	சிற்றிலக்கியங்கள்	1. கலம்பகம் - நந்திக்கலம்பகம் 2. பள்ளு – முக்கூடற்பள்ளு 3. குறவஞ்சி – திருக்குற்றாலக்குறவஞ்சி 4. பிள்ளைத்தமிழ் - மீனாட்சியம்மை பிள்ளைத்தமிழ் 5. பட்டினத்தார் பாடல்கள்	91 -100 பாடல்கள் 350 - 360 செய்யுள்கள் 1-10 செய்யுள்கள் 1 -10 செய்யுள்கள் 358 - 367 பாடல்கள்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : கலந்துரையாடல்			
III	நாவல்	1. இமையம் (வெ.அண்ணாமலை)	செல்லாத பணம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : நாவல் எழுதும் திறன் பெற்றமை			

IV	இலக்கணம்	1. வல்லினம் மிகும் இடங்கள் 2. வல்லினம் மிகா இடங்கள் 3. யாப்பின் உறுப்புகள் (எழுத்து முதல் தொடை வரை) 4. பாவின் வகைகள்	தமிழ் இலக்கணம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : பிழையின்றி தமிழ் எழுதுதல்			
V	தமிழ் இலக்கிய வரலாறு	1. சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 2. புதினத்தின் தோற்றமும் வளர்ச்சியும் 3. பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 4. விண்ணப்பங்கள், மடல்கள் எழுதச்செய்தல்	தமிழ் இலக்கிய வரலாறு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : குழு விவாதம்			
		Total Hours	**60 Hours**

Text Books	1. இளங்கலை முதலாம் ஆண்டுத்தமிழ் மாணவர்களுக்குரிய பாடநூல் "பைந்தமிழ்" தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. திருமந்திரம் - மாணிக்கவாசகர் அருளிய திருவாசகம் - சித்தாந்த பண்டிதர் திரு.ப.இராமநாத பிள்ளை விளக்க உரையுடன் கழக வெளியீடு, திருநெல்வேலி, 2. தமிழண்ணல - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சிப் புத்தக நிலையம் மதுரை.
Web. URLs	https://youtu.be/cL89sSZq_FI

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	**L**	H	L	H	H	M	H	M	H	M	H	M
CO2	H	**L**	M	L	H	L	H	H	H	M	H	M	H
CO3	H	**L**	L	L	M	M	H	H	M	H	M	M	M
CO4	H	**L**	H	L	H	M	M	L	M	L	H	M	H
CO5	H	**L**	H	L	H	L	H	H	H	M	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh kumar	Dr. A.Sridevi

Course Code	Title		
23U1HIN202	Part - 1 Sanchar Hindi (संचार हिन्दी)		
Semester: II	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता हैI		
Course Category	Skill Development		
Development Needs	National		
Course Description	Improves Reading and Translation Skills.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	कविता की मूल शब्दावली और व्यावहारिक तत्वों को समझें। मुक्त छंद और कविता के पारंपरिक रूपों में अंतर्निहित सामान्य तकनीकों को समझें।	Lecture / Video Methods	Assignment
CO 2	छात्र विभिन्न प्रकार की संवादात्मक स्थितियों में हिंदी में प्रदर्शित करने, चित्रित करने, नाटक करने और व्याख्या करने के लिए अर्जित कौशल को लागू करने में सक्षम होंगे	Case Studies	Group Project
CO 3	छात्र औपचारिक और अनौपचारिक पत्र लिखने में सक्षम होंगे।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सभी लोगों के बीच प्रभावी संचार को सक्षम बनाता है।	Lecture / Video Methods	Assignment
CO 5	छात्र हिंदी भाषा के वक्ता के साथ किसी भी सामान्य विषय पर विभिन्न स्तरों पर बातचीत करने में सक्षम होंगे I	Lecture / Dumb Charades	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	आधुनिक हिंदी काव्य : रश्मिरथी , रामधारी सिंह 'दिनकर'	1	All
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			02 Hrs
II	**एकांकी संग्रह** : 1. **शिवाजी का सच्चा स्वरूप** - सेठ गोविंददास 2. औरंगजेब की आखिरी रात - रामकुमार वर्मा 3. रीढ़ की हड्डी - जगदीशचंद्र माथुर 4. सिपाही की माँ - मोहन राकेश	1	1 to 4
		Instructional Hours	12
Suggested Learning Methods : Auditory			02 Hrs
III	पत्र लेखन : (छुटटी पत्र , संपादक को पत्र , पुस्तकों के लिए आदेश पत्र , नौकरी के लिए आवेदन पत्र , निजी पत्र)	1	1,2,3
		Instructional Hours	12

Suggested Learning Methods : Comprehensive writing			**02 Hrs**
IV	**अनुवाद : हिंदी से अंग्रेजी (अनुवाद अभ्यास** - 3) 1 - 10 passages	3	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			**02 Hrs**
V	बोलचाल की हिन्दी : 1. शिक्षक - विद्यार्थी 2. ग्राहक-दुकानदार 3. डॉक्टर - रोगी, 4. साक्षात्कार 5. दो यात्री 6. माँ - बेटा	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			**02 Hrs**
		Total Hours	**60**

Reference Books	1. रश्मिरथी / रामधारी सिंह "दिनकर" - कविता कोश 2. सरस एकांकी नाटक : डॉ. रामकुमार वर्मा 3. अनुवाद अभ्यास - 3 दक्षिण भारत हिंदी प्रचार सभा , चेन्नई -1
Reference Books	1. श्रेष्ठ हिन्दी एकांकी -डॉ विजयपाल सिंह 2. बोलचाल : पं० अयोध्या सिंह उपाध्याय 3. हिंदी व्याकरण निबंध और पत्र लेखन -डॉ. एन. एल. माथुर
Web. URLs	**www.webdunia.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assign ment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	H	H	M	L	M	L	M	L	M	M	M	L
CO2	M	L	H	L	H	H	H	L	M	L	L	M	M
CO3	H	L	L	L	M	H	M	H	M	L	L	L	M
CO4	H	M	M	M	L	L	L	H	M	L	L	M	M
CO5	M	H	L	M	M	M	M	M	L	M	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S.Swarnalatha	**Dr.S.Swarnalatha**

Course Code			
23U1MAL202	**Part – I: Novalum Bhashaapadanavum** (നോവലും ഭാഷാപഠനവും)		
Semester: II	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	വിദ്യാർത്ഥികളിൽ മലയാള ഭാഷയുടെ വികാസവും മലയാള സാഹിത്യത്തിൽ നോവലുകൾക്കുള്ള സ്ഥാനവും വായനാശീലവും വർദ്ധിപ്പിക്കുന്നു
Course Category	Skill Development
Development Needs	Regional
Course Description	Proper guidance, opportunities and encouragement that help them to achieve their ambitions

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	സമൂഹത്തിലെ ഒരു വിഭാഗത്തിന്റെ ജീവിതം	Lecture / Video Methods	Assignment
CO 2	പ്രകൃതിയുടെയും മറ്റു ജീവജാലങ്ങളുടെയും മാറ്റങ്ങൾ	Case studies	Group Project
CO 3	പ്രകൃതി നാശത്തിനെതിരായി ഒന്നിച്ചു പ്രവർത്തിക്കുന്നു	Lectures / Video Lessons	Seminar
CO 4	സമൂഹത്തിലെ ഭാഷാസങ്കല്പം തിരിച്ചറിയുന്നു	Lecture / Video Methods	Assignment
CO 5	നല്ല ഭാഷ എങ്ങനെ സൃഷ്ടിക്കാമെന്ന് മനസ്സിലാക്കുന്നു	Lecture / Dumb Charades	Seminar

Offered by	**Malayalam**

Course Content	**Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	നോവൽ - എൻമകജെ	1	1 to 16
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	നോവൽ - എൻമകജെ	1	17 to 34
		Instructional Hours	**12**
Suggested Learning Methods : Auditory Method			**02 Hrs**
III	നോവൽ - എൻമകജെ	1	35 to 51
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
IV	ഭാഷാപഠനം - തെളിമലയാളം	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory &Visual Method			**02 Hrs**

V	ഭാഷാപഠനം - തെളിമലയാളം	1	4,5
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. അംബികാസുതൻ മാങ്ങാട്, എൻമകജെ - ഡി.സി.ബുക്സ് കോട്ടയം 2. എം.എൻ.കാരശ്ശേരി, തെളിമലയാളം - ഡി.സി.ബുക്സ് കോട്ടയം
Reference Books	1. പ്രൊഫ.എൻ.കൃഷ്ണപ്പിള്ള, കൈരളിയുടെ കഥ - ഡി.സി.ബുക്സ് കോട്ടയം 2. ഡോ. പന്മന രാമചന്ദ്രൻ നായർ, സമ്പൂർണ്ണമലയാള സാഹിത്യ ചരിത്രം - ഡി.സി.ബുക്സ് കോട്ടയം 3. ഡോ.കെ.എം. ജോർജ്ജ്, ആധുനിക മലയാള സാഹിത്യ ചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം 4. എരുമേലി, മലയാള സാഹിത്യം കാലഘട്ടത്തിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം
Web. URLs	**http://www.keralaculture.org>literature** **http://www.manoramaonline.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	H	H	H	H	H	H	M	M	H	M
CO2	H	L	H	M	H	M	H	H	H	M	H	M	M
CO3	M	L	M	M	M	H	H	M	M	H	M	M	H
CO4	H	L	L	H	L	H	H	H	M	H	H	M	M
CO5	M	L	L	M	L	H	H	H	H	M	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms. N. RAJANI	Dr. SMITHA C. R.

Course Code	Title		
23U1FRN202	Part – I : Le Français Fondamental – II		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	This course is comprised of deep study of grammar categories and aims to apply the grammatical structures correctly.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course aims to develop communicative competence of the students in French, to create cultural awareness, to promote autonomy in learning French.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Acquire an understanding of French culture, use the basic foundation of verbs.	Lecture	Assignment
CO 2	Describe a place, learn pronom en, y and adjectives.	Tutorial / Case Studies	Seminar
CO 3	Recall the tenses and learn Imparfait tense	Lectures / Video Lessons	Quiz
CO 4	Write about the weather and learn pronom COD,	Word game / Lecture	Assignment
CO 5	Write short passages and translate, Comprehend the passage and learn pronom COI	Lecture	Group project

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Goûter à la campagne	1	5
	Instructional Hours		**12**
Suggested Learning Methods: Worksheets, TV5 App			
II	Voyager dans sa ville	1	6
	Instructional Hours		**12**
Suggested Learning Methods: Kahoot App, Duolingo			
III	Faire du neuf avec du vieux	1	7
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive Writing			

IV	Changer d'air	1	8
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			
V	Devenir éco-citoyen	1	9
		Instructional Hours	**12**
Suggested Learning Methods : Translating simple sentences and short passages			
		Total Hours	**60**

Text Books	Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 5 to 9)
Reference Books	A1 Echo Méthode de Français
Web. URLs	Lingua.com, TV 5 app, Learn French by podcast (spotify)

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	M	M	M	L	M
CO2	-	-	H	L	H	M	-	-	M	L	M	M	L
CO3	-	-	-	M	M	H	-	-	M	M	M	M	M
CO4	-	-	L	M	L	H	-	-	M	L	L	M	L
CO5	-	-	L	-	H	-	-	-	M	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Ms. SUNITA. R	Ms. SUNITA. R

Course Code	Title		
23U2ENG202	Part – II : Professional English – II		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	To equip the students with the language skills and its functional usage. Facilitate the insight and taste of Literature.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Mastering life skills through prose discourse.	Lecture/Tutorial	Assignment
CO 2	Acquire ethics and values through poetic genre.	Lecture/Tutorial	Assignment
CO 3	Recognise the nuances of English language through short stories.	Lecture/Tutorial	Speaking
CO 4	Enhance fluency over language with self-confidence.	Lecture/Tutorial	Reading
CO 5	Examine how the language is used in literature and develop LSRW Skills	Lecture/Tutorial	Writing

Offered by | **Department of English**

Course Content | **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** E.M. Forster - Tolerance Mahatma Gandhi - Women Not the Weaker Sex Issac Asimov - The Fun They had **Listening Activity** – Comprehension practice from Prose.	1	1-3
		Instructional Hours	**12**
Suggested Learning Methods : Cooperative Learning			
II	**Poetry** Robert Frost - Stopping by Woods on a Snowy Evening William Blake - A Poison Tree Alexander Pope – Ode on Solitude **Speaking Activity** – Group Discussion Forum	1	4-6
		Instructional Hours	**12**
Suggested Learning Methods : Inquiry Based Learning			
III	**Short Stories** Mark Twain - The Cat and the Painkiller Japanese Folk Tale - The Envious Neighbour Hector Hugh Munro (Saki) – The Open Window **Reading Activity** – Pronunciation practice and enhancement from Short-stories	1	7-9
		Instructional Hours	**12**
Suggested Learning Methods : Classroom Activity			

IV	**Grammar** Articles Concord Active and Passive Voices Direct and Indirect Speech **Writing Activity** – Paragraph Writing using grammar Components	1	10-13
		Instructional Hours	**12**
Suggested Learning Methods : Direct Method			
V	**Writing Skills** Resume Writing Email Writing Dialogue Writing Testimonial Writing Creative Writing	1	14-17
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Compiled by the Department of English NASC.
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	M	M	H	M	H	H	M	H	M
CO2	M	L	H	L	H	M	H	M	H	H	M	H	M
CO3	M	L	H	L	H	H	H	H	H	H	M	H	M
CO4	M	L	H	L	H	L	H	H	H	H	M	H	H
CO5	H	M	H	L	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Mr. D. Pradeek	Dr. R. Malathi

Course Code	Title		
23U3AMC202	Core Paper IV: Fundamentals of Artificial Intelligence		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To expose the student sot the fundamental concepts of Artificial Intelligence and its applications.		
Course Category	Employability		
DevelopmentNeeds	Global		
Course Description	Developing skill set in Artificial Intelligence and apply the concepts to build up Applications in order to meet the Local and Global needs.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understanding the Fundamental of the history of Artificial Intelligence.	Lecture	Assignment
CO 2	Understanding the basic concepts about problemsolving methods.	Tutorial	Assignment
CO 3	Demonstrating Knowledge Representation and Reasoning Systems.	Video Lesson	Seminar
CO 4	Explore Software Agents.	Demonstration	Seminar
CO 5	Identify various AI Applications and Natural Language Processing.	Lecture	Group Discussion

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	Introduction – Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents – Typical Intelligent Agents – Problem Solving Approach to Typical AI Problems.	I	1,2
	Instructional Hours		**15**
	Suggested Learning Methods: Peer Learning		
II	Problem Solving Methods – Search Strategies – Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems – Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search – Game Playing – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games.	I	2,3
	Instructional Hours		**15**
	Suggested Learning Methods: Video Presentation		
III	Knowledge Representation – First Order Predicate Logic – Prolog Programming – Unification –Forward Chaining – Backward – Chaining – Resolution – Knowledge Representation – Onto logical Engineering – Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories – Reasoning with Default Information.	I	4,5
	Instructional Hours		**15**
	Suggested Learning Methods: Group Discussion		

IV	Software Agents – Architecture for Intelligent Agents – Agent Communication – Negotiation and Bargaining – Argumentation among Agents –Trust and Reputation in Multi-agent Systems.	II	2,3
		Instructional Hours	**15**
		Suggested Learning Methods: Group Discussion	
V	AI Applications – Language Models –Information Retrieval – Information Extraction – Natural Language Processing –Machine Translation – Speech Recognition – Robot –Hardware – Perception – Planning - Moving.	II	5,6
		Instructional Hours	**15**
		Suggested Learning Methods: Video Presentation	
		Total Hours	**75**

Text Books	1. S. Russell and P. Norvig, **"Artificial Intelligence: A Modern Approach"**, Prentice Hall, Third Edition, 2009. 2. I. Bratko, **"Prolog: Programming for Artificial Intelligence"**, Fourth Edition, Addison-Wesley Educational Publishers Inc., 2011. Unit I : Sections: 1.1 to 1.3, .1.4 to 2.1(Chapter 1 and 2) Unit II : Sections: 2.3 to 2.5, 3.1 to 3.3 (Chapter 2 and 3) Unit III : Sections: 4.3 to 4.4, 4.6 to 5.5 (Chapter 4 and 5) Unit IV : Sections: 6.2 to 6.5, 7.1 to 7.5 (Chapter 2 and 3) Unit V : Sections 8.2 to 8.3, 9.1 to 9.4 (Chapter 5 and 6)
Reference Books	**1.** M. Tim Jones, **"Artificial Intelligence: A Systems Approach (Computer Science)"**, Jones and Bartlett Publishers Inc.; First Edition, 2008. **2.** Nils J. Nilsson, **"The Quest for Artificial Intelligence",** Cambridge University Press, 2009.
Web. URLs	https://www.yumpu.com/en/document/view/63606237/pdfdownload-artificial-intelligence-a-modern-approach-4th-edition-pearson-series-in-artifical-intelligence-full-pages

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Poster Making	Seminar	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	M	L	-	L	H	M	H	M	H	L
CO2	M	M	-	L	M	-	M	H	M	M	H	M	M
CO3	H	H	-	M	M	-	M	H	H	H	M	M	H
CO4	H	H	-	L	M	-	M	H	L	M	M	S	H
CO5	H	H	-	L	M	-	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K .Selvavinayaki

Course Code	Title		
23U3AMC203	Core Paper V : Relational Database Management Systems		
Semester: II	Credits: 4	CIA: 25 MARKS	ESE: 75 MARKS

(B.Sc. Artificial Intelligence and Machine Learning)

Course Objective	To inculcate fundamental knowledge in RDBMS concepts and make them to create, manipulate information with the real time datasets.
Course Category	Skill Development
Development Needs	Global
Course Description	The course gives introduction to the fundamentals of MySQL and relational databases using database programming techniques emphasizing database structures, modeling, and database access.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the Data types and fundamentals of database	Lecture	Assignment
CO 2	Understanding the concept of Database and Various queries in SQL.	Flipped Classroom	Assignment
CO 3	Applying the concept in various tables to retrieve information.	Video Lectures	Quiz
CO 4	Understanding the concept of PL/SQL using Cursors	Flipped Classroom	Seminar
CO 5	Able to evaluate the errors and write triggers in PL/SQL Statements.	Lecture	Seminar

Offered by | **B.Sc. Artificial Intelligence and Machine Learning**

Course Content | **Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapters
I	**Introduction:** Database **-** Purpose of Database Systems - Data Models – Database Language – Transaction Management - Overall System Structure.	2,1	1
	A Relational approach: Relationships –Relational Database Model – Integrity Rules – Theoretical Relational Languages. **Database Design:** Data Modelling and Normalization: Data Modelling – Dependency – Normal forms – Dependency Diagrams – De –Normalization.		
		Instructional Hours	**15**
Suggested Learning Methods : Video Lectures			
II	**Oracle9*i*:** Oracle9i an introduction – SQL –SQL *Plus Commands – Errors & Help – Alternate Text Editors. Oracle Tables.**DDL:** Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes	1	3, 4
		Instructional Hours	**15**
Suggested Learning Methods : Demonstration			
III	**Working with Table:** Data Management and Retrieval: DML – Adding a new Row/Record – Updating and Deleting an Existing Rows/Records – Retrieving Data from Table -Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command –	1	5,6

	CASE structure. Functions and Grouping: Built-in functions – Grouping Data. **Multiple Tables:** Joins and Set operations: Join – Set operations.		
		Instructional Hours	**15**
Suggested Learning Methods : Group Discussion			
IV	**PL/SQL:** A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. **Control Structures and Embedded SQL:** Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.	1	10,11, & 12
		Instructional Hours	**15**
Suggested Learning Methods : Seminar			
V	**PL/SQL Composite Data Types:** Records – Tables. **Named Blocks:** Procedures – Functions – Packages –Triggers –Data Dictionary Views	1	13,14
		Instructional Hours	**15**
Suggested Learning Methods : Quiz			
		Total Hours	**75 Hrs**

Text Books	1. Nilesh Shah ,**"Database Systems Using Oracle"**, 2nd edition, PHI. 2. Abraham Silberschatz, Henry F.Korth, S. Sudarshan , "**Database System Concepts**", 3rd Edition, McGraw – Hill Companies, inc.
Reference Books	1. Arun Majumdar & Pritimoy Bhattacharya, **"Database Management Systems"**, TMH, 2007. 2. Gerald V. Post , **"Database Management Systems"**, 3rd Edition, TMH.
Web. URLs	https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Poster Making	Seminar	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3AMP204	Core Paper VI : Practical in SQL and PL/SQL		
Semester: II	Credits: 4	CIA: 40 Marks	ESE: 60 Marks
(B. Sc Artificial Intelligence and Machine Learning)			
Course Objective	To acquire fundamental knowledge Relational Database Management System concepts.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To make the students to understand Relational Database Management System concepts using Oracle and able to do the various operations on Tables		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember to transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a RDBMS.	Program Demonstration	Program Creativity
CO 2	Understand the processes of Database Development and Administration using SQL and PL/SQL.	Program Demonstration	Debugging
CO 3	Apply the Programming and Software Engineering skills and techniques using SQL.	Laboratory Practice	Application of Logic
CO 4	Analyze the relational data model with optimal and feasible solutions	Code review	Program Development
CO 5	Evaluate the Optimal Solutions	Laboratory Practice	Program Development

Offered by	B.Sc Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 4

Unit	List of Practical
1	Create an Employee table with primary key, foreign key and Insert the Values.
2	Alter the existing table with an appropriate query, Update the values and retrieve using Select Verb.
3	Create a table and perform various DCL & TCL Commands
4	Perform various Single – row and Grouping functions using SQL.
5	Create an appropriate table and perform various Join Operations.
6	Create suitable table and perform various Set Operations.
7	Write a PL/SQL program to check whether the given string is palindrome or not.

8	Write a PL/SQL Cursor for referencing fields in a record.
9	Write a PL/SQL to raise the exceptions in Bank Account Management table
10	Write a PL/SQL program to find factorial of numbers using function and procedure.
11	Write a PL/SQL to handle package.
12	Write a PL/SQL trigger for entering mark in the student table.
	Total Hours **60**

Tools for Assessment (40 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	10	10	5	40

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3MIA202	Allied Paper II : Discrete Mathematics		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS,IT,DS,AIML,DCFS and BCA)			
Course Objective	To learn about the Discrete Structure for Computer Based Application.		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	This course is to understand and use abstract discrete structures that are backbones of Computer Science. In particular, this course meant to introduce logic, proofs, sets, relations, functions, counting, and graph with an emphasis on applications in Computer Science.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn the basic concepts of Set theory	Lectures / Peer Teaching	Assignment
CO 2	Implement the basic ideas of Mathematical Logic in Computer Science	Lectures / Tutorial	Seminar
CO 3	Classify different types of Relations and Functions	Lectures / Video Lectures	Assignment
CO 4	Infer the concepts of Grammar and Automata theory.	Lectures / Tutorial	Work Sheet
CO 5	Know the concepts of Graph theory	Lectures / Video Lectures	Quiz

Offered by	Mathematics

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Set Theory:** Introduction- Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory. Fundamental products- Partitions of sets – Minsets- Algebra of sets and Duality-Inclusion and Exclusion Principle	1	1
		Instructional Hours	15
Suggested Learning Methods: Problem Solving Practice			**02 Hrs**
II	**Mathematical Logic:** Introduction- prepositional calculus – Basic logical operations- Tautologies-Contradiction – Argument-PDNF & PCNF - Method of proof.	1	12
		Instructional Hours	15
Suggested Learning Methods : https://youtu.be/tyDKR4FG3Yw			**02 Hrs**
III	**Relations:** Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations. Functions – Types of functions – Invertible functions – Composition of functions.	1	3,4
		Instructional Hours	15
Suggested Learning Methods : Assignments			**02 Hrs**

IV	**Languages:** Operations on languages – Regular Expressions and regular languages. **Grammar:** Types of grammars – Grammar Construction-Finite state machine – Finite State Automata- DFA- NDFA- Conversion of NDFA into DFA.	1	15
		Instructional Hours	**15**
Suggested Learning Methods : Problem Solving Practice			**02 Hrs**
V	**Graph Theory:** Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs. Trees – Properties of trees – Binary trees -Traversal of Binary Trees.	1	9,10
		Instructional Hours	**15**
Suggested Learning Methods: Problem Solving Practice			**02 Hrs**
		Total Hours	**75 Hrs**

Text Books	1. J.K. Sharma, **Discrete Mathematics**, Macmillan India Ltd, 2nd edition, 2005. Unit – 1 : Chapter 1 - Section:1.1- 1.7, 1.9,1.10,1.12, 1.14 ; Page No : 1-16,18,19,22-27,32-36 Unit – 2 : Chapter 12 - Section:12.1-12.3,12.8,12.9, 12.11,12.12; Page No:333-341,352-354,356-361 Unit – 3 : Chapter 3 - Section : 3.3-3.7, 3.11; Page No:77-85,92-93 Chapter 4 – Section: 4.1 - 4.5; Page No: 99-108 Unit – 4 : Chapter 15 – Section 15.3 - 15.7; Page No:443-477 Unit – 5 : Chapter 9 – Section 9.1-9.5 ; Page No: 221-239 Chapter 10 – Section 10.1-10.3, 10.6; Page No:268-274,278-282 2. J.P.Tremblay & R.Manohar , **Discrete Mathematical Structures with Applications to Computer Science,** Tata McGraw Hill Publication, 1997 Unit – 2 : Chapter 1 – Page No : 52-58
Reference Books	**1.** J. P. Tremblay, R. Manohar, **Discrete Mathematics Structures with Applications to Computer Science**, McGraw Hill International Edition, 2005. 2. T.Veerarajan, **Discrete Mathematics with Graph Theory and Combinatories**, McGraw Hill International Edition, 2008
Web. URLs	1. https://www.youtube.com/watch?v=oaOm2pnKkyY 2. https://youtu.be/tyDKR4FG3Yw

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	M	M	L	M	H	M	M	H
CO2	H	H	L	M	H	M	M	L	M	H	M	H	M
CO3	H	H	L	M	H	M	M	L	M	H	H	M	M
CO4	H	H	L	M	M	M	M	L	M	M	M	H	H
CO5	H	H	L	H	M	M	M	L	M	H	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Ms. S. Ruth Kethsial	Dr. T. Chandra Pushpam

Course Code	Title	
21U4HRC202	Ability Enhancement Compulsory Course - Human Rights and Constitution of India	
Semester : II	Credits : 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective:

Understand the concept of human rights and the importance of Indian Constitution.

Course Outcomes:

CO1	Understand the principal aspects of human rights and duties in a broad sweep.
CO2	Acquire the knowledge about the Fundamental Duties and Rights of Indian Citizen
CO3	To know the rights of women and Children in India
CO4	Understand the structure and importance of Indian Constitution
CO5	Know the functions of Government and Election Commission of India

Course Content **Instructional Hours / Week : 2**

Unit	Description	
I	An Introduction to Human Rights :Values – Dignity, Liberty, Equality, Justice, Unity in Diversity - Human Rights – Meaning and features; Significance of the study - Classification of Human Rights - Rights and Duties – Correlation	
	Instructional Hours	**6**
II	Human Rights and Fundamental Rights - Fundamental Rights and Fundamental Duties - Directive Principles - Role of Judiciary in the protection of Human Rights- National Human Rights Commission *Activity : Case Study related to Human Rights*	
	Instructional Hours	**6**
III	Human Rights of Women and Children- Social Practice and Constitutional Safeguards – Female foeticide and infanticide-Physical assault and Harassment- Domestic violence- Conditions of Working Women *Activity : Conduct a Group Discussion on the above topics*	
	Instructional Hours	**6**
IV	**Constitution – Structure and Principles -** Meaning and importance of Constitution - Making of Indian Constitution –Sources - Salient features of Indian Constitution- Government of Union- Government of State-Features of judicial system in India	
	Instructional Hours	**6**
V	Federalism in India – Features - Local Government -Panchayat –Powers and functions -Election Commission –Organisation and functions-Citizen oriented measures – RTI – Provisions and significance *Activity : Seminar/ Role play related to Indian Constitution*	
	Instructional Hours	**6**
	Total Hours	**30**

Text Book:

1. **"Human Rights and Constitution of India",** Complied by Curriculum Development Cell, Nehru Artsand Science College.

Tools for Assessment (50 Marks)

Case Study and Report submission	Seminar / Role play	Group Discussion	Comprehensive test for 5×5 = 25 marks	Total
10	10	5	25	50

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	L	H	H	H	H	L	M	M	L	M
CO2	-	-	-	L	H	H	H	H	M	L	M	M	M
CO3	-	-	-	L	H	H	H	H	L	M	L	L	L
CO4	-	-	-	L	H	H	H	H	M	M	L	M	M
CO5	-	-	-	L	H	H	H	H	M	L	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by
Dr. N. Saranya	Dr. N. Saranya

Course Code	Title	
22U4HVY201	Value Education : Human Values and Yoga Practice	
Semesters : I & II	Credits : 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective:

- To help the students appreciate the essential complementarity between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
- To prepare and distribute standardized Yoga teaching and training material with reference to institute health**.**

Course Outcomes:

CO1	To know the importance of Ethics to be followed in the Human life.
CO2	To inculcate a sense of respect towards harnessing values of life and spiritof fulfilling social responsibilities.
CO3	To gain knowledge about the values that develops life skills.
CO4	To understand and Practice Meditation & Surya Namaskar.
CO5	To understand and apply the knowledge for physical health and well being through Asanas

Course Content **Instructional Hours / Week : 1 (For Semesters I and II)**

Unit	Description
I	**Human Values –** Introduction **-** Definition of Ethics and Values - Character and Conduct - Nature and Scope of Ethics. **Individual and Society -** Theories of Society - Social Relationships and Society - Empathy: Compassion towards other beings.
	Instructional Hours 4
II	**Self-realization and Human Values-**Self-realization and Harmony-Rules and Regulations-Rights and Duties-Good and Obligation-Integrity and Conscience. **Obligation to Family-** Trust and Respect-Codes of Conduct.
	Instructional Hours 5
III	**Character Formation Towards Positive Personality**: Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision. **Refinement of worries**: Neutralization of anger-Intelligent quotient(IQ),Emotional quotient(EQ),Spiritual Quotient (SQ)
	Instructional Hours 5
IV	**Power of Meditation**- Development of mind in stages - Mental Frequencies Methods for Concentration. Meditation Practices - Surya Namaskar. Physical Exercises -Kayakalpa Practices Training for Potentialising the Mind.
	Instructional Hours 6

V	**ASANAS** **Standing Posture:** Tadasana, Utkattasana, arthaKadi Chakrasana, Trikonasana, Artha Chandrarasana, Padahastasana, Virabhadrasana, Vrikshasana, Artha, Natarajasana. **Sitting posture:** Padmasana, Gomukasana, Ustrasana, ArdhaMatsyendrasana, Patchimottanasana. **Prone posture:**Bhujangasana, shalabhasana, Dhanurasana, Chakrasana. **Supine posture:**Sarvangasana, Halasana, Matsyasana, Shanti asana **Pranayama:** Bhastrika, Bhramari, NadiShodhan	
	Instructional Hours	**10**
	Total Hours	**30**

Text book:

1. **"Value Education",** compiled by Curriculum Development cell, Nehru Arts and Science College.

