Sadakathullah Appa College

(Autonomous)

(Reaccredited by NAAC at an 'A' Grade. An ISO 9001:2015 Certified Institution)

Rahmath Nagar, Tirunelveli- 11.

Tamil Nadu

DEPARTMENT OF INFORMATION TECHNOLOGY

MY LORD
VOUCHSAFE ME WISDOM

CBCS SYLLABUS

Learning Outcomes-based Curriculum Framework for

INFORMATION TECHNOLOGY (I.T.)

(Applicable for the students admitted from June 2021 as per the Resolutions of the Academic Council Meeting held on 20.03.2021)

CONTENTS

B. Sc. Information Technology

DISTRIBUTION OF HOURS, CREDITS, NO. OF PAPERS & MARKS

(Applicable for students admitted in June 2021 and onwards)

Part	Course	Semester	Hours	Credits	Papers	Marks
I	Tamil / Arabic	I to II	12	6	2	200
II	English	I to II	12	6	2	200
III	Discipline Specific Core (DSC) + Field work	I to VI	97	82	26	2100
	Discipline Specific Elective (DSE) + Project	III & VI	16	12	4	400
	Allied & Practical	I to IV	24	16	8	600
IV	Non-Major Elective (NME)	III to IV	4	4	2	200
	Skill Enhancement Course (SEC)	III , IV & VI	10	10	5	500
	Ability Enhancement Compulsory Course (AECC) Social Value Education (SVE)	I	2	2	1	100
	Environmental Science (EVS)	II	2	2	1	100
V	Extension Activities	IV	--	1+1	1	200
	Library Reading Hour	V	1			
		TOTAL	**180**	**142**	**52**	**4700**

SEMESTER WISE DISTRIBUTION OF HOURS

Part	**I**	**II**	**III**				**IV**				**Total**
SEM	**T/A**	**ENG**	**DSC**	**FW**	**DSE/ PRO**	**AL**	**NME**	**SEC**	**VE/ EVS**	**LR H**	
I	6	6	10	-	-	6	-	-	2		**30**
II	6	6	10	-	-	6	-	-	2		**30**
III			18	-	-	6	2	4	-	-	**30**
IV			18	-	-	6	2	4	-	-	**30**
V	-	-	21	-	8	-	-	-	-	1	**30**
VI	-	-	20	-	8	-	-	2	-		**30**
Total	**12**	**12**	**97**	**-**	**16**	**24**	**4**	**10**	**4**	**1**	**180**

COURSE Pattern
CBCS Syllabus – B.Sc. IT (2021-22 onwards)

SEM	Part	Course	Title of the paper	Course Code	H/W	L*	T*	P*	C	Marks		
										I	E	T
I	I	L-I	இக்காலத்தமிழ்	21ULTA11	6	-	-	-	3	25	75	100
			Grammar and Translation - I	21ULAR11								
	II	L-I	Communicative English -I	21ULEN11	6	-	-	-	3	25	75	100
	III	DSC-I	Programming in C	21UCIT11	4	4	-	-	4	25	75	100
	III	DSC-II	Computer and its Applications	21UCIT12	4	4	-	-	4	25	75	100
	III	P-I	Programming in C Practicals	21UCIT1P1	2	-	-	2	1	40	60	100/2
	III	A-I/1	Office Tools	21UAIT11	4	4	-	-	3	25	75	100
	III	A-I/1P	Office Tools Practicals	21UAIT1P1	2	-	-	2	1	40	60	100/2
	IV	AECC-I	Value Education-I	21USVE1A	2	2	-	-	2	25	75	100
			Value Education-II	21USVE1B								
II	I	L-II	சமயத்தமிழ்	21ULTA21	6	6	-	-	3	25	75	100
			Grammar and Translation - I	21ULAR21								
	II	L-II	Communicative English II	21ULEN21	6	6	-	-	3	25	75	100
	III	DSC-III	Object Oriented Programming with C++	21UCIT21	4	4	-	-	4	25	75	100
	III	DSC-IV	Digital Principles and System Architecture	21UCIT22	4	4	-	-	4	25	75	100
	III	P-II	Object Oriented Programming with C++ Practicals	21UCIT2P1	2	-	-	2	1	40	60	100/2
	III	A-I/2	Web Designing Tools	21UAIT21	4	4	-	-	3	25	75	100
	III	A-I/2P	Web Designing Tools Practicals	21UAIT2P1	2	-	-	2	1	40	60	100/2
	IV	AECC-II	Enviromental Science	21UEVS21	2	2	-	-	2	25	75	100
III	III	DSC-V	Programming in Java	21UCIT31	4	4	-	-	4	25	75	100
	III	DSC-VI	Data Structures	21UCIT32	4	4	-	-	4	25	75	100
	III	DSC-VII	Operating System	21UCIT33	4	4	-	-	4	25	75	100
	III	P-III	Programming in Java Practicals	21UCIT3P1	4	-	-	4	2	40	60	100/2
	III	P-IV	Data Structures Practicals	21UCIT3P2	2	-	-	2	1	40	60	100/2
	III	A-II/1	Desktop Publishing	21UAIT31	4	4	-	-	3	25	75	100
	III	A-II/1P	Desktop Publishing Practicals	21UAIT3P1	2	-	-	2	1	40	60	100/2
	IV	SEC-I	Digital Computing and Security	21USDC31	2	2	-	-	2	25	75	100
	IV	SEC-II	SWAYAM - NPTEL	21USOC32	2	2	-	-	2	25	75	100

			Online Course									
			BOOTSTRAP	21USIT32								
	IV	NME-I	Photo Editing Tools	21UNIT31	2	2	-	-	2	25	75	100
IV	III	DSC-VIII	RDBMS with Oracle	21UCIT41	4	4	-	-	4	25	75	100
	III	DSC-IX	PYTHON Programming	21UCIT42	4	4	-	-	4	25	75	100
	III	DSC-X	Java Script	21UCIT43	4	4	-	-	4	25	75	100
	III	P-V	RDBMS with Oracle Practicals	21UCIT4P1	4	-	-	4	2	40	60	100/2
	III	P-VI	PYTHON Programming Practicals	21UCIT4P2	2	-	-	2	1	40	60	100/2
	III	A-II/2	Computer Networks	21UAIT41	4	4	-	-	3	25	75	100
		A-II/2P	Computer Networks Practicals	21UAIT4P1	2	-	-	2	1	40	60	100/2
	IV	SEC-III	Soft Skills	21USSS41	2	2	-	-	2	25	75	100
	IV	SEC-IV	E-commerce	21USIT42	2	2	-	-	2	25	75	100
	IV	NME-II	Document Creation Tools	21UNIT41	2	2	-	-	2	25	75	100
	V	ECA	Extra Curricular Activities		-	-	-	-	1	-	-	100
	V	SOP	Sadakath Outreach Programme		-	-	-	-	1	-	-	100
	III	FW	Field Work/Internship	21UFIT41	-	-	-	-	2	-	-	100
V	III	DSC-XI	Computer Graphics and Multimedia	21UCIT51	5	5	-	-	4	25	75	100
	III	DSC-XII	DOT Net Programming	21UCIT52	4	4	-	-	4	25	75	100
	III	DSC-XIII	Data Mining	21UCIT53	4	4	-	-	4	25	75	100
	III	P VII	Computer Graphics and Multimedia Practicals	21UCIT5P1	4	-	-	4	2	40	60	100/2
	III	P VIII	Dot Net Programming Practical	21UCIT5P2	4	-	-	4	2	40	60	100/2
	III	DSE -I	A) Artificial Intelligence	21UEIT51A	4	4	-	-	3	25	75	100
			B) Robotics	21UEIT51B								
			C) Machine learning	21UEIT51C								
	III	DSE II	A) Cloud Computing	21UEIT52A	4	4	-	-	3	40	60	100
			B) Internet of Things	21UEIT52B								
			C) Virtual Reality	21UEIT52C								
			Library Reading Hour		1	-	-	-	-	-	-	-
VI	III	DSC-XIV	Mobile Application Development	21UCIT61	4	4	-	-	4	25	75	100
	III	DSC-XV	PHP Programming	21UCIT62	4	4	-	-	4	25	75	100
	III	DSC-	Software Engineering	21UCIT63	4	4	-	-	4	25	75	100

		XVI										
	III	P-IX	Mobile Application Development Practicals	21UCIT6P1	4	-	-	4	2	40	60	100/2
	III	P-X	PHP Programming Practicals	21UAIT6P2	4	-	-	4	2	40	60	100/2
	III	DSE-III	A) React JS	21UEIT61A	4	4	-	-	3	25	75	100
			B) Introduction to Docker	21UEIT61B								
			C) Linux	21UEIT61C								
	III	DSE-IV	Project	21UEIT62	4	4	-	-	3	-	-	100◆
	IV	SEC-V	Cyber Security	21USIT61	2	2	-	-	2	25	75	100
					180				**142**			**4700**

*** L – Lecture hours * T – Tutorial hours * P – Practical hours**

◆ Project Report - 60 marks, Viva-Voce Examination - 40 marks

Fieldwork Report - 60 marks, Viva-Voce Examination - 40 marks

B.Sc. Information Technology COURSE STRUCTURE (CBCS)
(Applicable for students admitted in June 2021 and onwards)

TITLE OF THE PAPERS, CREDITS & MARKS

GROUP II COURSES (ONE-YEAR LANGUAGE COURSES)

(B.Com. , B.Com. Finance, B.Com. (Hons.), BBA, B.Sc. Computer Science, Information Technology, B.C.A)

SEM	TITLE OF THE PAPER	COURSE CODE	H/W	C	I	E	T
PART I - TAMIL							
I	இக்காலத் தமிழ்	21ULTA11	6	3	25	75	100
II	சமயத் தமிழ்	21ULTA21	6	3	25	75	100
		TOTAL	**12**	**6**			**200**
PART I – ARABIC							
I	Applied Grammar and Translation – I	21ULAR11	6	3	25	75	100
II	Applied Grammar and Translation – II	21ULAR21	6	3	25	75	100
		TOTAL	**12**	**6**			**200**
PART II – ENGLISH							
I	Prose, Poetry and Grammar-I	21ULEN11	6	3	25	75	100
II	Prose, Poetry and Grammar-II	21ULEN21	6	3	25	75	100
		TOTAL	**12**	**6**			**200**

PART III

DSC, DSE, Field work and Project								
SEM	**COURSE**	**TITLE OF THE PAPER**	**COURSE CODE**	**H/W**	**C**	**MARKS**		
						I	**E**	**T**
I	DSC1	Programming in C	21UCIT11	4	4	25	75	100
	DSC2	Computer and its Applications	21UCIT12	4	4	25	75	100
	P-I	Programming in C Practicals	21UCIT1P1	2	1	40	60	100/2
II	DSC3	Object Oriented Programming with C++	21UCIT21	4	4	25	75	100
	DSC4	Digital Principles and System Architecture	21UCIT22	4	4	25	75	100
	P-II	Object Oriented Programming with C++ Practicals	21UCIT2P1	2	1	40	60	100/2
III	DSC5	Programming in Java	21UCIT31	4	4	25	75	100
	DSC6	Data Structures	21UCIT32	4	4	25	75	100
	DSC7	Operating System	21UCIT33	4	4	25	75	100
	P-III	Programming in Java Practicals	21UCIT3P1	4	2	40	60	100/2
	P-IV	Data Structures Practicals	21UCIT3P2	2	1	40	60	100/2
IV	DSC8	RDBMS with Oracle	21UCIT41	4	4	25	75	100
	DSC9	PYTHON Programming	21UCIT42	4	4	25	75	100
	DSC10	Java Script	21UCIT43	4	4	25	75	100
	P-V	RDBMS with Oracle Practicals	21UCIT4P1	4	2	40	60	100/2
	P-VI	PYTHON Programming Practicals	21UCIT4P2	2	1	40	60	100/2
	FW/I	Field Work/Internship	21UFCS41		2			100
V	DSC11	Computer Graphics and Multimedia	21UCIT51	5	4	25	75	100
	DSC12	DOT Net Programming	21UCIT52	4	4	25	75	100
	DSC13	Data Mining	21UCIT53	4	4	25	75	100
	P-VII	Computer Graphics and Multimedia Practicals	21UCIT5P1	4	2	40	60	100/2
	P-VIII	Dot Net Programming Practical	21UCIT5P2	4	2	40	60	100/2
	DSE-I	A) Artificial Intelligence	21UEIT51A	4	3	25	75	100
		B) Robotics	21UEIT51B					
		C) Machine learning	21UEIT51C					
	DSE-2	A) Cloud Computing	21UEIT52A	4	3	25	75	100
		B) Internet of Things	21UEIT52B					
		C) Virtual Reality	21UEIT52C					
VI	DSC14	Mobile Application Development	21UCIT61	4	4	25	75	100
	DSC15	PHP Programming	21UCIT62	4	4	25	75	100
	DSC16	Software Engineering	21UCIT63	4	4	25	75	100
	P-IX	Mobile Application Development Practicals	21UCIT6P1	4	2	40	60	100/2
	P-X	PHP Programming Practicals	21UAIT6P2	4	2	40	60	100/2
	DSE-III	A) React JS	21UEIT61A	4	3	25	75	100
		B) Introduction to Docker	21UEIT61B					
		C) Linux	21UEIT61C					
	DSE-IV	Project	21UEIT62	4	3			100
			TOTAL	**113**	**94**			**2600**

Part III - Allied								
SEM	**COURSE**	**TITLE OF THE PAPER**	**COURSE CODE**	**H/W**	**C**	**MARKS**		
						I	**E**	**T**
I	AI/1	Office Tools	21UAIT11	4	3	25	75	100
	AI/1P	Office Tools Practicals	21UAIT1P1	2	1	40	60	100/2
II	AI/2	Web Designing Tools	21UAIT21	4	3	25	75	100
	A1/2P	Web Designing Tools Practicals	21UAIT2P1	2	1	40	60	100/2
III	AII/1	Desktop Publishing	21UAIT31	4	3	25	75	100
	AII/1P	Desktop Publishing Practicals	21UAIT3P1	2	1	40	60	100/2
IV	AII/2	Computer Networks	21UAIT41	4	3	25	75	100
	AII/2P	Computer Networks Practicals	21UAIT4P1	2	1	40	60	100/2
			TOTAL	**24**	**16**			**600**
Part IV – NME								
III	NME1	Photo Editing Tools	21UNIT31	2	2	25	75	100
IV	NME2	Document Creation Tools	21UNIT41	2	2	25	75	100
			TOTAL	**4**	**4**			**200**
Part IV – SEC								
III	SEC-1	Digital Computing and Security	21USDC31	2	2	25	75	100
	SEC-2	SWAYAM - NPTEL Online Course	21USOC32	2	2	25	75	100
		BOOTSTRAP	21USIT32					
IV	SEC-3	Soft Skills	21USSS41	2	2	25	75	100
	SEC-4	E-commerce	21USIT42	2	2	25	75	100
VI	SEC-5	Cyber Security	21USIT61	2	2	25	75	100
			TOTAL	**10**	**10**			**500**
Part IV –Value Education & EVS								
I	VE	Value Education-I	21USVE1A	2	2	25	75	100
		Value Education-II	21USVE1B					
II	EVS	Environmental Science	21UEVS21	2	2	25	75	100
			TOTAL	**4**	**4**			**200**

PART – V – Extension Activities

SEM	**Extension Activities (Choose any one)**	**S. CODE**	**H/W**	**C**	**MARKS**		
					I	**E**	**T**
I to IV	NCC	21UEXNCC		**1**			**100**
	NSS	21UEXNSS					
	Physical Education	21UEXPHE					
	Red Ribbon Club	21UEXRRC					
	Youth Red Cross	21UEXYRC					
	Youth Welfare	21UEXYWL					
	Yoga	21UEXYOG					
III to IV	Sadakath Outreach Programme (SOP)	21UEXSOP		**1**			**100**
	Total		**-**	**2**			**200**

Department of Information Technology

Programme : B.Sc

Programme Learning Outcomes

PLO	Upon completion of B.Sc Degree Programmes, the graduates will be able to:
PLO 1	**Disciplinary Knowledge** • Acquire scientific knowledge and the understanding of major concepts and theoretical principles.
PLO 2	**Creative Thinking and Practical Skills / Problem Solving Skills** • Enrich skills of observation / research related skills to draw logical inferences from scientific experiments/ programming and skills of creative thinking to develop novel ideas. • Hone problem solving skills in theoretical, experimental and computational areas and to apply them in research fields and in real life situations.
PLO 3	**Sense of inquiry and Skilled Communicator** • Develop the capability for raising appropriate questions relating to the current/emerging issues encountered in the scientific field and to plan, execute and express the results of experiments / investigations through technical writings as well as through oral presentations.
PLO 4	**Ethical Awareness / Team Work / Environmental Conservation and Sustainability** • Equip them for conducting work as an individual / as a member, or as a leader in diverse teams upholding values such as honesty and precision and thus preventing unethical behaviours such as fabrication, falsification, misrepresentation of data, plagiarism etc. to ensure academic integrity. • Realise that environment and humans are dependent on one another and to know about the responsible management of our eCOsystem for survival, and for the well-being of the future generation as well.
PLO 5	**Usage of ICT/ Lifelong Learning / Self-Directed Learning** • Inculcate the habit of learning continuously through the effective adoption of ICT to update knowledge in the emerging areas in Sciences for inventions/discoveries and also to engage in remote / independent learning.