Tools for Assessment

25 marks	25 marks
Comprehensive test in Units I to III for 25 marks during CIA III of Sem. II	Perform 02 Yoga postures for Practical exam to be conducted during the mid. of Sem. II

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	H	L	M	H	H	L	M	M	L	M
CO2	-	-	-	L	M	H	M	H	M	L	M	M	L
CO3	-	-	-	L	M	H	S	H	M	M	L	M	L
CO4	-	-	-	L	L	H	M	H	M	L	M	L	M
CO5	-	-	-	L	L	H	M	H	M	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Mr. Karthik	Dr. N. Kavitha

Course Code	Title		
23U1TAM303	Part -I : Arunthamizh (அருந்தமிழ்)		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	தமிழ்க் காப்பியங்களின் வழி அறம் சார்ந்த சிந்தனைகளை உருவாக்குதல்
Course Category	**Skill Development (**மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	**Global/Regional (**உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்**)**
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	தமிழ் நூல்களில் அணிநலம் அறிதல், அறம் சார்ந்த சிந்தனைகளை வளர்த்தல்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	தமிழ் இலக்கிய வகைகளைக் கூறுவதன் மூலம் தமிழின் இலக்கிய வளத்தை உணரச்செய்தல்.	விரிவுரை	குழுத்திட்டம்
CO 3	மாணவர்களிடையே காலத்திற்கேற்ப மொழிவளர்ச்சியை உருவாக்குதல்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 4	நாட்டின் சிறந்த குடிமக்களாக மாணவர்களை உருவாக்குதல்.	விரிவுரை// குழு விவாதம்	கருத்தரங்கு
CO 5	மாணவர்களின் மனநலத்தை வளர்த்தல்.	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content : Arunthamizh (அருந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	காப்பியங்கள்	1.சிலப்பதிகாரம் 2.மணிமேகலை 3.சீவகசிந்தாமணி 4.கம்பராமாயணம்	1.1அடைக்கலக்காதை (மதுரைக்காண்டம்-பகுதி- 15) 1.2.பீடிகைக் கண்டுபிறப்புணர்ந்தக் காதை-பகுதி-9) 1.3.பூமகள் இலம்பகம் (பகுதி- 11-2347-2377 பாடல்கள்) 1.4சுந்தரகாண்டம்(கடல் தாவுப்படலம் 1-10பாடல்கள்)
		Instructional Hours	**12 Hours**
Suggested Learning Methods: நாடக முறையில் கலந்துரையாடல்			
II	சைவ,வைணவ, சுவடியியல்	1. தேவாரம் 2..நாலாயிரத்திவ்வியப் பிரபந்தம் 3.சுவடியியல்	2.1.திருநல்லூர்ப் பெருமணம் (பாடல் எண்-4137-4146) 2.2.ஆண்டாள் திருப்பாவை - (பாடல் எண்- 474-483) 2.3.சுவடியியல் - அறிமுகம் 2.4 சைவம் தமிழுக்குச் செய்த தொண்டு 2.5 வைணவம் தமிழுக்குச் செய்த தொண்டு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : பக்தி பாசுரங்கள் கலந்துரையாடல்			

III	மொழித்திறன் (இலக்கணம்)	1.நன்னூல் 2.தொல்காப்பியம்	3.1 நூல் வரலாறு (முதல் நூல், வழி நூல், சார்பு நூல்) 3.2 மாணாக்கர் வரலாறு 3.3 ஆசிரியர் வரலாறு 3.4 எண்வகை மெய்ப்பாடுகள்
Instructional Hours			**12 Hours**
Suggested Learning Methods :	மொழித்திறன் வாயிலாக பிழையின்றி எழுதும் திறன் பெற்றமை		
IV	நாட்டுப்புற வழக்காறுகள்	நாட்டுப்புறவியல்	4.1. பழமொழிகள் 4.2. விடுகதைகள் 4.3 தமிழர்க்கலைகள் 4.4 சிறுதெய்வ வழிபாடு மட்டும் 4.5 விளையாட்டுகள் (சிறுவர்,சிறுமியர் மட்டும்)
Instructional Hours			**12 Hours**
Suggested Learning Methods :	நாட்டுப்புறவியல் வழி நாட்டுப்புற மக்களின் வாழ்வியலை அறியச்செய்தல்		
V	இலக்கிய வரலாற்றுத் திறன்	தமிழ் இலக்கிய வரலாறு	1. காப்பியத்தின் தோற்றமும் வளர்ச்சியும் 2. பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 3. தமிழக நாட்டுப்புறவியல் வரலாறு
Instructional Hours			**12 Hours**
Suggested Learning Methods:	பாடத்திட்டத்தில் கொடுக்கப்பட்டுள்ள இலக்கிய வரலாற்றினை உணர்த்துதல்		
Total Hours			**60 Hours**
Text Books	இளங்கலை இரண்டாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"அருந்தமிம்"** தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.		
Reference Books	நாட்டுப்புறவியல் ஓர் ஆய்வு: டாக்டர் சு. சக்திவேல் விஜயா பதிப்பகம் சென்னை. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சிப் புத்தக நிலையம், மதுரை- 625 001.		
Web. URLs	https://youtu.be/EJcYgyw7e94, https://youtu.be/MgtwmerI4yw		

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	L	L	H	M	L	H	M	H	H	M
CO2	M	L	H	L	H	L	M	H	M	H	H	M	H
CO3	H	L	L	L	H	M	H	M	H	H	M	M	M
CO4	M	L	H	L	M	M	H	L	H	M	H	M	H
CO5	H	L	M	L	H	L	M	H	M	M	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh Kumar	Dr. A. Sridevi

Course Code	Title		
23U1HIN303	Part I - Sahityak Hindi (साहित्यिक हिंदी)		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	चुनिंदा कविताओं के माध्यम से हिंदी कविता की उत्पत्ति और विकास को समझना।. संकलन में उपलब्ध कराए गए सर्वोत्तम नमूनों का उपयोग करते हुए कविता की सराहना।		
Course Category	Skill Development		
Development Needs	National		
Course Description	Improves Writing Skills.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हिंदी भाषा से अच्छी तरह वाकिफ हो सकेंगे।	Role play	Assignment
CO 2	व्यक्तिगत अनुभवों की पहचान करें जिनका उपयोग कविताएँ लिखते समय किया जा सकता है।	Group learning Acting	Seminar
CO 3	कविता की मूल शब्दावली और व्यावहारिक तत्वों को समझें।	Story Narration	Assignment
CO 4	छात्रों को रचनात्मक लेखन में अच्छा अभ्यास मिलेगा।	Group learning and Work sheets	Group Project
CO 5	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता है।	Worksheets and Exercises	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	नाटक – सत्यमेव जयते – (श्री सूर्यनारायण मूर्ति)	1	3
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			02 Hrs
II	प्राचीन काव्य : कबीर के दोहे (10 दोहा), सूरदास के पद (4 पद) (काव्य तरंग)	1	2
		Instructional Hours	12
Suggested Learning Methods : Auditory			02 Hrs
III	1.आधुनिक काव्य : पुष्प की अभिलाषा– माखनलाल चतुर्वेदी, जलियांवाला बाग़ में बसंत – सुभद्राकुमारी चौहान, शक्ति और क्षमा – रामधारी सिंह दिनकर 2.संक्षिप्तीकरण	1	3
		Instructional Hours	12
Suggested Learning Methods : Comprehensive Writing			02 Hrs
IV	**अलंकार** : 1) **अर्थ अलंकार** और **शब्द अलंकार**, 2) **दिए गए चित्र पर कुछ वाक्य लिखना ।**	1	2
		Instructional Hours	12
Suggested Learning Methods : Auditory, Visual, Comprehensive			02 Hrs

V	गद्यांश लेखन, वाक्य शुद्धि, शब्द शुद्धि, अनेक शब्द के लिए एक शब्द	1	4
		Instructional Hours	**12**
Suggested Learning Methods : comprehensive writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	**1. नाटक – सत्यमेव जयते – (श्री सूर्यनारायण मूर्ति)** 2. काव्य सुमन - राजपाल एंड सन्स
Reference Books	1. हिंदी नाटक और रंगमंच - डॉ राम कुमार वर्मा 2. ओंकार नाथ वर्मा , सामान्य हिंदी अरिहंत प्रकाशन इंडिया लिमिटेड
Web. URLs	1. www.webdunia.com 2. https://www.hindikunj.com 3. www.bhashaindia 4. www.hindisamay.com

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M	L	H	M	L	L	M	M	L
CO2	H	H	H	L	L	H	M	H	L	L	M	M	L
CO3	L	M	L	L	M	H	M	L	L	L	M	M	L
CO4	M	M	M	M	H	L	L	L	L	L	M	M	L
CO5	M	L	L	M	H	L	L	H	L	L	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code	Title		
23U1MAL303	**Part - I : Kavithayum Smaranayum** (കവിതയും സ്മരണയും)		
Semester: III	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**
(Common to all UG Programmes)			
Course Objective	കവിതാ സാഹിത്യ പരിചയത്തോടൊപ്പം പുതു കവിതകളെ കുറിച്ച് അവബോധവും ആസ്വാദനവും ഉയർത്തുക. വിദ്യാർത്ഥികൾക്ക് മാതൃകയാവുന്ന സമൂഹത്തിലെ ഉന്നത വ്യക്തിത്വങ്ങളെ പരിചയപ്പെടുത്തുക		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Developing Personality and Self confidence		

Course Outcomes		**Assessment Methods**	**Assessment Methods**
CO 1	കവിതയിലൂടെയുള്ള സംവേദനം	Smart boards/ Chalk and Talk	Assignment
CO 2	പ്രകൃതിയുടെ നിസ്വാർത്ഥമായ പ്രവർത്തനങ്ങൾ	Group learning	Seminar
CO 3	അധ്യാപക വിഭാഗത്തിനിടയിൽ അവകാശ ബോധം ഉണ്ടാക്കുന്നു	Peer Teaching	Assignment
CO 4	സമൂഹത്തിന് മൂല്യബോധമുണ്ടാക്കുന്ന പ്രവർത്തനങ്ങൾ	Group learning	Group Project
CO 5	സമൂഹത്തിൽ അധ്യാപനത്തിന്റെ പ്രാധാന്യം	Smart boards/ Chalk and Talk	Assignment

Offered by	**Malayalam**

Course Content	**Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	നവീന കവിത - പുതു കവിതകൾ	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	നവീന കവിത - പുതു കവിതകൾ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory Method			**02 Hrs**
III	കണ്ണീരും കിനാവും - വി.ടി.ഭട്ടതിരിപ്പാട്	1	3
		Instructional Hours	**12**
Suggested Learning Methods : : Comprehensive writing			**02 Hrs**
IV	കണ്ടൽക്കാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Auditory &Visual Methods			**02 Hrs**
V	കണ്ടൽക്കാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. നവീന കവിത (പുതു കവിതകൾ) - നെഹ്റു കോളെജ് മലയാള വിഭാഗം എഡിറ്റു ചെയ്ത 10 കവിതകൾ . 2. കണ്ണീരും കിനാവും - വി.ടി.ഭട്ടതിരിപ്പാട് -ഡി.സി. ബുക്ക്സ്

	3. കണ്ടൽകാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ - ഗ്രീൻ ബുക്ക്സ്
Reference Books	1. മലയാള കവിതാപഠനങ്ങൾ - സച്ചിദാനന്ദൻ ,മാതൃഭൂമി ബുക്സ്, കോഴിക്കോട് 2. കവിതാ സാഹിത്യ ചരിത്രം - ഡോ.എം.ലീലാവതി കേരള സാഹിത്യ അക്കാദമി, തൃശൂർ 3. ആധുനികത മലയാള കവിതയിൽ എൻ. അജയകുമാർ , പഠനസംഘം, ചങ്ങനാശ്ശേരി 4. സാഹിത്യം മലയാളത്തിൽ ആത്മകഥ - നടുവട്ടം ഗോപാലകൃഷ്ണൻ , ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട് , തിരുവനന്തപുരം
Web. URLs :	**http://www.keralaculture.org>literature**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	M	H	H	H	H	H	M	H	M	M
CO2	M	L	H	L	H	M	H	H	M	H	M	H	H
CO3	H	L	L	M	M	H	M	H	H	M	H	M	M
CO4	M	L	L	M	L	H	H	M	M	H	M	H	M
CO5	M	L	L	M	H	L	H	M	M	H	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms.RAJANI N.	Dr. SMITHA C.R.

Course Code	Title		
23U1FRN303	Part – I : Le Francais General – III		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	Acquisition of standard French by knowing more about the culture.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Improved understanding and communication		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn about the other French speaking nations, hobbies,	Lectures/ Tutorial	Assignment
CO 2	Le passé compose, l'imparfait	Group Learning	Assignment
CO 3	Social network, les indicateurs de temps	Peer Teaching	Seminar
CO 4	Le discours direct et indirect	Video Lecture / Lectures	Group Project
CO 5	To learn to answer questions orally in French	Group learning	Assignment

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	La langue francaise en action	1	1
		Instructional Hours	12
Suggested Learning Methods : Visuals			
II	Aller a la rencontre des autres	1	2
		Instructional Hours	12
Suggested Learning Methods : Group discussions			
III	Enrichir son reseau	1	3
		Instructional Hours	12
Suggested Learning Methods : Group discussions			
IV	Vivre l'information	1	4
		Instructional Hours	12
Suggested Learning Methods : Visuals			
V	Interroger le passe	1	5
		Instructional Hours	12
Suggested Learning Methods : Comprehensive writing			
		Total Hours	60

Text Books	1. Saison 2 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 0 to 4)
Reference Books	1. Connexions 2 Methode de Français Régine Mérieux , Yves Loiseau
Web. URLs	1. www.academia.edu

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	M	M	M	L	M
CO2	-	-	H	L	H	M	-	-	M	L	M	M	L
CO3	-	-	-	M	M	H	-	-	M	M	M	M	M
CO4	-	-	L	M	L	H	-	-	M	L	L	M	L
CO5	-	-	L	-	H	-	-	-	M	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Ms. SUNITA. R	Ms. SUNITA. R

Course Code	Title		
23U2ENG303	Part – II : Communicative English – I		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to All UG Programmes)			
Course Objective	To enable the students to learn the different genres of literature and gain a better understanding of the English language.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Execute moral, ethical and literary merits and relate it to the society.	Lecture/Tutorial	Assignment
CO 2	Exhibit a comprehensive knowledge of poetry and execute life skills and human values through it.	Lecture/Tutorial	Assignment
CO 3	Develop reading strategies with enriched vocabulary, through short story.	Lecture/Tutorial	Speaking
CO 4	Identify the use of English language through the study of Grammar and use them in specific contexts.	Lecture/Tutorial	Reading
CO 5	Interpret their understanding of English works in LSRW mode	Lecture/Tutorial	Writing

Offered by | **Department of English**

Course Content | **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** J.B. Priestley - Travel by Train R.K. Narayan - Headache E.M. Forster - Tolerance	1	1 - 3
		Instructional Hours	**12**
Suggested Learning Methods : Intensive Reading			
II	**Poetry** William Blake - The School Boy Rudyard Kipling - If Sarojini Naidu - The Queen's Rival	1	4 - 6
		Instructional Hours	**12**
Suggested Learning Methods : Scaffolding Method			
III	**Short Stories** O. Henry - After Twenty Years Edgar Allan Poe – Tell - Tale Heart Frank R.Stockton - The Lady or The Tiger?	1	7 - 9
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			

IV	Herman Melville-Moby Dick (Abridged Version)	1	10 - 13
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			
V	**Oral & Written Communication (UnitI–IV) Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing / viewing E-content (with subtitles), Guest / Invited Lectures, Conference/ Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc **Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending / Mock Viva Voce, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions. **Reading**–Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc **Writing** – Modals, Concord, E-Mail & Report Writing, Spotting the Errors and How to avoid them, Sentence Completion, Prepositions, Idioms and Phrases, Collocation.	1	14 - 17
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Unit I–V: Compiled by the Department of English
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE:(Text: Prescribed chapters or pages will be given to the students by the department
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	-	H	-	M	M	H	M	H	H	M	H	M
CO2	M	-	H	-	H	M	H	M	H	H	M	H	M
CO3	M	-	H	-	H	H	H	H	H	H	M	H	M
CO4	M	L	H	-	H	-	H	H	H	H	M	H	H
CO5	H	M	H	-	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Mr. D. Pradeek	Dr. R. Malathi

Course Code	Title		
23U3CJC304	Core Paper VII: Computer Networks		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Common to DCFS / AIML			
Course Objective	To make the students understand the concepts of Computer Networks.		
Course Category	Employability		
Development Needs	Global, National and Local		
Course Description	To learn the fundamentals of networking systems, their architecture, function and operation and how those fundamentals are reflected in current network technologies.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Relate the uses of computer networks.	Collaborative Learning	Group Discussion
CO 2	Understand the concept of transmission technologies in networks	Video Lectures	Poster Presentation
CO 3	Interpret the data link layer and Bluetooth architecture	Brainstorming	Assignment
CO 4	Identify the routing algorithms for data transmission and transport service primitives	Interactive Lecture	Seminar
CO 5	Apply the concept of cryptographic technologies for network security	Lecture / Class Projects	Quiz

Offered by DCFS

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Introduction:** The Uses of Computer Networks - Network Hardware - Network Software - Reference Model	1	1
		Instructional Hours	**12**
Suggested Learning Methods: Collaborative Learning			
II	**The Physical Layer:** Guided Transmission Media - Communication Satellites - The Public Switched Telephone Network - Structure of the telephone system - The Local Loops - S Modems - Wireless Local loops	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Scenario Based Learning			
III	**The Data Link Layer:** Data Link Layer – Design - Issues- Error Detection & Correction. The medium access control sub layer - The channel allocation problem. **Bluetooth:** Bluetooth architecture - Applications. Data Link Layer **Switching:** Repeaters, Hubs, Bridges, Switches, routers, and gateways	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Blended Learning			

IV	**The Network Layer:** Network Layer Design issues - Routing algorithms - The Optimality principle shortest path routing – flooding - distance vector routing - routing for mobile hosts. **The Transport layer:** The transport services - service provided to the upper layers, transport service primitives.	1	7
		Instructional Hours	**12**
Suggested Learning Methods : Discussion Based Learning			
V	**The Presentation Layer:** DNS - The Domain Name System - Electronic Mail. Architecture and service the user agent. **Network Security:** Cryptography-Symmetric Key algorithms, DES - Public-key algorithms - Digital signature - symmetric key signature - public key signatures	1	10
		Instructional Hours	**12**
Suggested Learning Methods : Experiential Learning			
		Total Hours	**60Hrs**

Text Books	1. Andrew S. Tanenbaum, **"Computer Networks",** 4th Edition, PHI
Reference Books	1. Achyut Godbole, **"Data Communication and Networks"**, 2007, TMH. 2. Uyless Black, **"Computer Networks: Protocols, Standards, and Interfaces",** 2nd ed.,PHI
Web. URLs	www.geekforgeeks.com/compter-networks.com

Tools for Assessment 20 Marks)

CIA I	CIA II	CIA III	Group Discussion	Assignment	Seminar	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H	M	M	H	H	M	M	H	H
CO2	M	M	H	M	H	M	M	M	H	M	M	H	H
CO3	H	H	M	H	M	L	H	L	M	L	H	L	M
CO4	H	H	L	M	H	H	M	H	H	H	M	H	H
CO5	H	M	M	H	M	M	H	M	M	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. B. Karthikeyan	Dr. J. Maria Shyla

Course Code	Title		
23U3CKC306	Core Paper VIII: Java Programming		
Semester: III	Credits: 4	CIA: 20 Marks	ESE:55 Marks
(Common to B. Sc. AIML / B. Sc. DCFS / BCA)			
Course Objective	To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.		
Course Category	Entrepreneurship		
Development Needs	Global		
Course Description	To understand the Object-Oriented Paradigm for developing programs using Control statements, Arrays, Packages, Interfaces, Exceptional Handling, Multi-threading and create networking applications		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamental concepts of Object-oriented Programming.	Lecture	Class Participation
CO 2	Develop simple Java programs with Control statements and arrays.	Constructivist learning	Quiz
CO 3	Apply the principles of packages and interfaces.	Demonstration	Seminar
CO 4	Design Java application using the concepts of Exception Handling and Multithreading.	Constructivist learning,	Seminar
CO 5	Develop applications using IO Streams and AWT.	Problem-based Teaching,	Assignment

Offered by	Computer Applications

Course Content	Instructional Hours / Week: 4

Unit	Description	Text Book	Chapters
I	**Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine-Command Line Arguments.	1	1,2,3
		Instructional Hours	**12**
	Suggested Learning Methods: Code Debugging		
II	Constants, Variables, Data Types, Operators and Expressions, **Decision Making and Branching:** if, if...else, nested if, switch,? : Operator, **Decision Making and Looping:** while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods. **Arrays:** One Dimensional Array-Creating an Array- Two Dimensional Array.	1	4,5,6,7 & 8
		Instructional Hours	**12**
	Suggested Learning Methods: Code Debugging		
III	**Interfaces: Multiple Interface-**Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import.	1	10,11 & 12

		Instructional Hours	**12**
Suggested Learning Methods: Simple Application Development			
IV	**Exception Handling:** Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-Suspending, Resuming and Stopping Threads-JDBC.	**2**	10 & 11
		Instructional Hours	**12**
Suggested Learning Methods: Simple Application Development			
V	**Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. Java Networking -INetaddress-User Datagram Protocol, Internet Control Protocol, UDP Programming in Java Transmission Control Protocol, Multithreading & TCP Sockets Programming in Java.	2	16,18 &19
		Instructional Hours	**12**
Suggested Learning Methods: Simple Application Development			
		Total Hours	**60**

Text Books	1. E. Balagurusamy, "**Programming with Java – A Primer"**, Tata McGraw Hill Publication, 3rd Edition, 2007 2. ISRD Group, "**Introduction to Object Oriented Programming Through Java"**, Tata McGraw Hill Publication, Forth Reprint 2008. 3. Java Network Programming, 4th Edition,Orielly Publication.
Reference Books	1. Patrick Naughton & Hebert Schildt, "**The Complete Reference Java 2",** Tata McGraw Hill Publication**,** 3rdEdition, 2002 2. John R. Hubbard, "**Programming with Java"**, Tata McGraw Hill Publication, 2nd Edition, 2009.
Web. URLs	https://www.w3schools.com/java/default.asp

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	-	M	H	-	M	H	H	H	H	M	M
CO2	H	H	-	M	H	-	M	H	H	H	H	M	M
CO3	H	H	-	M	H	-	M	H	H	H	H	H	H
CO4	H	H	-	M	H	-	M	H	H	H	H	H	H
CO5	H	H	-	M	H	-	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. K. Selvavinayaki	Dr. K. Selvavinayaki

Course Code	Title		
23U3AMP305	Core Paper IX: Practical in Java and Network Programming		
Semester: III	Credits: 2	CIA: 20 Marks	ESE: 30 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To enable the students to develop problem solving skills and programming ability in Java language.		
Course Category	Employability		
Development Needs	Global		
Course Description	To make the students to understand the object-oriented paradigm,design technique, syntax.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop programs to implement the string, array and multiple inheritance concepts.	Code Review	Program Creativity
CO 2	Implement the multithreading, exception handling concepts to solve real world problems	Hands on Training	Debugging
CO 3	Apply the concept of package to illustrate reusability.	Code Review	Application of Logic
CO 4	Create application for file handling.	Hands on Training	Program Development
CO 5	Create Networking Applications using Java Network Programming concepts	Hands on Training	Program Development

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 3

Unit	List of Practical
1	Write a Java Applications to extract a portion of a character string and print the extracted string.
2	Write a Java program to insert an element (specific position) into an array.
3	Write a Java Program to implement the concept of Interfaces.
4	Write Java program to implement overloading of methods.
5	Write a program to implement the concept of Exception Handling.
6	Write java program to demonstrate runtime polymorphism using overriding.
7	Write Java program to add two matrices.
8	Write a Java Program to implement the concept of multithreading with the use of any three Multiplication tables and assign three different priorities to them.
9	Write a Java program to import classes from user defined package and creating package.
10	Write a Java program to process text file.
11	Write a Java Program to find the IP Address of the Machine

12	Write a Java Program to implement TCP Protocol.
13	Write a Java Program to illustrate the Local Loop in the network.
14	Write a Java Program to implement UDP Protocol.
15	Write a Java Program to implement Stop and Wait Protocol

Suggested Learning Methods: Solving Case studies, Peer tutoring and pair programming	
Total Hours	**45**

Tools for Assessment (20 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
3	3	3	4	4	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	M	M	-	-	H	M	H	H	M	M
CO2	M	H	-	M	M	-	M	H	M	H	M	H	M
CO3	M	H	-	M	M	-	-	H	H	M	M	M	H
CO4	H	H	-	M	M	-	-	H	M	H	H	H	M
CO5	H	H	-	M	M	-	-	H	H	M	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3MIA303	Allied Paper III : Operations Research		
Semester: III	Credits : 4	CIA: 25 Marks	ESE: 75 Marks
(Common to BCA, B. Sc., CS / IT / AIML)			
Course Objective	On successful completion of the course the students to learn various mathematical applications in industries, decision making for real time environment		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Operations research is an analytical approach of problem-solving skill and Decision-making that is useful in the management of organizations.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Classify different OR models and knowing their advantages in decision making environment	Group learning / Lectures	Assignment
CO 2	Recognize and formulate transportation, assignment problems and derive their optimal solution.	Peer Teaching / Lectures	Unit Test
CO 3	Gain knowledge about Game theory and replacement models.	Lectures / Tutorial	Seminar
CO 4	Outlining the Queuing Theory concepts.	Group learning / Lectures	Assignment
CO 5	Construct Network models (PERT & CPM) for scheduling the project.	Video Lectures / Lectures	Quiz

Offered by	Mathematics

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Linear programming – Mathematical Formulation - Solving LPP using Graphical Method - Canonical and Standard form of LPP.	1	2, 3
	Simplex Method – Big - M Method, Principles of Duality.	1	4, 5
	Instructional Hours		**12**
Suggested Learning Methods : Problem Solving Practice			**02 Hrs**
II	**Transportation Problems**: Introduction – Initial Basic Feasible solutions – Balanced Transportation Problem : North West Corner Rule, Least Cost Method , Vogel's Approximation Method - Unbalanced Transportation Problem- Optimality – MODI Method (Non Degeneracy).	1	10
	Assignment Problem: Introduction – Hungarian Assignment method – Maximization in Assignment problem - Unbalanced Assignment problem- Travelling salesman problem.	1	11
	Instructional Hours		**12**
Suggested Learning Methods : Seminar			**02 Hrs**
III	**Game Theory:** Concept of Pure and Mixed Strategies – Solving 2 x 2 matrix with and without saddle point - 2 x n & m x 2 games by Graphical Method - Dominance Property.	1	17

	Replacement models: Elementary Replacement Models - Present Value - Rate of Return - Depreciation - Individual Replacement – Group Replacement.	1	18
		Instructional Hours	**12**
Suggested Learning Methods : Group Discussion			**02 Hrs**
IV	**Queuing Theory (Derivations not included):** Introduction – Elements of Queuing System – Operating Characteristics of Queuing systems – Probability Distributions in Queuing Systems - Birth death process.	1	20
	Classification of Queuing Models: Single Server - finite and infinite population models. (Model I , Model II & Model III) – Problems only.	1	20
		Instructional Hours	**12**
Suggested Learning Methods : https://youtu.be/xGkpXk-AnWU			**02 Hrs**
V	**Network Scheduling:** Critical Path Method – Principles of Network Construction: Forward Pass – Backward Pass computations – Types of Floats - Practical Problems in Networking Methods. **PERT:** Critical Path – Probability of completion of project-Difference between PERT and CPM.	1	21
		Instructional Hours	**12**
Suggested Learning Methods : Problem Solving Practice			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	Kanti Swarup, P.K. Gupta, Man Mohan, "**Operations Research",** S. Chand & Sons, 2003. Unit – 1 : Chapter 2,3,4,5; Page No:29-42,43-55,57-78,87-92 Unit – 2 : Chapter 10 & 11; Page No : 171-185,209-230 Unit – 3 : Chapter 17 & 18; Page No : 313-329,341-356 Unit – 4 : Chapter 20 - 20.1 - 20.8; Page No: 415- 445 Unit – 5 : Chapter 21- 21.1- 12.7; Page No: 459-480
Reference Books	1. Hamdy A Taha, **Operations Research – An introduction,** Prentice Hall of India PVT.LTD, 8th edition, 2008. 2. J. K. Sharma, **Operations Research Theory and Applications**, MacMillan India Ltd, 2008.
Web. URLs	1. https://youtu.be/4U3B5lr-MqM.(Introduction to OR) 2.https://www.youtube.com/watch?v=2AOhCWhwOKo (PERT concepts)

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Seminar	Assignment	Periodical Quizzes	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	L	M	M	L	M	H	M	L	M	M	L
CO2	H	M	L	M	H	M	M	M	H	M	H	H	M
CO3	H	M	L	L	H	M	M	M	H	M	M	H	M
CO4	H	H	L	H	H	H	M	H	H	H	M	H	H
CO5	H	H	L	H	H	H	M	H	M	L	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. K. Reena	Dr. T. Chandrapushpam

Course Code	Title		
23U4AMZ301	Skill Based Paper I : Practical in Object oriented Programming		
Semester: III	Credits: 3	CIA: 30 Marks	ESE: 45 Marks
(B. Sc Artificial Intelligence and Machine Learning)			
Course Objective	To Acquire the concepts of Object-Oriented Programming Paradigm and the programming constructs of C++		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To make the students to understand Object oriented programming concepts using C++ Programs		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Apply the various basic programming constructs like decision making statements. Looping statements, functions, concepts like overloading, inheritance, polymorphism, virtual functions, constructors and destructors	Laboratory Practice	Program Creativity
CO 2	Illustrate the concept of Virtual Classes, inline functions and friend functions	Program Demonstration	Debugging
CO 3	Compare the various file stream classes; file types, usage of templates and exception handling mechanisms	Laboratory Practice	Application of Logic
CO 4	Compare the pros and cons of procedure-oriented language with the concepts of object oriented language	Code review	Program Development
CO 5	Evaluate the Optimal Solutions	Laboratory Practice	Program Development

Offered by	B. Sc Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 3

Unit	List of Practical
1	Write a C++ Program to create a class to implement the data structure STACK
2	Write a C++ Program to create a class ARITHMETIC which consists of a FLOAT and an INTEGER variable
3	Write a C++ Program to read an integer number and find the sum of all the digits until it reducesto a single digit using constructors, destructors and inline member functions
4	Write a C++ Program to create a class FLOAT that contains one float data member
5	Write a C++ Program to create a class STRING
6	Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number, E_Name, Department, Basic, Salary, Grade
7	Write a C++ Program to create a class SHAPE which consists of two VIRTUAL FUNCTIONS

8	Write a C++ Program to create two classes each class consists of two private variables, a integerand a float variable
9	Write a C++ Program using Function Overloading to read two Matrices of different Data Typessuch as integers and floating point numbers
10	Write a C++ Program to check whether the given string is a palindrome or not using Pointers.
11	Write a C++ Program to create a File and to display the contents of that file with line numbers.
12	Write a C++ Program to merge two files into a single file.