Programme Specific Outcomes

PSO	Upon completion of B.Sc. Degree Programme, the students will be able to:	PLOs Mapped
PSO-1	Understand the basic concepts, working process of hardware, software and networking aspects of computer system besides analyzing the principles and methodologies to implement the software system for real time problems.	1,3,4
PSO-2	Analyze and develop solution based programs in the areas related to Operating System, Mobile applications and software projects using programming environment such as Python, Java, C, C++, C#, UNIX by applying the principles and strategies of software engineering.	1,2,5
PSO-3	Apply the basic concepts of computer components, software, data structures, designing tools that include HTML, CSS, Java script and PHP to analyze the recent trends such as Virtual Reality, Data Mining, and Internet of Things.	1,2,3
PSO-4	Design software, documents, photo edit, graphics using applications and tools.	1,2,3,5
PSO-5	Analyze the networking, operating system and memory management operations besides applying the programming concepts.	1,2,3,4

SEMESTER – I

Course Title	**இக்காலத் தமிழ்** **Ikkala Tamil (Modern Tamil)**
Total Hrs.	**90**
Hrs./Week	**6**
Course Code	**21ULTA11**
Course Type	**Part – I - Tamil**
Credits	**3**
Marks	**100**

General Objective: To introduce literary history, the basics of grammar, and the genres such as poetry, short stories and essays.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the major literary forms such as poetry, short stories and essays and their characteristics.
CO-2	Apply their knowledge to learn the effective use of language and literature.
CO-3	Analyse the social / political / religious / economical issues dealt with in literary pieces.
CO-4	Differentiate the literary forms to know their nuances.
CO-5	Produce verses, short stories and essays.

அலகு 1 தமிழ்ச் செய்யுள்

1. தமிழ் - பாரதியார்
2. புதிய உலகு செய்வோம் - பாரதிதாசன்
3. மனிதனைத் தேடி - மு.மேத்தா
4. தொலைந்து போனவர்கள் - அப்துல் ரகுமான்
5. ஒவ்வொரு புல்லையும் பெயர் சொல்லி அழைப்பேன் - இன்குலாப்
6. சினேகிதனின் தாழ்வான வீடு - கலாப்ரியா
7. இடைவெளி - மனுஷ்ய புத்திரன்
8. சிறைச்சாலைக்காக -அறிவுமதி
9. விழித்தெழுக என் தேசம் - இரவீந்திரநாத் தாகூர் (ஜெயபாரதன் (மொ.பெ))
10. மறதி - ஈரோடு தமிழன்பன்
11. பெண்கவிகளின் கவிதைகள்
12. என்மேல் பரிவுகாட்டு என் ஆத்மாவே - கலீல் ஜிப்ரான்
13. அந்தி மனம் - கல்யாண்ஜி
14. நகைப்பா - மாமதயானை
15. பியானோ- பிரமிள்
16. அழிவு - ஆத்மாநாம்
17. உள் உலகங்கள் - ஞானக்கூத்தன்
18. கிளிக்குஞ்சு - ந.பிச்சமூர்த்தி
19. கடைசி விருந்து - சுகுமாரன்
20. தூர் - நா.முத்துக்குமார்
21. ஜென் கவிதைகள்
22. ஹைக்கூ கவிதைகள்

நீங்கள் பயின்ற புதுக்கவிதைகளின் அடிப்படையில் நவீனப் புதுக்கவிதைகள் மற்றும் ஹைக்கூக் கவிதைகள் தருக.

அலகு - 2 சிறுகதைகள்

1. மனித யந்திரம் - புதுமைப்பித்தன்
2. அனந்தசயனம் காலனி - தோப்பில் முகம்மது மீரான்
3. மிருகம் - வண்ணநிலவன்
4. செடிகளுக்கு – வண்ணதாசன்
5. கனவில் உதிர்ந்த பூ - நாறும்பூநாதன்
6. சொர்க்கக் கன்னிகை - கருணாமணாளன்
7. நீலம் பூக்கும் திருமடம் - ஜா.தீபா
8. குற்றமும் தண்டனையும் - லியோ டால்ஸ்டாய்

சிறுகதைகள் எழுதப் பயிற்சி அளித்து மாணவரின் சிறுகதையினைக் கல்லூரி ஆண்டு மலரில் இடம்பெறச்செய்தல்.

அலகு 3 அறிவுசார் கட்டுரைகள்

1. தொல்லியல் நோக்கில் உலகத் தமிழர் பண்பாடு
2. ஓங்கி ஒலித்த பெருங்குரல்; ஆத்மாநாம் கவிதைகள்
3. நகுலனின் தனிமை
4. கவிக்கோ அப்துல் ரகுமான் கவிதைகள்
5. இறைவனை நினைப்போம் அன்பினை வளர்ப்போம்
6. சுருக்கம் தேடும் விரிந்த கவிதைகள்
7. இலக்கியத்தில் சுற்றுச்சூழலியல்

நீங்கள் அண்மையில் பயணித்த ஓர் இடம் குறித்து இரசனையோடு எழுதுக.

அலகு 4 இலக்கிய வரலாறு

1. புதுக்கவிதை தோற்றமும் வளர்ச்சியும்
2. நவீனத் தமிழ்க் கவிதைகளின் புதிய போக்குகள்
3. தமிழ்ச் சிறுகதைகளின் தோற்றமும் வளர்ச்சியும்

அலகு 5 இலக்கணம் அறிமுகம்

1. முதலெழுத்துகள்
2. சார்பெழுத்துகள்
3. உயிர் எழுத்தின் வகைகள்
4. மெய் எழுத்தின் வகைகள்
5. சுட்டெழுத்துகள்
6. வினாவெழுத்துகள்
7. வல்லினம் மிகும் இடங்கள்
8. வல்லினம் மிகா இடங்கள்
9. பகுபத உறுப்புகள்
10. இலக்கணக் குறிப்புகள்

நீங்கள் வாசிக்கும் செய்தித்தாள்களில் இடம்பெறும் எழுத்துப் பிழைகளைச் சுட்டிக் காட்டுக.

பாடநூல்கள்

- இக்காலத்தமிழ், தமிழ்த்துறை வெளியீடு, சதக்கத்துல்லாஹ் அப்பா கல்லூரி, திருநெல்வேலி.

பார்வை நூல்கள்

தமிழ் இலக்கிய வரலாறு, முனைவர் சு.ஆனந்தன், கண்மணி பதிப்பகம்,

Course Outcomes:

CO	Upon completion of this course, students will be able to	PSOs Addressed	Cognitive Level
CO-1	Understand the concepts behind modern poetry, short stories, essays, literary history and grammar.	1	Understanding
CO-2	Explain the methodologies for the effective use of language and literature.	1, 2	Applying
CO-3	Apply their knowledge to analyse the socio-political / economic / religious issues presented in the literary texts.	1,2,3,4	Applying
CO-4	Categorize the major literary forms according to their origin and development.	1,2,3	Analysing
CO-5	Assess the ways and means to develop the art of writing insisting on environmental conservation, social harmony and interconnectedness regionally, nationally and globally.	1,2,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit
I	21ULTA11	Ikkala Tamil	90	3

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO-4	✓	✓	✓		✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	✓
	Number of matches (✓) = 43 Relationship = **High**									

SEMESTER – I

Course Title	**BASIC GRAMMAR AND TRANSLATION-I**
Total Hrs.	**90**
Hrs./Week	**6**
Sub. Code	**21ULAR11**
Course Type	**Part – I - Arabic**
Credits	**3**
Marks	**100**

General Objective: To teach the basics of Arabic Phonetics, Grammar and Translation.

Course Objectives:

CO	The learners will be able to:
CO-1	Identify the Arabic Alphabet.
CO-2	Understand the speech sounds in Arabic.
CO-3	Explain the basic grammatical items and their uses.
CO-4	Evaluate the strategies for developing communicative competency.
CO-5	Experiment the art of speaking and writing.

Unit I: Arabic for Beginners

Lesson 1-4 (Page No. 1 to 19) The Alphabet, Vowels-Diphthong,

Nunation Doubled consonant, changing shapes of the Alphabet, Definite article

Unit II: Arabic for Beginners

Lesson-5 Parts of Speech Class room (Page No. 20,21)

Model sentences (Page No. 25)

Lesson-6 Noun-Qualified and Adjectives (Page No. 26 &27)

Model sentences (Page No. 32,33)

Lesson-7 Gender (Page No. 34&35)

Lesson-8 Singular, Dual and Plural (Page No. 36&37)

Lesson-9 The Nominal Sentence (Page No. 38&40)

Model sentences (Page No. 44,45)

Unit III: Arabic for Beginners

Lesson-10 The possessive (Page No. 46& 47), Model sentences (Page No.51)

Lesson-11 Personal pronouns, We work (Page No. 52,53 &54)

Model sentences (Page No.58 & 59)

Lesson-12 demonstrative and Relative pronouns, New York city (Page No. 60,61,62,& 67)

Lesson-13 Interrogatives, Conversation (Page No. 68,69 & 70)

Model sentences (Page No.74 & 75)

Unit IV: Al -Qirat –Al-Wazhiha Part –I

Lesson 1-7 from

Unit V: Al -Qirat –Al-Wazhiha Part –I

Lesson 8-14

Textbooks:

1. Syed Ali. *Arabic for Beginners*. UBS Publishers & Distributors Ltd. New Delhi:

(International Edition 2011)

2 Waheed Az-zaman Al-Keeranavi. Al -Qira'ath –Al-Wazhiha Part –I.

Course Outcomes:

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Summarize the Arabic alphabet and speech sounds in Arabic.	1,2	Understanding
CO-2	Apply the basic grammar rules of Arabic in their communication.	1,2,5	Applying
CO-3	Discover the functions of Nouns, Adjectives, Personal and Demonstrative Pronouns, Prepositions, Countable and Uncountable for effective usage.	1,2,3	Applying
CO-4	Analyze the methods in order to attain communication skills.	1,2,3,5	Analyzing
CO-5	Evaluate conversational patterns and write short passages in Arabic.	1,2,4	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
I	21ULAR 11	GRAMMAR AND TRANSLATION-I	90	3

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓			✓	✓	✓			
CO-2	✓	✓				✓	✓			✓
CO-3	✓	✓	✓	✓		✓	✓	✓		
CO-4	✓	✓		✓		✓	✓	✓		✓
CO-5	✓			✓	✓	✓	✓		✓	
	Number of matches (✓) = 30 Relationship = **Medium**									

SEMESTER – I

Course Title	**COMMUNICATIVE ENGLISH - I**
Total Hrs.	**90**
Hrs./Week	**6**
Course Code	**21ULEN11**
Course Type	**Part – II - English**
Credits	**3**
Marks	**100**

General Objective:

To teach the four skills viz. Listening, Speaking, Reading, and Writing to train the students the skills necessary for social and academic interactions.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the significance and the use of the four skills (LSRW).
CO-2	Apply the skills acquired to listen to English keenly, to understand the context clearly and to respond to others accordingly.
CO-3	Identify the strategies of language learning and use in real-life situations by means of reading extensively.
CO-4	Examine the correct and incorrect expressions in everyday English to take notes and write essays.
CO-5	Express their ideas without committing any grammatical errors.

Unit – I

1. Listening and Speaking

   a. Introducing self and others
   b. Listening for specific information
   c. Pronunciation (without phonetic symbols)
      i. Essentials of pronunciation
      ii. American and British pronunciation

2. Reading and Writing

   a. Reading short articles – newspaper reports / fact based articles
      i. Skimming and scanning

ii. Diction and tone

iii. Identifying topic sentences

b. Reading Aloud: Reading an article/report
c. Journal (Diary) Writing

3. Study Skills - 1

Using dictionaries, encyclopedias, thesaurus
Grammar in Context:

Naming and Describing

- Nouns & Pronouns
- Adjectives

Unit – II

1. Listening and Speaking

a. Listening with a purpose:
b. Effective Listening:
c. Tonal Variation:
d. Listening for information
e. Asking for Information
f. Giving Information:

2. Reading and Writing

a. Strategies of Reading:

Skimming and Scanning

b. Types of Reading:

Extensive and Intensive Reading

c. Reading a prose passage

d. Reading a poem

e. Reading a short story

3. Paragraphs: Structure and types

a. What is a Paragraph?

b. Paragraph structure

c. Topic Sentence

d. Unity

e. Coherence.

f. Connections between Ideas: Using Transitional words and expressions.

g. Types of Paragraphs

4. Study Skills II:

Using the Internet as a Resource

a. Online search:
b. Know the keyword:
c. Refine your search:
d. Guidelines for using the Resources:
e. e-learning resources of Government of India
f. Terms to know

5. Grammar in Context

Involving Action-I

a. Verbs
b. Concord

Unit – III

1. Listening and Speaking
    a. Giving and following instructions
    b. Asking for and giving directions
    c. Continuing discussions with connecting ideas
2. Reading and writing
    a. Reading feature articles (from newspapers and magazines)
    b. Reading to identify point of view and perspective (opinion pieces, editorials etc.)
    c. Descriptive writing – writing a short descriptive essay of two to three paragraphs.
3. Grammar in Context:

Involving Action – II

- Verbals - Gerund, Participle, Infinitive
- Modals

Unit – IV

1. Listening and Speaking
    a. Giving and responding to opinions
2. Reading and writing
    a. Note taking
    b. Narrative writing – writing narrative essays of two to three paragraphs
3. Grammar in Context:

Tense

- Present
- Past
- Future

Unit - V

1. Listening and Speaking
    a. Participating in a Group Discussion
2. Reading and writing
    a. Reading diagrammatic information – interpretations maps, graphs and pie charts
    b. Writing short essays using the language of comparison and contrast
3. Grammar in Context: Voice (showing the relationship between Tense and Voice)

Textbook:

Board of Editors. *COMMUNICATIVE ENGLISH* -1. Tamil Nadu State Council for Higher Education (TANSCHE). Chennai: 2020.

References:

1. Radhakrishna Pillai.G,ed.Written English for You.Chennai:Emerald Publishers, 1990 (rpt2008).
2. Nihamathullah.A.et al. A Course in Spoken English.Tirunelveli: MSU, 2005. (rpt 2010).

Course Outcomes

CO No.	Upon completion of this course, students would have learned to:	PLO Addressed	Cognitive Level
CO-1	Understand the importance of language skills in order to communicate effectively.	1,2	Understanding
CO-2	Apply the listening skill to pronounce words better and to understand contextual meaning.	1,2,3	Applying
CO-3	Develop reading skill to learn vocabulary, use it appropriately, and acquire analytical skill and the like.	1,2,3,4	Applying
CO-4	Explain the nuances of common errors in English.	3,4,5	Analyzing
CO-5	Choose to use English language consciously without any errors.	1,2,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
I	21ULEN11	Communicative English - I	90	3

Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO3	PLO4	PLO5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓				✓	✓			
CO-2	✓	✓	✓			✓	✓	✓		
CO-3	✓	✓	✓	✓		✓	✓	✓	✓	
CO-4	✓		✓	✓	✓	✓		✓	✓	✓
CO-5	✓	✓		✓	✓	✓	✓		✓	✓
	Number of matches (✓) = 34 Relationship = High									

SEMESTER – I

Course Title	**PROGRAMMING IN C**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT11**
Course Type	**DSC-I**
Credits	**4**
Marks	**100**

General Objective:

Train the students in C Programming language and its basic concepts to provide exposure to problem-solving through hands-on experience.

Course Objectives:

CO No.	The learners will be able to::
CO-1	Understand the fundamentals of C programming.
CO-2	Develop programming code, compile and test C programs.
CO-3	Sketch reusable modules such as function, structure and union.
CO-4	Analyze various ways to solve the real-time problems through programming.
CO-5	Persuade them to pursue advanced C programming concepts.

UNIT I

Overview of C Language History Of C- C Fundamental: Constants-Variable- Data Types - Character Set – C Tokens – Identifiers - Keywords - Data Types - Operators &Expressions - Managing Input &Output Operations.

UNIT II

Decision Making &Branching: Introduction– IF statement - IF-ELSE- Nesting of IF ELSE – ELSE IF LADDER – Switch- Conditional Operator – GOTO Statement

Decision Making &Looping: Introduction – WHILE Statement – DO – FOR – Jumps In Loops

UNIT III

Arrays: Introduction –One Dimensional Arrays- Declaration-Initialization-Two Dimensional Arrays -Initialization –Multi Dimensional Arrays.-**Functions** : Introduction – Need for User Defined Functions –A Multi Function Program – Elements of User Defined Functions – Defintions of Functions – Category of Functions.

UNIT IV

Structures &Unions : Introduction – Defining a structures – Declaring Structure variables – Accessing Structure Members – Structure Initialization – Unions - **Pointers :**Introduction – Understanding Pointers – Accessing address of the variable – Declaring Pointer Variable - Initialization of pointer Variables – Pointers & Arrays.

UNIT V

File Management in C: Introduction - Defining & Opening a File – Closing a File – Input / Output Operations & files– Random Access to File – Command Line arguments.

TEXT BOOK

E.Balagurusamy - "Programming IN ANSI C", McGraw Hill Publications, 4th Edifiton, 2007

REFERENCE BOOK

C Ravichandran -"Programming With C", New Age International (P) Limited Publishers, 1st Edition, 2006

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Classify the different types of operators and expressions to bring out the essentials of decision making.	**1,2**	**Understanding**
CO-2	Apply their knowledge to design and develop the concept of pointers and functions.	**1,2**	**Applying**
CO-3	Apply an object-oriented approach to develop applications in various complications.	**1,2**	**Applying**
CO-4	Analyze structures and unions in C programming.	**1,2**	**Analyzing**
CO-5	Evaluate tasks where the numerical techniques are applicable and write programs to solve the problems concerned.	**1,2**	**Evaluating**

Relationship Matrix

Semester	Course Code		Title of the Course			Hours		Credits		
I	21UCIT11		PROGRAMMING IN C			60		4		
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓	✓	✓			
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓			
CO-5	✓	✓	✓	✓	✓	✓	✓			
	Number of matches (✓) = 35 Relationship = Medium									

SEMESTER – I

Course Title	**COMPUTER AND ITS APPLICATIONS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT12**
Course Type	**DSC-II**
Credits	**4**
Marks	**100**

General Objective:

To understand the fundamentals of computer system, networking, operating system and multimedia concepts.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the anatomy and architecture of digital computer.
CO-2	Comprehend number systems, Boolean algebra and memory units.
CO-3	Identify the types of input, output devices and operating system.
CO-4	Examine the various security issues in peripheral communications.
CO-5	Analyze the latest concepts of multimedia and Virtual Reality.

UNIT I

Computers an Overview: Introduction to computers – Five Generations of modern computers- Classification of Digital computer Systems.- **Inside the computer:** Anatomy of digital computer – Computer Architecture.

UNIT II

Number system & Boolean Algebra: Number system – Boolean algebra and logic circuits. **Memory:** Memory units **–** Auxiliary Storage Devices – Primary Storage Devices.

UNIT III

Input / Output: Input devices - Output Devices – **Computer Software & Software Development:** Introduction to computer software - Operating systems - Programming languages.

UNIT IV

Data processing and Networking: Data processing **–** Computer networks – Distributed data processing. **Telecommunications:** Introduction to Telecommunications. **Security:** Introduction to computer security – Cryptography - Computer Viruses, Bombs and worms.

UNIT V

Internet and Intranet: Internet and world wide web – Introduction to Intranets**. Multimedia and virtual reality:** Introduction to Multimedia - Multimedia tools - Introduction to virtual reality.

Textbook:

"Introduction to Computers" by Alexis Leon and Mathews Leon, 1st Edition, 1999, VIKAS publishing house Pvt Ltd.

Reference book:

"Computer Fundamentals and Applications" by Ashok Arora, 1st Edition, 2015, VIKAS publishing house Pvt Ltd.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Classify the various generations of computers.	1	Understanding
CO-2	Choose the various storage devices for collecting data.	1,5	Applying
CO-3	Explain the concepts of operating system.	1,5	Analyzing
CO-4	Inspect the various issues related to security to protect communication systems.	1,5	Analyzing
CO-5	Summarize the nuances of multimedia tools to understand Virtual Reality.	1,4,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours			Credits
I	21UCIT12			COMPUTER AND ITS APPLICATIONS			60			4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓		✓	✓		✓				
CO-2	✓		✓	✓		✓				✓
CO-3	✓		✓	✓		✓				✓
CO-4	✓		✓	✓		✓				✓
CO-5	✓	✓	✓	✓	✓	✓			✓	✓
	Number of matches (✓) = 27 Relationship = MEDIUM									

SEMESTER – I

Course Title	**PROGRAMMING IN C PRACTICALS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UCIT1P1**
Course Type	**P I**
Credits	**1**
Marks	**100/2**

General Objective:

Train the students to develop code in C Programming language by exposing them to solve real-time problems.

Course Objectives:

CO	The learners will be able to:
CO-1	Show the use of if, while and do-while statements in C.
CO-2	Identify the uses of switch and for statement in C.
CO-3	Examine the storage structures of arrays in C.
CO-4	Analyze reusable modules of functions and recursions in C.
CO-5	Explain the predefined functions of strings, storage concepts of structure and files in C programs.

1. Program using If statement.
2. Program using while & do – while statement.
3. Program using switch statement.
4. Program using for statement.
5. Program using one dimensional array.
6. Program using two dimensional arrays.
7. Program using Functions.
8. Programs using Recursions.
9. Program using strings.
10. Program using Structure.
11. Program using file concepts.

Course Outcomes

Co No	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO- 1	Apply the different ways to implement if, while and do-while statements in C.	1,2	Applying
CO- 2	Choose the proper statements in writing the program to find the solution using decision making and looping.	1,2	Applying
CO- 3	Differentiate the various types of arrays in C.	1,2	Analyzing
CO- 4	Develop programs using functions and recursions.	1,2	Creating
CO- 5	Build knowledge to construct the user defined data types in C.	1,2	Creating

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits	
I	21UCIT1P1			Programming in C Practicals			30		1	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓	✓	✓			
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓			
CO-5	✓	✓	✓	✓	✓	✓	✓			
	Number of matches (✓) = 35 Relationship = Medium									

SEMESTER – I

Course Title	**OFFICE TOOLS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UAIT11**
Course Type	**Allied-I/1**
Credits	**3**
Marks	**100**

General Objective:

To learn and create documentation, do mathematical calculation, design the presentations and access the database.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concepts of Word documentation.
CO-2	Explain the advanced features of Word.
CO-3	Apply the functions and mathematical calculations in Excel.
CO-4	Develop knowledge to create presentations with animation effects.
CO-5	Analyze the various queries in database.

UNIT I

Documentation Using Word : Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark.

UNIT II

Advance concepts in Word : Advance Features of MS-Word [Mail Merge, Macros], Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT III

Electronic Spread Sheet using Excel: Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, **Advance features of MS-Excel:** Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel- Sorting, Filtering, Table, Validation, Goal Seek, and Scenario, Macros

UNIT IV

Presentation using PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

UNIT V

Database concepts using ACCESS: Introduction to Databases-Defining a Database-Understanding RDBMS- Objects of a Relational Database- Macros- Functions of a DBMS-Starting Microsoft Access- Creating Tables- Understanding Database-Creating Database - Creating a table - Working a Tables- Saving the Table-Defining Primary Key-Closing the Table –Closing the Database Window and Quitting Access

Textbook:

Microsoft Office – Complete Reference – BPB Publication

Reference book :

Learn Microsoft Office – Russell A. Stultz – BPB Publication

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Summarize the methods to create documents in Word.	1,2,4	Understanding
CO-2	Apply the concepts of mail-merge, templates and linking in Word.	1,2,4	Applying
CO-3	Sketch the design of workbook, charts in Excel.	1,2,4	Applying
CO-4	Organize the slides using animations in PowerPoint presentations.	1,2,4	Analyzing
CO-5	Evaluate the queries for report generation in database.	1,2,4	Evaluating

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
I	21UAIT11			OFFICE TOOLS		60			3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER - I

Course Title	**OFFICE TOOLS PRACTICAL**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UAIT1P1**
Course Type	**Allied Practicals-I/1P**
Credits	**1**
Marks	**100/2**

General Objective:

1. Ability to create the documentation, Mathematical calculation, presentations and database management access.
2. Capacity to build their own document creation and data base tables.

Course Objectives:

CO	The learners will be able to:
CO-1	Create the documentation with advanced tools
CO-2	Formatting and designing
CO-3	Create excel functions and charts for financial reports
CO-4	Present a well effective presentations
CO-5	Create table with data base access.

WORD 2007

1. Typing letters and editing and printing.
2. Using Spell Check and Thesaurus.
3. Designing a cover page with word art.
4. Using Header, Footer, Bookmark, Foot notes.
5. Mail merge a letter to an address file.
6. Typing 5 pages of Mathematical equations and symbols.

EXCEL 2007

1. Entering spread sheets with formula
2. Entering spreadsheet and doing statistical calculations
3. Printing Of Graphs and charts for the given data.
4. Creating and using macros.

POWER POINT 2007

1. Creation of presentation with different styles on a given topic of current interest.
2. Preparing Presentation for a topic in the study of all course.

ACCESS 2007

1. Create an employee database
2. Create student database and set a primary key
3. Create a salary list preparation
4. Create a report
5. Create mailing labels

Course Outcomes:

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Familiar to create Documents	1,2,4	Evaluating
CO-2	Understand the concepts of formatting and editing in word	1,2,4	Understanding, Analysing
CO-3	Understand the concepts of Excel workbook	1,2,4	Understanding, Analysing
CO-4	Understand the concepts of Charts	1,2,4	Analysing
CO-5	Understand the concepts of powerpoint presentations and animation and database access	1,2,4	Analysing

Relationship Matrix

Semester	Code			Title of the course				Hours	Credit
I	21UAIT1P1			OFFICE TOOLS PRACTICALS				30	1
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – I

Course Title	**VALUE EDUCATION-1**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USVE1A**
Course Type	**AECC-I**
Credits	**2**
Marks	**100**

General Objective: To make students inculcate moral values, leading to faith and righteous action in their life.

Unit – I: Islam – Meaning – Importance – A complete Religion – The religion accepted by God – Five Pillars of Islam – Kalima – Prayers – Fasting – Zakat – Haj. Iman – Monotheism – Angels – Books – Prophets – Dooms Day – Life after death – Heaven and Hell.

Unit – II: Quran – The Book of Allah – Wahi – Revelation to Prophet Muhammad(sal) – Compilation – Preservance – Structure – Content – Purpose – Source of Islamic Law– SuraFathiha, Kafirun, Iqlas, Falakh and Nas.

Unit – III: Hadith – Siha Sitha – Buhari – Muslim – Tirmithi – Abu Dawood – Nasai – Ibn Maja – Collection of Hadith – Meaning of 40 Hadith.

Unit – IV: Life History of Prophet Muhammad (sal) – AiamulJahiliya – Prophet's Childhood and Marriage – Prophethood – Life at Mecca – Life at Medinah – Farewell Address – Seal of Prophethood.

Unit – V: Good character – Etiquettes – Halal and Haram – Duties towards Allah – Duties towards fellow beings – MasnoonDuas.

Textbooks:

Publication of SadakathullahAppa College

Reference Books:

1.V.A. Moahmed Ashrof – Islamic Dimensions – Reflection and Review on Quranic Themes.

2.The Presidency of Islamic Researchers – Revised & Edited – The Holy Quran.

3.M. ManzoorNomani – Islamic Faith & Practice.

4.Ali Nadawi, Abul Hasan– Muhammad Rasulullah.,Muassasathus Sahafawa Nashr publication Lucknow, India,1999.

5.K. Ali – A Study of Islamic History.

6.Abdul Rahuman Abdulla h – Islamic Dress code for Women.

7.Dr. MunirAhamed Mughal – Code For Believers.

8. Abdul Malik Mujahid – Gems and Jewels.

SEMESTER – I

Course Title	**VALUE EDUCATION-1I**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USVE1B**
Course Type	**AECC-I**
Credits	**2**
Marks	**100**

UNIT I

Individual Morality – Objective of Moral life – Living in accordance with the code of Morality – the goodness of Morality – Morality and *Thirukural*- The need for faith.

UNIT II

Adherence to higher code of Morality – Fear of God – Good Moral Values – Duty to Parents – Teacher, respecting elders – Moral Etiquettes – Right-minded Principle – High Principles for Proper conduct.

UNIT III

Inculcating good attitudes – Open mindedness – Morale – analysing the pros and cons of good and bad – Service to others – Mind Power, tolerance, respecting others, showing love to others, patience – tranquility – Modesty, kindness and forgiveness.

UNIT IV

Quotations and moral Stories expressing Good characters of Great personalities – Life History of Great people: Mahatma Gandhi, Abraham Lincoln, Dr. A.P.J. Abdul Kalam.

UNIT V

Truth, the importance of uprightness, integrity, friendship – Health awareness on Alcohol and drug abuse – inculcating reading habit – reading good books – Hygiene – Dowry – Corruption.

TEXTBOOKS:

Publication of Sadakathullah Appa College.

SEMESTER – II

Course Title	சமயத்தமிழ் **Religious Tamil or Tamil and Religion**
Total Hrs.	**90**
Hrs./Week	**6**
Course Code	**21ULTA21**
Course Type	**Part – I - Tamil**
Credits	**3**
Marks	**100**

General Objective: To expose students to the tenets of all the religions.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand religions and their objectives by means of the literary texts prescribed.
CO-2	Classify the tenets, concepts and rituals of various religions.
CO-3	Choose to know about the concept of virtues necessary for society through literature of ethics.
CO-4	Devise strategies to get through competitive exams.
CO-5	Consider focussing on their skill development by gaining confidence.

அலகு – 1

சைவம்

1. அ. திருஞானசம்பந்தர் - தோடுடைய செவியன்...
   - என்ன புண்ணியம் செய்தனை (2.106.1)
   - ஊனத் திருள்நீங் கிட ... (1.38.3)

   ஆ. திருநாவுக்கரசர் - மாசில் வீணையும்
   - குனித்த புருவமும் கொவ்வைச் ...
   - புழுவாய்ப் பிறக்கினும்

   இ. சுந்தரமூர்த்தி நாயனார் - பித்தா பிறைசூடி
   - பொன்னார் மேனியனே ...

2. மாணிக்கவாசகர்-திருவாசகம் - வானாகி மண்ணாகி
   திருவெம்பாவை - முன்னைப் பழம்பொருட்கும்
3. திருமூலர்-திருமந்திரம் - உள்ளம் பெருங்கோயில்

வைணவம்

4. அ. பொய்கையாழ்வார் - பாலன் தனதுருவாய் ஏழுலகுண்டு
   ஆ) பூதத்தாழ்வார் - சென்ற திலங்கைமேல் ....
   இ) பேயாழ்வார் - அடைந்த தரவணைமேல் ஐவர்க்காய்...
   ஈ) நம்மாழ்வார் - உண்ணும் சோறு...
   உ) மதுரகவியாழ்வார் - கண்ணி நுண்சிறுத்...
5. ஆண்டாள்-திருப்பாவை - மார்கழித் திங்கள்...

சமணம்

6. யசோதர காவியம் (கடவுள் வாழ்த்து) - நல்லார் வணங்கப் படுவான்..
   நீலகேசி (கடவுள் வாழ்த்து)

பௌத்தம்

7. மணிமேகலை (பாத்திரம் பெற்ற காதை) - மாரனை வெல்லும் வீரநின் (59-72)

கிறித்தவம்

8. இரட்சணிய யாத்திரிகம் (கடவுள் வாழ்த்து) - 1. மூல காரண முதற்பொருள் ...
   - 2. ஆதி மெய்த்திரு...
   - 3. வானமும், பூமியும்...

இஸ்லாம்

9. உமறுப்புலவர் - அல்லாஹ்
10. சதாவதானி செய்குதம்பிப் பாவலர் - மாண்டசவம் ஒன்றெடுத்து...
    (நபிகள் நாயக மான்மிய மஞ்சரி) - ஒன்று தெய்வம் ஒன்று மதம்....

இரகுமான் கண்ணி

11. குணங்குடி மஸ்தான் சாகிபு
    1) ஈறும் முதலுமற்றே இயங்குகின்ற முச்சுடராய்க்
    காணிக்கை வைத்தேனென் கண்ணே றகுமானே-2
    2) ஏகப் பெருவெளியில் இருட்கடலிற் கம்பமற்ற
    காகமது வானேன் கண்ணே றகுமானே – 7
    3) வேட்டை பெரிதென்றே வெறிநாயைக் கைப்பிடித்து
    காட்டிற் புகலாமோ கண்ணே றகுமானே – 22
    4) இன்றுள்ளோர் நாளைக் கிருப்பதுபொய்
    யென்பதையான் கண்டுகொண்டேன் ஐயாவென்
    கண்ணே றகுமானே - 37
    5) எட்டிப் பிடிக்கும் இதமறிந்தா லுன்பதத்தைக்
    கட்டிப் பிடித்திடுவேன் கண்ணே றகுமானே – 49

12. ஞானமாமேதை தக்கலை பீர்முகம்மது அப்பா - அலைகடலும் அம்புலியும்....
- பொல்லாக்குபிர்களும் வருங்....

13. இறையருட்கவிமணி பேராசிரியர்
காஅப்துல்கபூர் - அலகிலா அருளும் அளிவிலா..

நீதி இலக்கியம்

14. திருக்குறள் - உழவு (1031-1040)
15. நாலடியார் - கல்வி கரையில கற்பவர் நாள்சில... 135
16. நான்மணிக்கடிகை - நாற்றம் உரைக்கும் மலர்.... 45

அலகு – 2

புதினம்

வாடிவாசல் - சி.சு. செல்லப்பா, காலச்சுவடு, நாகர்கோவில்

அலகு – 3

உரைநடை

(போட்டித் தேர்வுகளுக்குக் கட்டுரை எழுதும் பயிற்சி)

1. நபிகள் நாயகம் (ஸல்) அன்பின் தாயகம்
2. சதக்கத்துல்லாஹ் அப்பா அவர்களின் வாழ்வும் பணியும்
3. பண்பெனப்படுவது பாடறிந்து ஒழுகுதல்
4. நம்பிக்கையோடிருப்போம்
5. தமிழின் தொன்மையும் சிறப்பும்
6. தடம் பதித்த தமிழ் நாவலாசிரியர்கள்

அலகு – 4

இலக்கிய வரலாறு

(போட்டித் தேர்வுத் தயாரிப்பு)

1. சைவம், வைணவம், கிறித்தவம், இசுலாம், வளர்த்த தமிழ்
2. புகழ்பெற்ற தமிழ் நூல்கள், நூலாசிரியர்கள்
3. சாகித்ய அகாதெமி விருது பெற்ற படைப்புகள்

அலகு – 5

தமிழ்நாடு அரசுப் பணியாளர் தேர்வாணையம் நடத்தும் போட்டித் தேர்வுக்குரிய பொதுத்தமிழ் இலக்கணப் பகுதி ஓர் அறிமுகம்

1. வேர்ச்சொல்லைக் கண்டறிதல்
2. பெயரெச்சம், வினையெச்சம், முற்றெச்சம் பற்றி அறிதல்

3. வினைமுற்று, ஏவல் வினைமுற்று அறிதல்
4. வியங்கோள் வினைமுற்று, வினையாலணையும் பெயர்
5. வினைத்தொகை, பண்புத்தொகை அறிதல்
6. உவமைத்தொகை, உம்மைத் தொகை அறிதல்
7. வேற்றுமைத் தொகையைக் கண்டறிதல்
8. அன்மொழித் தொகையைக் கண்டறிதல்
9. இரட்டைக்கிளவி, அடுக்குத்தொடர் அறிதல்

பாடநூல்:

சமயத்தமிழ், சதக்கத்துல்லாஹ் அப்பா கல்லூரித் தமிழ்த்துறை வெளியீடு,

பார்வை நூல்

சமயம் வளர்த்த தமிழ், வேங்கடசாமி நாட்டார், பாவைப் பதிப்பகம், சென்னை

Course Outcomes:

CO	Upon completion of this course, students will be able to	PSOs Addressed	Cognitive Level
CO-1	Understand the doctrines, divine thoughts and virtues of the various religions.	1,3,4,5	Understanding
CO-2	Develop impeccable spoken and written languge ability.	1,4,5	Applying
CO-3	Choose to improve their confidence and the nuances of governance by reading the history of great personalities.	1,4	Applying
CO-4	Explain the ancient Tamil people's life history.	3,4,5	Analyzing
CO-5	Summarize great literary works and to get substance from them to attract employment opportunites.	1,2	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credit
II	21ULTA21	சமயத்தமிழ்	90	3

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓		✓		✓	✓	✓
CO-2	✓	✓	✓			✓			✓	✓
CO-3	✓	✓	✓	✓	✓	✓			✓	
CO-4	✓	✓	✓					✓	✓	✓
CO-5	✓	✓				✓	✓			
	Number of matches (✓) = 31 Relationship = Medium									

SEMESTER – II

Course Title	**BASIC GRAMMAR AND TRANSLATION-II**
Total Hrs.	**90**
Hrs./Week	**6**
Sub. Code	**21ULAR21**
Course Type	**Part – I - Arabic**
Credits	**3**
Marks	**100**

General Objective: To make the students develop the intermediate Arabic Grammar and Translation skills.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the parts of speech of Arabic to comprehend text books in terms of the sentences given.
CO-2	Differentiate the conjugations of verbs in Arabic.
CO-3	Explain the various predicates in Arabic sentences.
CO-4	Illustrate the morphology in Arabic grammar.
CO-5	Analyze nominal sentences in Arabic.