Total Hours	**45**

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title	
22U3NM3BT	Part IV : Basic Tamil – I (அடிப்படைத்தமிழ் - I)	
Semester: III	Credits: 2	CIA: 50 Marks

(Common to all UG Programmes)

Course Objective	தமிழ் மொழியைக் கற்பித்தல்–மொழித்திறனை வளர்த்தல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாடு.	குழு விவாதம்	ஒப்படைவு
CO 2	பிறமொழி கற்றல் ஆர்வம் தூண்டல்.	குழு விவாதம்	கருத்தரங்கு
CO 3	பிறமொழி அறிவுத் திறன் மேம்படச்செய்தல	விரிவுரை/ காணொளிப்பட விளக்கம்	குழுத்திட்டம்
CO 4	வார்த்தை அமைக்கும் திறன் பெறச்செய்தல்.	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	கையெழுத்துத்திறன் பெறச்செய்தல்.	குழு விவாதம்	குழுத்திட்டம்

Offered by தமிழ்த்துறை

Course Content : Basic Tamil – I அடிப்படைத்தமிழ் - I — **Instructional Hours / Week : 2 Hours**

Unit	Description	Text Book	Chapters
I	தமிழ் மொழியின் அடிப்படைக் கூறுகள்	இலக்கணம்	1.உயிர்எழுத்துக்கள் 2.மெய் எழுத்துக்கள் 3.உயிர்மெய் எழுத்துக்கள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : எழுத்துக்களை எழுதும் மற்றும் வாசிக்கும் திறன் பெற்றமை			
II	சொல் அமைத்தல்	இலக்கணம்	1.ஓர் எழுத்து ஒருமொழி 2.இரண்டுமுதல் ஐந்து எழுத்துச்சொற்கள் 3.தமிழ் மாதங்கள் பெயர்,கிழமைகளின் பெயர் 4.வண்ணங்கள் பெயர், 5.சொல் ஆக்கம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : எழுத்துக்களை கொண்டு சொற்களை உருவாக்கும் பயிற்சி பெற்றமை			
III	தொடரமைப்பு	தொடரமைப்பு	1.எழுவாய் 2.செயப்படுபொருள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : சொற்களைக் கொண்டு தொடர் உருவாக்கும் பயிற்சி பெற்றமை			
IV	குறிப்பு எழுதுதல்	இலக்கணம்	1.தொடரமைப்பு 2.பத்தி அமைப்பு
		Instructional Hours	**6 Hours**
Suggested Learning Methods : பத்தி அமைப்பு உருவாக்கும் திறன் பெற்றமை			

V	பிழைநீக்குதல்	இலக்கணம்	1.ஒற்றுப்பிழை 2.வாக்கியப் பிழை
		Instructional Hours	**6 Hours**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் திறன் பெற்றமை			
		Total Hours	**30 Hours**

Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாடநூல்"அரிச்சுவடி" தொகுப்பு: தமிழ்த்துறை,நேரு கலை மற்றும் அறிவியல் கல்லூரி,கோயம்புத்தூர்.
Reference Books	1. பவணந்தி முனிவர்,நன்னூல் பூலியூர்க்கேசிகன் உரை,சாரதா பதிப்பகம், சென்னை–40. 2. தொல்காப்பியம், கணேசையர் பதிப்பு,உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை -113.
Web. URLs	https://youtu.be/P7vvUnjI6vY, https://youtu.be/Zx4R3yZseuQ.

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
8	8	10	8	8	8	50

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	H	L	H	M	H	H	M	H	M	H	M
CO2	M	L	H	L	M	M	L	H	H	M	H	M	H
CO3	H	L	H	L	L	M	M	H	M	H	M	H	M
CO4	H	L	M	L	L	M	H	M	M	H	M	M	H
CO5	M	L	H	L	M	M	H	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh kumar	Dr. A. Sridevi

Course Code	Title	
22U4NM3AT1	Part IV: Advanced Tamil – I (சிறப்புத்தமிழ் -I)	
Semester: III	Credits: 2	ESE: 50 Marks
Course Objective	புதுக்கவிதை உருவாக்கும் திறன் வளர்த்தல் - மொழித்திறனை மேம்படுத்துதல்	
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)	
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)	
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	புதுக்கவிதை படைக்கும் திறன்வளர்த்தல்	விரிவுரை	குழுத்திட்டம்
CO 2	படைப்பாக்கத்திறன் அறிவு பெறச்செய்தல்.	விரிவுரை / குழு விவாதம்	கருத்தரங்கு
CO 3	தகவல் தொடர்பியலுக்கான கடிதம்,அமைவுத்திறன் பெறச்செய்தல்	விரிவுரை / காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	மொழியைப் பிழையின்றிப் பேசும் ,எழுதும் திறன் பெறச் செய்தல்	விரிவுரை	ஒப்படைவு
CO 5	கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல்.	விரிவுரை / காணொளிப்பட விளக்கம்	குழுத்திட்டம்

Offered by	தமிழ்த்துறை

Course Content: Advanced Tamil - I (சிறப்புத்தமிழ் -I)	Instructional Hours / Week : 2 Hours

Unit	Description	Text Book	Chapters
I	புதுக்கவிதை	1. பாரதியார் 2. பாரதிதாசன்	1.1.தேசபக்திபாடல் தாயின் மணிக்கொடி பாரீர் 1.2.பாரதிதாசன்(தமிழ்மொழிபற்று- கனியிடை,தமிழுக்கும் அமுதென்று)
		Instructional Hours	6 Hours
Suggested Learning Methods : கவிதை எழுதும் திறன் பெற்றமை			
II	பிழை நீக்குதல்	இலக்கணம்	2.1.சொற்பிழை நீக்கம் 2.2.தொடர் பிழை நீக்கம் 2.3.பத்தி எழுதச் செய்தல்
		Instructional Hours	6 Hours
Suggested Learning Methods :வாக்கியங்களைப் பிழை இன்றி எழுதும் திறன் பெற்றமை			
III	இலக்கணப் பயிற்சி அளித்தல்	இலக்கணம்	3.1.தொகை நிலைத்தொடர், 3.2.தொகா நிலைத்தொடர் 3.3.ஆகுபெயர் வகைகள்

		Instructional Hours	**6 Hours**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் பயிற்சி பெற்றமை			
IV	கடிதம் எழுதுதல்	இலக்கணப் பயிற்சி ஏடு	4.1. பாராட்டுக்கடிதம் 4.2. நன்றிக்கடிதம் 4.3. அழைப்புக்கடிதம் 4.4. அலுவலகக் கடிதம் 4.5. நட்புக்கடிதம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : கடிதம் எழுதும் திறன் பெற்றமை			
V	இலக்கிய வரலாறு	தமிழ் இலக்கிய வரலாறு	1.வேலு நாச்சியார் 2.கப்பலோட்டிய தமிழன்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : தமிழ் இலக்கிய வரலாற்றின் சிறப்பினை அறிய பெற்றமை			
		Total Hours	**30 Hours**

Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல்"திரட்டு"தமிழ்த்துறை. தொகுப்பு: தமிழ்த்துறை,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. பாரதியார்- பாரதியார் கவிதைகள், அபிராமி பதிப்பகம், 7- பி, கொடிமரத் தெரு, சென்னை– 013. 2. பவணந்தி முனிவர் – நன்னூல் புலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்னை -040.
Web. URLs	https://youtu.be/xnsvFOHxDeo, https://youtu.be/kQoIj-29VIk.

Course designed by	**Verified by**
Dr. S. Satheesh kumar	Dr. A. Sridevi

Course Code	Title	
22U4NM3CAF/ 21U4NM3CAF	Non Major Elective : Consumer Affairs	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		
Course Objective	To enable the students to understand the concepts of Consumers and Markets	
Course Category	Employability	
Development Needs	National & Global	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Know their rights and responsibilities as a consumer	Lecture/ Video Lectures	Assignment
CO 2	Gain knowledge about Consumer protection law in India	Lecture/ Peer Teaching	Seminar
CO 3	Understand the procedure about redressed of consumer complaints	Lecture/ Group Discussion	Seminar
CO 4	Learn about Consumer related regulatory agencies and Norms	Lecture/ Role Play	Assignment
CO 5	Comprehend Business Firms, Interface with Consumers.	Lecture/ Group Discussion	Quiz

Offered by	Department of Business Administration
Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	**Conceptual Framework - Consumer and Markets:** Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labelling and packaging along with relevant laws, Legal Metrology. Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process.	1	1 & 2
		Instructional Hours	**6**
Suggested Learning Methods : Video lectures			
II	**The Consumer Protection Law in India** **Objectives and Basic Concepts:** Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice.	1	5 & 6
		Instructional Hours	**6**
Suggested Learning Methods : Peer Teaching			

III	**Grievance Redressal Mechanism under the Indian Consumer Protection Law** Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal f cases, Relief/Remedy available; Temporary Injunction, Offences and penalties.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	**Role of Industry Regulators in Consumer Protection -** Industry self-regulation (ISR) Protection Policies, Consumer Protection Agencies i. Telecommunication: TRAI ii. Food Products: FSSAI Insurance : IRDA and Insurance Ombudsman	2	4
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	**Contemporary Issues in Consumer Affairs** **Consumer Movement in India:** Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing. **Quality and Standardization:** Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance.	2	6 & 7
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
		Total Hours	**30**

Reference Books	1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, Universities Press. 2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	-	-	-	M	H	H	M	M	M	L	M	M
CO2	L	-	-	-	M	H	H	M	M	L	M	M	L
CO3	L	-	-	-	M	H	M	M	M	M	M	L	M
CO4	L	-	-	-	M	H	H	M	M	L	L	M	M
CO5	L	-	-	-	M	H	H	M	M	M	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. R. A. Ayyapparajan	Dr. R. A. Ayyapparajan

Course Code	Title	
22U4NM3GST	Non Major Elective : Gender Sensitization	
Semester : III	Credits : 2	ESE : 50 Marks

(Common to all UG Programmes)

Course Objective	To raise awareness of gender, promote gender equality, and equip learners with key concepts and principles of gender sensitization.
Course Category	Skill Development, Employability and Entrepreneurship
Development Needs	Local, National and Global
Course Description	The course aims an exploration of overview of gender, its social construction, gender issues and challenges in India, and equips learners with key concepts and principles of gender sensitization to promote inclusivity and equity.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn gender roles, socialization, and stereotypes.	Direct Instruction	Assignment
CO 2	Recognize the gender discrimination causes, areas, and levels in institutions.	Direct Instruction	Seminar
CO 3	Identify the gender identity formation, types, families, and socialization in India.	Video Lessons	Assignment
CO 4	Understand the gender concerns in access, enrollment, retention, participation, and achievement.	Direct Instruction	Assignment
CO 5	Apply the Laws Related to Women	Direct Instruction	Exhibition

Offered by | **Department of Costume Design and Fashion**

Course Content | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Gender Socialisation and Gender Roles:** Introduction- Meaning of Sex and Gender, Gender Socialisation– Definitions, Agents of Gender Socialisation, Gender Roles- Meaning, Definitions, Nature of Gender Roles, Factors Determining Gender Roles/Stereotypes	1	-
	Instructional Hours		**6**
Suggested Learning Methods : Group discussions			
II	**Gender Discrimination:** Gender Discrimination - Meaning and Causes of Gender Discrimination, Areas of Gender Discrimination, Gender Discrimination at Different Levels of Institutions	1	-
	Instructional Hours		**6**
Suggested Learning Methods : Video documentaries and films			
III	**Gender Identity:** Gender Identity - Meaning, Formation and Factors of Gender Identity, Types of Gender Identity, Types of Families in India, Gender Socialisation within Indian Families	1	-
	Instructional Hours		**6**
Suggested Learning Methods : Case Method			

IV	**Gender Concerns:** Gender Concerns Related to Access, Enrolment, Retention, Participation, and Achievement	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Video documentaries and films			
V	**Laws Related to Women:** Laws Related to Rape, Laws Related to Dowry - Dowry Prohibition Act, 1961, Laws Related to Remarriage, Laws Related to Divorce, Laws Related to Property Inheritance, Laws Related to Trafficking, Constitutional and Legal Aspects related to Women - Women's Reservation Bill – History and Current Status	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Case Method			
		Total Hours	**30**

Text Books	1. Gender School and Society : Self-learning Material, MANGALORE UNIVERSITY, Printed at Datacon Technologies, Bangalore, 2018
Reference Books	1. United Nations Development Programme. (2014). Gender Equality and Women's Empowerment: Training Manual. New York: UNDP.
Web. URLs	1. Coursera - https://www.coursera.org/courses?query=gender%20sensitization 2. edX - https://www.edx.org/learn/gender-sensitization 3. Udemy - https://www.udemy.com/topic/gender-sensitization/

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	M	M	H	H	M	L	M	M	L	M
CO2	H	M	M	M	H	H	M	M	-M	M	M	-M	M
CO3	H	M	M	M	M	H	H	M	L	L	M	M	L
CO4	H	M	M	M	L	H	H	M	M	-M	L	M	-M
CO5	H	M	M	M	M	H	M	M	M	L	-M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms. M. Nandhini	Dr. S. Jayapriya

Course Code	Title	
22U4NM3WRT / 21U4NM3WRT	Non Major Elective : Women's Rights	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		
Course Objective	To facilitate the awareness about the social, economical, political, intellectual or cultural contributions of Women in India.	
Course Category	Skill Development	
Development Needs	National	
Course Description	Apply the knowledge of Rights related to women for their betterment.	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Aware of basic constitutional rights	Lecture/ Case Study/ Role Play	Seminar
CO 2	Gain awareness on Political rights	Lecture/ Case Study/ Role Play	Role Play
CO 3	Understand individual and familial rights	Lecture/ Case Study/ Role Play	Role Play
CO 4	Grasp the provisions for Women's Rights in India	Lecture/ Case Study/ Role Play	Role Play
CO 5	Develop an understanding of the Protection Mechanisms for women	Lecture/ Case Study/ Role Play	Assignment

Offered by	Department of Social Work

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	**Constitutional Rights of Women in India**: Indian constitution relating to women - Fundamental rights - Directive principles of state policy - right to equality – rights against exploitation cultural and educational rights - the right to constitutional remedy - University Declaration of Human Rights -Enforcement of Human Rights for Women and Children - Role of Cells and Counseling Centers - Legal AID cells, Help line, State and National level Commission	4	2
		Instructional Hours	**6**
Suggested Learning Methods : Seminar			
II	**Political Rights of Women in India:** Political Rights of Women in India - Electoral process – women as voters - candidates and leader - pressure group, 73rd and 74th amendment and representation of women in local self –government – women in Rural and urban local bodies - Reservation of women - party ideologies and women's issues.	5	1
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			

III	**Women's Rights: Access to Justice:** Introduction – Criminal Law – Crime Against Women Domestic Violence – Dowry Related Harassment and Dowry Deaths - Molestation – Sexual Abuse and Rape Loopholes in Practice–Law Enforcement Agency	3	7
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
IV	**Women's Rights:** Violence Against Women – Domestic Violence The Protection of Women from Domestic Violence Act 2005, The Marriage Validation Act 1982 - The Hindu Widow Remarriage Act 1856 - The Dowry Prohibition Act 1961.	3	5
		Instructional Hours	**6**
Suggested Learning Methods : Creative Art Assignments			
V	**Special Women Welfare Laws:** Sexual Harassment at Work Places, Rape and Indecent Representation, The Indecent Representation (Prohibition) Act, 1986, Immoral Trafficking, The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment, Role of Rape Crisis Centers. Protection of Children from sexual Offences Act 2012.	3	9
		Instructional Hours	**6**
Suggested Learning Methods : Community Participation Program			
		Total Hours	**30**

Reference Books

1. P. D. Kaushik "Women Rights" Book well Publication 2007 UN Centre for Human Rights, Discrimination against Women (Geneva: World Campaign for Human Rights,1994).
2. Agnes, Flavia. (1992). "Give us "Give us This Day Our Daily Bread: Procedures and Case Law on Maintenance". Majlis, Bombay.
3. Agnes, Flavia. (1999). "Law and Gender Inequality: The Politics of Women"s Rights in India". OUP, New Delhi

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H	M	M	M	L	M	L	M	M
CO2	H	M	M	H	M	M	H	H	M	M	L	L	L
CO3	H	M	M	H	M	H	M	M	M	M	L	M	M
CO4	M	H	M	H	M	M	M	H	L	M	L	L	M
CO5	H	M	M	H	M	H	M	M	L	M	L	L	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. P. Nathiya	Dr. P. Nathiya

23U1TAM404	Part - I : Muthamizh (முத்தமிழ்)		
Semester: IV	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**
Course Objective	சங்ககால மக்களின் வாழ்வியல் வாயிலாக பண்பாட்டுக் கூறுகளை உணர்த்துதல		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Global/Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	தமிழர்களின் வாழ்வியல் பண்புகளைக் கற்று அறிதல்.	விரிவுரை/காணொளிப் பட விளக்கம்	ஒப்படைவு
CO 2	தமிழ் இலக்கிய வகைகளைக் கூறுவதன் மூலம் தமிழின் இலக்கிய வளத்தை உணரச்செய்தல்.	விரிவுரை	குழுத்திட்டம்
CO 3	மாணவர்களிடையே காலத்திற்கேற்ப மனவளர்ச்சியை உருவாக்குதல்.	விரிவுரை/காணொளிப் பட விளக்கம்	கருத்தரங்கு
CO 4	நாட்டின் சிறந்த குடிமக்களாக மாணவர்களை உருவாக்குதல்.	விரிவுரை	ஒப்படைவு
CO 5	மாணவர்களின் மனநலத்தை வளர்த்தல்.	விரிவுரை/குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content: Muthamizh (முத்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	எட்டுத்தொகை	1. நற்றிணை 2. குறுந்தொகை 3. பதிற்றுப்பத்து 4. புறநானூறு	1.1 குறிஞ்சி: நின்ற சொல்லார் .., 1.2 முல்லை : இளமை பாரார் ..., குறிஞ்சி : நிலத்தினும்..., பாலை :ஆடு அமை ...விளையாட்டு ஆயமொடு 1.3 ஐந்தாம் பத்து : ஊன் தூவை அடிசில் 1.4. யாதும் ஊரே .. பல் சான்றீரே .., அற்றைத்திங்கள்
			Instructional Hours — **12 Hours**
Suggested Learning Methods: சங்க இலக்கிய வழி நற்பண்புகளை அறியச்செய்தல்			
II	பத்துப்பாட்டு	1.சிறுபாணாற்றுப்படை 2.குறிஞ்சிப்பாட்டு 3.பொருநர்ஆற்றுப்படை 4.மதுரைக்காஞ்சி	2.1 கடையெழு வள்ளல்கள் சிறப்பு 2.2 அறத்தொடு நிற்றல் 2.3 மன்னனின் விருந்தோம்பல் 2.4 பாண்டிய நெடுஞ்செழியன் குடிச்சிறப்பு
			Instructional Hours — **12 Hours**
Suggested Learning Methods : புலவர்களின் மாண்புகளை வெளிப்படுத்துதல்			
III	அற இலக்கியங்கள்	1. நான்மணிக்கடிகை 2. இனியவை நாற்பது 3. களவழி நாற்பது- 4. ஆசாரக்கோவை	விளம்பிநாகனார் - (1-5 பாடல்கள்) பூதஞ்சேந்தனார் - (1-5 பாடல்கள்) பொய்கையார் - (11-15பாடல்கள்) பெருவாயின் முள்ளியார் (1-5 பாடல்கள்)
			Instructional Hours — **12 Hours**
Suggested Learning Methods : அற இலக்கியங்களின் மாண்புகளை அறிய பெற்றமை			
IV	தமிழ்ச் செயலிகள்	தனித்தமிழ்	4.1 செயலிகள் அறிமுகம் 4.2 வகைகள்

			4.3 மொழிபெயர்ப்புச் செயலிகள் 4.4 தமிழ்ச் செயலிகள்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : தமிழ்ச் செயலிகள் பற்றி அறியும் வாய்ப்பு பெற்றமை			
V	இலக்கணம்	1.நன்னூல் 2.தொல்காப்பியம்	5.1 முதற்பொருள், கருப்பொருள், உரிப்பொருள் 5.2 பத்து அழகு 5.3 பத்து குற்றம் 5.4 ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : இலக்கண மாண்புகளை அறியும் திறன் பெற்றமை			
		Total Hours	**60 Hours**

Text Books	1. இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் தொகுப்பு: "முத்தமிழ்" தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. சங்க இலக்கியங்கள் - எட்டுத்தொகை, பத்துப்பாட்டு கழக வெளியீடு, திருநெல்வேலி. 2. தனித்தமிழ்- இளசுந்தரம், விகடன் பிரசுரம். சென்னை.
Web. URLs	https://youtu.be/GrNnb68Fd6w , https://youtu.be/14-sEAUzXP8 .

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	**L**	H	L	H	H	M	H	H	M	H	M	H
CO2	M	**L**	H	L	M	L	M	H	M	H	M	H	M
CO3	H	**L**	H	L	H	H	M	H	M	H	M	M	M
CO4	M	**L**	M	L	H	H	H	M	H	M	H	M	H
CO5	H	**L**	L	L	M	H	L	M	M	M	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh kuma	Dr. A. Sridevi

Course Code	Title		
23U1HIN404	Part I - Prayogik Hindi (प्रायोगिक हिंदी)		
Semester: IV	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			

Course Objective	साक्षरता प्रशंसा और विश्लेषण के सौंदर्य, सांस्कृतिक और सामाजिक पहलुओं के प्रति छात्रों को संवेदनशील बनाना | उन्हें विभिन्न कालों के प्रख्यात लेखकों के हिंदी कथा साहित्य के बेहतरीन नमूने उपलब्ध कराना |
Course Category	Skill Development
Development Needs	National
Course Description	Improves Creative Writing.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हिंदी भाषा से अच्छी तरह वाकिफ हो सकेंगे।	Role play	Assignment
CO 2	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता है।	Group learning Acting	Seminar
CO 3	छात्र आधुनिक हिंदी साहित्य का ज्ञान प्राप्त कर सकेंगे।	Story Narration	Assignment
CO 4	छात्रों को निबंध लेखन में अच्छा अभ्यास मिलेगा।	Group learning and Work sheets	Group Project
CO 5	छात्रों को फिल्म की समीक्षा करने का अभ्यास मिलेगा।	Worksheets and Exercises	Seminar

Offered by	**Hindi**

Course Content	**Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	विरुद्ध उपन्यास: (मृणाल पाण्डे)	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	कथा माला , (मृदुला गर्ग) लौटना और लौटना : ममता जयशंकर) ,प्रसाद आदमी का बच्चा (यशपाल)	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory			**02 Hrs**
III	1.दिए गए अनुच्छेद पर समीक्षा लिखना 2.आधुनिक काल: प्रवृतियां और कवि	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**

IV	1.सामान्य निबंध: आधुनिक शिक्षा प्रणाली, मोबाइल का दुष्परिणाम, आधुनिक युवा पीढ़ी 2. हिंदी में दी गई कहानी के लिए सारांश लिखना।	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual, Comprehensive			**02 Hrs**
V	सिनेमा समीक्षा : पद्मावत	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. विरुद्ध उपन्यास: (मृणाल पाण्डे) 2. कहानी कुंज , गोविंद प्रकाशन , मथुरा 3. हर हाल बेगाने - मृदुला गर्ग , राजपाल एंड संस , दिल्ली 4. मेरा परिवार , लोकभारत प्रकाशन , इलाहाबाद
Reference Books	1. संजय चौहान , समकालीन हिंदी साहित्य विचार और विवाद , आशा किताबें 2. श्री रामदेव, व्याकरण प्रदीप, लोकभारती प्रकाशन, अलाहाबाद 3. डॉ वासुदेव नंदन प्रसाद, आधुनिक हिंदी व्याकरण और रचना, भारती भवन प्रकाशक 4. ओंकार नाथ वर्मा , सामान्य हिंदी , अरिहंत प्रकाशन भारत लिमिटेड
Web. URLs	1. www.webdunia.com 2. www.hindikunj.com 3. hindi-natak-vikas.html 4. www.bhashaindia. 5. www.hindisamay.com 6. https://ebook.pustak.org/

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	L	M	H	M	M	L	H	L	L	L	M	M	L
CO2	L	M	H	H	L	H	L	M	L	L	M	M	M
CO3	M	L	L	L	L	H	M	M	L	L	M	M	L
CO4	M	M	M	M	H	L	M	H	L	L	M	M	M
CO5	H	H	L	L	H	L	H	H	L	L	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code	Title		
23U1MAL404	**Part - I : Drisyakalaa Saahithyam (ദൃശ്യകലാസാഹിത്യം)**		
Semester: IV	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	സിനിമ എന്ന മാധ്യമത്തിന്റെ വിവിധ തലങ്ങളെ ആഴത്തിൽ മനസ്സിലാക്കാൻ കഴിയുന്നു.ദൃശ്യാവിഷ്ക്കരണത്തെ കുറിച്ചുള്ള അറിവ് ലഭിക്കുന്നു.
Course Category	Skill Development
Development Needs	Regional
Course Description	Guide and encourage them to achieve their ambitions

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	തിരക്കഥയിലെ സംഭാഷണത്തിന്റെ പ്രസക്തി	Smart boards/ chalk and Talk	Assignment
CO 2	മനക്കരുത്തിലൂടെ വീട്ടിലെ എല്ലാ അംഗങ്ങളെയും ദുഃഖം അറിയിക്കാതെ മംഗളകർമ്മം നടത്തുന്നു.	Group learning	Seminar
CO 3	കുടുംബത്തിന്റെ തകരുന്ന മൂല്യത്തെ ഉയർത്തുന്നു	Peer Teaching	Assignment
CO 4	ദൃ ശ്യാവിഷ്ക്കരണം മലയാളത്തിൽ	Group learning	Group Project
CO 5	രംഗവേദിയുടെ അവതരണം	Smart boards/ chalk and Talk	Assignment

Offered by **Malayalam**

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			**02 Hrs**
III	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
IV	നാടകം - ഭരതവാക്യം	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Auditory, Visual			**02 Hrs**
V	നാടകം - ഭരതവാക്യം	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. തിരക്കഥ - ഞാൻ പ്രകാശൻ - ശ്രീനിവാസൻ, ഡി.സി.ബുക്സ് 2. നാടകം - ഭരതവാക്യം , ജി. ശങ്കരപ്പിള്ള
Reference Books	1. കഥയും തിരക്കഥയും ഡോ.ആർ.വി.എം.ദിവാകരൻ - എൻ. ബി. എസ് കോട്ടയം 2. മലയാള സിനിമയും സാഹിത്യവും - മധു ഇറവങ്കര - ഡി.സി.ബുക്സ് 3. ഒരു സിനിമ എങ്ങനെ ഉണ്ടാകുന്നു. - കെ.കെ. ചന്ദ്രൻ

	4. നാടക സാഹിത്യ ചരിത്രം - ജി. ശങ്കരപ്പിള്ള - ഡി.സി.ബുക്സ് 5. നാടകം കലയും കാഴ്ചയും - പി.ജി.സദാനന്ദൻ - ഡി.സി.ബുക്സ്
Web. URLs	**http://www.keralaculture.org>literature** **http://www.manoramaonline.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	L	H	H	H	H	H	H	M	M	H	H	M
CO2	M	L	H	M	H	M	M	M	M	H	M	H	M
CO3	H	L	M	M	M	H	M	H	H	M	H	M	H
CO4	H	L	L	H	L	H	M	M	M	H	M	M	H
CO5	M	L	L	H	L	H	M	M	H	M	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms.RAJANI N.	Dr.SMITHA C. R.

Course Code	Title		
23U1FRN404	Part – I : Le Francais General – IV		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	Acquisition of standard French through French grammar and oral communication		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Improved understanding and communication		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	learn pronouns, gérondif along with culture adaptation in foreign countries	Lectures /Tutorial	Assignment
CO 2	French food culture, manners, futur simple & futur proche.	Group Learning	Assignment
CO 3	Business and economic culture, la cause et la consequence.	Peer Teaching	Seminar
CO 4	Letter writing official and to a patron, le passif, les doubles pronoms	Group Learning	Group Project
CO 5	The city and country, urbanisation, l'opposition et la concession, le subjonctif et l'infinitif	Group Learning	Assignment

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Explorer l'inconnu	1	1
		Instructional Hours	12
Suggested Learning Methods : Visuals			
II	Goûter l'insolite	1	2
		Instructional Hours	12
Suggested Learning Methods : Comprehensive writing			
III	Consommer autrement	1	3
		Instructional Hours	12
Suggested Learning Methods : Group discussions			
IV	S'engager pour une cause	1	4
		Instructional Hours	12
Suggested Learning Methods : Visuals			

V	Repenser le quotidien	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Group Discussion			
		Total Hours	**60**
Text Books	1. Saison 2 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 0 to 4)		
Reference Books	1. Connexions 2 Methode de Français Régine Mérieux , Yves Loiseau		
Web. URLs	1. www.academia.edu		

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	**4**	**5**	**2**	**2**	**3**	**20**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	M	M	M	L	M
CO2	-	-	H	L	H	M	-	-	M	L	M	M	L
CO3	-	-	-	M	M	H	-	-	M	M	M	M	M
CO4	-	-	L	M	L	H	-	-	M	L	L	M	L
CO5	-	-	L	-	H	-	-	-	M	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Ms. SUNITA. R	Ms. SUNITA. R

Course Code	Title		
23U2ENG404	Part – II : Communicative English – II		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to All UG Programmes)			
Course Objective	To equip the students with Language Skills and develop interest in and appreciation of literature.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the values of life reflected in the prescribed prose	Lecture/Tutorial	Assignment
CO 2	Learn to interpret poem based on contextual evidence.	Lecture/Tutorial	Assignment
CO 3	Enhance imaginative and communication skills through short stories.	Lecture/Tutorial	Speaking
CO 4	Understand the performing art through drama.	Lecture/Tutorial	Reading
CO 5	Acquire proficiency in English for global competency.	Lecture/Tutorial	Writing

Offered by	Department of English

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Prose** Francis Bacon – Of Adversity Dr. Radhakrishnan - Character is Destiny Sudha Murty - How I taught my grandmother to read	1	1
		Instructional Hours	**12**
Suggested Learning Methods : Intensive Reading			
II	**Poetry** Sarojini Naidu - The Soul's Prayer Emily Dickinson - Death in the Opposite House William Blake – London	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Scaffolding Method			
III	**Short Stories** W. Somerset Maugham - Mr. Know-All Edgar Allan Poe-The Purloined Letter Ruskin Bond-The Thief Story	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			

IV	**Drama** William Shakespeare – As You Like It	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			
V	**GRAMMAR AND COMPOSITION** **Oral & Written Communication (Unit I–IV) Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc **Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending/Mock Viva- Voce, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions. **Reading**–Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc **Writing** – Clauses – Conditional, Relative, Restrictive, Non-Restrictive, Denotation and Connotations Précis Writing, One word substitution.	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Unit I – V: Compiled by the Department of English
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department)
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Presentation	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	-	H	-	M	M	H	M	H	H	M	H	M
CO2	M	-	H	-	H	M	H	M	H	H	M	H	M
CO3	M	-	H	-	H	H	H	H	H	H	M	H	M
CO4	M	L	H	-	H	-	H	H	H	H	M	H	H
CO5	H	M	H	-	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Mr. D. Pradeek	Dr. R. Malathi

Course Code	Title		
23U3AMC406	Core Paper X : Operating System		
Semester: IV	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
B. Sc Artificial Intelligence and Machine Learning			
Course Objective	To understand the importance of Operating Systems and its functionalities to manage resources of Computer and Peripherals.		
Course Category	Employability		
Development Needs	Global		
Course Description	Operating System describes of types, States, Paging, Segmentations.		