Unit I: Arabic for Beginners

Lesson-14 Prepositions, The village (Page No. 76& 77)

Lesson-15 Verbal sentence – The past tense (Page No. 82 to 87)

Lesson-16 The Imperfect tense- The River Nile (Page No. 93 to 97)

Lesson-17 The Imperative and Negative command (Page No. 102 to 104)

Unit II: Al -Qirat –Al-Wazhiha Part –I

Lesson 15-21

Unit III: Arabic for Beginners

Lesson-20 The verbs of Incomplete predicate (Page No. 126 to 130)

Lesson-21 Inna and its categories, the banks (Page No. 136,137)

Lesson-22 the Numerals, Days and months (Page No. 144 to 148)

Lesson-24 اسم التفضيل (Page No. 151)

Unit IV: Al -Qirat –Al-Wazhiha Part –I

Lesson 22-28

Unit V: Al -Qirat –Al-Wazhiha Part –I

Lesson 29-35

Text and Reference books

1) Arabic for Beginners (selected topics only)

By Dr. Syed Ali (Former HOD of Arabic, The New College, Chennai.

(UBS Publishers & Distributors Ltd) 5, Ansari Road, New Delhi -110 002.

2) Al -Qirat –Al-Wazhiha Part –I, From Lesson 15 to 35 only.

by Waheed Az-zaman Al-Keeranavi.

Available at: Al-Manar Book Depot, Mannarpuram, Trichy-20.

Course Outcomes

CO	Upon completion of the course, the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Understand the intermediate Arabic grammar.	1,2,3	Understanding
CO-2	Apply the functions of verbs such as the past tense, the imperfect tense etc. in sentences.	1,2,4	Applying
CO-3	Produce sentences in Arabic with the grammar rules.	1,4,5	Applying
CO-4	Categorize the different particles in Arabic.	1,2,3	Analyzing
CO-5	Find errors in Arabic sentences with the rules of grammar and translate Arabic texts.	1,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
II	21ULAR 21	BASIC GRAMMAR AND TRANSLATION-II	90	3

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓		✓	✓		✓	
CO-3	✓	✓	✓			✓			✓	✓
CO-4	✓		✓	✓	✓	✓	✓	✓		
CO-5		✓			✓	✓			✓	✓
	Number of matches = 33 Relationship = Medium									

SEMESTER – II

Course Title	**COMMUNICATIVE ENGLISH - II**
Total Hrs.	**90**
Hrs./Week	**6**
Course Code	**21ULEN21**
Course Type	**Part – II - English**
Credits	**3**
Marks	**100**

General Objective:

To teach students the four skills viz. Listening, Speaking, Reading, and Writing and to impart language skills through basic grammatical categories.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the importance of real-life situations, as responding to complaints and to use language effectively.
CO-2	Generalize the nuances and methods of giving short speeches, proposing welcome address and vote of thanks and the like.
CO-3	Associate themselves with learning to give short presentations, formal presentations and writing e-mails.
CO-4	Apply their knowledge in writing sentences with grammatical order, writing brochure and understanding texts in context.
CO-5	Develop their knowledge and skills to use clauses and collocations appropriately in spoken and written contexts.

Unit – I

Listening and Speaking

a. Listening and Responding to Complaints (formal situation)

b. Listening to Problems and Offering Solutions (informal)

Reading and Writing

a. Reading Aloud (brief motivational anecdotes)

b. Writing a Paragraph on a Proverbial Expression / Motivational Idea

Word Power / Vocabulary

a. Synonyms and Antonyms

Grammar in Context

- Adverbs
- Prepositions

Unit – II

Listening and Speaking

a. Listening to Famous Speeches and Poems

b. Making Short Speeches – Formal:

Welcome Speech and Vote of Thanks.

Informal Occasions – Farewell Party, Graduation Speech

Reading and Writing

a. Writing Opinion Pieces (could be on travel, food, film / book reviews

or on any contemporary topic)

b. Reading Poetry

i. Reading Aloud: (Intonation and Voice Modulation)

ii. Identifying and using figures of speech-simile, metaphor, personification etc.

Word Power

a. Idioms and Phrases

Grammar in Context

Conjunctions and interjections

Unit – III

Listening and Speaking

a. Listening to Ted Talks

b. Making Short Presentations – Formal Presentation with PPT,

Analytical Presentation of Graphs and Reports of Multiple Kinds

c. Interactions during and after the Presentations

Reading and Writing

a. Writing Emails of Complaint

b. Reading Aloud Famous Speeches

Word Power

a. One word Substitution

Grammar in Context:

- Sentence Patterns

Unit – IV

Listening and Speaking

a. Participating in a Meeting: face to face and online

b. Listening with Courtesy and adding ideas and giving opinions

during the meeting and making concluding remarks

Reading and Writing

a. Reading Visual Texts - Advertisements

b. Writing a Brochure

Word Power

a. Denotation and Connotation

Grammar in Context:

- Sentence Types

Unit - V

Listening and Speaking

a. Informal Interview for Feature Writing

b. Listening and Responding to Questions at a Formal Interview

Reading and Writing

a. Writing Letters of Application

b. Reader's Theatre (Script Reading)

c. Dramatizing Everyday Situations / Social issues through Skits. (writing scripts and performing)

Word Power

a. Collocation

Grammar in Context:

- Working with Clause

Textbook:
COMMUNICATIVE ENGLISH-II. Tamil Nadu State Council for Higher Education (TANSCHE).2020.

References:

1. RadhakrishnaPillai.G,ed.Written English for You.Chennai: Emerald Publishers,1990 (rpt2008).
2. Nihamathullah.A.et al. A Course in Spoken English, Tirunelveli: MSU,2005. (rpt 2010).

Course Outcomes

CO No.	Upon completion of this course, students will be able to:	PLO Addressed	Cognitive Level
CO-1	Distinguish the various real life situations to use language accordingly.	1,2	Understanding
CO-2	Experiment giving short speeches, welcome address, vote of thanks in programmes and functions organised.	1,2,3	Applying
CO-3	Write e-mails and give short presentations, formal presentations using the English language.	1,2,3,4	Applying
CO-4	Order sentences with its basic units and to prepare brochures etc.	1,2,3,4	Analyzing
CO-5	Find errors in the correct use of collocations and clauses in everyday spoken and written communication.	1,2,3,4,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
II	21ULEN21	COMMUNICATIVE ENGLISH - II	90	3

Course Outcomes (COS)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓				✓	✓			
CO-2	✓	✓	✓			✓	✓	✓		
CO-3	✓	✓	✓	✓		✓		✓	✓	
CO-4	✓	✓	✓	✓		✓		✓	✓	
CO-5	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Number of matches (✓) = …36…. Relationship = High									

SEMESTER – II

Course Title	OBJECT ORIENTED PROGRAMMING WITH C++
Total Hrs.	60
Hrs./Week	4
Course Code	21UCIT21
Course Type	DSC-III
Credits	4
Marks	100

General Objective:

To enhance problem solving and programming skills in C++ by implementing the object oriented concepts.

Course Objectives:

CO	The learners will be able to:
CO-1	To understand design/implementation of OOPS concepts such as Class,objects and functions in C++
CO-2	Develop a greater understanding of function, constructor and destructor
CO-3	Create and implement generic classes, polymorphism concepts
CO-4	Learn to handle errors and to implement inheritance concepts
CO-5	Manipulate files and handle errors while accessing files

UNIT-I

Basic Concept of OOPS: Basic concept of oops-Introduction- c structures revisited - specifying a class- defining member functions - Nesting of member functions - Private member functions - Array within a class - Memory allocation for objects - Array of objects - Object as function arguments - returning objects

UNIT-II

Functions: Introduction-The Main function-Function prototyping-Static member functions- Friendly functions -Inline Function- Static data members - Function overloading. **Constructor:** Introduction-Parameterized Constructor-Constructor with default arguments-Copy constructor-Dynamic Constructor-**Destructors**.

UNIT-III

Operator Overloading: Introduction-Defining Operator Overloading-Overloading unary operators-Overloading binary Operators-Rules for Overloading Operators. **Templates:** Introduction-Class Templates-Class Templates with Multiple parameters-Function Templates-Function template with Multiple parameters-Member function template.

UNIT-IV

Exception Handling: Introduction-Basic of Exception Handling-Exception Handling mechanism-Throwing Mechanism-Catching Mechanism. **Inheritance:** Introduction-Defining

derived classes-Single Inheritance-Multilevel Inheritance-Multiple Inheritance-Hierarchical Inheritance-Hybrid Inheritance.

UNIT-V

Working with Files: Introduction-Classes for File stream Operations- Opening and Closing File-Detecting end-of-file-Updating a file: Random Access-Error handling during File Operations-Command line arguments-**New Features of ANSI C++.**

Textbooks:

E Balagurusamy -**"**ObjectOriented Programming with C++" , McGraw Hill Publications, 5h Edition, 2011

Reference books:

Robert Lafore - "Object Oriented programming in C++", Pearson Publications, 4th Edition, 2008

Course Outcomes

Co No	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO- 1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.	1,3	**Understanding**
CO- 2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc	1,3	**Understanding**
CO- 3	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.	1,3	**Understanding**
CO- 4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.	1,3	**Understanding**
CO- 5	Demonstrate the use of accessing files	1,3	**Applying**

Relationship Matrix

Semester	Code		Title of the course			Hours		Credits		
II	21UCIT21		Object Oriented Programming with C++			60		4		
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓	✓	✓			✓
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓			
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
	Number of matches (✓) = 37 Relationship = Medium									

SEMESTER – II

Course Title	**DIGITAL PRINCIPLES AND SYSTEM ARCHITECTURE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT22**
Course Type	**DSC-IV**
Credits	**4**
Marks	**100**

General Objective:

1. Understand the concepts of digital and internal structures of the computer systems like memory, registers, and counters.
2. Understand the concepts of basic Design principles of digital computer

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concepts of Digital Principles
CO-2	Understand and logic designs and mapping functions.
CO-3	Analyze the internal structure of the computer
CO-4	Understand the memory concepts
CO-5	Understand the storage structures

UNIT – I

Digital Logic: The Basic Gates – Universal Logic Gates – AND OR Invert Gates - **Combinational Logic Circuits:** Boolean Laws and Theorems - Sum of Products Method - Truth Table to Kamaugh Map - Product of sums Method - **Data Processing Circuits :** Multiplexers - Demultiplexers – Encoders - **Number Systems and Codes :** Binary Number System - The ASCII Code -The Excess 3 Code - The Gray Code

UNIT- II

Arithmetic Circuits : Binary Addition - Binary Subtraction - 2's Complement Representation - The Adder subtracter - **Flip Flops :** RS Flip Flops - Gated Flip Flops – Edge triggered D Flip Flops – Edge triggered JK Flip Flops - JK Master slave Flip Flops.

UNIT – III

Registers : Types of Registers - Serial In serial Out - Parallel In parallel Out - Universal Shift Register - Applications of Shift Registers - **Counters :** Asynchronous Counters - Synchronous Counters.

UNIT – IV

Central Processing Unit : Introduction - General Register Organization - Stack Organization - Instruction Formats - Addressing Modes - Program Control - Reduced Instruction Set Computer (RISC) - **Input Output Organization :** Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt - Serial Communication.

UNIT – V

Memory Organization: Memory Hierarchy - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory - Virtual Memory.

Textbooks:

1. Donald P Leach, Albert Paul Malvino, Goutam Saha,"Digital Principles and Applications", Seventh Edition, 2011, Tata McGraw Hill Education Private limited.
2. M. Morris Mano “Computer System Architecture” , Third Edition, 1992, Prientice Hall of India Pvt Ltd.

Reference Books:

1. M. Morris Mano, Michael D. Ciletti , "Digital Design: with an introduction to the verilog HDL ", 2011, Fifth Edition, Pearson Publication.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the basic concepts of digital principles	1,3	Remembering
CO-2	Understand the concepts of Boolean algebra and logic circuits.	1,3,5	Understanding
CO-3	Understand the concepts of registers and counters	1,3,5	Understanding
CO-4	Understand the concepts of addressing modes	1,3,5	Understanding
CO-5	Understand the concepts of memory management	1,3,5	Creating

Relationship Matrix

Semester	Code	Title of the course	Hours	Credits
II	21UCIT22	Digital Principles and System Architecture	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		✓
CO-3	✓	✓	✓	✓		✓		✓		✓
CO-4	✓	✓	✓	✓		✓		✓		✓
CO-5	✓	✓	✓	✓		✓		✓		✓
	Number of matches (✓) = 34 Relationship = High									

SEMESTER – II

Course Title	**OBJECT ORIENTED PROGRAMMINGWITH C++ PRACTICALS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UCIT2P1**
Course Type	**PRACTICAL-II**
Credits	**1**
Marks	**100/2**

General Objective:

This course involves a lab component which is designed to give the student hands-on experience in C++ programming language by implementing the object oriented concepts.

Course Objectives:

CO	The learners will be able to:
CO-1	Learn the syntax and semantics of the C++ programming language.
CO-2	Design C++ classes for code reuse and implement copy constructors and class member functions.
CO-3	Learn the containment, inheritance and virtual functions implement dynamic binding with polymorphism promote code reuse in C++.
CO-4	Use exception handling and file concepts in C++ programs
CO-5	Learn how to manipulate text files

1. Program to demonstrate all manipulators in C++.
2. Swap 2 Values
3. Evaluate an expression using macros (Macrosinic& inline function C++)
4. Compare any 2 elementary data types in C++ using function overloading.
5. Find m power n values using default arguments.
6. Program to perform simple banking operation.
7. Write a program using operator overloading .
8. Programs using multiple inheritance, hybrid inheritance, hierarchical inheritance, multilevel inheritance.
9. Program using polymorphism and virtual functions.
10. Create and copy a text file to another.

Course Outcomes

Co No	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO- 1	Identify solutions for a range of problems using objects and classes.	1,2	Remember
CO- 2	Programs to demonstrate the implementation of constructors, destructors and operator overloading.	1,2,5	Understand
CO- 3	Solve the real time problems using C++ concepts	1,2	Apply
CO- 4	Apply fundamental algorithmic problems including type casting, inheritance, and polymorphism.	1,2	Apply
CO- 5	Explain the generic programming, templates and file handling.	1,2,5	Apply

Relationship Matrix

Semester	Code			Title of the course				Hours	Credits
II	21UCIT2P1			Object Oriented Programming with C++ Practicals				30	1
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓	✓	✓			✓
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓			
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
	Number of matches (✓) = 37 Relationship = High									

SEMESTER – II

Course Title	**WEB DESIGNING TOOLS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UAIT21**
Course Type	**Allied I/2**
Credits	**3**
Marks	**100**

General Objective:

The purpose of this course is to develop flexible, attractive and user friendly Websites.HTML describes the structure of Website where as CSS is used for presenting the web page interactively..

Course Objectives:

CO	The learners will be able to:
CO-1	Describe the function of HTML and semantic web tags to develop a web page.
CO-2	Acquire knowledge about Cascading Style Sheets (CSS) in Web communications, linking a HTML document and importing an image
CO-3	know about font attribute, page formatting attributes to enhance the appearance of web page
CO-4	Familiar with the concepts of Menu, Tables and layouts in HTML
CO-5	Develop web forms and import multimedia contents to create an interactive web pages

UNIT I

Introducing HTML: The History of HTML-Exploring an HTML Document-The Document Type Declaration-Introducing Element Tags-The Element Hierarchy-**Introducing Element** Attributes-Creating an HTML File-Creating the Document Head-**Writing the Page Body:** Using Sectioning Elements-Using Grouping Elements-Using Text-Level Elements-Linking an HTML Document to a Style Sheet-Working with Inline Images

UNIT II

Working with Lists-**Working with Hypertext Links:**Turning an Inline Image into a Link-Linking to a Location within a Document-Linking to a Web Resource-Linking to an E-Mail Address-Working with Hypertext Attributes

Introducing CSS: Types of Style Sheets- Creating a Style Sheet-Writing Style Comments-Working with Color in CSS

UNIT III

Working with Fonts-Controlling Spacing and Indentation-Working with Font Styles-Working with Margins and Padding-Using Pseudo-Classes and Pseudo-Elements: Pseudo Classes-Pseudo-classes for Hypertext-Pseudo Elements-Introducing the display Style- Exploring Page Layout Designs-Working with Width and Height-Floating Page Content

UNIT IV

Introducing Grid Layouts-Creating Figure Boxes-Exploring Background Styles-Working with Borders-Creating Drop Shadows-Creating Semi-Transparent Objects-Exploring CSS Filters-Working with Image Maps-Creating a Pulldown Menu with CSS-Creating a Navicon Menu-Introducing Web Tables:Table Headings and Table Data-Adding Table Borders with CSS-Spanning Rows and Columns-Creating a Table Caption-Creating Row Groups-Creating Column Groups

UNIT V

Introducing Web Forms: Parts of a Web Form-Starting a Web Form-Creating a Field Set-Creating Input Boxes-Adding Field Labels-Designing a Form Layout-date time control-Selection list-option button-check boxes-text area-Creating a Spinner Control-Creating a Range Slider-Working with form buttons-Working with the audio Element-Using HTML 5 video element-Introducing Transitions

Textbook:

Patrick Carey -New-Perspectives-HTML5-and-CSS3- Cengage Learning - 7th-Edition,2017

Reference book:

Julie C.Meloni ,Sams Teach Yourself HTML,CSS and JavaScript All in One -Pearson Education,2012

Course Outcomes:

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Define the function of Hypertext Markup Language (HTML) in Web Development.	1,3	Remembering
CO-2	Describe how to organize the web pages and Write CSS effectively to create well organized, styled web pages.	1,3	Understanding
CO-3	Apply various attributes of font, border, page layout to enhance the richness of web page	1,3	Applying
CO-4	Illustrate the advance feature of CSS like CSS grid layout, Menus, Image mapping, tables.	1,3	Applying
CO-5	Build a portfolio websites and add multimedia contents to web page.	1,3	Applying

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
II	21UAIT21			WEB DESIGNING TOOLS		60			3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		
CO-3	✓	✓	✓	✓		✓		✓		
CO-4	✓	✓	✓	✓		✓		✓		
CO-5	✓	✓	✓	✓		✓		✓		
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – II

Course Title	**WEB DESIGNING TOOLS PRACTICALS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UAIT2P1**
Course Type	**Allied I/2P**
Credits	**1**
Marks	**100/2**

General Objective:

Differentiate how various web mark-ups and languages work together to create graphic and interactive web page elements.

Course Objectives:

CO	The learners will be able to:
CO-1	To acquire knowledge about HTML and Cascading Style Sheets (CSS) tags to create web page
CO-2	Create web page using cascading stylesheets (CSS) properties
CO-3	Understand the concepts of semantic web tags and menus
CO-4	Implementing advance feature of CSS tables, filters and image mapping
CO-5	Focus on building a beautiful, semantic, HTML & CSS web page

1. Design a simple web page using HTML.
2. Design a web page in HTML using list.
3. Design a web page using CSS Background and Text Properties
4. Design a web page using CSS font Properties
5. Design a web page using CSS border and align properties
6. Design a web page using page layout properties
7. Design a web page using CSS semantic tags
8. Design a web page using CSS pull down menu.
9. Create a webpage that prints your name to the screen, print your name in Tahoma font, print a definition list with 5 items, Create links to five different pages
10. Create a webpage using tables
11. Create a web page using CSS Filter
12. Create a Webpage using Image map
13. Create a tribute Webpage

14. Create a web page to import audio file
15. Create a web page to import video file

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Demonstrate how to create simple web page and list	1,3	Applying
CO-2	Apply CSS font,text,background and page layout properties in web page	1,3	Applying
CO-3	Use semantic tags and menus to create responsive web page	1,3	Applying
CO-4	Construct a web page using tables, filters, Image mapping concepts	1,3	Applying
CO-5	Sketch an innovative web page using various tags and Style sheet properties and import multimedia contents	1,3	Applying

Relationship Matrix

Semester	Code			Title of the course			Hours	Credits		
II	21UAIT2P1			WEB DESIGNING TOOLS PRACTICALS			30	1		
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		
CO-3	✓	✓	✓	✓		✓		✓		
CO-4	✓	✓	✓	✓		✓		✓		
CO-5	✓	✓	✓	✓		✓		✓		
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – II

Course Title	**ENVIRONMENTAL SCIENCE**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UEVS21**
Course Type	**AECC-II**
Credits	**2**
Marks	**100**

UNIT - I: Nature of Environmental Studies

Goals, Objectives and guiding principles of environmental studies. Towards sustainable development - Environmental segments– Atmosphere, Hydrosphere, Lithosphere, Biosphere – definition. Pollution episodes -– Hiroshima – Nagasaki, - Bhopal gas Tragedy, Fukushima. Stone leprosy in Taj Mahal, Minamata disease.

UNIT - II: Natural Resources

Renewable and Non-Renewable resources - classification.

- Forest resources: Use and over - exploitation, Afforestation and deforestation.
- Water resources: Use and over - utilization and conservation of surface and ground water – Rain harvesting.
- Marine Resources: Fisheries and Coral reefs.
- Mineral resources: Use and exploitation - environmental impacts of extracting and using mineral resources.
- Food resources: Effects of modern agriculture fertilizers - pesticide problem.
- Energy resources: Growing energy needs - use of alternate energy source - Solar cells & wind mills.
- Land resources: Land degradation

UNIT - III: Ecosystem

- Concept of Eco-systems - Tropic level, food chains, food web and Ecological pyramids, Living conditions on other planets (Brief account). Types, structure & Functions, prevention and control of pollution of the following:

a) Aquatic ecosystem

b) Terrestrial ecosystem – Grassland, Forest and Desert ecosystem

UNIT - IV: Biodiversity & Its Conservation

Introduction - Definition: ecosystem diversity, species diversity and Genetic diversity. Hot spots of biodiversity - Western Ghats, Eastern Himalayas and Gulf of Mannar. Threats to biodiversity - Habitat Loss, Poaching of wildlife and Man - wildlife conflicts. Nature reserves. Conservation of biodiversity: In-situ and Ex-situ, Environmental movements – Green peace and Chipco movement. Biodiversity law.

UNIT - V: Environmental protection, Policies and practices

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Prevention, Control of Pollution and Environmental Laws:

- Water, Air and Noise (prevention & Control of Pollution) Act.
- Environmental Protection Act.
- Wildlife production Act, Forest Conservation Act, International agreements, Monstreal and Kyoto protocols and conservation on biological Diversity. The Chemical Weapons Convention (CWC)
- Role of Central & State Pollution Control Boards.

Field work : 5 marks

Visit to an area to document environmental assets: river/ forest / fauna.

or

Visit to a local polluted site-urban/rural/Industrial / Agricultural

or

Study of common plants, insects, birds and basic principles of identification

Reference books:

1. Basic of Environmental Science. Vijayalakhmi, Murugesan and Sukumaran – Manonmaniam Sundaranar University publications.
2. Environmental Studies. John de Brito, Victor, Narayanan and Patric Raja - published by St. Xavier's College, Palayamkottai, 2008.
3. Environmental Science and Biotechnology. A.G. Murugesan and C. Raja Kumar - MJP Publishers.
4. Fundamental of Environmental pollution - Krishnan Kannan - Chand & Company Ltd., New Delhi, 1997.
5. Environmental Studies. S. Muthiah, Ramalakshmi publications, Tirunelveli.
6. EnRole of central and state pollution control boards. Environmental Studies. V.M. Selvaraj, Bavani Publications, Tirunelveli.

SEMESTER – III

Course Title	**PROGRAMMING IN JAVA**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT31**
Course Type	**DSC-V**
Credits	**4**
Marks	**100**

General Objective:

The course aims to Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms and also the Concepts of inheritance, packages, interfaces and multithreading are introduced.

Course Objectives:

CO	The learners will be able to:
CO-1	Learn the basic syntax and semantics of the Java programming language.
CO-2	Gain knowledge to write Java programs and use concepts such as variables, conditional and iterative execution methods, and managing classes, objects, invoking methods etc.
CO-3	Understand the fundamentals of object-oriented programming in Java, including Constructor, destructor, Inheritance and Interface mechanisms.
CO-4	Learn to handle errors, invoking thread concepts and API packages
CO-5	To learn perform graphics and animation using Applet Interface

UNIT I

Overview of Java Language: Basic concept of Object oriented programming-Introduction to java- Simple java program- java program structure-Java Development Kit-Java Virtual Machine-Command line arguments. **Constant, variables, Data types:** Constants-Symbolic constant-Data types-Variables-Declaration of variables-Scope of variables. **Operators & Expression:** Operators-Precedence of Operators-Expression-Evaluation of Expression

UNIT II

Decision Making & Branching: Introduction-Decision making with IF Statement- Simple IF Statement-IF…ELSE Statement-Nesting of IF….ELSE Statement-ELSE If LADDER-Switch Statement-?: Operator. **Decision Making & Loops:** While Statement-Do Statements-For Statements-Jumps in Loops. **Classes, Objects and Methods:** Introduction-Defining a class-Creating Objects - Method Declaration-Accessing Class Members.

UNIT III

Constructor: Introduction-Default Constructor-Parameterized Constructor. **Inheritance:** Introduction-Extending a Class-overriding methods. **Array, String & Vectors:** Introduction-One dimensional arrays-creating an array-Two dimensional array-String-vectors-Wrapper classes-Enumerated types. **Interface:** Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface variables.

UNIT IV

Packages: Introduction-Java API Packages-Creating Packages-Accessing a Packages-Using a Packages-Adding a Class to a packages. **Multithreaded Programming:** Introduction-Creating Threads-Extending the Thread class-Life cycle of a thread-Using Thread Methods-Thread Exception-Thread Priority. **Managing Errors & Exception:** Introduction-Types of Errors-Exception-Multiple catch statements-Using Finally Statements-Throwing Our Own Exceptions-Using Exception for Debugging.

UNIT V

Applet Programming: Introduction-Applet Life cycle-Creating an executable Applet-Designing web page-Applet tag-Adding Applet to HTML Files-Running the Applet. **Graphics Programming:** Introduction- The Graphics class-Lines, Rectangles, Circles, Ellipse, arcs, polygons-Line graphs- Drawing Bar chats-Introducing to AWT Package and Swing. **Managing I/O Files:** Introduction-Concept of Stream-Types of Stream classes-Other useful I/O classes-Creation of files- Reading/ Writing Characters and bytes-Random Access Files.

TextBook

E Balaguruswamy - **"**Programming with Java a primer", Mc.Graw Hill Publications ,4th Edition,2010

Reference Books

C Muthu - "Programming with Java" , 2nd Edition, McGraw Hill Buplications, 2008

Course Outcome:

Co No	Upon Completion of this course, students will be able to	PSO Addressed	Cognitive level
CO- 1	Explain the behaviour of program structure involving the following fundamental programming constructs: assignment, I/O (including file I/O), selection, iteration, methods	1,2,4	Understand
CO- 2	Describe the concepts of looping, control statement and basic of OOPs concepts	1,2,4	Understand
CO- 3	Classify how to allocate and release the resource occupied by objects and also learn about Inheritance, Interface	1,2,4	Understand
CO- 4	Illustrate how to implement Package, Multithread and error handling concepts	1,2,4	Applying
CO- 5	Demonstrate applet and graphics programming to perform animation in java	1,2,4	Applying

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
III	21UCIT31			Programming in JAVA		60			4	
Course Outcomes (COs)	Programme Learning Outcome (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – III

Course Title	**DATA STRUCTURE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT32**
Course Type	**DSC-VI**
Credits	**4**
Marks	**100**

General Objective:

This course is aimed at offering fundamental concepts of data structures and explains how to implement them

Course Objectives:

CO	The learners will be able to:
CO-1	To understand the basic concepts of data structures and algorithms
CO-2	Familiar about the concepts of stacks, queues, lists, trees and graphs
CO-3	To acquire knowledge about non linear data structure like trees and graph
CO-4	Learn to create algorithm to maintain a sorted data and manage a large amount of data efficiently using the concepts b-tree, heap, networks..etc
CO-5	To impart familiarity with various sorting, searching and hashing techniques and their performance comparison.

UNIT I

Introduction : Basic Concepts - Pseudo code - The Abstract Data Type - Model for an Abstract Data Type - ADT Implementations - Algorithm Efficiency - Recursion - Designing Recursive Algorithms

UNIT II

Linear Lists: Stacks - Basic Stack Operations - Stack Linked List - Stack Applications - Queues - Queue Operations - Queue Linked List Design - Queue Applications General Linear Lists - Basic Operations – Implementation – Application - Complex Implementations.

UNIT III

Non-Linear Lists: Introduction to Trees - Basic Tree Concepts - Binary Trees – General Trees - Binary Search Trees - Basic Concepts - BST Operations – BST Applications - AVL Search Trees - AVL Tree Basic Concepts - AVL Tree Implementations - Applications.

UNIT IV

Heaps: Basic Concepts - Heap Implementation - Heap Applications - Multiway Trees - M-way Search Trees - B-trees -Simplified B-tree - B-tree Variations - Lexical Search Tree - Graphs- Basic Concepts – Operations – Networks.

UNIT V

Sorting and Searching: Sorting - Sort Concepts: Selection Sorts - Insertion Sorts - Exchange Sorts - External Sorts – Searching - List Searches - Search Implementations - Hashed List Searches - Collision Resolution

Textbook

Richard F. Gilberg and Behrouz A Forouzan. - "Data Structures A Pseudocode Approach with C" ,Thomson Learning, Inc. , 2nd Edition, 2005

Reference Books

1. Y. Langsam, M. Augenstein And A. M. Tenenbaum , "Data Structures Using C And C++" , Prentice - Hall Of India Pvt. Ltd., 2nd Edition, 2006,
2. YashavanthKanetkar , "Data Structures Through C" , BPB Publications..2nd Edition, 2003,

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Describe the basic data structure concepts and also evaluating the efficiency of an algorithm	1,2,3	Understanding
CO-2	Summarize the concepts of Arrays, stacks, queues to maintain a linear data structure	1,2,3	Understanding
CO-3	Ability to apply the ADT concepts insert , delete, list, traverse in real time data	1,2,3	Applying
CO-4	Apply the b-tree, heap and networking concepts to maintain and manage the data in a linear way	1,2,3	Applying
CO-5	Compare various Sorting and searching concepts in data	1,2,3	Analyzing

Relationship Matrix

Semester	Code			Title of the course				Hours		Credits
III	21UCIT32			DATA STRUCTURES				60		4
Course Outcomes (COs)	Programme Learning Out Come (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – III

Course Title	OPERATING SYSTEM
Total Hrs.	60
Hrs./Week	4
Course Code	21UCIT33
Course Type	DSC-VII
Credits	4
Marks	100

General Objective:

This course covers the process scheduling policies, memory management, paging, deadlocks, system calls. The course extends to know about UNIX commands, the concepts of system management and use of system editor.

Course Objectives:

CO	The learners will be able to:
CO-1	Gain the knowledge about system structures and process management.
CO-2	Know about the semaphores and deadlocks
CO-3	Manage the primary and secondary memories
CO-4	Identify the functionalities of external memories
CO-5	Build a powerful programming paradigm through commands

UNIT I

Introduction: Operating-System Structure - Operating-System Operations - Process Management - Memory Management - Storage Management - Protection and Security - **System Structures :** Operating-System Services - System Calls - Types of System Calls - **Process Management:** Process Concept- Process Scheduling- Operations on Processes – Inter process Communication.

UNIT II

Process Synchronization - The Critical section problem- Semaphores - Usage – Implementation - Monitors - Usage – Deadlocks – System model – Deadlock Characteristics – Methods and Handling Deadlocks - **CPU Scheduling:** Scheduling Criteria – Scheduling Algorithms – Multi – Processor Scheduling – Real – Time CPU Scheduling

UNIT III

Main Memory - Swapping- Contiguous Memory allocation- Segmentation - Paging- Structure of the Page Table - **Virtual Memory:** Demand Paging - Page Replacement- Allocation of Frames- Thrashing.

UNIT IV

Mass Storage Structure: Overview of Mass – Storage Structure – Magnetic Disks – Magnetic Tapes – Disk Scheduling – RAID Structure: RAID levels – **I/O Systems:** I/O Hardware – Poling – Interrupts.

UNIT V

General purpose Utilities: cal – date – echo – passwd - bc – who – tty – stty - **The File System:** pwd – cd – mkdir – rmdir – ls - **Handling ordinary files:** cat – cp – rm – mv – more – file - wc – od – cmp

– comm - diff. **Basic file attributes**: ls l – d - file ownership - file permission - chmod –directory permission - changing file ownership.

Textbooks:

Silberschatz, Galvin, Gagne, **"**Operating System Concepts", John Wiley & Sons Inc Publications, 9th Edition, 2012.

Sumitabha Das, "Unix Concepts And Applications", Tata McGraw Hill Publications, 4th Edition, 2006.