Course Outcomes		Teaching Methods	Assessment Methods
CO1	Recognize the basic concepts of operating system	Lecture	Assignment
CO2	Understand the concepts of processes and scheduling of process.	Tutorial	Assignment
CO3	Explain the techniques of managing the deadlock and memory	Flipped Classroom	Seminar
CO4	Illustrate the Segmentation of Paging and Page Replacement policies.	Tutorial	Quiz
CO5	Apply various file system implementation	Case Studies	Quiz

Offered by	B. Sc Artificial Intelligence and Machine Learning

Course Content — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	Introduction: Abstract views of an OS – Goals of an OS – OS and the Computer System – Classes of Operating System: Batch Processing systems – Multiprogramming systems – Time sharing systems – Real Time Operating System – Distributed Operating System – Modern Operating systems	1	1,2
		Instructional Hours	**12**
Suggested Learning Methods: Assignment and Seminar Preparation			
II	Processes and Programs – Programmer View of Process – OS view of Process – Controlling Processes – Process State Transitions – Process Control Block – Process Scheduling: Scheduling Concepts and Terminology – Fundamental Techniques of scheduling – Non Preemptive scheduling policies - Preemptive scheduling policies	1	3,4
		Instructional Hours	**12**
Suggested Learning Methods: Assignment and Seminar Preparation			
III	Deadlock: Definition – Deadlocks in Resource Allocation – Handling deadlocks – Deadlock Detection and Resolution - Deadlock Prevention – Deadlock Avoidance. Memory Management: Static and dynamic Memory Allocation – The Memory Allocation Model – reuseof Memory – Contiguous Memory allocation – Non Contiguous Memory Allocation.	1	11
		Instructional Hours	**12**
Suggested Learning Methods: Preparing Procedure for Deadlock and Memory Management			

IV	Paging – Segmentation – Segmentation with Paging. Virtual Memory: Basics – Demand Paging – Overview of Paging – Demand Paging preliminaries – Page replacement policies – Virtual Memory using segmentation	1	5
		Instructional Hours	**12**
Suggested Learning Methods: Preparation for Quiz			
V	Layers of the Input Output Control System (IOCS) – Overview of I/O Organization – Disk Scheduling. File systems: File System and IOCS – Files and File Operations – Fundamental File organizations – directory Structures – Case study on LINUX OS ,UNIX OS, Android OS (Self Study)	1	7
		Instructional Hours	**12**
Suggested Learning Methods: Case Studies on Latest Operating Systems			
		Total Hours	**60**

Text Books	1. D M Dhamdhere, **"Operating Systems- A Concept –Based Approach"**, 2nd Edition, 2006.
Reference Books	1. William Stallimgs, **"Operating Systems Internals and Design Principles"**, Seventh Edition,Pearson Education Inc.2012. 2. Abraham Silberchatz, Peter Baer Galvin,Greg Gagne, **"Operating System Concepts"**, Seventh Edition, Pearson 2009.
Web. URLs	https://www.geeksforgeeks.org/operating-systems

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M	L	M	H	H	H	H	M	M
CO2	H	M	L	M	H	M	M	H	M	M	H	M	M
CO3	M	H	M	M	H	L	H	H	H	M	M	H	H
CO4	H	M	M	M	H	M	M	M	H	H	H	M	M
CO5	H	H	M	M	M	L	M	H	M	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3CKC408	Core Paper XI: R Programming		
Semester: IV	Credits: 3	CIA:20 Marks	ESE: 55 Marks
Common to B. Sc. CS / CS(DS) and AIML			
Course Objective	To enhance the student with the fundamental concepts of R Programming		
Course Category	Employability		
Development Needs	Global		
Course Description	This course provides the basic knowledge in Data Analysis, Data Manipulation, Graphics, Data Frames And Interfacing.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognize the basics of R Programming	Lecture	Assignment
CO 2	Understand the concept of Matrices and Lists	Tutorial	Seminar
CO 3	Use of data frames and functions	Video Lectures	Quiz
CO 4	Describe the file operations and graphs	Tutorial	Program Execution
CO 5	Distinguish between Linear and Non Linear Models	Flipped Classroom	Program Execution

Offered by	Computer Science(Data Science)
Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Introducing to R :**Introducing to R – R Data Structures – Help Functions in R – Vectors – Scalars – Declarations – Recycling – Common Vector Operations – Using all and any – Vectorized operations – NA and NULL values – Filtering – Vectorized if-then else – Vector Element names.	I	1-2
		Instructional Hours	**12**
Suggested Learning Methods: Video Lecturer			
II	**Matrices :**Creating Matrices – Matrix Operations – Applying Functions to Matrix Rows and Columns – Adding and deleting rows and columns - Vector/Matrix Distinction – Avoiding Dimension Reduction – Higher Dimensional arrays – lists – Creating lists – General list operations – Accessing list components and values – applying functions to lists – recursive lists	I	3-4
		Instructional Hours	**12**
Suggested Learning Methods : Case Study			
III	**Data Frames:** Creating Data Frames – Matrix-like operations in frames – merging Data frames – Applying functions to Data Frames – Factors and Tables – Factors and levels – Common Functions used with factors – Working with tables – Other factors and table related functions – Control statements – Arithmetic and Boolean operators and values – Default Values for arguments – Returning Boolean	I	5-8

	Values – Functions are objects – Environment and scope issues – Writing Upstairs – Recursion – Replacement functions – Tools for Composing function code – Math and Simulation in R.		
		Instructional Hours	**12**
Suggested Learning Methods : Assignment			
IV	**Classes:** S3 Classes – S4 Classes – Managing your objects – Input / output – accessing keyboard and monitor – reading and writing files – accessing the internet – String Manipulation – Graphics – Creating Graphs – Customizing Graphs – Saving Graphs to files – Creating Three-Dimensional plots.	I	9-12
		Instructional Hours	**12**
Suggested Learning Methods : Video Lecturer			
V	**Interfacing:** R to other languages – Parallel R – Basic Statistics – Linear Model – Generalized Linear models – Non-linear Models – Time Series and Auto-Correlation – Clustering.	II	15-17 20-22
		Instructional Hours	**12**
Suggested Learning Methods : Group Discussion			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. Norman Matloff, **"The Art of R Programming: A Tour of Statistical Software Design",** No Starch Press, 2011. 2. Jared P. Lander, **"R for Everyone: Advanced Analytics and Graphics",** Addison-Wesley Data & Analytics Series, 2013.
Reference Books	1. Mark Gardner, **"Beginning R - The Statistical Programming Language",** Wiley, 2013. 2. Robert Knell, **"Introductory R: A Beginner's Guide to Data Visualization, Statistical Analysis and programming in R",** Amazon Digital South Asia Services Inc, 2013. Richard Cotton (2013). Learning R, O'Reilly Media.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. Anitha Merlin	Dr. N. Kavitha

Course Code	Title		
23U3AMP407	Core Paper XII : Practical in R Programming		
Semester: IV	Credits: 2	CIA: 20 Marks	ESE: 30 Marks
(B.Sc. Artificial Intelligence and Machine Learning)			
Course Objective	To enable the students to gain an in-depth understanding of data structure used in R and learn to import/export data using R.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To make the students to understand the fundamentals of R Programming		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember various data types, conditional and looping statements	Problem Based Teaching, Constructivist learning	Program Creativity
CO 2	Understand about R-studio, workspace setup and the various R packages	Constructivist learning, Code Review	Debugging
CO 3	Apply data Structures: Vectors, Lists, Matrices and Arrays and Factors and Data Frame in R language and manipulate	Constructivist learning	Application of Logic
CO 4	Analyze the feasible logics	Problem Based Teaching, Constructivist learning	Program Development
CO 5	Evaluate the optimal solution of the problem	Problem Based Teaching, Constructivist learning	Program Development

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 3

Unit	List of Practical
1	Write a R Program to take input from the user (name and age) and display the values. Also print version of R installation.
2	Write a R Program to create a sequence of number from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
3	Write a Program to check whether the given number is Armstrong Number or not.
4	Write a R Program to create a simple bar plot of five subjects mark.
5	Write aR Program to create a list and to append, modify and delete the elements in the list.
6	Write a R Program to find the sum of ‘n’ natural numbers
7	Write a R Program to multiply two vectors of integers type and length 3.
8	Write a Program to create a matrix addition and subtraction.
9	Write a Program to check whether the given number is palindrome or not using function.

10	Write a Program to create the Data Frame and extract the value.
11	Write a Program to Find Sum, Mean and Product of Vector
12	Write a Program to Sample from a Population

Suggested Learning Methods: Solving Case studies, Peer tutoring and pair programming	**10**
Total Hours	**45**

Tools for Assessment (20 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
3	3	3	4	4	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	M	M	-	-	H	M	H	H	M	M
CO2	M	H	-	M	M	-	M	H	M	H	M	H	M
CO3	M	H	-	M	M	-	-	H	H	M	M	M	H
CO4	H	H	-	M	M	-	-	H	M	H	H	H	M
CO5	H	H	-	M	M	-	-	H	H	M	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3MIA404	Allied Paper – IV : Linear Algebra and Differential Equations		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
Course Objective	To enable the students to learn develop Logical thinking and to build an intuitive understanding of Mathematics and its applications relating to Machine Learning.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	It provides a mathematically rigorous introduction to these developments with emphasis on methods and their analysis.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts of Matrices.	Lecture / Peer Teaching	Assignment
CO 2	Understand the concepts of Vector Spaces	Group learning/Lecture	Problem solving Skill
CO 3	Calculate Eigen Values and Eigen Vectors for a matrix which is used to determine the natural frequencies.	Lectures / Video Lecture	Seminar
CO 4	Describe some methods to solve different types of first order differential equations.	Group Learning / Lecture	Assignment
CO 5	Use the effective mathematical tools for the solutions of Partial Differential Equations.	Lecture /Tutorial	Quiz

Offered by Mathematics

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	Matrices : Introduction – Types of Matrices – Matrix Operations – Properties – Determinants – Inverse of a Matrix – Rank of a Matrix – Orthogonal Matrices – Solving Simultaneous linear Equations – Cramer's Rule.	1	1, 2, 3
	Instructional Hours		**12**
Suggested Learning Methods : Group Discussion & Quiz			
II	**Linear Algebra:** Vectors – Linear Dependence and Linear Independence of Vectors – Methods of Testing Linear Dependence or Independence of a set of Vector.	2	1
	Instructional Hours		**12**
Suggested Learning Methods : Problem solving Practice			
III	Eigen Values and Eigen Vectors – Cayley Hamilton Theorem – Calculation of Powers of a Matrix A – Diagonalization by Orthogonal Transformation or Orthogonal Reduction – Quadratic Forms	2	1
	Instructional Hours		**12**
Suggested Learning Methods : https://youtu.be/CVvCvYFoCmM			
IV	**Differential Equations:** Equations of the first order and higher degree – Linear Differential Equations of Second and Higher order - Euler's Homogeneous Linear Differential Equations.	3	1, 2 , 4

		Instructional Hours	**12**
Suggested Learning Methods : Problem solving Practice			
V	**Partial Differential Equation :** Introduction – Formation of Differential Equations - Solution of Partial Differential Equation of the form f(p, q) = 0 , Clairaut's type z = px + qy + f(p, q) – Lagrange's Linear Equation .	3	1
		Instructional Hours	**12**
Suggested Learning Methods : Practice Tests			
		Total Hours	**60**

Text Books	1. P. Kandasamy and Thilagavathy, **Mathematics for B. Sc Branch I , Vol. 11** (For B. Sc – I semester), S. Chand and Company Ltd, New Delhi, 2004. Unit 1 : Chapter 1,2,3 Page No: 3 - 54 2. T. Veerarajan, **Engineering Mathematics**, Tata McGraw – Hill Publishing Company Limited , New Delhi, Fifth Edition. Unit 2 : Chapter – 1, Page No : 1.1 – 1.23 Unit 3: Chapter – 1, Page No : 1.25 – 1.71 3. P. Kandasamy , K. Thilagavathi , **Mathematics for B. Sc. Branch – I, Volume III**, S. Chand & Company PVT. LTD. New Delhi Unit 4: Chapter – 1, 2 & 4 Unit 5 : Chapter 1, Sec: 1.1 -1.4,1.5,1.10,1.11 Page No: 117-125,127-136
Reference Books	G. Balaji, **Engineering Mathematics – 1**, Balaji Publishers Pvt. Ltd, 3rd Edition, 2005
Web. URLs	1. https://www.khanacademy.org/math/linear-algebra/alternate-bases/eigen-everything/v/linear-algebra-introduction-to-eigenvalues-and-eigenvectors 2. https://www.mathworks.com/videos/differential-equations-and-linear-algebra-11-overview-of-differential-equations-117335.html 3. https://www.youtube.com/watch?v=SrDyuEH3rHA

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	-	L	M	H	H	M	M	M	H	M	M
CO2	M	H	-	M	H	M	H	H	M	M	M	H	H
CO3	L	M	-	M	M	H	M	H	M	H	H	H	M
CO4	L	L	-	M	M	M	H	H	H	M	M	H	L
CO5	M	L	-	H	M	M	H	M	H	M	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. T. Chandrapushpam	Dr. T. Chandrapushpam

Course Code	Title		
22U4AMZ402	Skill Based Paper II : Capstone Project Work - I		
Semester: IV	Credits: 3	CIA: 30 Marks	ESE: 45 Marks
Course Objective	To understand and select the task based on their core skills, get the knowledge about analytical skill for solving the selected task and get confidence for implementing thetask and solving the real time problems.		
Course Category	Employability		
Development Needs	Global		
Course Description	Capstone Project Work can be used in a variety of fields, such as software development, government administration, business, science, arts, education, and others		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Illustrate a real world problem and identify the list of project requirements	Demonstration	Program Execution
CO 2	Compare existing system with the proposed system and extract the innovative ideas	Code Review	Program Execution
CO 3	Judge the features of the project including forms,databases and reports	Class Projects	Observation
CO 4	Demonstrate the Project work	Demonstration	Test
CO 5	Appreciate the underlying software packages andprogramming concepts.	Class Projects	Review

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 3

Aim of the project work

1. The aim of the project work is to acquire practical knowledge on the implementation of the programming concepts studied.
2. Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.
3. The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

Viva Voce

1. Viva-Voce will be conducted at the end of the year by both Internal (Respective Guides) and External Examiners, after duly verifying the Annexure Report available in the College, for a total of 75 marks at the last day of the practical session.
2. Out of 45 marks,30 marks for record work and presentation, 15 Marks for Viva Voce.

Total Hours	45

Tools for Assessment (30 Marks)				
Review I	**Review II**	**Review III**	**Document Preparation and Implementation**	**Total**
7	**7**	**7**	**9**	**30**

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	L	L	M	-	-	H	M	H	H	M	M
CO2	M	M	L	L	M	-	-	H	M	H	M	M	H
CO3	H	H	-	L	M	-	-	H	L	M	M	H	M
CO4	H	H	-	L	M	-	-	H	H	H	M	H	H
CO5	H	M	-	L	M	-	-	H	H	H	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title	
22U4NM4BT2	Part IV : Basic Tamil – II (அடிப்படைத்தமிழ் - II)	
Semester: IV	Credits: 2	CIA: 50 Marks

(Common to all UG Programmes)

Course Objective	அற இலக்கியங்களை அறிமுகப்படுத்தல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	**Regional (** தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்**)**
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	அற இலக்கிய அறிவு பெறுதல் - சிறுகதைகள் வழி சமூக அறிவு பெறுதல்.	விரிவுரை / காணொளி வகுப்பு	ஒப்படைவு
CO 2	தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாடு.	குழு விவாதம்/ விரிவுரை	கருத்தரங்கு
CO 3	பிறமொழி அறிவுத் திறன் மேம்படச்செய்தல்.	விரிவுரை/காணொளி ப்பட விளக்கம்	ஒப்படைவு
CO 4	மொழிப்பெயர்ப்புத் திறன் மேம்படச்செய்தல்.	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	வார்த்தை அமைக்கும் திறன் பெறச்செய்தல்.	விரிவுரை / குழுத்திட்டம்	குழுத்திட்டம்

Offered by தமிழ்த்துறை

Course Content : Basic Tamil – II (அடிப்படைத்தமிழ் II) | **Instructional Hours / Week : 2 Hours**

Unit	Description	Text Book	Chapters
I	நீதி நூல்கள்	1.பாரதியார் ஆத்திச்சூடி 2.கொன்றைவேந்தன்	1.1 1 முதல் 12 வரிகள் 2.1 1 முதல் 7 வரிகள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : நீதிநூல்களின் சிறப்பினை அறியும் பயன் பெற்றமை			
II	பதினெண் கீழ்க்கணக்கு நூல் (திருக்குறள்)	திருக்குறள்	2.1.கடவுள் வாழ்த்து -அகர முதல எனத் தொடங்கும்... அதி 1 குறள் -1 2.2. வான் சிறப்பு- நீரின்றி அமையாது உலகு. அதி-2.குறள் - 10 2.3. அன்புடைமை - அன்பின் வழியது உயிர்நிலை. அதி - 8.குறள் - 10 2.4. கல்வி - கண்ணுடையார் என்பர் . அதி-40 குறள்-393 2.5. இனியவை கூறல் - இனிய உளவாக இன்னாத அதி10. குறள் -10
		Instructional Hours	**6 Hours**
Suggested Learning Methods : திருக்குறளின் சிறப்பினை அறிந்தமை			
III	கிராமியக் கதைகள்	கிராமியக் கதைகள்	3.1.பரமார்த்தக்குரு கதைகள் 3.2.நாட்டுப்புறக் கதைகள் அறிமுகம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : கிராமியக் கதைகளின் கதை அமைப்பினை அறியும் வாய்ப்பு பெற்றமை			

IV	மொழிப்பயிற்சி	மொழிப்பயிற்சி	4.1. பிறமொழிச் சொற்களுக்கு தமிழ்ச்சொல் எழுதுதல்
Instructional Hours			**6 Hours**
Suggested Learning Methods :		தமிழ்ச்சொல் எழுதும் திறன் பெற்றமை	
V	எழுத்துப்பயிற்சி	எழுத்துப்பயிற்சி	5.1தன்விவரம் எழுதுதல் 5.2 பெயர், கல்லூரி விவரம் எழுதச்செய்தல்
Instructional Hours			**6 Hours**
Suggested Learning Methods : பிறமொழி கலப்பு இன்றி தமிழ்ச்சொல் எழுதும் திறன் பெற்றமை			
Total Hours			**30 Hours**
Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாடநூல்"அரிச்சுவடி" 2. தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.		
Reference Books	1. ஔவையார் ஆத்திச்சூடி மணிவாசகர் பதிப்பகம், கோயம்புத்தூர் இராஜவீதி,01. 2. திருக்குறள் - பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை - 600018.		
Web. URLs	https://youtu.be/d5be921uxhE, https://youtu.be/Wtg-GJPfXTM.		

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
8	8	10	8	8	8	50

Mapping

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	H	M	H	H	H	M	M	H	M
CO2	L	L	H	L	M	M	L	H	M	H	M	M	H
CO3	H	L	H	L	L	M	M	H	M	M	H	M	M
CO4	H	L	M	L	L	M	H	M	M	H	M	M	H
CO5	H	L	H	L	M	M	H	H	H	M	M	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh Kumar	Dr. A. Sridevi

Course Code	Title	
22U4NM4AT2	Part IV : Advanced Tamil – II (சிறப்புத்தமிழ் -II)	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	நூல்களின் வழி அறச் சிந்தனைகளை உருவாக்குதல் செம்மொழியினைச் செம்மைப்படுத்துதல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	அறச்சிந்தனைகள் பெறுதல் மற்றும் இலக்கண வழக்கு முறைகளைப் பெறுதல்.	விரிவுரை/காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 2	கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல்	விரிவுரை/ குழு விவாதம்	ஒப்படைவு
CO 3	படைப்பாக்கத்திறன் அறிவுபெறச்செய்தல்	விரிவுரை	கருத்தரங்கு
CO 4	தகவல் தொடர்பியலுக்கானகடிதம்,அமைவுத்திறன் பெறச்செய்தல்	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	மொழியைப் பிழையின்றிப் பேச,எழுதும் திறன் பெறச்செய்தல்	விரிவுரை/காணொளிப்பட விளக்கம்	ஒப்படைவு

Offered by தமிழ்த்துறை

Course Content : Advanced Tamil – II (சிறப்புத்தமிழ் -II) | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	பதினெண் கீழ்க்கணக்கு நூல்கள்	1.திருக்குறள் 2.நாலடியார்	1.1. கூடாநட்பு 1.2. செய்நன்றியறிதல் - நாலடியார் 1.3. கல்வி (131,132 செய்யுள்கள்)
		Instructional Hours	**6**
Suggested Learning Methods : திருக்குறளின் சுவை அறியும் வாய்ப்பு பெற்றமை			
II	சிறுகதை	1.வெ.இறையன்பு - பூனாத்தி சிறுகதைகள்	2.1 சேவியர் வாத்தியார் 2.2 தூரிகை
		Instructional Hours	**6**
Suggested Learning Methods : சிறுகதைகளின் சுவை அறியும் வாய்ப்பு பெற்றமை			
III	இலக்கணம்	இலக்கணப் பயிற்சி ஏடு	3.1 எழுத்தும் சொல்லும் 3.2 சுட்டெழுத்துகள் 3.3 சொற்களைச் சரியாகப் பயன்படுத்தும் முறை 3.4 வினைச்சொற்கள், பெயர்ச்சொற்கள் 3.5 வினா எழுத்துகள்
		Instructional Hours	**6**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் பயிற்சி பெற்றமை			
IV	வழக்கறிதல்	இலக்கணம்	மரபு வழக்கு - இயல்பு வழக்கு, தகுதி வழக்கு - அறிதல்
		Instructional Hours	**6**
Suggested Learning Methods : வழக்குகள் பற்றி முழுமையாக அறியும் பயிற்சி பெற்றமை			

V	படைப்பாற்றல் பயிற்சி	இலக்கிய வரலாறு	கவிதை–சிறுகதை–நூல் மதிப்பீடு எழுதுதல்
Instructional Hours			**6**
Suggested Learning Methods : மதிப்பீடு செய்யும் பயிற்சி பெற்றமை			
		Total Hours	**30 Hrs**
Text Books	1. இளங்கலைத்தமிழ் மாணவர்களுக்குரிய பாடநூல்"திரட்டு" தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.		
Reference Books	1. திருக்குறள் –பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை - 018 2. வெ.இறையன்பு - பூனாத்தி சிறுகதைகள், விஜயா பதிப்பகம், கோவை.		
Web. URLs	https://youtu.be/_vB59q6At8s, https://youtu.be/aSvxO_rV9eQ.		

Course designed by	Verified by
Dr. S. Satheesh Kumar	**Dr. A. Sridevi**

Course Code	Title	
22U4NM4GEN	Non Major Elective : General Awareness	
Semester : IV	Credits : 2	ESE : 50 Marks

(Common to all UG Programmes)

Course Objective:

Enable the students to learn General knowledge and prepare for different competitive exams.

Course Outcomes:

CO1	Determine Verbal Aptitude , Numerical Aptitude and Logical Reasoning
CO2	Recall basic Science, history , Tamil , Computer , Commerce concepts which would help to crack competitive Examinations
CO3	Acquire time Management skills to attempt competitive Examinations
CO4	Develop Aptitude and problem solving skills
CO5	Gain Knowledge about Current Affairs

Course Content **Instructional Hours / Week : 2**

S. No.	Topics
1.	Verbal Aptitude
2.	Numerical Aptitudeand Logical Reasoning
3.	Abstract Reasoning
4.	Tamil and Other Literature
5.	General Science and Technology
6.	Computer
7.	Economics and Commerce
8.	History and Freedom Struggle
9.	Sports
10.	Current Affairs
	Total Hours : 30

Text Book: "General Awareness", compiled by Nehru Arts and Science College, Coimbatore

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	-	-	H	-	-	L	M	M	L	M	M
CO2	H	L	-	-	H	-	-	L	L	M	L	M	M
CO3	H	L	-	-	H	-	-	M	M	L	M	L	L
CO4	H	L	-	-	H	-	-	L	M	L	M	M	M
CO5	H	L	-	-	H	-	-	L	M	M	M	L	M

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Ms. P. Sheeba Maybel	Dr. T. Chandra Pushpam

Course Code	Title	
22U4VBOE01	Value Based Open Elective Course : Design Ecosystem	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To gain the knowledge on ecosystem and environmental sustainability
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	Global
Course Description	Design ecosystem describes about the components, types, structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment.

Course Outcomes		Teaching Methods
CO 1	Understand about the basic concepts of ecosystem and environmental planning	Lecture / Video Lessons
CO 2	Gain knowledge of challenges and design process of ecosystem	Lectures / Video Lessons
CO 3	Understand about functions and flow of energy in ecosystem	Case study / Model
CO 4	Analyse about process and mechanism of ecosystem control	Tutorial / Group Discussion
CO 5	Demonstrate about green infrastructure and regulatory framework	Lecture / Tutorial

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Sustainable Human Dominated-Ecosystem and Environmental planning:** Introduction to Ecology & environmental sciences; Principles and Scope of Ecology. Axioms of Ecological Engineering, Sustainable design principles, Global population dymanics, Human dominated earth.	1	1
		Instructional Hours	**6**
Suggested Learning Methods: Video Lectures			
II	**Designing Ecosystem services & Biomes:** Design challenges and needs, the design process, biomes, ecoregions, other land classification systems.	1	3 & 4
		Instructional Hours	**6**
Suggested Learning Methods: Video Tutorials			
III	**Energy and mass flow through ecosystem:** Structure and Functions of Ecosystems - Abiotic and Biotic components, Flow of energy and cycling of materials; water, carbon, nitrogen and phosphorus	3	2
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			

IV	**Ecosystem control:** Population control process, community control process. Stream restoration design -hydrology, sedimentology, geomorphology, habitat, riparian corridor and construction.	2	6
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
V	**Green infrastructure design:** Green infrastructure network, sustainable cities initiatives, agricultural sustainability indicators, surrounding environmental, ecological and social justice; environmental ethics, issues and possible solutions	3	4
		Instructional Hours	**6**
Suggested Learning Methods : Online Tutorial			
		Total Hours	**30**

Text Books	1. Matlock, M. D. and M. Robert. Ecological Engineering Design: Restoring and Conserving Ecosystem Services. JohnWiley& Sons, Inc. 2011. 2. Meffe, G.K., L. Nielson, R. L. Knight and D. Schenborn. Ecosystem Management: Adaptive, Community-Based Conservation. Island Press. 2012. 3. Elliot, D. 2003. Energy, Society and Environment, Technology for a Sustainable Future. Routledge Press.
Reference Books	1. Sim Van Der Ryn and S. Cowan. Ecological Design. Island Press, 1996. 2. Neeraja, N. Environment and Ecology: A Dymanic Approach, 3rd Edition. GKP Books Catalogue. 2018.
Web. URLs	1. https://www.nationalgeographic.org/encyclopedia/ecosystem/ 2. https://www.environmentandecology.com/

Course Designed by	**Verified by Chairman**
Dr. S. Esath Natheer	Dr. N. Thangavel

Course Code	Title	
22U4VBOE02	Value Based Open Elective Course: Design Thinking	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	Inculcate the fundamental concepts of design thinking and develop the students as a good designer by imparting creativity and problem solving ability
Course Category	Crosscutting Issue : Professional Ethics
Development Needs	Local, National and Global
Course Description	The course aims to provideintroduction to the basic concepts and techniques of design thinking and methods of implementing design thinking in the real world.

Course Outcomes		Teaching Methods
CO 1	Learn the basic concepts of design thinking	Direct Instruction
CO 2	Develop the skill of applying the design thinking	Direct Instruction
CO 3	Learn the business uses of design thinking	Video Lessons
CO 4	Understand the variety of approaches within the design thinking discipline	Direct Instruction
CO 5	Impart knowledge in design thinking mindset	Direct Instruction

Course Content	Instructional Hours / Week: 2

Unit	Description	Text Book	Chapters
I	**Design Thinking Background** Definition of Design Thinking, Variety within the Design Thinking Discipline, Design Thinking Mindset	1	1
		Instructional Hours	**06**
Suggested Learning Methods:Brain Storming			
II	**Design Thinking Approach** Fundamental Concepts – Empathy, Ethnography, Divergent Thinking, Convergent Thinking, Visual Thinking, Assumption Testing, Prototyping, Time for Learning and Validation	1	5,1,3
		Instructional Hours	**06**
Suggested Learning Methods :Learning by Teaching			
III	**Design Thinking Resources** – People, place, material, organizational fit **Design Thinking Processes** - Numerous Approaches, Double Diamond Process, 5-Stage, School Process, Designing for Growth Process, Role of Project Management	1	5,6
		Instructional Hours	**06**
Suggested Learning Methods :DIY Activities			

IV	**Design Thinking in Practice I:** Process Stages of Designing for Growth - Design Thinking Tools and Methods – I- Purposeful Use of Tools and Alignment with Process, Visualization, Journey Mapping	1	6
		Instructional Hours	**06**
Suggested Learning Methods: Case Method			
V	**Design Thinking in Practice II:** Design Thinking Tools and Methods – II- Value Chain Analysis, Mind Mapping, Brainstorming, Concept Development, Assumption Testing, Rapid Prototyping, Customer Co-Creation, Learning Launch	2	8
		Instructional Hours	**06**
Suggested Learning Methods :Project Based Learning			
		Total Hours	**30**

Text Books	1. "Designing for growth: A design thinking tool kit for managers", by Jeanne Liedtka and Tim Ogilvie., 2011, ISBN 978-0-231-15838-1 2. "The design thinking playbook: Mindful digital transformation of teams, products, services, businesses and ecosystems", by Michael Lewrick, Patrick Link, Larry Leifer., 2018, ISBN 978-1-119-46747-2
Reference Books	1. "Presumptive design: Design provocations for innovation", by Leo Frishberg and Charles Lambdin., 2016, ISBN: 978-0-12-803086-8 2. "Systems thinking: Managing chaos and complexity: A platform for designing business architecture.", "Chapter Seven: Design Thinking", by JamshidGharajedaghi, 2011, ISBN 978-0-12-385915-0
Web. URLs	1. https://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond

Course Designed by	**Verified by Chairman**
Ms. M. Nandhini	Dr. S. Jayapriya

Course Code	Title	
22U4VBOE03	Value Based Open Elective Course :Disaster Management	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To learn knowledge about disaster and risk and apply the same in the time of any disaster.
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	National
Course Description	This course is designed to provide students with a comprehensive understanding of the concepts, theories, and practices of disaster and risk management. Students will learn how to identify and assess risks, develop emergency plans, and mitigate the impact of disasters on communities and organizations.

	Course Outcomes	Teaching Methods
CO 1	Understand different types of disasters and their impact on individuals and communities.	Lecture/ Demonstration
CO 2	Analyze the disaster management scenario in India, the policy framework, and the role of different stakeholders in reducing disaster risk and building resilience	Lecture/ Case Studies
CO 3	Understand the concepts of risk and vulnerability in disaster management and analyze the different approaches to disaster risk reduction.	Lectures / Video Lessons
CO 4	Analyzethe concept and nature of disaster preparedness, different components of a disaster preparedness plan	Tutorial / Case Studies
CO 5	Narrate the emergency responses to be taken by the national disaster management force and the practical training process on disaster management	Lecture / Class Projects

Course Content	**Instructional Hours / Week:2**

Unit	Description	Text Book	Chapters
I	**Introduction on Disaster** Definitions and Terminologies used in Disaster Management, Basic concepts in Disaster Management, Types of Disaster: Natural Disaster: Flood, Cyclone, Earthquakes, Landslides, epidemic or Pandemic etc. (Case studies of each), Man-made Disaster: Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc. (Case studies of each).	1	1
	Instructional Hours		**6**
Suggested Learning Methods:Power Point Presentation			
II	**Disaster management in India** Hazard and Vulnerability Profile India, Disaster Management Indian scenario, India's vulnerability profile, Disaster Management Act 2005 and Policy guidelines, National Institute of Disaster Management, National Disaster Response Force (NDRF),	1	2

	National Disaster Management Authority, States Disaster Management Authority, District Disaster Management Authority and Cases Studies.		
		Instructional Hours	**6**
Suggested Learning Methods: PPT and Video Lecture			
III	**Risk and Vulnerability** Analysis Risk: Assessing Disaster Risk, Disaster Risk Reduction, Vulnerability: Its concept and analysis, Strategic Development for Vulnerability Reduction, Climate Variability & Disaster Risk, Industrial hazard and Risk Management	1	3
		Instructional Hours	**6**
Suggested Learning Methods: Video Lecture			
IV	**Disaster Preparedness** Concept and Nature, Disaster Preparedness Plan, Prediction, Early Warnings and Safety Measures of Disaster, Role of Information, Education, Communication, and Training, Role of Government, International and NGO Bodies.	1	4
		Instructional Hours	**6**
Suggested Learning Methods: PPT and Group Activity			
V	**Response and 3Rs** Emergency Response: Introduction, Crisis Response Plan (CRP), Communication, Participation, and Activation of Emergency Preparedness Plan, Search, Rescue, Evacuation and Logistic Management, Role of Government, International and NGO Bodies, Psychological relief and recovery, Relief operation and Recovery, Post Disaster Public Health Management, 3R - Rehabilitation, Reconstruction and Recovery, Reconstruction and Rehabilitation as a Means of Development, Damage Assessment, Post Disaster effects and Remedial Measures, Role of Educational Institutions in Disaster management.	1	5
		Instructional Hours	**6**
Suggested Learning Methods: Laboratory Practice			
		Total Hours	**30**

Text Books	1. Disaster and Risk Management (2023), Notes Compiled by the Department of Criminology, Nehru Arts and Science College, Coimbatore
Reference Books	1. J. P. Singhal, "Disaster Management", Laxmi Publications, 2003. 2. M C Gupta, "Manual on Natural Disaster Management in India", NIDM, New Delhi, 2013 3. R K Bhandani, "An Overview on Natural &Man-made Disasters and their Reduction", CSIR, New Delhi, 2000 4. Dr. Mrinalini Pandey, "Disaster Management", Wiley India Pvt. Ltd, 2014. 5. National Disaster Management Authority Publications-Guidelines & Templates for Disaster Management

Course Designed by	**Verified by Chairman**
Dr. Reneesh K. Rajan	Dr. Reneesh K. Rajan

Course Code	Title	
22U4VBOE04	Value Based Open Elective Course : Environmental Pollution and Waste Management	
Semester: IV	Credits : 2	ESE : 50 Marks

Course Objective	To acquire deeper knowledge about Environmental Management Systems
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	Global
Course Description	Environmental Pollution and waste Management involves studying the management of any unnecessary resource use or release of substances into the water, land or air that could harm human health or the environment

Course Outcomes		Teaching Methods
CO 1	Understand the types of environmental pollutants	Lecture / Group Learning
CO 2	Describe, develop and interpret methods of the Environmental Management Systems.	Lecture/ Online Tutorial
CO 3	Critically evaluate methods and possibilities within Environmental Management Systems from asystems perspective.	Lecture/ Online Tutorial
CO 4	Understand the effective management of environmental pollutants	Lecture/ Online Tutorial
CO 5	Learn Environmental Auditing for various Industries/Projects.	Lecture/ Online Tutorial

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	Introduction to Environmental pollutants,Types of pollutants, Biodegradable pollutants, Non-biodegradable pollutants; Air pollution, Water Pollution, Soil Pollution	1	1,2
		Instructional Hours	**6**
Suggested Learning Methods: Industrial Visit			
II	Introduction to Environmental Management System basic definitions and terms, Framework for Environmental Management Systems, Approach for developing an Environmental Management System.	2	2, 4
		Instructional Hours	**6**
Suggested Learning Methods :Web search			
III	The introduction and implementation of ISO 14001: environmental policy, planning, implementation and operation, checking, management review.Applications EMS in terms of Process flow chart, effluent Generation, composition and treatment of effluents from following industries – sugar, pulp and paper, electroplating, dairy, oil refineries, etc.	2	5
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			

IV	Introduction to Environmental Auditing, Category "A" & "B" types of projects. Procedures and Guidelines to conduct Environmental Audit. Plastic Pollution: Causes, impacts, and reduction strategies -Global issue of plastic pollution and innovative solutions	3	7
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			
V	Municipal Solid Waste Management: Collection, transportation, and disposal of solid waste - Examination of waste treatment technologies and waste-to-energy processes. E-waste Management: Challenges and recycling techniques for electronic waste - Discussion on the environmental and health hazards associated with improper e-waste disposal.	1	8
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			
		Total Hours	**30**

Text Books	1. ISO 14001 Certification - Environmental Management Systems: A Practical Guide for Preparing Effective Environmental Management Systems Textbook Binding – Import, 10 Aug 1995 by W. Lee Kuhre (Author) 2. M. N Rao, "Waste Water Treatment" Oxford and IBH publishing Co. Pvt Ltd, 2007 3. Peavy, H.S, D.R. Rowe &T.George, "Environmental Engineering", New York: McGraw Hill, 1987
Reference Books	1. Christopher Sheldon and Mark Yoxon, "Installing Environmental management Systems – a step by step guide" Earthscan Publications Ltd, London, 1999.
Web. URLs	1. https://www.anits.edu.in/online_tutorials/es/Unit%203.pdf

Course Designed by	**Verified by Chairman**
Dr. O. S. Nimmi	Dr. N. Saranya

Course Code	Title	
22U4VB0E05	Value Based Open Elective Course : History of Ancient India	
Semester: IV	Credits: 2	ESE : 50 Marks

Course Objective	To explore the rich and diverse history of ancient India, examining its civilizations, political systems and cultural achievements.
Course Category	Employability
Development Needs	Global
Course Description	This course gives an in depth analysis of the Ancient Indian History marking the beginning of urban civilization in the Indian subcontinent.

Course Outcomes		Teaching Methods
CO 1	Understand the salient features of Indus valley civilization	Lecture
CO 2	Evaluate the features Civilizations	Tutorial
CO 3	Evaluate the rise of new movements	Lecture
CO 4	Visualize the administration of Mauryas and the art and architecture of Mauryas	Tutorial
CO 5	Identify the administration of Guptas and their contribution to University	Lecture

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Definitions - Nature and Scope of History - History and Its Relationship with other Social Sciences - Geographical Features of India Sources of Indian History: Pre- History Paleolithic, Mesolithic, Neolithic, Chalcolithic and Megalithic Cultures.	1 &4	1-5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
II	Indus Valley Civilization - Its Features & Decline; Early Vedic and Later Vedic Civilizations Vedic Literature Society Economy - Polity Religion.	2	2-4
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
III	Rise of New Religious Movements Charvakas, Lokayathas, Jainism and Buddhism; Mahajanapadas - Rise of Magadha; Impact.	3	3
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			

IV	Foundation of the Mauryan Dynasty; Ashoka and His Dharma Polity Administration - Society Economy Religion Literature - Art and Architecture; Disintegration of the Mauryan Empire; Post-Mauryan Kingdoms - Indo-Greeks - Kushanas and Kanishka - Society Economy Literature Art and Architecture; The Satavahanas; Sangam Age Literary Development.	4	4 &5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
V	Gupta Empire: A Brief Political Survey - Polity and Administration, Social and Economic Conditions, Agriculture and Land Grants - Feudalism, Caste System, Position of Women, Education, Literature, Science and Technology, Art and Architecture - Harshavardana and His Achievements.	4	5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
		Total Hours	**30**

Text Books	1. E.H. Carr, What is History? Penguin Books, England, 1990. 2. Majumdar, R.C., History and Culture of the Indian People, Vols. I, II & & III. 3. Romila Thapar, Asoka and the Decline of the Mauryas, OUP, New Delhi, 1995. 4. Romila Thapar, Early India (From the earliest to AD 1300).
Reference Books	1. Poonam Dalal : Ancient and Medival India for UPSC & State Level Exam

Course Designed by	**Verified by Chairman**
Ms. S. Kavitha	Dr. R. Malathi

Course Code	Title	
22U4VBOE06	Value Based Open Elective Course : Indian Knowledge System	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	To make the students understand the knowledge system in India and apply it to their day to day life
Course Category	Value Education
Development Needs	National
Course Description	This course will actively engage for spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, Architecture, Management, Economics, etc

Course Outcomes		Teaching Methods
CO 1	Understand the History and an overview of Indian knowledge System.	Flipped Classroom
CO 2	Interpret the Importance of Vedic Corpus and Philosophical System	Student Centric
CO 3	Analyse the Foundational Concepts like Linguistics and and Number Systems.	Blended Mode
CO 4	Interpret the concepts of Astronomy and Town Planning Architecture.	Flipped Classroom
CO 5	Describe the Importance of Health, Wellness, Psychology and Administrative Governance	Case-Base

Course Content | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Indian Knowledge System** : An Introduction: Importance of Ancient Knowledge-Defining Indian Knowledge System –The Indian Knowledge System Corpus-A Classification Framework-History of Indian Knowledge System.	1	1
		Instructional Hours	**06**
Suggested Learning Methods : Cooperative Learning			
II	**The Vedic Corpus**: Introduction to Vedas-The four Vedas. **Philosophical System**: Indian Philosophical System – Development and Unique Features-Vedic schools of Philosophy.	1	2 & 3
		Instructional Hours	**06**
Suggested Learning Methods : Peer Learning			

III	**Linguistics:** Component of a Language-Role of Sanskrit in Natural Language Processing. **Mathematics:** Unique Aspects of Indian Mathematics-Great Mathematicians and their Contributions-Arithmetic Calculations.	1	5 & 8
		Instructional Hours	**06**
Suggested Learning Methods : Group Learning			
IV	**Astronomy:** Unique aspects of Indian Astronomy-Historical Development of Astronomy in India-Elements of the Indian Calendar **Town Planning Architecture:** Indian Architecture- A Historical Perspective –Town Planning-Unitary Building –Temple Architecture	1	9 & 12
		Instructional Hours	**06**
Suggested Learning Methods : Mind Mapping			
V	**Health, Wellness and Psychology:** Ayurveda -Definition of Health-Tridosas-Relationships to Health-Disease-Disease Management-Yoga way of Life-Indian Approach to Psychology. **Governance and Public Administration:** Arthasastra Governance and Administration.	1	13 & 14
		Instructional Hours	**06**
Suggested Learning Methods : Case Studies			
		Total Hours	**30**

Text Books	1. B.Mahadevan,Vinayak Rajat Bhat,Nagendra Pavana R.N , Introduction to Indian Knowledge System: Concepts and Applications, PHI Learning Private Limited,Delhi, 2022.
Reference Books	1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002. 2. Traditional Knowledge System in India, by Amit Jha, 2009.
Web. URLs	1. https://www.youtube.com/watch?v=LZP1StpYEPM 2. http://nptel.ac.in/courses/121106003/

Course Designed by	**Verified by Chairman**
Dr. N. Saranya	Dr. K. Raja Rajeswari

Course Code	Title	
22U4VBOE07	Value Based Open Elective Course : Principles of Intellectual Property Rights	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	To make the students to recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights. To learn the procedure of obtaining Patents, Copyrights, Trade Marks &Industrial Design
Course Category	Entrepreneurship
Development Needs	Global
Course Description	The course is designed to provide comprehensive knowledge to students regarding the general principles of IPR, Concepts and Theories, Criticisms of Intellectual Property Rights, the registration process, and the International Regime Relating to IPR.

Course Outcomes		Teaching Methods
CO 1	Understand Intellectual Property Rights (IPR), its significance in promoting innovation and creativity, and the different types of IPRs.	Lecture
CO 2	Equip with the knowledge to navigate the patent filing process effectively.	Tutorial
CO 3	Comprehend the fundamentals of copyrights, their types, registration procedures, terms and remedies	Lecture
CO 4	Narrate the trademarks, their rights, types, purpose, registration process, and the trademark landscape in India	Tutorial
CO 5	Analyze the significance of geographical indications (GI) and the need for their protection, the relevant laws and regulations in India	Lecture

Course Content	Instructional Hours / Week : 2		
Unit	**Description**	**Text Book**	**Chapters**
I	**Introduction to Intellectual Property Rights (IPR):**Definition of IPR, Importance of IPR, Kinds of Intellectual property rights: Copy Rights, Patent, Trade Mark, Trade Secret and trade dress, Design, Layout Design, Geographical Indication, Plant Varieties and Traditional Knowledge, IPR in India and the world, IPR and WTO.	1	1,2
		Instruction Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
II	**Patent:** Introduction to Patent, Patent Act 1970 and its amendments, Patentable and non-Patentable inventions, legal requirements for obtaining Patent, Registration Procedure of Patent, The role of Patentees and Different layers of the international patent system: National and International Patent filing procedures.	1	4
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
III	**Copyright**: Introduction to Copyrights, Origin, and Definition & Types of Copyrights, Registration procedure, Assignment & license, Terms of Copyright, Piracy, Infringement, Remedies, Copyrights with special reference to software, Copyrights in India.	1	
		Instructional Hours	**6**

Suggested Learning Methods : Lecture/Tutorial			
IV	**Trademarks:** Introduction to trademarks, Rights of trademark, Types of trademark, purpose, and function of a trademark, trademark protection, and trademark registration process, trademarks in India.	1	9
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
V	**Design:** Introduction to Design, Registration of Design, Cancellation of Registration, International Convention on Design, functions of Design, **Geo Graphical Indication:** Introduction to Geo Graphical Indication, Why and how GI needs protection and GI laws, Indian GI act.	1	7,10
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
		Total Hours	**30**

Text Book	**1.** Intellectual Property Rights, Asha Vijay DurafeDhanashree K. Toradmalle, Wiley Publisher, 2022
Reference Book	1. B.L. Wadera, Patents, trademarks, copyright, Designs and Geographical Judications.
Web. URLs	1. https://dst.gov.in/sites/default/files/E-BOOK%20IPR.pdf

Course Designed by	**Verified by Chairman**
Dr. K. Prathapchandran	Dr. K. Selvavinayaki

Course Code	Title	
22U4VBOE08	Value Based Open Elective Course : Science, Society and Culture	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	To create awareness on Science, Indian Society and cultural heritage of our Country
Course Category	Skill Development
Development Needs	Global
Course Description	Facilitate the awareness on Science in everyday life, Indian Society and Social empowerment, Democracy and Freedom of our Country.Ancient Civilization, cultural heritage and perceptions of Indian Culture

Course Outcomes		Teaching Methods
CO 1	Know the concepts of Science in our daily life and awareness about Scientific community	Lecture / Video Lessons/ Model
CO 2	Gain knowledge on Indian society and development of modern society	Lecture / Video Lessons
CO 3	Learn about Indian social issues and awareness on our social laws	Lectures / Case study
CO 4	Understand the Indian culture, diversity of culture and Traditional customs	Tutorial / Group Discussion
CO 5	Comparison of ancient heritage and civilization of our country and follow them in our life	Lecture / Tutorial

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Common Science**-Developments and their applications- effects in day to day Life - Achievements of Indians in Science and Technology. Awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology and Biotechnology. Scientists of Ancient India, Science and Scientists of Medieval India, Scientists of Modern India. India's Policy in the Field of the Science, Policies and Reports related to Science-Innovative Technology Vision.	1	1
		Instructional Hours	**6**
Suggested Learning Methods: Video Lectures			
II	**Social Behaviour** -Salient features of our Society-Social diversity of India-Impact of globalization on Indian society. Social empowerment, Democracy and Freedom-Role of women and women's organization in the development of healthy society.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Tutorials			
III	**National Integration**– Communalism-Regionalism and Secularism – Problems relating to development and management of Social Sector-Services relating to Health, Education and Human Resources. Welfare schemes for vulnerable sections of the people-Performance of Centre and States schemes-Mechanisms-Laws,	2	1 & 2

	Institutions and Bodies constituted for the protection and development of vulnerable sections.		
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	**South Asian Cultures**-Indian culture-combination of several cultures-Indian philosophy-Religious culture-Family structure and marriage-Wedding rituals-Indian greetings-Indian foods- Festivals-Traditional clothing. Epics of India-Indian Arts and Music-Indian architecture and Sculptures-Indian Languages and Literature-Perceptions of Indian culture.	3	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Tutorials			
V	**Ancient Civilization**-Indus Valley Civilization-Harappa and Mohenjo-Daro civilization-Evolutions of early Buddhist Architecture-Advent in China-Ellora caves civilization-King Gupta's period of civilization-Vijayanagara inscriptions-Mohall's period of civilization-British culture.	4	2
		Instructional Hours	**6**
Suggested Learning Methods : Online Tutorial			
		Total Hours	**30**

Text Books	1. Science, Culture and Society: Understanding Science in the 21st Centuryby Mark Erickson, Paperback – Illustrated, 2015. 2. Khanna, Indian Social order and Laws, Universities Press. 3. Choudhary, Social Protection Law Provisions and Procedure. 4. Indian Heritage systems-Universal Law Publishing Company. 5. Ancient Civilization of Indian sub-continent- Ancient Books.
Reference Books	1. National integration and Secularism: Issues and Challenges, Regal Publications. 2. Ancient Culture of India: Issues and Concerns.
Web. URLs	1. https://www.amazon.in/Science-Culture-Society-Understanding-Century-dp-0745662250/dp/0745662250/ref=dp_ob_title_bk. 2. https://iasscore.in/upsc-syllabus/indian-society/indian-society-mains. 3. https://www.worldhistory.org/india/

Course Designed by	**Verified by Chairman**
Dr. K. Narayanasamy	Dr. M. Thangavel

Course Code	Title	
22U4VBOE09	Value Based Open Elective Course: Community Engagement	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	This course serves as an introduction to community engagement, helping learners to explore methods of community involvement, change making process, and professionalism within the community.
Course Category	Skill Development
Development Needs	National
Course Description	Apply the principles of communication for outreach to the diverse public, decision makers, and stakeholder groups.

Course Outcomes		Teaching Methods
CO 1	Apply professional behavior when working with community organizations	Lecture/ Case Study
CO 2	Investigate the complexity of problems related to community needs	Lecture/ Role Play
CO 3	Design and conduct the phases of a community engagement process, using consensus building and relating to formal planning procedures.	Lecture/ Case Study
CO 4	Recognize community interests, power dynamics, and conflict, and facilitate empowerment of excluded groups and negotiation	Lecture/ / Role Play
CO 5	Direct cross-jurisdictional, inter-agency, inter-disciplinary, and multi-stakeholder collaboration.	Lecture/ Case Study

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	Concept, Ethics and Spectrum of Community engagement, Local community, Rural culture and Practice of community engagement	3	2
		Instructional Hours	**6**
Suggested Learning Methods: Seminar			
II	Rural Development Programs and Rural institutions,Local Administration and Community Involvement	2	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
III	Stages, Components and Principles of community development, Utility of public resources. Social contribution of community networking, Various government schemes.	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			

IV	Community Engaged Research and Ethics in Community Engaged Research. PRA, Programmes of community engagement and their evaluation.	1	2
		Instructional Hours	**6**
Suggested Learning Methods : Creative Art Assignments			
V	Rural Distress, Rural Poverty, Impact of Disasters on Migrant Laborers, Mitigation of Disaster.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : CommunityParticipation Program			
		Total Hours	**30**
Text Books	1. Participatory Rural Appraisal, PRA Application in Rural Development Planning, R Ramesh 2. Introduction to Community Development, Theory, Practice, and Service-Learning, Gary Paul Green, Jerry W. Robinson, Jr, 2011, SAGE Publications		
Reference Books	1. Community-based participatory research: a capacity-building approach for policy advocacy aimed at eliminating health disparities. Am J Public Health. 2010 2. Achieving successful community engagement: A rapid realist review. BMC Health Services Research.		
Web. URLs	1. https://unnatbharatabhiyan.gov.in › presentations 2. https://www.wellawareworld.org/		

Course Designed by	**Verified by Chairman**
Dr. T. Lidya	Dr. P. Nathiya

Course Code	Title	
22U4VBOE10	Value Based Open Elective Course : Emotional Intelligence	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	To enable the Students to understand the concepts of Emotional Intelligence, its models and components
Course Category	Employability & Skill Development
Development Needs	National & Global
Course Description	Understanding the importance of Emotional Intelligence and build effective relationships

Course Outcomes		**Teaching Methods**
CO 1	Understand the Self-Awareness, Self-Management, Social Awareness and Relationship Management	Lecture/ Video Lectures
CO 2	Discover personal competence and techniques of building emotional intelligence.	Lecture/ Role Play
CO 3	Narrate the insights into establishing positive relationships	Lecture/ Peer Teaching
CO 4	Understand the emotional intelligence and its importance	Lecture/ Role Play
CO 5	Summarize the Self-Management Techniques	Lecture/ Group Discussion

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Fundamentals of Emotional Intelligence**: Meaning Definition Nature and Significance Models of Emotional Intelligence-: Ability, Trait and Mixed Building blocks of emotional intelligence: Self-awareness, Self-Management, Social Awareness, and Relationship Management	1	1&2
	Instructional Hours		**6**
Suggested Learning Methods: Video lectures			
II	**Personal Competence:** Meaning Definition Self Awareness: Observing and recognizing one's own feelings, Knowing one's strengths and areas of development. Self-Management: Managing emotions, anxiety, fear, and anger.	1	5&6
	Instructional Hours		**6**
Suggested Learning Methods: Role Play			
III	**Social Competence**: Social Awareness: Others' Perspectives, Empathy and Compassion Relationship Management: Effective communication, Collaboration, Teamwork and Conflict Management	2	1&2
	Instructional Hours		**6**
Suggested Learning Methods: Peer Teaching			

IV	**Emotional Intelligence:** Measurement and Development - Meaning Definition, Importance Measures of emotional intelligence Strategies to develop and enhance Emotional Intelligence	2	4&5
		Instructional Hours	**6**
Suggested Learning Methods: Role Play			
V	**Self-Management Techniques**: Meaning Definition Techniques to regulate emotions such as Mindfulness, Conditioned relaxation response and Boundary setting Techniques of Relationship Management: Display of empathy, Effective Communication , Teamwork , Conflict resolution	2	6&7
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
		Total Hours	**30**

Text Books	1. Bar-On, R., & Parker, J.D.A.(Eds.) (2000). The handbook of emotional intelligence. San Francisco, California: Jossey Bros. 2. Goleman, D. (2005). Emotional Intelligence. New York: Bantam Book. 3. Sternberg, R. J. (Ed.). (2000). Handbook of intelligence. Cambridge University Press.
Reference Books	1. HBR's 10 Must Reads on Emotional Intelligence (2015) 2. HBR's 10 Must Reads on Managing Yourself (2011) 3. Self-Discipline: Life Management, Kindle Edition, Daniel Johnson.

Course Designed by	**Verified by Chairman**
Dr. R .A. Ayyapparajan	Dr. R. A. Ayyapparajan

Course Code	Title	
22U4VBOE11	Value Based Open Elective Course : Fundamentals of Tourism	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	To impart Knowledge on Tourism and its development in the economic growth and also to identify the tourist needs.
Course Category	Employability
Development Needs	Global
Course Description	To enhance the students to get part in the tourism industry and to know about concepts of tourism.

Course Outcomes		Teaching Methods
CO 1	Understand tourism and its development	Direct Instruction
CO 2	Analyse the Factors influencing the Travel Motivations.	Direct Instruction
CO 3	Comprehend the Tourist Transport	Video Lessons
CO 4	Understand the Tourist Accommodations	Direct Instruction
CO 5	Apply the Travel Agency Operations	Video Lessons

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**The Tourism Phenomenon:** Definition – Tourism; Tour; Tourist; Visitor; Excursionist; Domestic; International; Inbound; Outbound; Destination. Growth of Tourism / Evolution / History of Tourism & Present status of tourism in India. Thomas Cook – Grand Circular Tour.	1	9, Key Terms
		Instructional Hours	**6**
Suggested Learning Methods: Lecture Based Learning			
II	**Travel Motivations:*Categories of Motivations:*** Physical Motivators, Cultural Motivators, Interpersonal Motivators, Status and prestige Motivators. ***Types of Tourism:*** Pleasure, relaxation, Rest and recreation, Health, Participation in Sports, Curiosity and Culture, Ethnic and Family, Spiritual and Religious, Professional or Business.	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Group Learning Method			
III	**Tourist Transport:** Role of Transport in Tourism, Modes of Transport, Road Transport, Air Transport, Rail Transport, Sea Transport.	2	15
		Instructional Hours	**6**
Suggested Learning Methods : Group Learning Method			
IV	**Tourist Accommodation:** Definition, Types of Hotels, International Hotels, Resort Hotels, Commercial Hotels, Residential Hotels, Floating Hotels. **Supplementary Accommodation:** Motel, Youth Hostel, Camping Sites, Pension, Bed and Breakfast Establishment, Tourist Holiday Villages, Time and Resort Condominiums.	1	8
		Instructional Hours	**6**
Suggested Learning Methods: Group Learning Method			

V	**Travel Agency:** Products of Travel Agency, Classification of Travel Agency, Functions, Travel Related Business, International Travel Requirements, Travel Agency Operations.	3	2,3
		Instructional Hours	**6**
Suggested Learning Methods: Lecture Based Learning			
		Total Hours	**30**
Text Books	1. A.K. Bhatia, Tourism Development: Principles & Practices, Sterling Publishers Pvt 2007. 2. A.K. Bhatia, International Tourism Management, Sterling Publishers Pvt 2012. 3. Jagmohan Negi, Travel Agency Operations Concepts and Principles, Kanishka Publishers and Distributors, 2003.		
Reference Books	1. Biswanth Gosh, Tourism & travel management, Vikas Publishing House, Second Edition, 2008. 2. Christopher Holloway, Business of tourism, Elsevier Publisher, Second Edition, 2006.		

Course Designed by	**Verified by Chairman**
Mr. B. Tamilselvan	Mr. T. R. Rajesh Pandian

Course Code	Title	
22U4VBOE12	Value Based Open Elective : Health Education	
Semester : IV	Credits : 2	ESE: 5 0Marks

Course Objective	1. Acquire knowledge on different dimensions of health. 2. Inbuilt healthy life style practices
Course Category	Value education
Development Needs	Local
Course Description	It provides knowledge on values and practices for healthy living

Course Outcomes		Teaching Methods
CO1	Recall the importance of health education	Interactivesession
CO2	Enlist the right choice of foods and dietary pattern	Interactivesession
CO3	Identify methods to manage mental health issues	Activitybased teaching
CO4	Practice effective personal health habits	Interactivesession
CO5	Summarize the importance of environmental health for mankind	Interactivesession

Course Content **Instructional Hours/Week:2**

Unit	Description	Text Book	Chapters
I	**Health Education:** Concept of health, Components of wellness,spectrum and determinants of health - Definition of health-health education-Aim, objective and principles of health education - Health services, Related Activity -Measuring the health attitudes of students	1	1
	Instructional Hours		**6**
Suggested Learning Methods: Group Activity			
II	**Food and Health** Basic 4, 5and7 food groups; functional food groups-energy yielding, body building and protective foods (only sources and functions), food pyramid, meal planning pattern, healthy eating pattern.Related Activity -Assessing dietary adequacy of students	3,4	1 & 1, 2
	Instructional Hours		**6**
Suggested Learning Methods: Peer learning			
III	**Mental Health** Meaning of mental health –importance of mental health-characteristics of emotionally healthy-Self esteem-Values and patterns in decision making- Mental health problem of adolescences –depression & stress -causes and managementRelated activity-Stress level assessment in students	1	6
	Instructional Hours		**6**
Suggested Learning Methods: Role play			

IV	**Personal Health** Definition of personal health- under nutrition and over nutrition -prevalence of life style disease-healthy lifestyle practices- personal hygiene-Importance of physical activities& exercise Related Activity -Analyzing the physical activity pattern of students	1	8
		Instructional Hours	**6**
Suggested Learning Methods: Assignment			
V	**Environment and Health** Definition of environmental health, Biodiversity, climate change and biodiversity, environmental pollution-causes and consequences of air, water and soil pollution-Food contamination and consequences Related Activity-Group discussion on case studies	2	5,8
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
		Total hours	**30**

Text Books	1. Anspaugh (2001), Teaching Today's Health, Library of Congress Cataloging, 6th Edition, US 2. Tyler Miller (2006), Environmental Science, Cengage learning India private ltd 3. Srilakshmi (2010), Dietetics, New age International private limited, New Delhi 4. Srilakshmi (2010), Food Science, New age International private limited, New Delhi
ReferenceBooks	1. Howley& Don Franus(B) (2003) Health Fitness Instructor's Handbook. Human Kinetics publication. 2. Ramachandran. L. Dharmalingam. T (1993) Health Education India. Vikas publishing House Private Limited
Journals	1. Health education

Course Designed by	**Verified by Chairman**
Dr. A. Swarnalatha	Dr. A. Swarnalatha

Course Code	Title	
22U4VBOE13	Value Based Open Elective Course : Media and Politics	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To Impart knowledge of understanding the media and politics
Course Category	Skill Development
Development Needs	Global
Course Description	This course examines how media and political institutions interact to shape public thinking and debates around social problems.

	Course Outcomes	Teaching Methods
CO 1	Understand the basic idea of media and Politics	Lecture and Demonstration
CO 2	Summarize the political stance of media.	Lecture
CO 3	Apply the Skills on writing political news.	Lecture and Demonstration
CO 4	Evaluate the various characteristics of media Organization.	Video Lectures
CO 5	Apply the mass media influences as individuals, groups, and society in political contexts	Discussion

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Media –- Meaning and importance. Role of media in Society Political Communication – Mass Media politics and Society- Cinema and political manifestation. Social media and Political narration	1	1
		Instructional Hours	**06**
Suggested Learning Methods: Learning by Teaching			
II	Characteristics of Modern Mass Media: Print and Electronic Media – Political economy and Ownership	2	2
		Instructional Hours	**06**
Suggested Learning Methods : Active Learning			
III	Political Economy - State ownership versus private ownership of mass media – Consequences of private and public- Media ownership pattern Government Regulation – Monopoly- Media content and its Censorship.	1	2
		Instructional Hours	**06**
Suggested Learning Methods : Group Learning			
IV	Public Opinion- The relationship between the mass media and public sphere- Political manipulation of media content- the impact of mass media on global political processes.	3	3
		Instructional Hours	**06**
Suggested Learning Methods: Visual Learning			

V	Political effects of Mass Media: Individual- group- and Society Public- making public opinion- Setting of Political agenda- Political Socialization- Political mobilization	2	4
		Instructional Hours	**06**
Suggested Learning Methods : Case study based Learning			
		Total Hours	**30**

Text Books	1. Lowe, L. (2016). The Definitive Guide to Creative Writing and Media Productions. United States: Xlibris UK. 2. Marshall, C. (2018). Writing for Social Media. United Kingdom: BCS Learning & Development Limited. 3. Cain, S., Batty, C. (2016). Media Writing: A Practical Introduction. United Kingdom: Palgrave Macmillan.
Reference Books	1. Mencher, Melvin."Basic News Writing" Universal Bookstall, New Delhi.1993. 2. Sreenivas Rao. Academic Book Centre, Ahmedabad. 1981. 3. Barnard, J. (2019). The Multimodal Writer: Creative Writing Across Genres and Media. United Kingdom: Bloomsbury Academic. 4. Kuehn, S. A., Lingwall, J. A. (2016). The Basics of Media Writing: A Strategic Approach. United States: SAGE Publications.
Web. URLs	1. https://www.bing.com/videos/

Course Designed by	**Verified by Chairman**
Dr. Baiju Paul	Dr. Paul Benzier

Course Code	Title	
22U4VBOE14	Value Based Open Elective : Positive Psychology and Work Life	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To bring an experience marked by predominance of positive emotions and informing them about emerging paradigm of Positive Psychology
Course Category	Skill Development
Development Needs	National
Course Description	Build relevant competencies for experiencing and sharing happiness as lived experience and its implications

Course Outcomes		**Teaching Methods**
CO 1	Understand the realities of Psychology and Work life	Lecture/ Case Study
CO 2	Insight on origin and development of Positive Psychology	Lecture/ Role Play
CO 3	Reveal the knowledge about phases of Positive Psychology	Lecture/ Case Study
CO 4	Perceptiveness about Happiness in Psychology and its Traits	Lecture/ Role Play
CO 5	Furnish the specific skills and techniques for working with Trust and Companionship	Lecture/ / Role Play

Course Content		**Instructional Hours / Week : 2**	
Unit	**Description**	**Text Book**	**Chapters**
I	Introduction to Positive Psychology : Positive Psychology: Concept, History, Nature, Dimension and scope of Positive Psychology Seligman's PERMA	3	1
	Instructional Hours		**6**
Suggested Learning Methods: Seminar			
II	Positive Emotional States and Processes, Positive Emotions and well being: Hope & Optimism, Love, The Positive Psychology of Emotional Intelligence, Influence of Positive Emotions	2	3
	Instructional Hours		**6**
Suggested Learning Methods : Role Play			
III	Strengths and Virtues : Character Strengths and Virtues Resilience in the phase of challenge & Loss, Empathy and Altruism	1	3
	Instructional Hours		**6**
Suggested Learning Methods : Role Play			
IV	Happiness : Introduction to Psychology of happiness, well being and scope, Types of happiness- Eudaimonic and Hedonic History of Happiness, Theories, Measures and Positive correlates of happiness, Traits associated with Happiness, Setting Goals for Life and Happiness	3	2
	Instructional Hours		**6**
Suggested Learning Methods : Creative Art Assignments			

V	**Forgiveness and Gratitude** : Forgiveness and Gratitude , Personal transformation and Role of suffering , Trust and Compassion	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Community Participation Program			
		Total Hours	**30**
Text Books	1. Argyle, M. 1987. *The psychology of happiness.* London: Methuen. 2. Carr, Alan (2007). Positive Psychology: The science of human happiness and human strengths. Routledge, Taylor and Francis Group-London. Csikzentmihalyi, Mihaly (1990) Flow: The Psychology of Optimal Experience, Harper Perennial. 3. Garcia,Hector., &Mirrales. Francesc.(2017) IKIGAI-The Japanese Secret to a Long and Happy Life, Hutchinson London.		
Reference Books	1. Frankl, Viktor E. (1988). The Will to Meaning: Foundations and Applications of Logotherapy.Meridian/Plume 2. Frankl, Viktor E. (2000) Man's Search for Ultimate Meaning, Basic Books. 3. Snyder, C. R., & Lopez, S. J., &Pedrotti, J. T (2011) Positive Psychology: The Scientific and Practical Explorations of Human Strengths, Sage Publications India Pvt Ltd.		