Reference Books:

1. Andrew S. Tanenbaum, Modern Operating Systems, Pearson Prentice Hall Publication, 3rd Edition, 2009.
2. William Stallings, Operating Systems Internals and Design Principles, Pearson Prentice Hall Publication, 7th Edition, 2012.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Describe the important of computer system resources and the role of operating system in their management policies and algorithms.	1,2	Remembering
CO-2	Understand the process management policies and scheduling of processes by CPU.	1,2,5	Understanding
CO-3	Establish the requirement for process synchronization and coordination handled by operating system.	1,5	Applying
CO-4	Explain the use and sketch the storage technologies.	1,5	Analyzing
CO-5	Justify the architecture and features of operating system through commands in UNIX.	1, 2,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course				Hours		Credits
III	21UCIT33			OPERATING SYSTEM				60		4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓		✓	✓		✓		✓		
CO-2	✓	✓			✓	✓	✓	✓		✓
CO-3	✓	✓	✓			✓	✓	✓	✓	
CO-4	✓	✓	✓		✓	✓		✓		✓
CO-5	✓	✓	✓	✓		✓	✓	✓	✓	✓
	Number of matches (✓) = 35 Relationship= high									

SEMESTER – III

Course Title	**PROGRAMMING IN JAVA PRACTICALS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT3P1**
Course Type	**PRACTICAL-III**
Credits	**2**
Marks	**100/2**

General Objective:

This course introduces computer programming using the JAVA programming language with object-oriented programming principles. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, graphics concepts, applet programming concepts etc.,

Course Objectives:

CO	The learners will be able to:
CO-1	Learn to solve the problems using Java programming language.
CO-2	Gain knowledge to implement in built function
CO-3	Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms.
CO-4	To learn the OOPs Concepts like inheritance, packages, interfaces, threads.
CO-5	Learn to implement graphics and applet programming concepts

1. Program to find the sum of digits of a given number
2. Program to create String object and working with String function
3. Program to read N numbers in array and Find the largest and Smallest Numbers
4. Program using class and objects
5.Program to find area of rectangle, circle and squarer using method overloading
6.program using Multi_Level inheritance
7.Program to show how a class implements two interfaces.
8.Program to catch more than one exceptions.
9.Program to create user_defined exception.
10.Program using threads.
11.Program using Packages.
12.Program to copy a text file into another text file
13.Create an applet to draw different shapes.
14.Create an applet to move an object.
15. Create an applet to calculate simple interest

Course Outcomes

Co No	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive level
Co- 1	Implementing basic programming concepts to solve problems	1,2,4	Understanding
Co- 2	Develop Java Application using OOPs concepts	1,2,4	Apply
Co- 3	Demonstrate how to handle errors occur at runtime	1,2,4	Apply
Co- 4	Using interface and packages concepts, create a simple java application	1,2,4	Apply
Co- 5	Apply graphics packages and methods to create animation	1,2,4	Evaluating

Relationship Matrix

Semester	Code	Title of the course	Hours	Credits
III	21UCIT3P1	Programming in JAVA Practicals	60	2

Course Outcomes (COs)	Programme Learning OutcomeS (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = Medium									

SEMESTER – III

Course Title	**DATA STRUCTURE PRACTICALS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT3P2**
Course Type	**Practical-IV**
Credits	**1**
Marks	**100/2**

General Objective:

To provide the knowledge of basic data structures and their implementations, and understand importance of data structures in context of writing efficient programs

Course Objectives:

CO	The learners will be able to:
CO-1	To understand the basic concepts of data structures and algorithms to solve problems
CO-2	Classify the concepts of stacks, queues, lists to manage data
CO-3	Learn the potentiality of implementing linked list
CO-4	Learn about various sorting methodology to solve problems with the data structure
CO-5	To impart familiarity with binary search and binary tree to maintain a data in a orderly manner

1. Implementation of Recursive function
2. Implementation of Array
3. Implementation of Stack
4. Implementation of Queue
5. Implementation of List
6. Implementation of Single Linked list
7. Implementation of selection sort
8. Implementation of Insertion sort
9. Implementation of external sort (merge sort)
10. To search an element using binary search
11. Implementation of infix to postfix expression
12. Implementation of Binary tree

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	To understand the basic concepts of data structures and algorithms to solve problems	1,2,3	Understand
CO-2	Classify the concepts of stacks, queues, lists to manage data	1,2,3	Understand
CO-3	Demonstrating the capabilities of implementing linked list	1,2,3	Applying
CO-4	Apply the sorting concepts by analyzing various sorting techniques	1,2,3	Applying
CO-5	Construct the Code by implementing tree concepts to shows the hierarchical relationship between data	1,2,3	Applying

Relationship Matrix

Semester	Code		Title of the course					Hours	Credits
III	21UCIT3P2		DATA STRUCTURE PRACTICALS					30	1
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – III

Course Title	**DESKTOP PUBLISHING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UAIT31**
Course Type	**ALLIED-II/1**
Credits	**3**
Marks	**100**

General Objectives:

1. To understand the concepts of DESKTOP PUBLISHING tools Page maker, CorelDraw and Photoshop
2. Ability to create and develop different types of documents.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concepts of Desktop publishing tools
CO-2	Create the pagemaker documents and formatting
CO-3	Create the drawings and logos in coreldraw
CO-4	Create photo editing and filters in photoshop
CO-5	Develop enhanced and interactive photos

UNIT I

Introduction To DTP – Hardware Requirements Of DTP-Designing Common Media Publications. Getting Started With Pagemaker -The Page Maker Layout Window – BasicPagemaker Function: Open, New, Close, Print, Save And Save Us – Working With Text –Story Editor – Editing Text – Formatting A Text: Character Formatting, Paragraph Formatting - Style Sheets.

UNIT II

Master Pages-Working With Column-Working With Graphics And Objects-Wrapping Text Around A Graphic-Group And Ungroup –Managing And Printing A Publication- Book Creation – TOC Creation. The Coreldraw Layout Window- Corel Draw Function: Open, New, Close, Print, Save And Save Us-Views-Drawing And Selecting: Changing Shape, Combine, Weld, Group.

UNIT III

Working With Text: Artistic Text, Artistic Tool And Paragraph Text –Formatting Text-Text Editor-Working With Images: Bitmap And Vector Image – Page Layout And Page Background, Page Frame

UNIT IV

The Photoshop Layout Window- Photo Shop Function: Open, New, Close, Print, Save And Save Us-Working With Images And Colors-The Selection Tools-Editing Selection –Painting Tools –Drawing Tools –Editing Tools

UNIT V

Toning Tools-Eraser Tools-Layers – Creating A New Layer –Merging Layers –Linking Layers- Layer Effects-Transforming Layers-Type Tool And Type Settings- Filters

Text books:

"Comdex Desktop Publishing Cource Kit" by Vikas Gupta, 2006, Vikas Publications

Reference books:

1. "Mastering Page Maker6 For Windows 95" by Rebecca Bridges Altman & Rick Altman
2. "Corel Draw 8: The Official Guide" by Foster Coburn & Peter Mccormick
3. "Photoshop 4 Studio Skills" by Steven Moniz.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Familiar to create PageMaker documents	1,3,4	Recalling
CO-2	Understand the concepts of formatting, indexing, book creation	1,3,4	Understanding
CO-3	Familiar to create logo designing in corel draw	1,3,4	Creating
CO-4	Understand the photo editing tools	1,3,4	Applying
CO-5	Generate quality of pictures in Photoshop	1,3,4	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours			Credits
III	21UAIT31			DESKTOP PUBLISHING			60			3
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓	✓	
CO-2	✓	✓	✓	✓	✓	✓		✓	✓	
CO-3	✓	✓	✓	✓	✓	✓		✓	✓	
CO-4	✓	✓	✓	✓	✓	✓		✓	✓	
CO-5	✓	✓	✓	✓	✓	✓		✓	✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – III

Course Title	**DESKTOP PUBLISHING PRACTICALS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UAIT3P1**
Course Type	**ALLIED PRACTICAL-II/1P**
Credits	**2**
Marks	**100/2**

General Objective:

1. To create and design the document creation tools according to satisfy the needs of the industry level.
2. To develop Interactive photo creation to develop the quality of pictures.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concepts of Desktop publishing tools
CO-2	Create the page maker documents and formatting
CO-3	Create the drawings and logos in corel draw
CO-4	Create photo editing and filters in photoshop
CO-5	Develop enhanced and interactive photos

PAGE MAKER

1. Preparing simple document with formatting and type equations
2. Creating and Using new colors and styles (user defined)
3. Prepare document with column layout and Apply word wrap options.
4. Creating BOOK with TOC.
5. Creating index.

COREL DRAW

6. Document with print merging.
7. Designing a visiting card.
8. Draw water drop effect.
9. Design a Scenery (Natural, Sunset)
10. Design a Fish Tank with fishes using Artistic Tool.

PHOTO SHOP

11. Picture focus light effects
12. Retro Comic Book Effect

13. Realistic Water Reflection
14. Blend two picture together.
15. Designing lighting text effect

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Pagemaker document formatting	1,3,4	Creating
CO-2	Create Table of Contents and Index	1,3,4	Understanding, Analysing
CO-3	Designing effects in Corel draw	1,3,4	Understanding, Analysing
CO-4	Draw the images with drawing and artistic tools	1,3,4	Analysing
CO-5	Familiar in Photo editing	1,3,4	Analysing

Relationship Matrix

Semester	Code	Title of the course	Hours	Credits
III	21UAIT3P1	DESKTOP PUBLISHING PRACTICALS	30	1

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓	✓	
CO-2	✓	✓	✓	✓	✓	✓		✓	✓	
CO-3	✓	✓	✓	✓	✓	✓		✓	✓	
CO-4	✓	✓	✓	✓	✓	✓		✓	✓	
CO-5	✓	✓	✓	✓	✓	✓		✓	✓	
	Number of matches (✓) =40 Relationship = High									

SEMESTER – III

Course Title	**DIGITAL TECHNOLOGY AND SECURITY**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USDC31**
Course Type	**SEC-I**
Credits	**2**
Marks	**100**

General Objective:

To gain the knowledge of the basic principles and applications under pinning the digital technology and security.

Unit I: Digital India

Digital India: Agencies Enabling Digital India - Digital India Services - Electronic Payment and Receipt (EPR) - The Government policy statement on EPR states as follows - Overview of Payments and Receipts in Government Departments - Digital Locker - Benefits of Digital Locker - e-District Services - Digital AIIMS - India BPO Promotion Scheme (IBPS) - Geographical Information System (GIS) - Mobile Sewa App Store (m-Appstore) - GARV Grameen Vidyutikaran

Unit II: Digital Learning

SWAYAM- SWAYAM PRABHA- e-PG Pathshala - ShodhGangotri - E-Shodh Sindhu (eSS) – VIDWAN - NPTEL - NEAT AICTE – ELIS free course - DIKSHA – NROER – IBM – TATA STEEL – E-CBSC - HARVARD Online courses - E-GYANKOSH – VIDYA-MITRA – National Digital Library of India – Virtual Labs – e-Yantra – Talk to a Teacher Program – E-acharya – E-Kalpa - FOSEE (Free / Libre and Open Source Software in Education) –Spoken Tutorial – BAADAL

Unit III: Digital-Governance

Introduction - Concept of E-governance - Stages of E-governance - Models of E -governance - Significance of E-governance - Types of Interaction in e-Governance : G2G- G2C – G2B – G2E – Initiatives Taken for e-Governance in India : Bhoomi Project - KHAJANE - e-Seva - e-

Courts - e-District - MCA21- e-Office- E-Governance Initiatives in India: CSC 2.0 Scheme - National e-Governance Plan

Unit IV: Digital Services

PMJJBY: About Pradhan Mantri Jeevan Jyoti Bima Yojana - PMJJBY premium, benefits and claim amount - become a member of PMJJBY - Debit our Savings Bank account towards the payment of annual premium. PMSBY: About Pradhan Mantri Suraksha Bima Yojana - PMSBY premium, benefits and claim amount - become a member of PMSBY - Debit our Savings bank account towards the payment of annual premium

PAN Card: About PAN card - Structure and Validation of PAN card - Need for a PAN card and to know your PAN card - apply for PAN Card - Documents needed for proof of identity - Tracking the status of the application

UNIT V: Cyber Security

Introduction-Basics of ICT- Ethical & Social Issues in ICT -Digital Citizenship-Elements of Digital Citizenship- Need for Cyber Security - Cyber Crime: Introduction--Types of Cyber Crime-Security Issues: Threats-Attacks-Vulnerabilities.- Cyber Space-Security Services-Cyber Security: Definition, Key Concepts, Fundamentals, Cyber Challenges and Ethics.

Textbooks:

1) Digital Literacy – "Unit I to Unit III , PG and Research Department of Computer Science "
2) Cyber Crime & Cyber Security – "Unit IV and V , Dr. S. Shajun Nisha,PG and Research Department of Computer Science"

SEMESTER- III

Course Title	**SWAYAM-NPTEL Online Certification Course**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USOC32**
Course Type	**SEC-II**
Credits	**2**
Marks	**100**

SWAYAM NPTEL ONLINE CERTIFICATION COURSES

GUIDELINES AND INSTRUCTIONS

1. National Programme on Technology Enhanced Learning (NPTEL) provides e-learning through online web and video courses in Engineering, Science and Humanities streams through its portal https://swayam.gov.in/ncdetails/NPTEL.
2. Enrollment to all the courses is FREE.
3. Enrollment to courses and Examination Registration can be done ONLINE only. The link is available on NPTEL Website http://nptel.ac.in/
4. SWAYAM – NPTEL Online Certification Courses are made optional for the students in the UG Programmes from the Academic year 2021-2022.
5. Any Eight – Week, Two-Credit Course in any discipline be chosen by the respective Departments in the Third Semester of the Undergraduate Programmes.
6. The SWAYAM–NPTEL Online Certification Courses offered during the December – April Semester be chosen by the Departments. The courses may be handled by the Department Mentor or by any teacher in the respective Departments.

7. Candidates must have completed Examination Registration and submitted assignments successfully within the prescribed time to receive hall tickets and to write examinations.

8. The allocation of marks for the online examination conducted by the respective IITs is 25:75 for each course.

9. A candidate should obtain a minimum of 40 marks on 100 marks (a minimum of 10 marks for Assignment and 30 marks in the final examination) to pass the Online Courses.

10. If a student fails in the Online Examination conducted by the respective IITs he/she would be permitted to write a Supplementary Examination for 75 marks by the Controller of Examinations of our College.

11. Those who registered for the Online Courses, obtained Assignment marks, appeared for the Online Examination and failed in the courses alone are eligible to apply for the Supplementary Examinations conducted by the College.

12. If a candidate fails in the Supplemenary Examinations or does not appear for the Supplemenary Examinations conducted by the College, the norms followed for taking an Arrear Examination will be adopted.

13. Course Completion Certificate will not be issued by the respective IITs for the candidates who clear the Online Courses through the Supplementary Examinations conducted by the College. The two credits the candidate earns, if passed in the Supplemenary Examinations would be added in the Consolidated Statement of Marks issued by the Controller of Examinations.

SEMESTER – III

Course Title	**BOOTSTRAP**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USIT32**
Course Type	**SEC-II**
Credits	**2**
Marks	**100**

Objective

Overview: Bootstrap is a sleek, intuitive, and powerful, mobile first front-end framework for faster and easier web development. It uses HTML5, CSS and JavaScript.

Course Objectives:

CO.No	The learners will be able to:
CO -1	Built-in Support for layout, grids, fluid grids, and responsive designs.
CO - 2	Pre-built CSS: Contains global CSS classes for typography, tables, grids, forms, buttons, images, and more
CO - 3	Components: Contains lots of reusable components including Icons, Dropdowns, Navbars, Breadcrumbs, Popovers, Alerts, and many more.
CO - 4	JavaScript Plug-ins: Contains lots of custom jQuery plug-ins. You can include them all or one by one.
CO - 5	Customizable Components: We can customize Bootstrap's components with LESS variables and jQuery plug-ins to create our own version.

UNIT I

Bootstrap ─ Overview - Bootstrap ─ Environment Setup - Download - File Structure -Html Template - Grid System - Options Responsive - Column Resets - Offset Columns Nesting Columns- Column Ordering - **Css Overview** - Html5 Doc Type - Mobile First - Typography - Links Normalize Containers - Addresses - Block Quotes - Lists - Tables - Table Optional - Table Classes - Contextual Classes - Responsive Tables **- Bootstrap - Forms** Form Layout Supported Form Controls Static Control Form Control States Form Control Sizing Help Text Bootstrap **- Bootstrap - Buttons** - Button Size - Button State - Button Tags -

UNIT II

Bootstrap ─ Images - Helper Classes - Close Icon- Carets- Quick Floats - Center Content Blocks- Clear Fix - Showing And Hiding Content- Screen Reader Content- **Responsive Utilities** - Print Classes- **Bootstrap ─ Glyphicons**- Glyphicons - Find Glyphicons - Usage - **Dropdowns** - Options - Button Groups – Nesting & Vertical Button - Input Groups - Navigation Elements

UNIT III

Bootstrap ─ Navbar- Responsive Navbar- Forms - Buttons - Text - Non-Nav Link - Component Alignment- Fixed To Top - Fixed To Bottom - Breadcrumb – Pagination - Pager- Labels - Badges - Active Nav States - Jumbotron - Page Header- Thumbnails - Adding Custom Content - Alerts

UNIT IV

Bootstrap ─ Progress Bars - Default - Alternate - Striped - Animated - Stacked - Media Object ─ List Group - Adding Badges - Linking - Add Custom Content - Panels - Heading - Footer- Contextual Alternatives - Panel Tables - Panel List Groups - Wells- Sizing- **Plugins Overview** - Data Attributes - Programmatic Api - No Conflict - Events - **Transition Plugin** - Use Cases- Modal Plugin- Usage - Methods- Events - Dropdown Plugin

UNIT V

Bootstrap ─ Scrollspy Plugin -Tab Plugin- Usage - Fade Effect - Tooltip Plugin - Popover Plugin- Alert Plugin - Button Plugin- Loading State - Single Toggle - Checkbox- Radio- Usage - Options - Methods- Collapse Plugin - Carousel Plugin

Textbook :-

Bootstrap Reference Guide, V4, **e by jacboob let** – Bootstrap Creative - ISBN: 9781732205833, 9781732205833

Course Outcomes:

CO	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Demonstrate the basic file structure and responsive built in controls	1,2,5	Understanding
CO-2	outline Bootstrap utilities,bootstrap glypicons	1,2,5	Understanding
CO-3	Make use of navbar,nav link and alert to create responsive webpage	1,2,5	Applying
CO-4	Explain how to add plugins and panels in webpage	1,2,5	Analyzing
CO-5	Create their own plugins and use customize components	1,2,5	Applying

Relationship Matrix

Semester	Code			Title of the course			Hours			Credits
III	21USIT32			BOOTSTRAP			30			2
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓			✓	✓	✓			✓
CO-2	✓	✓			✓	✓	✓			✓
CO-3	✓	✓			✓	✓	✓			✓
CO-4	✓	✓			✓	✓	✓			✓
CO-5	✓	✓			✓	✓	✓			✓
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – III

Course Title	**PHOTO EDITING TOOLS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UNIT31**
Course Type	**NME-I**
Credits	**2**
Marks	**100**

General Objective:

- To create, edit and manipulate the graphics with creativity by using Adobe Photoshop and illustrator tools.

Course Objectives:

CO	The learners will be able to:
CO-1	Classify the parts and tools in Photoshop layout window.
CO-2	Employ the different kind of tools and layer options in Photoshop.
CO-3	Examine the ways to work with documents, objects and shapes in Illustrator.
CO-4	Categorize the different types of effects to objects and symbols in illustrator,
CO-5	Evaluate the applications of Pen and Pencil tools to produce animation effects in Illustrator,

UNIT I

The Photoshop Layout Window- Open, New, Close, Print, Save And Save As-Working With Images And Colors-The Selection Tools- Editing Selection –Painting Tools-Drawing Tool-Editing Tool.

UNIT II

Toning Tools-Eraser Tools- Layers- Creating A New Layer –Merging Layers –Linking Layers-Layer Effects-Transforming Layers –Type Tool And Setting-Filters.

UNIT III

Introduction to Adobe Illustrator -Working with documents-Creating basic shapes-Basic Geometric Shapes- Reshape and move a corner-Fill, stroke and color-Reshaping objects-Paths and selection-Create a logo.

UNIT IV

Combination and effects-Shapes-Grouping objects-Create alive paint group-Apply color to edges-cut objects and apply gradients-Creating blends-Create and edit symbols-Place a single Symbol-Place a set of Symbols-Create edit and replace a symbol-symbolism tools.

UNIT V

Pen and Pencil tools-Draw with pencil tools-Convert points-Add or remove points-Cut and join paths-Brushes-Create, Apply and edit brushes-Use the Blob brush-Create point types –Apply effects to point-Control text flow-Place type on a path-Create Area Type-Create outline Type-Flow type on a circle

Textbooks:

1. Comdex Desktop Publishing Course Kit ByVikas Gupta -2006 Edition
2. Learn Adobe Illustrator for graphic design and illustration Dena Wilson and Peter Lourekas with Rob Schwartz-2016 Edition

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Identify the most important features to manipulate an image in Photoshop.	1,3,4	Understanding
CO-2	Apply layer transformation and layer effects to create better image in Photoshop.	2,3,4	Applying
CO-3	Experiment the features of Adobe Illustrator to create shapes and logos.	3,4	Applying
CO-4	Explain the creation and manipulation of objects and symbols in Illustrator,	3,4	Analyzing
CO-5	Summarize the different ways to use points, brushes, area types in Illustrator,	3,4,5	Evaluating

Relationship Matrix

Semester	Course Code			Title of the Course				Hours		Credits
III	21UNIT31			PHOTO EDITING TOOLS				30		2
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓		✓	✓	
CO-2	✓	✓	✓		✓		✓	✓	✓	
CO-3	✓	✓	✓		✓			✓	✓	
CO-4	✓	✓	✓		✓			✓	✓	
CO-5	✓	✓	✓	✓	✓			✓	✓	✓
	Number of matches (✓) = 34 Relationship = High									

SEMESTER – IV

Course Title	**RDBMS WITH ORACLE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT41**
Course Type	**DSC-VIII**
Credits	**4**
Marks	**100**

General Objective:

Give a basic knowledge on the relational model of data and usage of Relational Algebra. Gain knowledge on the concepts of basic SQL as database language. To enhance the knowledge to advanced SQL topic like procedure, function, package, cursor..

Course Objectives:

CO	The learners will be able to:
CO-1	Enhance the knowledge and understanding of Database design.
CO-2	Familiar about the concepts of The Relational model and how it is supported by SQL and PL/SQL.
CO-3	Learn to implement Queries to define, manipulate and control the data in Oracle database
CO-4	Learn the advance feature of SQL like transaction data control and event tracking concepts
CO-5	Solve Database problems using Oracle 9i SQL and PL/SQL. This will include the use of Procedures, Functions,Packages, and Triggers.

UNIT I

Introduction : Purpose of Data base Systems – view of data – data models – data base models – data base languages – transaction management – storage management – data base administrator – data base users. Entity – relationship model; Basic concepts – design issues – mapping cardinalities – keys – ER Diagrams – Weak entity sets.

UNIT II

Relational Model:Structure of relational databases – relational Algebra – the tuple relational calculus – the domain relational calculus – extended relational Algebra operations – Modification of the database – views

UNIT III

Oracle Tables: DDL - Working with tables: Data Manipulation and Retrieval – Working with Tables: Function and Grouping - Multiple tables: join and set operators

UNIT IV

Subqueries: Nested Queries - Advanced Features: Objects, Transactions, and Data Control - PL/SQL: A Programming Language - Cursors and Exceptions

UNIT V

PL/SQL Composite Data Types: Records, Tables, and Varrays - PL/SQL Named Blocks: Procedure, Function, Package, and Trigger

Textbooks:

1. Alexis Leon and Mathews Leon **,"**Database Management systems" , Leon Vikas Publisher, 1st Edition, 2008,
2. Nilesh shah - "Database system using oracle A simplified guide to SQL and PL/SQL", , Prentice Hall India Publisher, 2nd Edition, 2004

Reference Books:

1. Abraham Silberschatz, Henry F.Korth, S.Sudarshan ,"Database System Concepts" , McGraw Hill Publications, 6th Edition, 2009,
2. Jose A. Ramalho, "Learn Oracle 8i" , BPB Publications, 2007

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Demonstrate the basic concepts and appreciate the applications of database models	1,2,3	Understanding
CO-2	Be familiar with the relational database theory, and be able to write relational algebra expressions for queries	1,2,3	Understanding
CO-3	Illustrate the Basics of SQL and construct queries using SQL	1,2,3	Applying
CO-4	Distinguish the concepts of Transaction control management and Event tracking mechanism like cursor	1,2,3	Analyzing
CO-5	Discriminate composite datatype and use advance features like procedure, function,triggers..etc	1,2,3	Analyzing

Relationship Matrix

Semester	Code			Title of the course				Hours	Credits
IV	21UCIT42			RDBMS with Oracle				60	4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – IV

Course Title	**PYTHON PROGRAMMING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT42**
Course Type	**DSC-IX**
Credits	**4**
Marks	**100**

General Objective:

This aim of this course is to develop a basic understanding of programming and the Python programming language.Demonstrate the principles of object-oriented programming and the interplay of algorithms and data structures in well-written modular code

Course Objectives:

CO	The learners will be able to:
CO-1	To introduce the fundamentals of PYTHON programming language.
CO-2	Gain knowledge to implement user defined and in built function
CO-3	To impart the knowledge of Lists, Tuples, Files and Directories.
CO-4	Familiar with the concepts of Files,Modules
CO-5	Learn to implement exception handling and packages in PYTHON

UNIT I

Need for Logical Analysis and Thinking – Algorithm – Pseucode – Flowchart – Tower of Hanoi Problem - About Python – Features of Python – Python Setup – Fundamentals of Python – Values and Datatype – Variables – Keywords - Identifiers – Comments – Quotations – Indentation in Python – Multiline Statements.

UNIT II

Input /Output and Import Functions – Expressions – Statements – Operators – Mathematical Functions – Random Number Functions – Trignometric Functions – Advantages of Python – Disadvantages of Python - Conditional for decision making – Iterations/ Loops – Nested Loops - Control Statements – Looping Techniques.

UNIT III

Defining a Function – Function Call – Types of Functions – Python Function Arguments – Composition – Python Recursion – Python Anonymous/Lambda Function – Function with more than one return value – Initializing the String variable – Accessing String variable – Slicing Strings – String Concatenation – Repeating a String – Escape Sequences – Format method – String Functions and Methods - String Module

UNIT IV

List – Tuples – Mappings – Dictionary - Mutable and Immutable Objects – Data Type Conversion or Coercion – List Comprehension - Opening a File – Writing to a File – Reading

data from a file – Closing a file – Appending Data to a File – Renaming and Deleting a File – OS Directories in Python – File Methods – Command Line Arguments

UNIT V

Creating Modules – Importing Modules – Built –in Modules - Locating Modules – Namespaces and Scope – Dir() Function – The Reload() Function – Packages in Python - Built – In Exceptions – Handling Exceptions - Exception with Arguments- Raising an Exception – User Defined Exception – Assertions in Python.

Textbook:

Dr. A. Kannan , Dr. L. Sai Ramesh - "Problem Solving and Python Programming", United Global Publishers Pvt. Ltd, 2017

Reference Book:

Wesley J. Chun ,"Core Python Programming" , 3rd Edition,Prentice Hall Publisher, 2012,

Course Outcomes:

Co No	Upon Completion of this course, students will be able to	PSO Addressed	Cognitive level
CO- 1	Describe the Python language syntax including control statements, loops and functions to write the programs for the wide variety of problems in mathematics, science, and games.	1,2,4	Understanding
CO- 2	Demonstrate the Python syntax and semantics and be fluent in the use of Python flow control and functions.	1,2,4	Understanding
CO- 3	Explain how to implement the concepts of function and string functions	1,2,4	Understanding
CO- 4	illustrate the core data structures like lists, dictionaries, tuples and sets in Python to store, process and sort the data in file	1,2,4	Applying
CO- 5	Analyze the concepts of modules and files in python	1,2,4	Analyzing

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits
IV	21UCIT42			Python Programming			60		4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – IV

Course Title	**JAVA SCRIPT**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT43**
Course Type	**DSC-X**
Credits	**4**
Marks	**100**

General Objective:

The objective of this course is to develop a responsive web application using javascript and to be familiarized with Angular JS framework.

Course Objectives:

CO	The learners will be able to:
CO-1	To impart familiarity with basic concepts of javascript
CO-2	Learn to know about DOM scripting concepts
CO-3	To gain knowledge about Angular JS framework and its directives
CO-4	To create their own directives,Filters and also familiarized with the concepts of form validation
CO-5	To impart familiarity with creating Single page application,modules and also learn about binding data

UNIT I

Introduction to java script and web-Data types and variables-Array-Decision Making: If and Switch Statement – **Looping:**The for and while statement-**Function and scope:** Creating Your Own Functions-Scope And Lifetime-Functions As Values **-String manipulation-Date time and timers**

UNIT II

DOM Scripting: The Document Object Model-Manipulating The Dom **–Events:** Types Of Events-Connecting Code To Events-The Standard Event Model-Native drag and drop-Event Handling **-HTML forms:**HTML forms-HTML5 form object properties and methods**-Error handling**

Unit III

Introduction to AngularJS :Architectural concepts -Setting up the framework - Organizing the code :- The inline style -The stereotyped style -The specific style-The domain style-**Using Angular JS built-in directives**

Unit IV

Creating our own directives : template - templateUrl –replace-link-require-controller-compile-**Animation :** Animating Repeat - Animating Hide - Animating Class- **Expressions-Filters :**Basic usage with expressions-Creating filters-**Form validation :**Creating our first form -**Basic validation** -Understanding the $pristine and $dirty properties -The $error object-

Unit V

Creating services - Creating a single-page application - **Two-way data binding -**$apply and $watch **-Best practices using the scope -The root Scope object -Scope Broadcasting Creating modules :**The UI module -The search module -The parking application module

Textbook

1. Jeremy McPeak - Beginning JavaScript® 5e -, Published by John Wiley & Sons, Inc., 2015
2. Rodrigo Branas - Angular JS essential - PACKT publishing - 2014

Reference Book

MichaelMoncur - Sams Teach Yourself JavaScript in 24 Hours- Sams Publishing - 2007

Andrew grant - **Beginning Angular JS** -Apress Publishing

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Describe the basic scripting concept to create responsive web application using JavaScript	1,3	Understanding
CO-2	Demonstrate JS document object models and forms	1,3	Understanding
CO-3	Understand Angular JS framework and use various directives and create custom directives using Angular.js	1,3	Understanding, Applying
CO-4	Build dynamic web applications by implementing directives,Animation and validation concepts	1,3	Applying
CO-5	Utilize the binding and modules concept ,to handle user inputs	1,3	Applying

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
IV	21UCIT43			JAVA SCRIPT		60			4	
Course Outcomes (COs)	Programme Learning Outcomes (PLOS)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		
CO-3	✓	✓	✓	✓		✓		✓		
CO-4	✓	✓	✓	✓		✓		✓		
CO-5	✓	✓	✓	✓		✓		✓		
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – IV

Course Title	**RDBMS WITH ORACLE PRACTICAL**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT4P1**
Course Type	**PRACTICAL-V**
Credits	**2**
Marks	**100/2**

General Objective:

This course culminates with a programs that challenges students to code, implement, and demonstrate a database solution using SQL and PL/SQL

Course Objectives:

CO	The learners will be able to:
CO-1	Familiar about the concepts of defining, manipulating and adding constraints to the database
CO-2	Implement pre defined function to summarise the database data
CO-3	Implement Sequence ,view, synonyms concepts using SQL
CO-4	Demonstrate the basic PL/SQL concepts to access data
CO-5	Describe the advance features of PL/SQL

1. Creating, modifying and dropping tables.
2. Creating tables with referential and check constraints.
3. Inserting, modifying, deleting rows.
4. Dropping, disabling / enabling constraints.
5. Retrieving rows with operators in where clause.
6. Retrieving rows with Character functions.
7. Retrieving rows with Number and Date functions.
8. Retrieving row with Group functions and HAVING.
9. Joining Tables (Inner and Outer)
10. Creating, modifying and deleting sequence.
11. Creating, modifying and deleting view.
12. Creating, renaming and removing synonyms.
13. Simple PL/SQL Programs.
14. PL/SQL programs with control structures.
15. PL/SQL programs with procedures.
16. PL/SQL programs with functions.
17. PL/SQL programs with package.
18. PL/SQL programs with cursors.
19. PL/SQL programs with Exception Handling.
20. Working with Triggers.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Build queries using basic DDL, DML and DCL commands	1,2,3	Understanding
CO-2	Construct queries using build in functions of SQL	1,2,3	Applying
CO-3	Develop code using view, sequence and synonyms	1,2,3	Analyzing
CO-4	Construct the PL/SQL programs to solve real time problems	1,2,3	Analyzing
CO-5	Make use of cursor, triggers, function, procedure..etc to create a problem solving queries	1,2,3	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits	
IV	21UCIT4P1			RDBMS with Oracle Practical			60		2	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – IV

Course Title	**PYTHON PROGRAMMING PRACTICAL**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UCIT4P2**
Course Type	**PRACTICAL-VI**
Credits	**1**
Marks	**100/2**

General Objective:

This course develops a basic understanding of programming and the Python programming language and Solve problems requiring the writing of well-documented programs in the Python language

Course Objectives:

CO	The learners will be able to:
CO-1	Learn Syntax and Semantics and create Functions in Python.
CO-2	Invoke string function and search algorithm in python
CO-3	Create simple application in python
CO-4	Understand Lists, Dictionaries and Regular expressions in Python.
CO-5	Implement modules and package concepts in Python

1. Program to demonstrate numbers and operators.
2. Program using Mathematical Functions.
3. Program using Trigonometric Functions.
4. Program using Conditional statements.
5. Program using Looping Statements.
6. Program using Continue, Pass and BreakStatement.
7. Program to design a Arithmetic Calculator
8. Program to search an element in an array using Binary Search Technique.
9. Program using Recursive Function
10. Program to demonstrate String Manipulation.
11. Program using lists.
12. Program using tuples.
13. Program using dictionary.
14. Program using Modules.
15. Program using Packages.
16. Program to demonstrate Exception handling

Course Outcomes:

Co No	Upon Completion of this course, students will be able to:	PSO Addressed	Cognitive level
Co- 1	Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python	1,2,4	Understanding
Co- 2	Express different Decision Making statements and Functions Conditionals and Loops for Python Programs	1,2,4	Understanding
Co- 3	Use functions and represent Compound data using Lists, Tuples and Dictionaries	1,2,4	Applying
Co- 4	Apply modules and package concepts in python	1,2,4	Applying
Co- 5	Understand and summarize different File handling operations	1,2,4	Applying

Relationship Matrix

Semester	Code			Title of the course				Hours	Credits
IV	21UCIT4P2			Python Programming Practicals				30	1
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – IV

Course Title	**COMPUTER NETWORKS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UAIT41**
Course Type	**Allied II/2**
Credits	**3**
Marks	**100**

General Objective:

This course provides the knowledge about communication between the computers using the seven layer structure, methodologies of cable TVand Bluetooth communication and also provides the clear idea about security in connections.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand an effective communication between computer and handheld devices
CO-2	Understand the methods of data exchange and information among computers
CO-3	Analyze the concepts of error control and flow control between the computer systems.
CO-4	Identify the routing methods and the Quality of Services.
CO-5	Build a well secure network for emailing and file sharing services.

UNIT I

Overview: Introduction - Data communication – Networks – Protocols and Standards – Network Models: Layered Tasks – OSI Model - Layers in the OSI model – TCP/IP protocols suit – Addressing – **Physical Layer and Media:** Analog and Digital – Periodic Analog Signal – Digital Signals – Performance

UNIT II

Transmission Media: Guided Media – Un Guided Media – Using Telephone and Cable network for Data Transmission: Telephone Network - Digital Subscriber Line – Cable TV Networks – Cable TV Data Transfer - **Data Link Layer:** Error Detection and Correction: Introduction – Block Coding – Cyclic Codes-Checksum.

UNIT III

Data Link Control: Framing – Flow and Error Control – Protocols – Noiseless Channels – Noisy Channels –Multiple Access: Random Access - Controlled Access – Bluetooth – Connecting LANs, Backbone Networks and Virtual LANs: Connecting devices – Backbone Networks – Virtual LANs.

UNIT IV

Network Layer: Logical Addressing: IPv4 Addresses – IPv6 Addresses – Address Mapping, Error Reporting and Multicasting: Address Mapping - ICMP – IGMP – Delivery Forwarding and Routing: Delivery – Forwarding –**Transport Layer:** Process to Process Delivery – User Datagram Protocol (UDP) – TCP – Conjunction Control and Quality of Service: Data Traffic – Conjunction – Conjunction Control – Quality of Service.

UNIT V

Application Layer: Domain Name System: Name Space – Domain Name Space – Remote Logging – Electronic Mail – File Transfer – **Security:** Cryptography: Introduction – Symmetric key Cryptography - Asymmetric key Cryptography – Network Security: Security Services – Message Confidentiality – Digital Signature – Entity Authentication – Security in the Internet: IP Security – Firewalls.

Textbooks:

Behrouz A. Forouzan , Data Communications and Networking, McGraw Hill Publications, 4th Edition, 2007.

Reference Books:

Andrew S. Tanenbaum , David J. Wetherall, Computer Networks, , Prentice Hall of India Pvt Ltd, 5th Edition, 2011.