Course Designed by	**Verified by Chairman**
Ms. Merlin Jenefer	Dr. P. Nathiya

Course Code	Title	
22U4VBOE15	Value Based Open Elective Course : Professional Ethics	
Semester : IV	Credits : 2	ESE : 50 Marks

Course Objective	Students will understand the importance of Values and Ethics in their personal lives and Professional careers
Course Category	Employability & Skill Development
Development Needs	National & Global
Course Description	Understanding the importance of maintaining Professional Ethics and build effective career.

Course Outcomes		**Teaching Methods**
CO 1	Understand the basic purpose of Profession	Lecture
CO 2	Summarize the Professional Rights And Responsibilities	Lecture/Peer Teaching
CO 3	Apply thevarious Roles in Applying Ethical Principles at Various Professional Levels	Lecture/Case Study
CO 4	Professional Ethical Values and Contemporary Issues	Lecture/Role Play
CO 5	Excelling in Competitive and Challenging Environment to Contribute to Industrial Growth.	Lecture/Group Discussion

Course Content	**Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introduction to Professional Ethics: Meaning Definition Basic Concepts** Governing Ethics, Personal & Professional Ethics, Life Skills, Emotional Intelligence Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.	1	1&2
	Instructional Hours		**6**
Suggested Learning Methods: Video lectures			
II	**Basic Theories:** Basic Ethical Principles, Moral Developments, Deontology Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy	1	5&6
	Instructional Hours		**6**
Suggested Learning Methods: Mini Case Analysis			

III	**Professional Practices:** Professions and Norms of Professional Conduct, Norms of Professional Conduct vs. Profession Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.	2	1&2
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
IV	Ethics in changing domains of Research: The US government wide definition of research misconduct, research misconduct distinguished from mistakes and errors, recent history of attention to research misconduct The emerging emphasis on understanding and fostering responsible conduct, responsible authorship, reviewing & editing.	2	4&5
		Instructional Hours	**6**
Suggested Learning Methods: Role Play			
V	Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Deflection, Pollution, Ethics in Manufacturing and Marketing Media Ethics; War Ethics; Bio Ethics, Intellectual Property Rights	2	6&7
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
		Total Hours	**30**

Text Books	1. Professional Ethics: R. Subramanian, Oxford University Press, 2015. 2. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press, 2015
Reference Books	1. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008

Course Designed by	**Verified by Chairman**
Dr. R .A. Ayyapparajan	Dr. R .A. Ayyapparajan

Course Code	Title	
22U4VBOE16	Value Based Open Elective Course : The Science of Happiness	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To explore the key elements of happiness at work and strategies to cultivate joy, well-being, and productivity in the workplace, relationship between happiness and various work-related factors, such as efficiency, creativity, innovation, work-life balance, and making a difference for others.
Course Category	Skill Development
Development Needs	Global
Course Description	To create a positive work environment and promote happiness for themselves and others.

Course Outcomes		Teaching Methods
CO 1	Understand the Happiness as a Scientific Construct	Lecture Method
CO 2	Apply the Theories and Models of Well-being	Flipped Teaching
CO 3	Demonstrate the Individual Factors and Happiness	Lecture Method
CO 4	Analyze the Social and Environmental Factors in Happiness	Lecture Method
CO 5	Apply Happiness and Work Efficiency	Flipped Teaching

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introduction to Happiness as a Scientific Construct** Defining happiness and its importance in individual and societal well-being, Overview of subjective well-being and its components - life satisfaction, positive emotions, and negative emotions, Exploration of cultural variations in happiness and its measurement	1	1
	Instructional Hours		**6**
Suggested Learning Methods: Group Discussion			
II	**Theories and Models of Well-being** Prominent theories of well-being - hedonic well-being, eudemonic well-being, PERMA model. Role of factors - autonomy, meaning, and engagement in happiness. Strengths and limitations of different well-being models	1	2
	Instructional Hours		**6**
Suggested Learning Methods: Group Discussion			
III	**Individual Factors and Happiness** Personality traits - optimism, resilience and their influence on happiness. Role of genetics and biological factors in determining happiness levels. Examination of personal values, goals, and self-esteem and their impact on subjective well-being	1	3
	Instructional Hours		**6**
Suggested Learning Methods: Group Discussion			

IV	**Social and Environmental Factors in Happiness** Importance of social relationships and social support in promoting happiness. Influence of social comparison, social norms, and cultural factors on well-being. Impact of environmental factors - access to nature, quality of living conditions on happiness.	1	4
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
V	**Happiness and Work Efficiency** Impact of happiness on work efficiency and productivity, strategies for managing daily hassles and reducing stress in the workplace, link between happiness and creativity in the workplace, Strategies for fostering a creative and innovative work environment	1	5
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
		Total Hours	**30**

Text Books	1. Susan A. David, IlonaBOni well, and Amanda Conley Ayers; The Oxford Hand book of Happiness.
Reference Books	1. Achor, S. (2010). The happiness advantage: The seven principles of positive psychology that fuel success and performance at work. Random House. 2. Lyubomirsky, S. (2008). The how of happiness: A scientific approach to getting the life you want. Penguin. 3. Diener, E., & Seligman, M. E. P. (2002). Very happy people. Psychological Science, 13(1), 81-84.
Web. URLs	1. https://onlinecourses.nptel.ac.in/noc23_hs06/preview

Course Designed by	**Verified by Chairman**
Dr. S. Balaji	Dr. K. Rajarajeswari

Course Code	Title		
23U3AMC508	Core Paper XIII: Machine Learning Techniques		
Semester: V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(B. Sc Artificial Intelligence and Machine Learning)			
Course Objective	To be able to formulate machine learning problems corresponding to different applications. To understand a range of machine learning algorithms along with their strengths and weaknesses.		
Course Category	Employability		
Development Needs	Global		
Course Description	This course introduces principles, algorithms, and applications of machine learning from the point of view of modeling and prediction. It includes formulation of learning problems and concepts of representation, over-fitting, and generalization.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts and techniques ofMachine Learning.	Lecture / Demonstration / Flipped Classroom	Assignment
CO 2	Explain the regression methods, classification methods, clustering methods.	Demonstration / Constructivist Approach/ Tutorial	Seminar
CO 3	Understand the Tree and Probabilistic Models	Lectures / Video Lessons	Quiz
CO 4	Demonstrate Dimensionality reduction Techniques	Tutorial / Case Studies	Quiz
CO 5	Apply the Graphical models for the various Markov methods and hidden Markov model.	Lecture / Demonstration	Assignment

Offered by	B. Sc Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	Introduction – Types of Machine Learning – Supervised Learning – The Brain and the Neuron –Design a Learning System – Perspectives and Issues in Machine Learning – Concept Learning Task –Concept Learningas Search- Finding a Maximally Specific Hypothesis – Version Spaces and the Candidate Elimination Algorithm–Linear Discriminants– Perceptron–Linear Separability– Linear Regression.	1	1,2
		Instructional Hours	15
Suggested Learning Methods: Video lectures about the basics Machine Learning			
II	Linear Models–Multi Layer Perception–Going Forwards–Going Backwards: Back Propagation Error–Multilayer Preceptor in Practice– Examples of using the MLP–Overview–Deriving Back - Propagation–Radial Basis Functions and Spines–Concepts–RBF Network–Curse of Dimensionality– Interpolations and	1	2,3

	Basic Functions– Support Vector Machines		
		Instructional Hours	**15**
		Suggested Learning Methods: Video Lecture	
III	Tree and Probabilistic Models – Learning with Trees – Decision Trees – Constructing Decision Trees – Classification and Regression Trees – Ensemble Learning – Boosting – Bagging – Different ways to Combine Classifiers - Probability and Learning – Data into Probabilities – Basic Statistics – Gaussian Mixture Models – Nearest Neighbor Methods – Unsupervised Learning – K means Algorithms – Vector Quantization – Self Organizing Feature Map.	1	4,5
		Instructional Hours	**15**
		Suggested Learning Methods: Video Lecture	
IV	Dimensionality Reduction and Evolutionary Models-Dimensionality Reduction–Linear Discriminate Analysis–Locally Linear Embedding–Isomap–Least Squares Optimization–Evolutionary Learning–Genetic Algorithms–Genetic Offspring–Genetic Operators–Using Genetic Algorithms–Reinforcements Learning–Overview–Getting Lost Example–Markov Decision Process.	1	6,7
		Instructional Hours	**15**
		Suggested Learning Methods: Video Lecture	
V	Graphical Models – Markov Chain Monte Carlo Methods – Sampling – Proposal Distribution – Markov Chain Monte Carlo – Graphical Models – Bayesian Networks – Markov Random Fields – Hidden Markov Models – Tracking Methods.	1	8,9
		Instructional Hours	**15**
		Suggested Learning Methods: Group Discussion	
		Total Hours	**75 Hrs**

Text Books	1. Ethem Alpayd **,"Introduction to Machine Learning (Adaptive Computation and Machine Learning Series)"**, Third Edition, MIT Press,2014. **Unit I:** Sections: 1.1 to 1.3, .1.4 to 2.1 (Chapter 1 and 2) **Unit II :** Sections: 2.2 to 2.3, 3.1 to 3.3 (Chapter 2 and 3) **Unit III :** Sections: 4.2 to 4.4, 4.6 to 5.5 (Chapter 4 and 5) **Unit IV :** Sections: 6.1 to 6.3, 7.1 to 7.5 (Chapter 6 and 7) **Unit V :** Sections 8.1 to 8.3, 9.1 to 9.4 (Chapter 8 and 9)
Reference Books	1. Jason Bell,"**MachineLearning–Handson for Developers and Technical professionals",** First Edition, Wiley, 2014. 2. Peter Flach**, "Machine Learning: The Art and Science of Algorithms that Make Sense of Data"**, First Edition, Cambridge University Press, 2012.
Web. URLs	https://www.geeksforgeeks.org/machine-learning/ https://www.dgp.toronto.edu/~hertzman/411notes.pdf

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	L	M	-	-	-	-	M	H	M	M	M	H	M
CO2	L	M	-	M	L	-	M	H	M	H	H	M	H
CO3	M	M	-	M	L	-	M	H	L	M	H	H	H
CO4	H	H	-	L	M	-	M	H	H	H	M	M	M
CO5	H	H	-	L	M	-	M	H	H	M	M	M	M
H-High; M-Medium; L-Low													
Course designed by								**Verified By Chairman**					
Dr. N. Saranya								Dr. K. Selvavinayaki					

Course Code	Title		
23U3AMC509	Core Paper XIV : Natural Language Processing		
Semester: V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(B. Sc. Artificial Intelligence and Machine Learning)			

Course Objective	To introduce the fundamental concepts and techniques of natural language processing (NLP)
Course Category	Skill Development
Development Needs	Global
Course Description	The Natural Language Processing course covers concepts like statistical machine translation and neural models, deep semantic similarity models (DSSM), neural knowledge base embedding, deep reinforcement learning techniques, neural models applied to image captioning ,and visual question answering with Python's Natural Language Toolkit.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the fundamental concepts and techniques of natural language processing (NLP)	Lecture	Assignment
CO 2	Understand the lexical models and algorithms in the field of NLP.	Tutorial	Seminar
CO 3	Demonstrate the computational properties of natural languages and the commonly used algorithms forprocessing linguistic information.	Lectures	Quiz
CO 4	Understand semantics and pragmatics of languages for processing	Case Studies	Seminar
CO 5	Understand Machine Translation of languages forprocessing	Demonstration	Assignment

Offered by	**B. Sc Artificial Intelligence and Machine Learning**

Course Content — **Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapters
I	Introduction to NLP: Introduction: - Application of NLP techniques and key issues- MT Grammar Checkers-Dictation-Document generation-NL interfaces-Natural language processing key issues-The different analysis levels used for NLP: Morpho-Lexical-Syntactic-Semantic-Pragmatic-Markup (TEI, UNICODE)-Finite state automata- Recursive and augment-ed transition networks- Open problems	1	1,2
		Instructional Hours	15
	Suggested Learning Methods: Video lectures		
II	**Lexical Level:** Error tolerant lexical processing (spelling error correction)-Transducers for the design of morphologic analyzers features-Towards syntax: part-of-speech tagging (BRILL, HMM) - Efficient representations for linguistic resources (lexical and grammars) tries and finite state automata.	1,2	5,11
		Instructional Hours	15
	Suggested Learning Methods: Video lectures		

III	Syntactic Level: Grammars (eg. formal/Chomsky hierarchy, DCSGs, systematic case, unification, stochastic)- Parsing (top-down, bottom up), char(early algorithm), CYK algorithm- Automated estimation of probabilistic model parameters(inside-outside algorithm)- Data oriented parsing - Grammar formalisms and treebanks- Efficient parsing for context free grammars(CFGs)- Statistical parsing and Probabilistic CFGs(PCFGs)-Lexicalized PCFGse.	1	12-14
		Instructional Hours	**15**
		Suggested Learning Methods: Video lectures	
IV	Semantic Level: Logical forms- Ambiguity resolution- Semantic network and parsers- Procedural semantics- Montague semantics- Vector space approaches- Distributional semantics-Lexical semantics and word sense disambiguation-Compositional semantics- Semantic role labeling and Semantic parsing	I	17-20
		Instructional Hours	**15**
		Suggested Learning Methods: Video lectures	
V	Pragmatic Level: Knowledge representation- Reasoning- Plan/goal recognition –Speech acts/intentions – Belief models- Discourse- Reference. Natural language generation: Content determination – Sentence planning- Surface realization, Subjectivity and Sentiment analysis: Information Extraction – Automatic summarization- Information retrieval and question answering – Named entity recognition and relation extraction.	I	21-23,25
		Instructional Hours	**15**
		Suggested Learning Methods: Laboratory practice	
		Total Hours	**75**

Text Books	1. Daniel J and James H. Martin, "**Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics & Speech Recognition"**, Prentice Hall, 2009. UNIT I: Chapter 1-2 UNIT II: Chapter 5,11 UNIT III: Chapter 12-14 UNIT IV: Chapter 17-20 UNIT V: Chapter 21-23,25
Reference Books	1. Ela Kumar, **"Natural Language Processing"**, I K International Publishing House Pvt.Ltd, 2013
Web. URLs	https://www.tutorialspoint.com/natural_language_processing/index.htm https://www.javatpoint.com/nlp https://www.mygreatlearning.com/blog/natural-language-processing-tutorial/

Tools for Assessment (20Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	L	L	-	-	L	-	-	H	M	M	M	M	M
CO2	M	M	-	-	M	M	M	H	H	M	M	M	H
CO3	H	H	M	L	M	-	M	H	M	M	M	M	M
CO4	H	H	M	L	M	-	M	H	M	L	H	M	M
CO5	H	H	-	L	M	H	M	H	H	H	M	H	H
H-High; M-Medium; L-Low													

Course designed by	**Verified By Chairman**
Mr .M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3AMC510	Core Paper XV: Cloud Computing		
Semester : V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
B. Sc. (Artificial Intelligence and Machine Learning)			
Course Objective	To enable the students to learn the concepts of Cloud Computing.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course gives students an insight into the basics of cloud computing along with virtualization, cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Analyze the evolution and services delivered of cloud computing.	Smart Board / Demonstration	Class Participation
CO 2	Identify the building of cloud networks.	Smart Board / Demonstration	Quiz
CO 3	Evaluate security mechanisms using various approaches.	Demonstration	Seminar
CO 4	Compare the end user access and mobile internet service.	Video Lessons	Seminar
CO 5	Analyze the Collaboration Applications for Mobile Platforms l.	Smart Board / Demonstration	Assignment

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week: 5

Unit	Description	Text Book	Chapters
I	**The Evolution of Cloud Computing:** Overview, Hardware Evolution - First-Generation Computers, Second-Generation Computers, Third-Generation Computers, Fourth-Generation Computers, Internet Software Evolution -Establishing a Common Protocol for the Internet, Evolution of Ipv6, Finding a Common Method to Communicate Using the Internet Protocol, Building a Common Interface to the Internet, The Appearance of Cloud Formations—From One Computer to a Grid of Many. Server Virtualization-Parallel Processing, Vector Processing, Symmetric Multiprocessing Systems, Massively Parallel Processing Systems.	1	1
	Instructional Hours		**15**
	Suggested Learning Methods: Group Discussion		
II	**Web Services Delivered from the Cloud:** Overview - Communication-as-a-Service(CaaS)- Advantages of CaaS, Fully Integrated, Enterprise-Class Unified Communications. Infrastructure-as-a-Service (IaaS)-Modern On-Demand Computing, Amazon's Elastic Cloud, Amazon EC2 Service Characteristics, Mosso (Rackspace). Monitoring-as-a-Service(MaaS)-Protection Against Internal and External Threats, Delivering Business Value, Real-Time Log Monitoring Enables Compliance, Platform-as-a-Service (PaaS)-The Traditional On-Premises Model, The New	1	2

	Cloud Model, Key Characteristics of PaaS. Software-as-a-Service(SaaS)-SaaS Implementation Issues-Key Characteristics of SaaS, Benefits of the SaaS Model.		
		Instructional Hours	**15**
		Suggested Learning Methods: Group Discussion	
III	**Building Cloud Networks:** Overview-The Evolution from the MSP Model to Cloud-Computing and Software-as-a-Service, From Single-Purpose Architectures to Multipurpose Architectures, Data Centre Virtualization, The Cloud Data Centre – Collaboration - Why Collaboration?. Service - Oriented Architectures as a Step Toward Cloud Computing- Basic Approach to a Data Centre-Based SOA-Planning for Capacity, Planning for Availability, Planning for SOA Security, The Role of Open Source Software in Data Centres-Where Open Source Software Is Used-Web Presence, Database Tier, Application Tier, Systems and Network Management Tier.	1	3
		Instructional Hours	**15**
		Suggested Learning Methods: Video Presentation	
IV	**Security in the Cloud:** Overview, Cloud Security Challenges, Software-as-a-Service Security - Is Security-as-a-Service the New MSSP?. **Common Standards in Cloud Computing:** Overview- The Open Cloud Consortium- The Distributed Management Task Force-Standards for Application Developers- Standards for Messaging-Standards for Security.	**1**	6,7
		Instructional Hours	**15**
		Suggested Learning Methods: Video Presentation	
V	**End-User Access to Cloud Computing:** Overview- YouTube-YouTube API Overview-Zimbra-Face book-Zoho- DimDim Collaboration. **Mobile Internet Devices and the Cloud:** Overview - What Is a Smartphone? Mobile Operating Systems for Smartphone's- Mobile Platform Virtualization, Collaboration Applications for Mobile Platforms.	1	8,9
		Instructional Hours	**15**
		Suggested Learning Methods: Video Presentation	
		Total Hours	**75**

Text Books	1. John W. Rittinghouse, James F. Ransome, "**Cloud Computing Implementation, Management and Security"**, CRC Press, Reprint 2017. Unit I: Chapter 1 - Sections:- 1.1 to 1.4 Unit II: Chapter 2 - Sections: - 2.1 to 2.6 Unit III: Chapter 3 - 3.1 to 3.8 Unit IV: Chapter 6 - Sections:- 6.1 to 6.4, Chapter 7 - Sections:- 7.1 to 7.6 Unit V: Chapter 8- Sections:- 8.1 to 8.7,Chapter 9 - Sections:- 9.1 to 9.5
Reference Books	1. Bloor R., Kanfman M., Halper F. Judith Hurwitz , "**Cloud Computing Implementation, Management and Security",** (Wiley IndiaEdition), 2010 2. John Rittinghouse& James Ransome, **"Cloud Computing Implementation Management and Strategy",** CRC Press, 2010.
Web. URLs	**https://www.tutorialspoint.com/cloud_computing/index.htm**

Tools for Assessment (20 Marks)							
CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total	
4	4	5	2	2	3	20	

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	-	M	H	-	M	H	H	H	H	M	M
CO2	H	H	-	M	H	-	M	H	H	H	H	M	M
CO3	H	H	-	M	H	-	M	H	H	H	H	H	H
CO4	H	H	-	M	H	-	M	H	H	H	H	H	H
CO5	H	H	-	M	H	-	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3AMP511	Core Paper XVI: Practical in Natural Language Processing		
Semester: V	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

(B. Sc. Artificial Intelligence and Machine Learning)

Course Objective	To understand the programming knowledge of Natural Language Processing
Course Category	Skill Development
Development Needs	Global
Course Description	It provides basic programming knowledge of Natural Language Processing and its applications

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the fundamental concepts and techniques of natural language processing (NLP)	Practical	Application of logic
CO 2	Understanding of the models and algorithms in the field o f NLP.	Practical	Program creativity
CO 3	Demonstrate the computational properties of natural languages and the commonly used algorithms for processing linguistic information.	Practical	Program Debugging
CO 4	Understanding semantics and pragmatics of languages for processing	Practical	Internal Test
CO 5	Understanding Machine Translation of languages forprocessing	Practical	Model Test

Offered by	**Artificial Intelligence and Machine Learning**
List of Programs	**Instructional Hours / Week : 5**

1. Implementing word similarity
2. Implementing simple problems related to word disambiguation
3. Simple demonstration of part of speech tagging.
4. Lexical analyzer.
5. Semantic Analyzer.
6. Sentiment Analysis

Total Hours | **75**

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	L	M	-	L	M	-	L	H	M	H	H	M	M
CO2	M	M	-	L	M	-	-	H	M	H	M	H	H
CO3	H	H	L	L	M	M	M	H	H	H	M	M	M
CO4	H	H	M	L	M	M	L	H	H	H	M	H	H
CO5	H	H	M	L	M	-	L	H	H	M	H	H	M
H-High; M-Medium; L-Low													
Course designed by								**Verified By Chairman**					
Mr. M. Vijayakumar								Dr. K. Selvavinayaki					

Course Code	Title		
23U3AME501	Discipline Specific Elective paper I : Fundamentals of Robotics		
Semester: V	Credits: 4	CIA: 25 Marks	ESE:75 Marks

B.Sc. Artificial Intelligence and Machine Learning	
Course Objective	To introduce the basic concepts of robotics and its characteristics
Course Category	Employability
Development Needs	Global
Course Description	Introduction to Robotics is a university-level course that teaches students the fundamentals of creating and programming a robot to interact with its environment and perform basic tasks involving motion, sensor data and decision-making

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts of robotics and its characteristics	Flipped Classroom	Assignment
CO 2	Describe the different physical forms of robot architectures.	Tutorial	Seminar
CO 3	Explain about the actuators and characteristics of actuating system	Lectures	Group Discussion
CO 4	Demonstrate to mathematically describe a kinematic robot system	Demonstration	Test
CO 5	Analyze manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.	Class Projects	Test

Offered by	B.Sc. Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to Robotics:** Classification, Components, Characteristics,Applications.	1	1
		Instructional Hours	18
		Suggested Readings: Video Lecture	
II	**Robotics Kinematics:** Position Analysis, Robots as Mechanisms, Matrix Representation, Transformation Matrices, Forward and Inverse Kinematics.	1	2
		Instructional Hours	18
		Suggested Readings: Video Lecture	
III	**Actuators:** Characteristics of Actuating Systems, Actuating Devicesand Control.	1	7
		Instructional Hours	18
		Suggested Readings: Video Lecture	

IV	**Sensors:** Sensor Characteristics, Description of Different Sensors. Dynamic characteristics- speed of motion, load carrying capacity & speed of response-Sensors-Internal sensors: Position sensors, & Velocity sensors, External sensors: Proximity sensors, Tactile Sensors, & Force or Torque sensors.	1	8
		Instructional Hours	**18**
		Suggested Readings: Video Lecture	
V	**Kinematics**: Manipulators Kinematics, Rotation Matrix, Homogenous Transformation Matrix, D-H transformation matrix, D-H method of assignment of frames. Direct and Inverse Kinematics for industrial robots. Differential Kinematics for planar serial robots	1	2
		Instructional Hours	**18**
		Suggested Readings: Video Lecture	
		Total Hours	**90**

Text Books	1. Saeed B. Niku, "**Introduction to Robotics Analysis, Application"**, Pearson Education Asia, 2001 2. R.K.Mittal and I J Nagrath, **"Robotics and Control"**, TMH, 2003
Reference Books	1. Davis Poole, Alan Mackwath, Randy Coehel, **"Computational Intelligence",** Oxford University Press 1998. 2. Groover M P., **"Industrial Robotics"**, McGraw Hill, 2001 3. John J. Craig, **"Introduction to Robotics"**, Pearson, 2010
Web. URLs	geeksforgeeks.org/robotics-introduction/

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	-	L	M	-	M	H	M	L	M	M	M
CO2	L	M	M	M	M	M	M	H	M	M	M	M	H
CO3	H	H	M	M	M	M	H	M	M	L	H	L	M
CO4	H	H	M	M	M	M	H	M	M	M	H	H	H
CO5	H	M	-	H	M	-	M	H	H	H	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K .Selvavinayaki

Course Code	Title		
23U3AME502	Discipline Specific Elective Paper I : Social Network Analysis		
Semester: V	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

B.Sc. Artificial Intelligence and Machine Learning

Course Objective	To enable the students to understand the methodologies used in social network analysis
Course Category	Skill Development
Development Needs	Global
Course Description	This course covers data analysis on social networks, focusing on ways to handle large-scale networks efficiently. It provides the main theoretical results in social network mining as well as hands-on practice on key issues in the area.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand a broad range of network concepts and theories.	Demonstration	Open book Test
CO 2	Appreciate how network analysis can contribute to increasing knowledge about diverse aspects of society.	Online Tutorial	Assignment
CO 3	Understand the relational approach for network designing.	Video Lessons	Group Discussion
CO 4	Analyse social network data using various software packages.	Tutorial	Quiz
CO 5	Present results from social network analysis, both orally and in writing.	Case Studies	Seminar

Offered by	**Artificial Intelligence and Machine Learning**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**The Semantic Web**: Limitations of the current web- Wrong with the web-Diagnosis: A lack of Knowledge-The semantic solutions-Development of semantic web-Research, development and standardization-Technology adoption-The emergence of the social web. **Social Network Analysis**: Development of social Network analysis-Key concepts and measures in network analysis.	**1**	1 , 2
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
II	**Electronic Sources For Network Analysis**: Electronic discussion networks-Blogs and online communities-Web based networks. **Knowledge Representation On The Semantic Web:** Ontologies and their role in the semantics web-Ontology languages for semantic web-web based knowledge representation.	1	3,4
		Instructional Hours	**18**
	Suggested Learning Methods: Online Tutorial		

III	**Modelling And Aggregating Social Network Data** :State of the art in network data representation-Ontological representation of social individual-Ontological representation of social relationships-Aggregating and reasoning with social network data	1	5
		Instructional Hours	**18**
	Suggested Learning Methods: Case studies		
IV	**DEVELOPING SOCIAL SEMANTIC APPLICATIONS:** Building Semantic Web applications with social network features-Fink :the social network of the semantic web community-open academia: Distributed, Semantic-based publication management-Evaluation of web based social network extraction	1	6,7
		Instructional Hours	**18**
	Suggested Learning Methods: Video Lectures		
V	**CASE STUDIES:** Semantic – Based Social Network Analysis in the Sciences: Context-Methodology-Result. ONTOLOGIES ARE US: Emergent Semantics IN FOLKSONOMY Systems	1	8,9
		Instructional Hours	**18**
	Suggested Learning Methods: Case Studies		
		Total Hours	**90**

Text Books	1. Peter Mika, **"Social networks and the Semantic Web",** Springer, 2007.
Reference Books	1. Borko Furht, **"Handbook of Social Network Technologies and Applications"**, Springer, 2010. 2. Reza Zafarani, Mohammad Ali Abbasi, Huan Liu, **"Social Media Mining"**, Cambridge
Web. URLs	https://onlinecourses.swayam2.ac.in/aic20_sp06/preview

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Discussion	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	-	L	M	-	H	M	M	M	M	H	M
CO2	L	M	M	M	L	M	M	H	M	H	M	M	H
CO3	M	M	M	M	M	H	M	M	M	M	M	H	M
CO4	H	H	M	M	M	M	M	M	H	H	M	H	H
CO5	H	M	-	M	L	-	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3AME503	Discipline Specific Elective Paper I: Healthcare Analytics		
Semester: V	Credits: 4	CIA: 25 Marks	ESE:75 Marks

B.Sc. Artificial Intelligence and Machine Learning

Course Objective	To apply mining, modeling and analytics techniques to health and healthcare data. Students will understand the use of healthcare data to make decisions and transform healthcare delivery and the health of individuals and populations
Course Category	Skill Development
Development Needs	Global
Course Description	To understand the concepts of Healthcare Data Analytics, Biomedical Signal Analysis, Natural Language Processing. Applications and Practical Systems for Healthcare

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To Demonstrate the use of business intelligence or health data analytics tool, application or approach.	Flipped Classrooms	Assignment
CO 2	Articulate the value of big volumes of data to health and healthcare, and future trends.	Tutorial	Seminar
CO 3	Construct the concept of health data visualization principles and techniques for supporting decision making.	Lecture	Group Discussion
CO 4	To provide comprehensive knowledge of data analytics, business intelligence, and data governing practices and opportunities in health and healthcare.	Lecture	Unit Test
CO 5	Utilize critical thinking to construct how with business intelligence processes and tools health and healthcare data.	Video Lessons	Unit Test

Offered by	**B.Sc. Artificial Intelligence and Machine Learning**

Course Content	**Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**An Introduction to Healthcare Data Analytics:** Introduction. **Healthcare Data Sources and Basic Analytics:** Electronic Health Records - Components of HER - Benefits of HER. **Mining of Sensor Data in Healthcare**: Mining Sensor Data in Medical Informatics - Challenges in Healthcare Data Analysis - Sensor Data Mining Applications.	1	1,2
		Instructional Hours	**18**
Suggested Learning Methods: Assignment			
II	**Biomedical Signal Analysis:** Types of Biomedical Signals - ECG Signal Analysis - Denoising of Signals - Recent Trends in Biomedical Signal Analysis. **Genomic Data Analysis for Personalized Medicine:** Genomic Data Generation - Methods and Standards for Genomic Data Analysis - Types of Computational Genomics Studies towards Personalized Medicine	1	5,6
		Instructional Hours	**18**
Suggested Learning Methods: Seminar			

III	**Natural Language Processing and Data Mining for Clinical Text:** Natural Language Processing - Mining Information from Clinical Text. **Social Media Analytics for Healthcare:** Social Media Analysis for Detection and Tracking of Infectious Disease Outbreaks - Social Media Analysis for Public Health Research - Analysis of Social Media Use in Healthcare	1	7,9
		Instructional Hours	**18**
Suggested Learning Methods : Group Discussion			
IV	**Advanced Data Analytics for Healthcare:** A Review of Clinical Prediction Models - Basic Statistical Prediction Models - Alternative Clinical Prediction Models. **Information Retrieval for Healthcare** - Knowledge-Based Information in Healthcare and Biomedicine – Retrieval – Evaluation. **Privacy-Preserving Data Publishing Methods in Healthcare** - Privacy-Preserving Publishing Methods.	1	10,14,15
		Instructional Hours	**18**
Suggested Learning Methods : Video Lecture			
V	**Applications and Practical Systems for Healthcare:** Data Analytics for Pervasive Health - Supporting Infrastructure and Technology - Basic Analytic Techniques - Advanced Analytic Techniques – Applications. **Fraud Detection in Healthcare:** Understanding Fraud in the Healthcare System - Knowledge Discovery-Based Solutions for Identifying Fraud.	1	16,17
		Instructional Hours	**18**
Suggested Learning Methods : Video Lecture			
		Total Hours	**90 Hrs**

Text Books	1. Chandan K. Reddy and Charu C. Aggarwal, **"Healthcare Data Analytics"** CRC Press, 2015
Reference Books	1. Trevor L. Strome, **"Healthcare Analytics for Quality and Performance Improvement",** John Wiley & Sons, Inc. 2013.
Web. URLs	**https://www.sciencedirect.com/journal/healthcare-analytics** https://www.coursera.org/articles/healthcare-analytics

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	L	M	L	M	H	H	H	H	M	M
CO2	H	M	L	M	M	L	M	H	H	M	H	M	M
CO3	M	H	M	L	H	M	L	M	M	H	M	H	H
CO4	H	M	M	M	M	M	M	H	H	H	M	H	M
CO5	M	H	M	H	M	L	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3CKE504	**Discipline Specific Elective Paper I : Big Data Analytics**		
Semester: V	**Credits: 4**	**CIA: 25 Marks**	**ESE: 75 Marks**
(Common to B. Sc. CS / IT / BCA / AIML)			
Course Objective	To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSql Map-Reduce and learn fundamental techniques and principles in achieving big data analytics.		
Course Category	Employability		
Development Needs	Global		
Course Description	To understand the concepts of Big Data and analysis of these data entails along with ethical and conceptual challenges		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Remembering big data terminologies	Lecture	Group Discussion
CO 2	Understanding Hadoop framework and its application.	Demonstration	Quiz
CO 3	Apply NoSQL Data Model in real time	Demonstration	Assignment
CO 4	Implement Map Reduce Programming	Lecture	Assignment
CO 5	Develop Hadoop streaming with R	Flipped Classrooms	Seminar

Offered by	**Information Technology**

Course Content	**Instructional Hours / Week : 6**

Unit	**Description**	**Text Book**	**Chapters**
I	**INTRODUCTION TO BIG DATA**: Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach, Bigdata Challenges, Case Study of Big Data Solutions.	1	1
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Lecture			
II	**HADOOP:** Introducing Hadoop – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – History of Hadoop – Hadoop Overview – Hadoop Distributed File System (HDFS) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem	2	2
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Quiz			
III	**NoSQL DATA MODEL:** Introduction to NoSQL – NoSQL Business Drivers – NoSQL Data Architectural Patterns – Variations of NoSQL Architectural Patterns – Using NoSQL to Manage Big data – Case study of NoSQL	1	3

		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Assignment			
IV	**MAP REDUCE Programming:** Introduction to MapReduce – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression	2	4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Assignment			
V	**Hadoop streaming with R:** Understanding the basics of Hadoop streaming – How to run Hadoop streaming with R – Understanding a MapReduce application – Understanding how to code and run a Map-Reduce application – how to explore the output of Map Reduce application	3	4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Seminar			
		Total Hours	**90 Hrs**

Text Books	1. Radha Shankarmani, M Vijayalakshmi, **"Big Data Analytics",**WileyPublications,first Edition 2016 2. Seema Acharya, Subhashini Chellappan**,** "**Big Data and Analytics",** Wiley Publication, first edition. Reprint in 2016 3. Vignesh Prajapati, **"Data analytics with R and Hadoop"** , Copyright © 2013, Packt Publishing.
Reference Books	1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, **"Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses"**, Wiley, 2013 2. Bill Franks, Taming,**"The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics"**, Wiley
Web. URLs	1. https://www.guru99.com/what-is-big-data.html 2. https://techtarget.com/searchbusinessanalytics/definition/big-data-analytics

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Hands on Activity	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	M	M	M	M	M	M	M	M
CO2	M	M	H	H	H	M	M	H	H	H	H	H	H
CO3	H	M	H	H	H	H	M	H	H	H	H	H	H
CO4	H	H	H	H	H	H	H	H	H	H	H	H	H
CO5	H	H	H	H	H	H	H	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. T. Ramaprabha	Dr. J. Maria Shyla

Course Code	Title	
22U3AMV513	In-plant Training	
Semester: V	Credits: 2	ESE: 50 Marks

Objective:

To give optimum exposure on the practical side of industrial society

Guidelines:

1. Duration of the internship training is 2**0 days** during the summer vacation which falls at the **endof the 4th semester.**
2. The departments concerned will prepare on exhaustive panel of institutions, industries andpractitioners.
3. The individual student has to identify the institution / industry / practitioners of their choice andinform the same to the HOD / staff-in-charge.
4. The students hereafter will be called as trainees should maintain a work diary in which the dailywork done should be entered and the same should be attested by the section in-charge.
5. The departments should prepare an outline of the job to be done, sections in which they have tobe attached both in the office as well as in the field.
6. The trainees should strictly adhere to the rules and regulations and office timings of theinstitutions to which they are attached.
7. The trainees have to obtain a certificate on successful completion of the internship from the chiefexecutive of the organization.
8. Monitoring and inspection by staff on a regular basis.
9. Report writing manual and format should be prepared by the respective departments.
10. All model forms are to be attached wherever it is necessary.
11. Report evaluation: Internal viva-voce examination will be conducted and the maximum mark awarded is 50.
12. In-Plant Training has to be carried out only in the approved industries by the department/College
13. Report should be submitted in the 5th semester at end of the September

Course Code	Title		
22U4AMZ503	Skill Based Paper III: Practical in Data Visualization		
Semester: V	Credits: 3	CIA: 30 Marks	ESE: 45 Marks
B. Sc. (Artificial Intelligence and Machine Learning)			
Course Objective	To implement and practice various concepts in python programming		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Data stored in MongoDB Database is transferred to Relational Database or Hadoop so that it can transform into a format interpretable by Tableau for Data Analysis.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Creation of form for data entry using MongoDB	Program Demonstration	Application of Logic
CO 2	Creation of views for data records using MongoDB	Program Demonstration	Debugging
CO 3	Analyze data analysis techniques using MongoDB	Program Demonstration	Program Creativity
CO 4	Implement various data Visualization Implementationusing Tableau	Program Demonstration	Program Development
CO 5	Implement Interactive Filter using tableau	Program Demonstration	Program Development

Offered by	Artificial Intelligence and Machine Learning

List of Programs	Instructional Hours / Week : 4

1. Create the following tables:
Order party: Order_number, Order_date, customer_code
Order: Order_number, Item_code, Quantity
The key to the second table is Order_number + Item_code
Create a form for data entry to both the tables

2. Create a view to know member name and name of the book issued to them. Use any inbuilt function andoperators like IN, ANY, ALL, EXISTS.
a. List the records of members who have not been issued any book using EXISTS operator.
b. List the members who have got issued at least one book (use IN/ANY operator).
c. List the books which have maximum Price using ALL operator.
d. Display Book Name, Member Name, Issue date of Book. Create a view of this query of the currently issuedbooks.

3. Design an Electricity Bill Report generating system that generates electricity bills details of customers for a month using MongoDB.

4. Generate a Library Information System that generates report of the books available in the library using MongoDB.

5. Program to load and display dataset on tableau.

6. Program to implement Data Preparation using Data Interpreter on tableau

7. Program to Implement Interactive Filter using tableau	
8. Program to plot a graph to show the Data in histogram using tableau	
9. Program to show Data in Tree Map using tableau	
10. Program to use a background image map using tableau	
Solving Case Studies and Program Development	**10 Hrs**
Total Hours	**60**

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3AMC612	Core Paper XVII : Internet of Things		
Semester: VI	Credits: 3	CIA: 20 Marks	ESE:55 Marks
B.Sc. (Artificial Intelligence and Machine Learning)			
Course Objective	To understand the Data and Knowledge Management and the use of Devices In IoT Technology. Also to make the students familiar with IIoT and Industry4.0		
Course Category	Employability		
Development Needs	Global		
Course Description	This course teaches a deep understanding of IoT technologies from the ground up. Students will learn IoT device programming sensing and actuating technologies, Industry 4.0 and Industrial Internet of Things		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the vision of IoT from a global context.	Lecture	Assignment
CO 2	Understand the Market perspective of IoT.	Lecture	Seminar
CO 3	Understand Use of Devices, Gateways and Data Management in IoT.	Demonstration	Quiz
CO 4	Familiar with Basic features of the Industry 4.0 and Industrial Internet of Things	Case Studies	Exams
CO 5	Gain knowledge of the various aspects of IIoT	Class Projects	Exams

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**M2M to IoT**-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.	1	2
		Instructional Hours	**12**
	Suggested Learning Methods: Video lectures		
II	**M2M to IoT – A Market Perspective**– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. **M2M to IoT-An Architectural Overview**– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.	1	3-4
		Instructional Hours	**12**
	Suggested Learning Methods: Video lectures		
III	**M2M and IoT Technology Fundamentals-** Devices and gateways, Local and wide area networking, Data management.	1	5
		Instructional Hours	**12**
	Suggested Learning Methods: Video lectures		

IV	**Overview of Industry 4.0** Introduction - Evolution of Industry 4.0 - Environmental impacts - Industrial Internet - Applications of Industry4.0 - Prerequisites of IIoT - Basics of CPS - CPS and IIoT	2	2
		Instructional Hours	**12**
	Suggested Learning Methods: Video lectures		
V	**IIoT** Introduction - IIC - Industrial Internet Systems : Design , Impact, Benefits - Industrial sensing - Industrial Processes : Features - Industrial plant - Viewpoint - Digital Enterprise - Applications	2	4
		Instructional Hours	**12**
	Suggested Learning Methods: Video lectures		
		Total Hours	**60 Hrs**

Text Books	1.Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Aves and, Stamatis Karnouskos, David Boyle, **"From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence",** AcademicPress, 2014. 2. S. Misra, C. Roy, and A. Mukherjee, **Introduction to IndustrialInternet of Things and Industry 4.0** CRC Press, 2020 Unit I : Text Book 1, Chapter 2 Unit II : Text Book 1, Chapter 3,4 Unit III: Text Book 1, Chapter 5 Unit IV: Text Book 2, Chapter 2 Unit V : Text Book 2, Chapter 4
Reference Books	1.VijayMadisetti and ArshdeepBahga, **"Internet of Things (A Hands-on-Approach)",** VPT, 2014. **2.**Francis daCosta, **"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything",** A press Publications, 2013
Web. URLs	https://www.javatpoint.com/iot-internet-of-things https://www.geeksforgeeks.org/introduction-to-internet-of-things-iot-set-1/ https://www.edureka.co/blog/iot-tutorial/

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	-	M	L	-	M	H	L	L	H	H	M
CO2	M	M	M	M	L	M	M	H	M	M	M	M	M
CO3	H	H	L	M	L	L	M	H	H	H	M	H	H
CO4	H	H	M	M	L	-	M	H	M	M	H	M	H
CO5	H	M	-	M	L	M	M	H	M	M	M	M	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3CJC608	Core Paper XVIII: Deep Learning		
Semester: VI	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to B. Sc (CS(DS) / AIML)			
Course Objective	To introduce the basic concepts and techniques of deep Learning.		
Course Category	Employability		
Development Needs	Global		
Course Description	This course aims to present the core fundamentals behind the much talked about field of Deep Learning.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts and techniques ofDeep Learning.	Lecture	Assignment
CO 2	Implementing Neural Networks in Tensor Flow	Demonstration	Seminar
CO 3	Understand and apply Convolution NeuralNetworks.	Lectures	Quiz
CO 4	Analyze the Memory Augmented Neural Networksand Differentiable Neural Computers	Tutorial	Program Execution
CO 5	Explore Deep Reinforcement Learning.	Lecture	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Neural Network.:** Building Intelligent Machines-The Limits of Traditional-Computer Programs- The Mechanics of Machine Learning- The Neuro Expressing Linear Perceptrons as Neurons- Feed-Forward Neural Networks- Linear Neurons and Their Limitations- Sigmoid, Tanh, and ReLU Neurons-Softmax Output Layers. **Training Feed-Forward Neural Networks:** The Fast-Food Problem-Gradient Descent-The Delta Rule and Learning Rates-Gradient Descent with Sigmoidal Neurons-The Back propagation Algorithm-Stochastic and Minibatch Gradient Descent-Test Sets, Validation Sets, and Overfitting-Preventing Over fitting in Deep Neural Networks.	1	1,2
	Instructional Hours		**12**
	Suggested Learning Methods: Video lectures		
II	**Implementing Neural Networks in Tensor Flow**: What Is Tensor Flow?-How Does Tensor Flow Compare to Alternatives?- Installing Tensor Flow-Creating and Manipulating Tensor Flow Variables-Tensor Flow Operations - Placeholder Tensors-Sessions in Tensor Flow-Navigating Variable Scopes and Sharing Variables - Managing Models over the CPU and GPU-Specifying the Logistic	1	3

	Regression Model in Tensor Flow- Logging and Training the Logistic Regression Model-Leveraging Tensor Board to Visualize Computation Graphs and Learning-Building a Multilayer Model for MNIST in Tensor Flow		
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
III	**Convolutional Neural Networks:** Neurons in Human Vision-The Shortcomings of Feature Selection-Vanilla Deep Neural Networks Don't Scale-Filters and Feature Maps-Full Description of the Convolutional Layer-Max Pooling-Full Architectural Description of Convolution Networks-Closing the Loop on MNIST with Convolutional Networks-Image Preprocessing Pipelines Enable More Robust Models-Accelerating Training with Batch Normalization-Building a Convolutional Network for CIFAR-10-Visualizing Learning in Convolutional Networks-Leveraging Convolutional Filters to Replicate Artistic Styles-Learning Convolutional Filters for Other Problem Domains	1	5
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
IV	**Memory Augmented Neural Networks: N**eural Turing Machines-Attention-Based Memory Access-NTM Memory Addressing Mechanisms-Differentiable Neural Computers-Interference-Free Writing in DNCs-DNC Memory Reuse-Temporal Linking of DNC Writes-Understanding the DNC Read Head-The DNC Controller Network-Visualizing the DNC in Action-Implementing the DNC in Tensor Flow-Teaching a DNC to Read and Comprehend	1	8
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
V	**Deep Reinforcement Learning:** Deep Reinforcement Learning Masters Atari Games-What Is Reinforcement Learning?-Markov Decision Processes (MDP)- Explore Versus Exploit-Policy Versus Value Learning- Pole-Cart with Policy Gradients- Q-Learning and DeepQ-Networks- Improving and Moving Beyond DQN	1	9
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
		Total Hours	**60**

Text Books	1. Nikhil Buduma, Nicholas Locascio, **"Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms**",O'Reilly Media, 2017. **Unit I :** Text Book 1, Chapters 1,2 **Unit II:** Text Book 1, Chapter 3 **Unit III:** Text Book 1, Chapter 5 **Unit IV:** Text Book 1, Chapter 8 **Unit V:** Text Book 1, Chapter 9
Reference Books	1. Keras Navin Kumar Manaswi , **"Deep Learning with Applications Using Python: Chatbots and Face, Object, and Speech Recognition with Tensor flow and Keras",** Apress, 2018 2. Ian Good fellow, Yoshua Bengio, Aaron Courville, **"Deep Learning (Adaptive computation and Machine Learning series**", MIT Press, 2017.

Web. URLs	https://www.javatpoint.com/deep-learning

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	L	H	L	H	M	M	H	M	M
CO2	M	M	L	L	M	M	M	H	L	H	L	M	H
CO3	M	H	M	L	M	M	M	M	L	M	H	H	M
CO4	H	M	M	L	L	M	M	M	H	H	M	H	M
CO5	H	M	M	L	L	L	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr .K. Selvavinayaki

Course Code	Title		
23U3AMP613	Core Paper XIX : Practical in Internet of Things		
Semester: VI	Credits: 2	CIA: 20 Marks	ESE : 30 Marks

B.Sc. Artificial Intelligence and Machine Learning

Course Objective	On the successful completion of the course the students will able to design IoT applications
Course Category	Employability
Development Needs	Global
Course Description	This course gives practical knowledge in Internet of Things using Arduino

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Familiar with Arduino board working	Practical	Application of logic
CO 2	Implement the design of digital meter	Practical	Program creativity
CO 3	Interfacing with various sensors	Practical	Program Debugging
CO 4	Design with Tinkercad	Practical	Internal Test
CO 5	Implementing IoT applications	Practical	Model Test

Offered by	**B.Sc. Artificial Intelligence and Machine Learning**
List of Programs	**Instructional Hours / Week : 3**

1. Demonstrate the working of Arduino
2. Blinking LED
3. Design of digital dc voltmeter
4. Measure the air humidity using sensor
5. Measure the temperature using sensor
6. Simulate motor control on Tinkercad
7. Measure the distance of an object using sensor
8. Smart Home Automation system
9. Sense the available network
10. Sense the finger print when it is placed on board
11. Patient health monitoring system
12. Traffic light control system

Total Hours	**45**

Tools for Assessment (20 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation NoteBook	Total
3	3	3	4	4	3	20

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	M	H	M	L	M	M	M	H	L	M	M	M	H
CO2	M	M	M	M	M	L	M	H	M	L	M	L	H
CO3	H	M	L	M	H	M	M	M	M	M	H	M	H
CO4	H	H	M	L	M	M	M	H	M	H	M	M	M
CO5	H	M	L	L	M	H	M	M	M	M	H	M	H
H-High; M-Medium; L-Low													

Course designed by	**Verified By Chairman**
Mr. M. Vijayakumar	Dr.K.Selvavinayaki

Course Code	Title		
23U3AME605	Discipline Specific Elective Paper II : Ethical Hacking		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	To explain about system hacking and introduce the concepts of security and carious kinds of attacks.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Ethical hacking is a subject that has become very important in present-day context, and can help individuals and organizations to adopt safe practices and usage of their IT infrastructure.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand ethical and email hacking	Online Quiz	Assignment
CO 2	Explain windows hacking and its security	Video Lessons	Seminar
CO 3	Describe about Trojan attacks and attack on web server	Online Quiz	Seminar
CO 4	Analyze wireless hacking and mobile hacking	Case study Assignments	Group Discussion
CO 5	Gain knowledge on Mobile hacking	Fishbowl Techniques	Assignment

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Concept of Ethical Hacking:** What Is Hacking - Types of hacker - Why hackers Hack? - Preventions from Hacker - Steps Performed by Hackers Working of an Ethical Hacker. **Email Hacking:** How Email Works? - Email service Protocols - Email Spoofing - PHP Mail Sending Script - Email Spamming - Phishing - Prevention from Phishing - Email Tracing - Keystroke Loggers - Securing Your Email Account.	1	1 & 2
		Instructional Hours	**18**
	Suggested Learning Methods: Report Presentation		
II	Windows Hacking and Security - -Security Architecture of Windows - Windows user account Architecture - Cracking Windows User Account password - Windows User Account Attack Counter Measures of Windows Attack -To hide a file Behind a Image - Make a Private Folder - To run net user in Vista and Windows - Brute Force Attack -Rainbow Table Attack - Counter Measures for Windows Attack.	1	3
		Instructional Hours	**18**
	Suggested Learning Methods: Report Presentation		

III	**Trojans in Brief -** Knowing the Trojan - Different Types of Trojans - Components of Trojans - Mode of Transmission for Trojans - Detection and Removal of Trojans - Countermeasures for Trojan Attacks. **Attacks on web servers and Security -** Introduction to Web Servers - The Basic Process: How Web servers work - **Attacks on Web servers** - Web Ripping - Google Hacking - Protecting Your Files from Google - Cross Site Scripting (XSS) - Directory Traversal Attack - Database Servers - Login Process on the websites - SQL injection - Input validation on the SQL Injection - PHP Injection: Placing PHP backdoors - Directory Access controls - How Attackers Hide Them While Attacking - Types of Proxy Servers.	1	4 & 5
		Instructional Hours	**18**
		Suggested Learning Methods: Group Discussion	
IV	**Wireless hacking -** Wireless Standards - Services provided by Wireless Networks - MAC address Filtering - WEP key Encryption - Wireless Attacks - MAC Spoofing - WEP Cracking - Countermeasures For Wireless Attacks **Mobile Hacking – SMS & Call forging -** What Does It Involve - Call Spoofing / Forging - SMS Forging -Blue snarfing	1	6 &7
		Instructional Hours	**18**
		Suggested Learning Methods: Group Discussion	
V	**Information gathering and Scanning -**Why Information Gathering? - Reverse IP Mapping - Information Gathering Using Search Engine - Detecting 'live' Systems On Target Network - War Diallers **Sniffers -** What are Sniffers ? - Defeating Sniffers - Ant Sniff.	1	8 & 9
		Instructional Hours	**18**
		Suggested Learning Methods: Video Presentation	
		Total Hours	**90**

Text Books	**1.** ManthanDesai,**"Hacking for Beginners",** Hacking Tech (eBook), Dec 2010. **Unit I** – Chapter 1 & 2; **Unit II** – Chapter 3; **Unit III** – Chapter 4 & 5; **Unit IV** – Chapter 6 & 7; **Unit V** – Chapter 8 & 9
Reference Books	1. Jon Erickson, **"Hacking, The Art of Exploitation"**, No Starch Press Inc., 2nd Edition:2008. 2. Rafay Boloch, **"Ethical Hacking and Penetration Testing Guide"**, CRC Press, 2014. 3. EC-Council, "**Ethical Hacking and Countermeasures: Attack Phases"**, Cengage Learning, 2010.
Web. URLs	https://usermanual.wiki/Document/Hacking20For20Beginners2020a20beginners20guide20for20learning20ethical20hacking.1399758492/view

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	M	M	H	H	H	H	M	M	M	M	M
CO2	M	M	H	M	H	M	M	M	M	H	M	M	H
CO3	H	H	M	H	M	M	L	H	L	M	H	M	M
CO4	H	H	L	M	H	M	H	M	H	H	M	H	M
CO5	H	M	M	H	M	H	L	H	H	M	M	M	M
H-High; M-Medium; L-Low													

Course designed by	**Verified By Chairman**
Dr .N. Saranya	Dr .K .Selvavinayaki

Course Code	Title		
23U3AME606	Discipline Specific Elective paper II : Ethics and Social Implications of AI		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE:75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	To introduce the basic concepts of Ethics in Artificial Intelligence		
Course Category	Employability		
Development Needs	Global		
Course Description	The aim of the course is to raise awareness of ethical and societal aspects of AI and to stimulate reflection and discussion upon implications of the use of AI		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts of AI Ethics	Flipped Classroom	Assignment
CO 2	Describe the Methodology and Hype in AI	Tutorial	Seminar
CO 3	Understand the challenges of professional ethics	Lectures	Group Discussion
CO 4	Understand the human and machine agency	Demonstration	Test
CO 5	Analyze the organization and codes in AI	Video Lessons	Test

Offered by	B.Sc. Artificial Intelligence and Machine Learning
Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	Introduction: Artificial Intelligence and Ethics - Current Initiatives in AI and Ethics - Codes of Ethics in Context - Normative Ethical Theories - Ethics and Empirical Evidence – need of Ethics – sort of issues - Four Domains of Ethics - Adequate Justification and Argument in Ethics - Moral Relativism, Moral Justification and AI - A Distributed Morality - Moral Agents - Moral Motivation - AI, Codes of Ethics and the Law	1	1,2
	Instructional Hours		**18**
	Suggested Readings: Video Lecture		
II	Methodology: Focusing in on Ethical Questions - Ethical Issues in AI - Ethical Questions Arise from AI - Methods of Production of AI - Hype in AI and Implications for Methodology in Ethics Codes of Professional Ethics - The Varieties of Ethical Codes - Professional Codes of Ethics Tend to Have Certain Commonalities - Codes of Ethics and Institutional Backing- The Context of Codes of Ethics - Codes of Ethics Make the Situation Worse	1	3,4
	Instructional Hours		**18**
	Suggested Readings: Group Discussion		
III	AI Challenges Professional Ethics - AI Professional Organizations and Companies- Gradients of Professional Power and Vulnerability in AI - A Third Layer of Complexity in Codes of Professional Ethics for AI - The Authority of Any Resulting Codes - Social, Cultural and Technological Change and Ethics -	1	5,6

	The Example of AI and Employment - The Global Reach of AI, Universalism, and Relativism		
		Instructional Hours	**18**
		Suggested Readings: Video Lecture	
IV	The Idealisation of Human and of Machine Agency - Building Ethics into AI and the Idealisation of Moral Agency - Replacing and Enhancing Human Agency, Boundaries and AI - Addressing the Increased Gradient of Vulnerability - Common Language, Miscommunication and the Search for Clarity	1	7
		Instructional Hours	**18**
		Suggested Readings: Video Lecture	
V	Organisations and Codes - Procedures for Drawing Up and Implementing Codes - The Content of Codes - Thinking About Ethical Issues in Developing and Implementing Codes of Ethics - Asilomar AI Principles	1	8
		Instructional Hours	**18**
		Suggested Readings: Seminar	
		Total Hours	**90**

Text Books	1. Paula Boddington, "**Towards a Code of Ethics for Artificial Intelligence",** Springer, 2017
Reference Books	1. Markus D. Dubber, Frank Pasquale, Sunit Das, "**The Oxford Handbook of Ethics of AI"**, Oxford University Press Edited book, 2020 2. S. Matthew Liao, **"Ethics of Artificial Intelligence",** Oxford University Press Edited Book, 2020
Web. URLs	https://www.linkedin.com/pulse/ethics-social-implications-ai-dan-cernich

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	M	L	M	L	M	H	M	L	M	M	M
CO2	L	M	M	M	M	H	M	M	M	M	M	M	M
CO3	M	H	M	M	M	M	M	H	M	L	H	L	M
CO4	M	H	M	M	M	L	M	H	M	M	M	H	H
CO5	H	M	M	H	M	M	M	M	H	H	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3AME607	Discipline Specific Elective II : Introduction to Neural Networks and Fuzzy Logic		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

B.Sc. Artificial Intelligence and Machine Learning	
Course Objective	To introduce the concepts of neural networks and fuzzy systems and To explain the basic mathematical elements of the theory of fuzzy sets.
Course Category	Skill development
Development Needs	Global
Course Description	Neural networks are artificial systems that were inspired by biological neural networks Fuzzy Logic is used in a wide range of applications, such as control systems, image processing, natural language processing, medical diagnosis, and artificial intelligence.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts of fuzzy sets and fuzzy logic	Lecture / Demonstration	Assignment
CO 2	In Understanding of the basic mathematical elements of the theory of fuzzy sets.	Demonstration / Constructivist Approach	Seminar
CO 3	To Explain the fundamentals and history of neural networks	Lectures / Video Lessons	Quiz
CO 4	To Outline about the mapping and recurrent networks	Tutorial / Case Studies	Program Execution
CO 5	Analyse the applications of Fuzzy logic and neural network for various applications	Lecture / Class Projects	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	Basic concepts of Fuzzy sets – Operations on fuzzy sets-Fuzzy relation equations-Fuzzy logic control. Fuzzification – Defuzzificatiuon – Knowledge base –Decision making logic – Membership functions – Rule base.	1	1,2
		Instructional Hours	18
		Suggested Learning Methods: Video lectures	
II	Performance index – Modification of rule base-Modification of membership functions - Simultaneous modification of rule base and membership functions – Genetic algorithms –Adaptive fuzzy system Neuro fuzzy systems.	1,2	3,4,5,9
		Instructional Hours	18
		Suggested Learning Methods: Video lectures	

III	Introduction – History of neural networks – multilayer perceptions – Back propagation algorithm and its variants – Different types of learning, examples.	1	6,7,8
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
IV	Counter propagation – Self organization Map –Cognition and Neocognitron – HopfieldNet - Kohonnen Nets-Grossberg Nets - Art-I, Art-II reinforcement learning.	2	8
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
V	Application of fuzzy logic and neural networks to Measurement – Control – Adaptive Neural Controllers –Signal Processing and Image Processing.	1	13,17
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
		Total Hours	**90**

Text Books	1.Valluru B. Rao,HyRao, " **C++ Neural networks and Fuzzy logic"**, BPB Publications, New Delhi, 2003.
Reference Books	1. Sudarshan K. Valluru, T. Nageswara Rao , **"Introduction to Neural Networks, Fuzzy Logic & Genetic Algorithms Theory and Applications",** Jaico Publications, 2010
Web. URLs	https://www.javatpoint.com/artificial-neural-network

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	H	M	L	L	M	M	H	M	M	L	M	M
CO2	M	L	M	L	L	H	L	M	M	H	M	M	H
CO3	M	M	M	M	M	H	L	M	L	M	H	H	M
CO4	H	M	M	M	M	L	M	H	H	M	L	H	H
CO5	H	M	L	L	M	M	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr.N.Saranya	Dr.K.Selvavinayaki

Course Code	Title		
23U3AME608	Discipline Specific Elective II : Cyber Threat Intelligence		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	The main objectives of this course are to understand Threat Intelligence, Threat Intelligence types and Life Cycle and to understand and apply Threat detectionand prevention.		
Course Category	Skill development		
Development Needs	Global		
Course Description	This course gives you the background needed to gain Cyber security skills as part of the Cyber security, Security Analyst and network defensive tactics, define network access control and use network monitoring tools.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand threats, threats, intelligence types.	Lecture / Demonstration	Assignment
CO 2	Understand the stages of a threat intelligence life cycle.	Tutorial	Seminar
CO 3	Understand various types of threats and its features.	Lectures / Demonstration	Quiz
CO 4	Understand, analyze and evaluate the efficiency of secure methods to detect and prevent threats.	Tutorial / Demonstration	Program Execution
CO 5	Understand and evaluate the effective detection and prevention methods.	Lecture / Demonstration	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to Threat Intelligence:** Define TI, Importance of TI, Benefits and challenges of Threat Information Sharing, Creating CyberThreat Information	1	1,2,3
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
II	**Threat Intelligence Life Cycle :** Phases of Life cycle, Direction, Collection, Processing, Analysis, Dissemination and Feedback.	1	4.5
		Instructional Hours	**18**
		Suggested Learning Methods: Seminar	
III	**Types of Threat Intelligence :** Strategic Threat Intelligence, tactical Threat Intelligence, operational Threat Intelligence, and technicalThreat Intelligence.	1	7.8
		Instructional Hours	**18**
		Suggested Learning Methods: Seminar	

IV	**Applications of Threat Intelligence:** Threat Intelligence for Security Operations, Threat Intelligence for Incident Response, Threat Intelligence for Vulnerability Management, Threat Intelligence for Security Leaders, Risk Analysis, Threat Intelligence for Fraud Prevention, Threat Intelligence for Reducing Third Party Risk, Threat Intelligence for Digital Risk Protection	1	10,11
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
V	**Threat Intelligence Use cases:** Machine learning for better Threat Intelligence, Threat Intelligence use cases: Payment fraud, Compromised data, Typo squatting and fraudulent domains, Contemporary Issues Advantages of Threat Hunting, Cyber Kill Chain, The role of private Channels and the Dark web.	2	3,4
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
		Total Hours	**90**

Text Books	1. Florian Skopik, **"Collaborative Cyber Threat Intelligence: Detecting and Responding to Advanced Cyber Attacks at the National Level"**, CRC Press, 2017. 2. Christopher Ahlberg, **"The Threat Intelligence Handbook : A Practical Guide for Security Teams to Unlocking the Power of Intelligence",** CyberEdge Group, 1997.
Reference Books	1. https://paper.bobylive.com/Security/threat-intelligence-handbook-second-edition.pdf 2. https://cyber-edge.com/wp-content/uploads/2018/11/Recorded- Future-eBook.pdf
Web. URLs	https://books.google.co.in/books?id=cyE6DwAAQBAJ&printsec=frontcover&source=gb s_ge_summary_r&cad=0#v=onepage&q&f=false

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	L	L	H	M	M	M	M	H	M	M
CO2	M	L	M	L	L	M	M	M	M	H	M	M	H
CO3	L	M	H	M	M	L	L	H	L	M	H	H	M
CO4	H	M	M	L	M	M	M	H	H	H	M	M	H
CO5	M	M	M	L	M	L	M	H	H	M	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr .M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
23U3AME609	Discipline Specific Elective III : Augmented Reality and Virtual Reality		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	This course has been designed for students to Creating an interactive virtual environment.		
Course Category	Skill development		
Development Needs	Global		
Course Description	This course provides various interactive techniques involved in VR and AR. and the applications of VR /AR in Digital platform		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic VR & AR concepts.	Lecture / /Flipped Classroom	Assignment
CO 2	Analyze the various interactive techniques.	Constructivist Approach	Seminar
CO 3	Build the systematic environments for data exploration.	Lectures / Video Lessons	Quiz
CO 4	Implement the various VR & AR methods.	Demonstration / Case Studies	Program Execution
CO 5	Design and develop interactive VR and ARapplications.	Demonstration / Class Projects	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to Virtual Reality:** Introduction - Fundamental concept and components of Virtual Reality – Primary features - Present development on Virtual Reality - Computer graphics - Real time computer graphics - Flight simulation - Virtual environment requirement – Benefits of virtual reality - Historical development ofVR.	1	1,2,3
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
II	Scientific Landmark 3D Computer Graphics Introduction - The Virtual world space - Positioning the virtual observer – The perspective projection - Human vision - Stereo perspective projection - 3D clipping - Colour theory - Simple 3D modelling - Illumination models - Reflection models - Shading algorithms - Radiosity - Hidden Surface Removal - Realism – Stereographic image.	1	5,6
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		

III	**Interactive Techniques in Virtual Reality :** Introduction - From 2D to 3D-3D space curves - 3D boundary representation - Geometrical Transformations: Introduction - Frames of reference – Modelling transformations - Instances - Picking - Flying - Scaling the VE - Collision detection - Generic VR system: Introduction - Virtual environment - Computer environment - VR technology - Model of interaction - VR Systems	1	7,8,
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
IV	**Augmented and Mixed Reality:** Taxonomy - Technology and features of augmented reality - Difference between AR and VR - Challenges with AR - AR systems and functionality - Augmented reality methods - Visualization techniques for augmented reality - Wireless displays in educational augmented reality applications - Mobile projection interfaces – markerless tracking for augmented reality - Enhancing interactivity in AR environments - Evaluating AR systems.	1	10,11,12
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
V	**Application of VR /AR in Digital Entertainment:** VR Technology in Film & TV Production - VR Technology in Physical Exercises and Games - Demonstration of Digital Entertainment by VR - AR in Aircraft simulation - Vehicle modelling .	2	2,3
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
		Total Hours	**90**

Text Books	1. Burdea, G. C. and P. Coffet., (2011)**,"Virtual Reality Technology",** (3rd Edn.) Wiley-IEEE Press. 2. Alan B. Craig, (2013)**,"Understanding Augmented Reality, Concepts and Applications",** (2nd Edn.), Morgan Kaufmann.
Reference Books	1.Anand R., (2010), **"Augmented and Virtual Reality",** (1st Edn.) Khanna Publishing House, Delhi 2. William R. Sherman, Alan B. Craig, (2008), **"Understanding Virtual Reality: Interface, Application and Design",** (1st Edn.), Morgan Kaufmann.

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	M	M	H	M	L	M	M	M	H	M	M
CO2	M	L	M	L	L	M	L	H	M	H	M	M	H
CO3	M	M	M	H	M	L	L	H	L	M	H	H	M
CO4	M	H	M	L	M	M	M	H	H	H	M	H	H
CO5	H	M	L	M	M	L	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr.N.Saranya	Dr.K.Selvavinayaki

Course Code	Title		
23U3AME610	Discipline Specific Elective Paper III : Pattern Recognition		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	To introduce the students about fundamentals of image formation, the major ideas, methods, and techniques of computer vision and pattern recognition.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	The course will study the state of the art techniques of an analyzing the data. The goal is to extract meaningful information from future data.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the fundamentals of image formation.	Smart Board	Assignment
CO 2	Comprehend the major ideas, methods and techniques of image processing and computer vision.	Video Lessons	Seminar
CO 3	Understand typical pattern recognition techniques for object recognition.	Smart Board	Seminar
CO 4	Implement the basic image processing and computer vision techniques.	Case study Assignments	Group Discussion
CO 5	Develop simple object recognition systems and patternclassifiers.	Fishbowl Techniques	Assignment

Offered by	Artificial Intelligence & Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Classifiers Based on Bayes Decision Theory:** Is Pattern Recognition Important? - Features, Feature Vectors, and Classifiers - Supervised, Unsupervised, and Semi-Supervised Learning - MATLAB Programs.	1	1
	Instructional Hours		**18**
	Suggested Learning Methods : Report Presentation		**2**
II	**Classifiers Based on Cost Function Optimization –** Introduction - Bayes Decision Theory - Discriminant Functions and Decision Surfaces - Bayesian Classification for Normal Distributions - Estimation of Unknown Probability Density Functions - The Nearest Neighbor Rule - Bayesian Networks	1	2
	Instructional Hours		**18**
	Suggested Learning Methods : Report Presentation		**2**

III	**Data Transformation: Feature Generation and Dimensionality Reduction -** Introduction - Linear Discriminant Functions and Decision Hyperplane- The Perceptron Algorithm - Least Squares Methods - Mean Square Estimation Revisited - Logistic Discrimination -Support Vector Machines	1	3
		Instructional Hours	**18**
		Suggested Learning Methods : Group Discussion	**2**
IV	**Nonlinear Classifiers –** Introduction - The XOR Problem - The Two-Layer Perceptron - Three-Layer Perceptron's -. Algorithms Based on Exact Classification of the Training Set -The Backpropagation Algorithm - Pruning Techniques -Constructive Techniques - Support Vector Machines: The Nonlinear Case - Beyond the SVM Paradigm - Decision Trees- Combining Classifiers	1	4
		Instructional Hours	**18**
		Suggested Learning Methods : Group Discussion	**2**
V	**Context-Dependent Classification –** Introduction - The Bayes Classifier - Markov Chain Models - The Viterbi Algorithm - Channel Equalization - Hidden Markov Models - HMM with State Duration Modeling -Training Markov Models via Neural Networks - A Discussion of Markov Random Fields	1	9
		Instructional Hours	**18**
		Suggested Learning Methods : Video Presentation	**2**
		Total Hours	**90 hrs**

Text Books	1. S Theodoridis and K Koutroumbas**, "Pattern Recognition"**, 4th Edition, Academic Press, 2009.
Reference Books	1. C Bishop **," Pattern Recognition and Machine Learning**", Springer , 2006.
Web. URLs	https://www.mygreatlesrning.com/blog/pattern-recognitoin- machine learning

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	M	M	M	H	L	M	M	H	H	M	H	M	M
CO3	M	H	M	H	L	M	H	M	H	M	M	M	H
CO4	M	M	H	M	L	M	M	H	H	M	M	M	H
CO5	H	H	L	M	H	L	H	M	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Dr .N. Saranya	Dr. K. Selvavinayaki

Course Code	Title		
23U3AME611	Discipline Specific Elective III : Web Application Security		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

B.Sc. Artificial Intelligence and Machine Learning	
Course Objective	To introduce the concepts of security in web applications and aid in fixing any security vulnerabilities during the web development
Course Category	Skill development
Development Needs	Global
Course Description	This Course helps to understand the security principles in developing a reliable web application.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Identify the vulnerabilities in the web applications.	Flipped Classroom	Assignment
CO 2	Understand the security principles for authentication and authorization	Constructivist Approach	Seminar
CO 3	Apply the security principles in developing a policies	Video Lessons	Quiz
CO 4	Understand the Database security Principles for file access	Case Studies	Program Execution
CO 5	Apply the industry standard tools for web application security.	Lecture	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**World Wide Web Application Security :** Introduction - Network Security versus Application Security - The OWASP Top Ten List **Security Fundamentals:** Input Validation - Attack Surface Reduction - Classifying and Prioritizing Threats	1	1,2
	Instructional Hours		**18**
	Suggested Learning Methods: Video lectures		
II	**Web Application Security Principles: Authentication**: Authentication Fundamentals - Two-Factor and Three-Factor Authentication - Web Application Authentication - Securing Password-Based Authentication - Secure Authentication Best Practices. **Authorization:** Authorization Fundamentals - Authorization Goals - Detailed Authorization Check Process - Types of Permissions Authorization Layers - Controls by Layer - Web Authorization Best Practices - Session Management Fundamentals - Securing Web Application Session Management	1	3,4
	Instructional Hours		**18**
	Suggested Learning Methods: Peer learning		

III	**Browser Security Principles:** The Same-Origin Policy: Defining the Same-Origin Policy - Exceptions to the Same-Origin Policy - Final Thoughts on the Same-Origin Policy**. Cross-Site Scripting and Cross-Site Request Forgery**: Cross-Site Scripting - Cross-Site Request Forgery	1	5,6
		Instructional Hours	**18**
		Suggested Learning Methods: Group Discussion	
IV	**Database Security Principles**: Structured Query Language (SQL) Injection - Setting Database Permissions - Stored Procedure Security - Insecure Direct Object References - **File Security Principles**: - Keeping Your Source Code Secret - Security Through Obscurity	1	7,8
		Instructional Hours	**18**
		Suggested Learning Methods: Video lectures	
V	**File Security Principles:** Forceful Browsing - Directory Traversal. Secure Development and Deployment: Secure Development Methodologies - The Holistic Approach to Application Security - Industry Standard Secure Development Methodologies and Maturity Models	1	8,9
		Instructional Hours	**18**
		Suggested Learning Methods: Seminar	
		Total Hours	**90**

Text Books	1. Bryan Sullivan and Vincent Liu, **"Web Application Security, A Beginner's Guide",** US: McGraw-Hill Osborne Media, 2011
Reference Books	1. Stuttard, Dafydd, and Marcus Pinto. **"The Web Application Hacker's Hand book : Finding and Exploiting Security Flaws"**. John Wiley Sons, 2011.
Web. URLs	https://www.udemy.com/course/web-application-security

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	L	H	M	M	H	M	M	H	M	M
CO2	M	L	M	L	L	M	M	H	M	H	M	M	H
CO3	M	M	M	L	H	L	H	M	M	M	H	M	M
CO4	H	M	M	L	M	M	H	M	H	H	M	H	H
CO5	M	M	L	M	M	M	M	H	H	M	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K .Selvavinayaki

Course Code	Title		
23U3AME612	Discipline Specific Elective III : Computational Intelligence		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
B.Sc. Artificial Intelligence and Machine Learning			
Course Objective	This course has been designed for students to provide a strong foundation on fundamental concepts in CI.		
Course Category	Skill development		
Development Needs	Global		
Course Description	To understand the fundamental concepts and algorithms of computational intelligence (CI), including, neural networks and evolutionary computation		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the goals and methods of CI.	Flipped Classroom	Assignment
CO 2	Identify the design of intelligent computational techniques.	Constructivist Approach	Seminar
CO 3	Create and apply CI techniques in applications.	Video Lessons	Quiz
CO 4	Emphasis CI techniques for information retrieval mechanism.	Tutorial	Program Execution
CO 5	Analysis the genetic techniques for complex problem solving.	Lecture	Program Execution

Offered by	Artificial Intelligence and Machine Learning
Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to CI:** Computational Intelligence Paradigms - Artificial Neural Networks- Evolutionary Computation- Swarm Intelligence -Swarm Intelligence - Fuzzy Systems. **Artificial Neural Networks:** The Artificial Neuron - Calculating the Net Input Signal - Activation Functions - Artificial Neuron Geometry - Artificial Neuron Learning	1	1,2
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
II	**Supervised Learning Neural Networks:** Neural Network Types - Supervised Learning Rules - Functioning of Hidden Units - Ensemble Neural Networks **Unsupervised Learning Neural Networks:** Hebbian Learning Rule- Principal Component Learning Rule - Learning Vector Quantizer-I - Self-Organizing Feature Maps	1	3,4
		Instructional Hours	**18**
	Suggested Learning Methods: Seminar		

III	**Reinforcement Learning:** Learning through Awards - Model-Free Reinforcement Learning Model - Neural Networks and Reinforcement Learning. **Performance Issues (Supervised Learning):** Performance Measures - Analysis of Performance - Performance Factors	1	6,7
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
IV	**Evolutionary Computation**: Introduction - Generic Evolutionary Algorithm – Selection **Genetic Algorithms:** Canonical Genetic Algorithm – Crossover – Mutation - Control Parameters - Genetic Algorithm Variants	1	8,9
		Instructional Hours	**18**
	Suggested Learning Methods: Seminar		
V	**Genetic Programming:** Tree-Based Representation - Initial Population - Fitness Function - Crossover Operators - Mutation Operators - Building Block Genetic Programming – Applications **Evolutionary Programming:** Basic Evolutionary Programming - Evolutionary Programming Operators - Strategy Parameters - Evolutionary Programming Implementations - Applications	1	10,11
		Instructional Hours	**18**
	Suggested Learning Methods: Video lectures		
		Total Hours	**90**

Text Books	1. Andries P. Engelbrecht, **"Computational Intelligence: An Introduction"**, 2nd Edition, John Wiley & Sons Ltd, 2007
Reference Books	1 Stuart Russell, Peter Norvig, **" Artificial Intelligence: A Modern Approach",** Third Edition, Pearson Education / Prentice Hall of India. 2010 2 Elaine Rich and Kevin Knight, "**Artificial Intelligence**, (3rd Edn.), TMH.2010

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	L	L	L	M	H	H	M	M	H	M	M
CO2	M	L	M	L	L	L	M	H	M	M	M	M	H
CO3	M	M	M	M	M	M	M	M	L	M	M	H	M
CO4	H	M	M	L	M	L	M	M	H	L	M	M	M
CO5	M	M	M	L	M	M	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title		
22U3AMV617	Project and Viva-Voce		
Semester: VI	Credits: 3	CIA : 30 Marks	ESE:45 Marks

Project Guidelines **Instructional Hours : 4**

1. ARRANGEMENT OF CONTENTS:

The sequence in which the project report material should be arranged andbound is as follows:

1. Cover Page & Title Page
2. Bonafide Certificate
3. Abstract
4. Table of Contents
5. List of Tables
6. List of Figures
7. List of Symbols, Abbreviations
8. Chapters
9. Appendices
10. References

The table and figures shall be introduced in the appropriate places.

2. PAGE DIMENSION AND SIZE OF THE PROJECT REPORT:

(a) The size of the project report for undergraduate and post graduate degree should contain a minimum of 40 and 60 pages of content respectively. The pages will be counted from the first page of Chapter I. The dimension of the project report should be in A4 size.

(b) The project report should be bound using flexible cover of thick art paper. The cover should be **printed in black letters** and the text for printing should be identical.

(c) Page Numbering

All page numbers **(whether it is in Roman or Arabic numbers)** should be typed without punctuation on the central bottom of each page. The preliminary pages of the reports (such as Title page, Acknowledgement, Table of Contents, etc.) should be numbered in lower case Roman numerals. The title page will be numbered as (i) but this should not be typed. The page immediately following the title page shall be numbered as (ii) and it should appear at the top right hand corner as already specified.Pages of main text, starting with Chapter 1 should be consecutively numbered using Arabic numerals.

3. PREPARATION FORMAT:

Cover Page & Title Page – A specimen copy of the Cover page & Title page of theproject report are given in **Appendix 1.**

Bonafide Certificate – The Bonafide Certificate shall be in **double line spacing using Font Style Times New Roman and Font Size 14**, as per the format in **Appendix 2.**

The certificate shall carry the supervisor's signature and shall be followed by the supervisor's name, academic designation (not any other responsibilities of administrative nature) and Department where the supervisor has guided the student. The term **„SUPERVISOR"** must be typed in capital letters between the supervisor's name and academic designation.

Abstract – Abstract should be one page synopsis of the project report typed **double line spacing, Font Style Times New Roman and Font Size 13**.

Table of Contents – The table of contents should list all material following it as well as the Abstract which precedes it. The Title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents. **One and a half** spacing should be adopted for typing the matter under this head.

List of Tables – The list should use exactly the same captions as they appear above the tables in the text. **One and a half** spacing should be adopted for typing the matterunder this head.

List of Figures – The list should use exactly the same captions as they appear below the figures in the text. **One and a half** spacing should be adopted for typing the matter under this head.

3.7. Table and figures - By the word Table, is meant tabulated numerical data in the body of the project report as well as in the appendices. All other non- verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

List of Symbols, Abbreviations– One and a half spacing should be adopted for typing the matter under this head. Standard symbols, abbreviations etc. should beused.

Chapters – The chapters may be broadly divided into 3 partsIntroductory chapter,

(i) Chapters developing the main theme of the project work

(ii) Conclusions and scope

The introductory chapter will have sections covering a general introduction andimportance of the research project.

The main text will be divided into several chapters and each chapter may be furtherdivided into several divisions and sub-divisions.

- ❖ Each chapter should be given an appropriate title.
- ❖ Tables and figures in a chapter should be placed in the immediatevicinity of the reference where they are cited.

Appendices – Appendices are provided to give supplementary information, which if included in the main text may serve as a distraction.

- Appendices should be numbered using Arabic numerals, e.g. Appendix 1,Appendix 2, etc.
- Appendices, Tables and References appearing in appendices should be numbered and referred at appropriate places just as in the case of Chapters.
- Appendices shall carry the title of the work reported and the same title shallbe made in the contents page also.

List of References –The listing of references should be typed 4 spaces below the heading"REFERENCES" in alphabetical order in single spacing left – justified. The reference material should be listed in the alphabetical order of the first author. The name of the author / authors should be immediately followed by the year and other details.

(i) If more than one paper by the same first author and same year of publications,the year of citation will be followed by a, b etc to differentiate them.

(ii) While citing the paper in the text, the name of the first author and year alone must be cited. e.g Samson (2004) or Jeyaraj (2007a). The reference numbers should not beused in the text of the paper

A paper, a monograph or a book may be designated by the name of the first author followed by the year of publication, placed inside brackets at the appropriate places in the Thesis.

4. TYPING INSTRUCTIONS:

The impression on the typed copies should be black in colour.

One and a half spacing should be used for typing the general text. The general textshall be typed in the **Font style „Times New Roman" and Font size 13.**

APPENDIX 1

TITLE <Font Size 18> <1.5 line spacing>

a project report submitted by

<Font Size 14> <Italic>

NAME OF THE STUDENT (REGISTER NUMBER)<Font Size 16>

in partial fulfillment for the award of the degree

<Font Size 14> <Italic> <1.5 line spacing>

in

NAME OF THE PROGRAMME <Font Size 16>

under the supervision of **<Font Size 14> <Italic>**

NAME OF THE SUPERVISOR <FontSize 16>

NAME OF THE DEPARTMENT<Font Size 14>

NEHRU ARTS AND SCIENCE COLLEGE
(An Autonomous Institution affiliated to Bharathiar University)
(Reaccredited with "A+" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified
Recognized by UGC with 2(f) &12(B), Under Star CollegeScheme by DBT,Govt. of India)
Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, TamilNadu.

MONTH & YEAR <Font Size 14>

APPENDIX 2

(A typical specimen of Bonafide Certificate)

<Font Style Times New Roman>

BONAFIDE CERTIFICATE

<Font Style Times New Roman – size -16>

<Font Style Times New Roman – size -14>

This is to certify that the project report entitled **"…….TITLE OF THE PROJECT……..."** is the bonafide work of "**……..NAME OF THE CANDIDATE(S) WITH REGISTER NUMBER……"** who carried

out the project work under my supervision.

<<Signature of the Head of the Department>>	<<Signature of the Supervisor>>
SIGNATURE	**SIGNATURE**
<<Name>> <<size -16>	<<Name>> <<size -16>
HEAD OF THE DEPARTMENT	**SUPERVISOR**
<<Academic Designation>>	<<Academic Designation>>
<<Department>>	<<Department>>
<Font Style Times New Roman – size -14>	<Font Style Times New Roman – size -14>

Submitted for the Viva Voce held on …….

Internal Examiner **External Examiner**

EVALUATION PROCESS

Review – I has to be conducted during the Last week of December

Review – II has to be conducted during the Last week of January

Review – III has to be conducted during the Last week of February

Document, Preparation and Implementation has to be done during the First week ofMarch

Viva-Voce examination will be conducted at the end of the semester by both Internal (Respective Guides) and External Examiners, after duly verifying theProject Report available in the College.

Distribution of Marks for the Continuous Internal Assessment

Evaluation	Marks Distribution
Review – I	07 Marks
Review – II	07 Marks
Review – III	07 Marks
Document, Preparation and Implementation	09 Marks
Total	**30 Marks**

Distribution of Marks for the Continuous External Examination

Evaluation	Marks Distribution
Record work and Presentation	30 Marks
Viva Voce	15 Marks
Total	**45 Marks**

Course Code	Title		
22U3AMZ604	Skill Based Paper IV : Practical in Deep Learning		
Semester: VI	Credits: 3	CIA: 30Marks	ESE:45 Marks
(B. Sc. Artificial Intelligence & Machine Learning)			
Course Objective	To implement neural networks using computational tools for variety of problems.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course will cover the basic components of building and applying prediction functions with an emphasis on practical applications		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop algorithms simulating human brain.	Practical	Application of logic
CO 2	Implement Neural Networks in Tensor Flow for solving problems.	Practical	Program creativity
CO 3	Explore the essentials of Deep Learning and DeepNetwork architectures.	Practical	Program Debugging
CO 4	Define, train and use a Deep Neural Network for solving real world problems that require artificialIntelligence based solutions.	Practical	Internal Test
CO 5	Implement deep learning in various applications	Practical	Model Test

Offered by	B. Sc Artificial Intelligence and Machine Learning

List of Programs — **Instructional Hours / Week : 3**

1. Write a program to implement AND OR gates using Perceptron.Implement Classification using pattern
2. Write a program to implement Classification using Back propagation.
3. Write a program to implement classification of linearly separable Data with a perceptron.
4. Write a program to study Long Short Term Memory for Time Series Prediction
5. Write a program to study Convolutional Neural Network
6. Write a program to study Recurrent Neural Network
7. Write a program to use deep neural networks to design agents that can learn to take actions in a simulated environment.
8. Write a program to implement Markov Decision Process
9. Write a program to study the use of Long Short Term Memory / Gated Recurrent Units to predict thestock prices based on historic data

Total Hours 45

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping													
CO / PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	L	M	M	L	M	L	M	H	M	H	M	M	M
CO2	L	M	M	L	M	M	M	H	H	M	M	M	M
CO3	M	H	H	L	M	M	H	M	M	M	M	M	M
CO4	M	H	M	L	M	H	M	H	H	M	H	M	M
CO5	M	H	L	L	M	L	M	H	M	H	M	H	M
H-High; M-Medium; L-Low													

Course designed by	**Verified By Chairman**
Mr. M. Vijayakumar	Dr. K. Selvavinayaki

Course Code	Title	
23U4CS3ED1	Extra Departmental Course :: Introduction to IoT	
Semester: III	Credits: 2	ESE : 50 Marks
Course Objective	To familiarize students with the IoT ecosystem and impart knowledge of the technologies and standards associated with the Internet of Things.	
Course Category	Employability	
Development Needs	Global	
Course Description	This course is designed to introduce the concepts, basic networks, predecessors, sensing, and actuation of IoT, along with their applications	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the comprehensive grasp of the fundamental principles and concepts of the Internet of Things	Lecture	Group Discussion
CO 2	Applying the basics of networking and effectively implementing network security measures in IoT systems.	Lecture	Quiz
CO 3	Analyze the predecessors and historical context that contributed to the emergence of IoT technology.	Tutorial / Video Lessons	Seminar
CO 4	Proficient in evaluating and selecting appropriate sensing, actuation, and data processing topologies for specific IoT applications.	Tutorial / Video Lessons	Seminar
CO 5	Apply IoT concepts through the analysis and presentation of relevant case studies from various industry domains.	Tutorial / Video Lessons	Assignment

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	**Fundamental of IoT :** Introduction - Evolution of IoT concept - IoT vision - IoT Definition - IoT basic characteristics - IoT General Enablers - IoT Architectures –Advantages and Disadvantages of IoT	1	1
		Instructional Hours	**6**
Suggested Learning Methods : Tutorial			
II	**Basics of Networking and Network Security :** Network Types - Layered Network Models - Addressing - TCP/IP Transport layer - Security	2	1,2
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
III	**Predecessors and Emergence of IoT :** Introduction - Wireless Sensor Networks - Machine-to-Machine Communications - Cyber Physical Systems -Architectural components of CPS - IoT versus M2M - IoT versus CPS - IoT versus WoT - IoT Networking Components	2	3,4
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			

IV	**IoT Sensing, Actuation and Processing Topologies :** Introduction – Sensors - Sensor Characteristics – Sensorial Deviations – Sensing Types - Sensing Considerations, Actuators - Actuators Types - Actuator Types - Actuator Characteristics - Data Formats - Processing in IoT - Processing Topologies	2	5,6
		Instructional Hours	**6**
Suggested Learning Methods : Video Presentation			
V	**IoT Case Studies: Agricultural IoT:** Components of an agricultural IoT - Advantages of IoT in agriculture **Vehicular IoT:** Components of vehicular IoT - Advantages of vehicular IoT **Healthcare IoT** : Components of healthcare IoT - Advantages and risk of healthcare IoT	2	12-15
		Instructional Hours	**6**
Suggested Learning Methods : Video Presentation			
		Total Hours	**30**

Text Books	1. Muhammad Azhar Iqbal, Sajjad Hussain, Huanlai Xing, and Muhammad Ali Imran, **"Enabling the Internet of Things: Fundamentals, Design, and Applications"**, Published 2021 by John Wiley & Sons Ltd. 2. Sudip Mishra, Anandarup Mukherjee, Arijit Roy: **"Introduction to IoT",** Cambridge University Press.
Reference Book	1. Bassi, Alessandro, et al, **"Enabling things to talk"**, Springer-Verlag Berlin
Web. URL	1. https://onlinecourses.nptel.ac.in/noc17_cs22/course

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	M	M	M	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	M	M	H	M	M	H	H	M	H	H	M	M
CO4	M	H	M	M	H	H	H	M	H	M	H	H	M
CO5	H	H	H	H	M	H	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
Dr. N. Saranya	Dr. K. Selvavinayaki

Course Code	Title	
23UCKSS01	Self Study Paper : Libre Office	
Semester: II - V	Credits: 1	ESE: 50 Marks

Course Objective	Introduces the basic features of Libre Office, Writer, Calc, Impress.
Course Category	Employability
Development Needs	Global
Course Description	This course is introduced to gain knowledge in Microsoft Office programs for creating personal and/or business documents. Students will recognize when to use each of the Microsoft Office programs to create professional business documents. They can pursue future courses specializing in one or more of the programs.
Offered by	**B.Sc. Artificial Intelligence and Machine Learning**

Course Content **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introducing Libre Office –** What is Libre Office – Advantages – Minimum Requirement – How to get and Install the Software – Extensions and Add-Ons – How to get Help – Starting Libre Office – Parts of Main Window – Starting a New Document – Opening - Saving – Renaming and Deleting – Navigator – Undoing and Redoing – Closing a Document and Libre Office -	1	1
	Suggested Learning Methods: Video lectures		
II	**Getting Started with Writer** – Introducing – Setting Up – Working – Formatting – Introduction to Styles – Working with Graphics – Working with Tables – Working with Templates in Writer – Using Mail Merge – Creating Tables – Working with Master Documents – Working with Fields – Using Forms in Writer – Customizing Writer	1	4
	Suggested Learning Methods: Video lectures		
III	**Getting Started with Calc –** Introducing – Entering, Editing, Formatting – Using Charts and Graphs – Using Styles and Templates – Using Graphics in Calc – Printing, Exporting and E-mailing – Formulas and Functions – Using the Datapilot – Data Analysis – Linking Calc Data – Sharing and Reviewing – Calc Marcos – Calc as a simple DataBase	1	5
	Suggested Learning Methods: Video lectures		
IV	**Getting Started with Impress** – Introducing – Using Slide Masters – Adding and Formatting text – Pictures – Managing and Formatting Graphic Objects – Including Spread Sheets, Charts and Other Objects – Adding and Formatting Slides, Notes, and Handouts – Slideshows – Printing, E-mailing, Exporting and Saving Slide Shows	1	6
	Suggested Learning Methods: Video lectures		

V	**Getting Started with Draw –** Introducing Draw – Drawing Basic Shapes – Working with Objects and Object Points – Changing Object Attributes – Combining Multiple Objects – Editing Pictures – Working with 3D Objects – Tips and Tricks - Organization Charts – Flow Diagrams – Advanced Draw Technique	1	7
		Suggested Learning Methods: Laboratory practice	
Text Books	1.Libre Office – Getting Started Guide, 2017		
Reference Books	1.http://www.open-of-course.org/courses/course/view.php?id=86.		
Web. URLs	https://documentation.libreoffice.org/assets/Uploads/Documentation/en/GS7.0/GS70-GettingStarted.pdf		

Course designed by	**Verified By Chairman**
Dr. N. Saranya	Dr.K. Selvavinayaki

Course Code	Title	
23UCSSS02	Self Study Paper : Management Information System	
Semester: II - V	Credits: 1	ESE: 50 Marks

Course Objective	To enable the students to know the Integration of Business Information, Learn the core activities in the systems development process.
Course Category	Skill Development
Development Needs	Global
Course Description	This course is introduced to understand the usage of Information Systems in management, the activities that are undertaken in acquiring an Information System in an organization, analyze and synthesize business information needs to facilitate evaluation of strategic alternatives and learn to aware of utilization on business information for decision making.
Offered by	**B.Sc. Artificial Intelligence and Machine Learning**

Course Content	**Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Management Information System :** Meaning – Features – Requisites of an effective MIS –MIS Model – Components – Subsystems of an MIS – Role and Importance – CorporatePlanning for MIS – Growth of MIS in an Organization - Centralization Vs. Decentralization of MIS – Limitations of MIS.	1	1
	Suggested Learning Methods: Video lectures		
II	**System Concepts: –** Elements of a System- Characteristics of a system - Types of System–Categories of Information System – System Development Life Cycle – System Enhancement.	1	3
	Suggested Learning Methods: Video lectures		
III	**Information Systems Requirements**: Developing Long Range Information System Plan – Strategies for the Determination of Information Requirements-Database requirements-User Interface Requirements.	2	5
	Suggested Learning Methods: Video lectures		
IV	**Conceptual Foundations:** The Decision Making Process- Concepts of Information-Humans as Information Processors-System Concepts-Concepts of Planning and Control-Organizational Structure and Management concepts.	2	3
	Suggested Learning Methods: Video lectures		
V	**Development, Implementation, and Management of Information System Resources:** Developing and Implementing Application Systems-Quality Assurance and Evaluation of Information Systems-Organization and Management of the Information Resources Function- Future Developments and Their Organizational and SocialImplications.	2	6
	Suggested Learning Methods: Video lectures		

Text Books	1. Aman Jindal**, Management Information System**, Kalyani Publishers, New Delhi, FirstEdition,2003. Unit I : Section 2.2 to 2.5 , 2.14 to 2.24 (Chapter 2) Unit II : Section 1.1 to 1.5, 2.2, 3.6,3.7 (Chapter 1,2 and 3) 2. Gordon B. Davis, Margrethe H. Olson, **Management Information Systems,** TataMcGraw Hill, Second Edition, 2008. Unit III : Chapter 14, 15,16,17 Unit IV : Chapter 6,7,8,9,10 and 11 Unit V : Section 18,19,20,21 (Chapter 18, 19, 20 and 21)
Reference Books	1. P.Mohan**, Management Information System**, Himalaya Publishing house, New Delhi,First Edition,2007.

Course designed by	**Verified By Chairman**
Dr. N. Saranya	Dr. K. Selvavinayaki