Course Outcomes

CO. No.	Upon Completion of this course, students will be able to	PSO Addressed	Cognitive level
CO-1	Describe the functions of each layer in OSI and TCP/IP model.	1,2,3	Remembering
CO-2	Explain the functions of transmission media, error detection and correction	1,2	Understanding
CO-3	Demonstrate the function of flow control, and understand the technology of Bluetooth and VLANs.	1,2,4	Applying
CO-4	Classify the routing protocols and analyze how to assign the IP addresses for the given network.	1,5	Analyzing
CO-5	Evaluate the functions of remote logging and file transfer	1,3,5	Evaluating

Relationship Matrix

Semester	Code		Title of the course			Hours			Credits	
IV	21UAIT41		COMPUTER NETWORKS			60			3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓				✓	✓		✓	✓
CO-2	✓		✓		✓	✓		✓	✓	✓
CO-3	✓	✓		✓		✓	✓		✓	✓
CO-4	✓		✓			✓		✓	✓	✓
CO-5	✓	✓		✓		✓			✓	✓
	Number of matches (✓) = 35 Relationship=Low/Medium/high									

SEMESTER IV

Course Title	**COMPUTER NETWORKS PRACTICALS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UAIT4P1**
Course Type	**ALLIED- II/2P**
Credits	**1**
Marks	**100/2**

General Objective:

The objective of this course is to get practical knowledge about protocols,data transmission using CISCO packet tracer and learn to configure network connecting devices

Course Objectives:

CO	The learners will be able to:
CO-1	To develop an effective communication between digital computers.
CO-2	To test data exchange and information among computers.
CO-3	To implement the concepts of sharing between computers.
CO-4	Learn to configure network routing devices
CO-5	Understand the concepts of network addressing and subnetting

1. Study of different types of network cables and practically implement cross wire cable and straight through cable using clamping tool
2. Study of network IP,
    a. Classification of IP network
    b. Sub netting
3. Study of basic network comments and network configuration comments
4. Interpreting Ping and Traceroute output
5. Performing an initial switch configuration using CISCO packet tracer
6. Performing an initial router concepts
7. Implementing an IP addressing scheme
8. Observing static routing
9. Observing dynamic routing
10. Planning network base firewalls
11. Configuring a CISCO Router as a DHCP server
12. Experiment to understand the concept of Network address translation

Course Outcomes

Co No	Upon Completion of this course, students will be able to:	PSO Addressed	Cognitive level
CO- 1	Describe practical knowledge about transmission media	1,2,5	Understand
CO- 2	Ability to get vast knowledge in CISCO packet tracer	1,2,5	Understand
CO- 3	Learn to configure switches,routers..etc	1,2,5	Applying
CO- 4	Apply knowledge to test data transmission via routing concepts	1,2,5	Applying
CO- 5	Analyze the concepts of network addressing using CISCO	1,2,5	Analyzing

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits
IV	21UAIT4P1			Computer NetworksPracticals			2		1
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)			
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓			✓
CO-2	✓	✓	✓	✓	✓	✓	✓			✓
CO-3	✓	✓	✓	✓	✓	✓	✓			✓
CO-4	✓	✓	✓	✓	✓	✓	✓			✓
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
	Number of matches (✓) = 40 Relationship = Medium									

SEMESTER – IV

Course Title	**SOFT SKILLS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USSS41**
Course Type	**SEC-III**
Credits	**2**
Marks	**100**

Unit – I - Introduction to Soft skills:

Soft skills – Meaning and definition – Importance of soft skills – Soft Skills Vs Hard Skills – Components of Soft skills – Life skills, Communication Skills , Employability Skills and Corporate Skills – Ways to develop soft skills – Applications of Soft skills.

Unit – II - Life Skills:

Life Skills **–** Meaning and Significance – Elements of Life skills – **Attitude** – Types of Attitude – Developing positive attitude – **Self development** – self awareness – benefits – Motivation – Types – Intrinsic and Extrinsic - Self Assessment through SWOT – **Emotional Intelligence** – Need of E.I - Goleman's EQ model – Methods of EI Development.

Unit – III - Communication skills

Communication skills - Types of communication - Barriers of communication - Overcoming barriers of communication – **Listening Skills** – Process of listening – Types of listening – Barriers to effective listening – Effective listening Strategies - **Reading Skills** – Essential of Reading - Methods of Reading – **Speaking Skills** - benefits of speaking - Self development through speaking skills - **Writing skills** - purpose - Importance of styles in writing skills - **Non verbal Communication** – Importance – Types.

Unit – IV - Employability Skills:

Internet Skills **–** Job web portals – Roles and Significance of Job portals – Registration process in Job Portals – **Resume Building** – Resume Content – Resume designs and Layouts – Job Application letter – Format and writing Tips of Application Letter – **Interview Skills** – Types of Job Interview – Interview preparation techniques – Group Discussion – Roles to play in Group discussion.

Unit – V - Corporate Skills:

Leadership skills - Manager Vs Leader – Mintzberg's Managerial roles – Traits of Good leader – **Time Management** – Major Blocks to Time Management – Covey's Time Management Matrix – Time Management tips – **Negotiation Skills** – Approaches of Negotiation – **Avoid , Compete, Accommodate, Compromise and Collaborate – Stages of Negotiation – Stress Management – Causes and Consequences of stress – Stress Coping Strategies.**

Reference books:

1. Suresh, K. E. (2010). *Communication Skills and Soft Skills: An Integrated Approach (With Cd)*. Pearson Education India.
2. S. Hariharan, S. Sundararajan and SP. Shanmughapriya, Soft skills, MJP publishers, Chennai, 2010.

SEMESTER- IV

Course Title	**E-COMMERCE**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USIT42**
Course Type	**SEC-IV**
Credits	**2**
Marks	**100**

General Objective:

Focuses on all aspects of e-commerce like business development and strategy, technological innovations, and social and legal issues and impacts

Course Objectives:

CO	The learners will be able to:
CO-1	To know the basic concept of electronic commerce
CO-2	Learn about Challenges when making ethical decisions related to E-commerce considering laws, privacy, and security.
CO-3	Learn the Regulatory and legal environments as it relates to E-commerce
CO-4	To create awareness about the key security threats in the E-commerce environment.
CO-5	To make our students capable for the current and emerging new trends in IT from software development point of view

Unit I

INTRODUCTION TO E-COMMERCE - Meaning and concept of E-Commerce – History of E-Commerce -Traditional Commerce and E-Commerce - Different types of E-Commerce – B2B,B2C, C2C, B2E, G2C - Need and Role of E-Commerce - Advantage and Disadvantage of ECommerce

Unit II

E-COMMERCE TECHNOLOGIES - Internet & WWW - Internet Protocols – OSI Model,TCP/IP, TCP, UDP, IP, DNS, FTP - Multimedia technology – ISDN, ATM, Cell relay, desktop,Video Conferencing - Information Publishing Technology - HTML, URL, HTTP, HTML FORM, HTTPD,CGI SERVICES, Web Server and client - Advance Technologies –Mobile Agents, WAP, XML, web 2.0, REST web services, Web Mashup.

Unit III

E-COMMERCE STRATEGIES - Consumer Oriented – strategies for marketing, sales & promotion, e-CRM, order - delivery Cycle - Business Oriented - strategies for purchasing & supportactivities (SCM), Strategies for Web Auction - Virtual Communities - Web Portal.

ELECTRONIC PAYMENT SYSTEM: Introduction to payment system - Online Payment System – prepaid e-payment service, postpaid e-payment system -SET protocol - Operational, Credits & legalrisk of e payment system.

Unit IV

ELECTRONIC DATA INTERCHANGE -Meaning EDI and Paperless trading – EDI architecture - EDI standards – VAN - COst of EDI Infrastructure - Internet based EDI - FTP- basedmessaging. E-COMMERCE INFRASTRUCTURE - Cluster of servers -Virtualization techniques -Cloud Computing - Server Consolidation using cloud -Introduction to Hadoop, HDFS, Google AppsEngine.

Unit V

SECURITY & LEGAL ISSUES - Computer security classification - E-Commerce threats -Security of Clients and sever -Cyber law introduction - Copyright and intellectual Property concept relating to ecommerce.

References :

1. Bharat Bhasker, Electronic Commerce – Frame work technologies and Applications, 3rd Edition.Tata McGraw Hill Publications, 2008.

2. Kamlesh K.Bajaj and Debjani Nag, Ecommerce- the cutting edge of Business, Tata McGrawHill Publications, 2008

3. Kalakota et al, Frontiers of Electronic Commerce, Addison Wesley, 2004

4. David- E- Commerce Strategies, Technology and applications -Tata McGrawHill

5. Jeffrey -Introduction to E-commerce -Tata- Mcgrawhil

Course Outcome

Co No	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO- 1	Impart knowledge electronic commerce. Bring out the essentials of Internet.	1,3	Understanding
CO- 2	Ability to get vast knowledge in Internet technologies	1,5	Applying
CO- 3	Learn about strategies involved in electronic commerce and electronic payment method	1,3,5	Applying
CO- 4	Acquire knowledge about legal and security issues involved in electronic commerce	1,4	Analyzing
CO- 5	Learn about the current and emerging new trends in IT from software development point of view	1,5	Analyzing

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits
IV	21USIT42			E Commerce		30			2
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)			
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓	✓	✓	✓				
CO-2	✓		✓	✓	✓	✓				
CO-3	✓		✓	✓	✓	✓				
CO-4	✓		✓	✓	✓	✓				
CO-5	✓		✓	✓	✓	✓				
	Number of matches (✓) = 25 Relationship = Medium									

SEMESTER – IV

Course Title	**DOCUMENT CREATION TOOLS**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21UNIT41**
Course Type	**NME – II**
Credits	**2**
Marks	**100**

General Objective:

The course provides an efficient designing of books, pamphlets, visiting cards, invitations and notices with the help of Pagemaker and Coreldraw tools.

Course Objectives:

CO	The learners will be able to:
CO-1	Teach the ways of commercialize marketing and advertising using printing
CO-2	Learn about the program that generates brochures, newsletters, business cards, etc., used in the professional space
CO-3	Know about the tool used to create and print books, flyers, etc.,
CO-4	Handle an object efficiently by separate, Intersection and shaping the object.
CO-5	Implement the effects on creating buttons with rollover effects.

UNIT I

Introduction to Page Maker - layout window – Document setup – Basic PageMaker function: Open, new, close, print, save and save us – Working with text tool, TEXT Block – Editing text – Formatting a Text Character formatting, paragraph formatting and style creation and Color creation

UNIT II

Working With Graphics: Graphics Tool, Masking, Rotation, Flipping, Cropping, positioning and scaling, Fill option. Arrange the object, Grouping, locking, Frame concept polygon setting and Text wrap properties Master pages: Header and Footer and Template files – Story editor: Find & Replace. Spell Checker – Book Creation – TOC Creation - Index Creation both page reference and cross reference – Table editor: Create Tables using Adobe Table, Import tables into Page maker

UNIT III

Introduction to CorelDraw – features and advantages – Layout window – Basic Corel Draw functions: open, new, close, print , save and save as. Basic Tools: Rectangle, Ellipse, Text, Freehand drawing, Outline, fill and shape – Creating and manipulating text: Artistic Text, Artistic Tool and paragraph text - Text based Roll – ups: Enveloping., Extruding, Text and fit text to path.

UNIT IV

Fill, Outline, Group, ungroup weld, combine, breaking apart, Separate, Intersection. Trim, Align and ordering – Effects: transforming object, Shaping object - Graphic based Roll – ups: Pen, Blend, Contour, symbol, Preset, Layer and Power clip option - Template creation Creating New: Arrow, Pattern, symbol and style.

UNIT V

Working with Bitmap Commands:- Introduction - Working with Bitmaps- Editing Bitmaps Applying effects on Bitmaps Printing - Corel Draw- Web resources Introduction -Internet Tool bar -Setting your webpage -Exporting files- Creating buttons with rollover effects.

Textbooks:

Vikas Gupta, Comdex Desktop Publishing Cource Kit, Vikas Publications, 2006.

Reference Books:

Rebecca Bridges Altman & Rick Altman, Mastering Page Maker6 for Windows 95.

Foster Coburn & Peter McCormick, Corel Draw 8: The Official Guide

Steven Moniz, Photoshop 4 Studio Skills.

Course Outcomes

CO. No.	Upon Completion of this course, students will be able to:	PSO Addressed	Cognitive level
CO-1	Demonstrate the basic Pagemaker operations	1,3	Understand
CO-2	Explain the TOC, index and Table creation in Pagemaker	1,2	Understand
CO-3	Make uses of artistic tools effectively.	1,2,4	Apply
CO-4	Recall the tools used in Pagemaker to design Coreldraw	1,3,5	Remember
CO-5	Apply effects on bitmap printing	1,5	Apply

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
IV	21UNIT41			Document Creation Tools		30			2	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓			✓			✓	
CO-2	✓	✓			✓	✓			✓	✓
CO-3	✓	✓		✓	✓	✓	✓	✓	✓	
CO-4	✓	✓	✓			✓			✓	✓
CO-5	✓	✓			✓	✓			✓	
	Number of matches (✓) = 37 Relationship=Low/Medium/high									

SEMESTER – IV

Course Title	**FIELDWORK / INTERNSHIP**
Course Code	**21UFIT41**
Course Type	**FW/I**
Credits	**2**
Marks	**100**

The following guidelines have been framed for the courses titled Fieldwork and Internship for all the U.G. Programmes.

- Fieldwork/Internship shall be in the fourth semester of each programme.
- A Department can opt for either Fieldwork or Internship.
- Fieldwork may be done individually or in groups not exceeding five per group.
- The minimum length of the Fieldwork report should be 15 to 20 pages in A4 size.
- Marks for the Fieldwork Report will be 100 divided as 60% for the Fieldwork and 40% for Viva-Voce Examination. 2 Credits will be awarded to the students who complete Internships and produce Internship Completion Certificate duly signed by the authority concerned.
- Fieldwork / Internship shall be allotted outside the working hours for a maximum of six days.

Scheme of Evaluation:

Fieldwork	Internal	External
Word of title / Topic	5	5
Objectives / Formulation including Hypothesis	5	5
Methodology / Techniques / Procedures adopted	15	15
Chapterization of the Fieldwork Report	15	15
Summary / Findings / Summation	5	5
Works Cited / Work Consulted / References / Annexures / Footnotes	10	10
Relevance of the Fieldwork to social needs	5	5
	60	**60**

SEMESTER – V

Course Title	**COMPUTER GRAPHICS AND MULTIMEDIA**
Total Hrs.	**75**
Hrs./Week	**5**
Course Code	**21UCIT51**
Course Type	**DSC-XI**
Credits	**4**
Marks	**100**

General Objective:

1. To understand the concepts of graphics devices, 2D , 3D concepts and projections.
2. To enhance the knowledge towards computer and its applications with visual effects.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the video display devices
CO-2	Understand the output primitives
CO-3	Understand the 2D, 3D geometric transformations
CO-4	Remember the concepts of interactive computer graphics
CO-5	Projections and animation

UNIT I

Graphics Primitives: Introduction To Computer Graphics - Video Display Devices- Raster Scan Systems - Random Scan Systems - Interactive Input Devices - Hard Copy Devices - Graphics Software - **Output Primitives**: Line Drawing Algorithms - Initializing Lines - Line Function - Circle Generating Algorithms.. Filled Area Primitives: Boundary Fill And Flood Fill Algorithms.

UNIT II

Two-Dimensional Geometric Transformation: Basic Transformation – Matrix - Representations And Homogeneous Coordinates - Composite Transformations - **Two - Dimensional Viewing**: The Viewing Pipeline - Window- To View Port CoOrdinate Transformation - Two Dimensional Viewing Functions - Clipping Operations - Point Clipping - Line Clipping - Polygen And Curve Clipping.

UNIT III

Three - dimensional Concepts: Three dimensional display methods - parallel Projection - Perspective Projection - Depth Cueing - Visible line and surface identification - Three dimensional transformations.

Unit IV

History of Scratch - Create scratch account –Understanding coordinates- Drawing with Scratch-Changing sprite's position-Using pen-Drawing house in scratch-Using directions to move-creating rainbow painter-Indroducing spiral rider-Changing backdrop-Animating crab-Introducing super dodgeball.

Unit V

Programming with Scratch-scratch editor-movement and loops-turning and waiting- repeat loops-more repeat loops-forever loops-cleanup and save-conditional actions and keyboard commands-if blocks-messages-Animation-vector mode and bitmap mode-drawing COstumes-simple animation-layers-flipping COstumes-coordinates movements-variables and its types-algorithms and program structure.

Textbook

"Computer Graphics C Version" by D.Hearn and M.P.Baker, 2nd Editon, Pearson Education Publication.

Scartch Programming in Easy Steps-Sean McManus, Copyright 2019

Reference Book

W.M. Newman and RF.Sproull - Principles of Interactive Computer Graphics - McGraw Hill International Edition - 1979.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Understand graphics programs in 2D Transformations	1,2,3	Understanding
CO-2	Classify different clipping algorithm	1,2,3	Analyzing
CO-3	Build and apply 3D Transformations in 3D objects	1,2,3	Creating
CO-4	Understand Interactive graphics Animations	1,2,3,4	Evaluating
CO-5	Demonstrate programming concepts	1,2,3,4	Evaluating

Relationship Matrix

Semester	Code		Title of the course			Hours			Credits	
V	21UCIT51		COMPUTER GRAPHICS AND MULTIMEDIA			75			4	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Number of matches (✓) = 42 Relationship = High									

SEMESTER – V

Course Title	**DOT NET PROGRAMMING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT52**
Course Type	**DSC-XII**
Credits	**4**
Marks	**100**

General Objective:

- To understand the Microsoft .NET Framework and ASP.NET page structure
- To design, develop, configure and deploy web application with variety of controls
- To access the database using inbuilt data access tools

Course Objectives:

CO	The learners will be able to:
CO-1	Learn the fundamentals of Dot Net with C#
CO-2	Develop web sites with exception handling, cookies and session
CO-3	Gain experience with different types of server controls, themes, wizards
CO-4	Understand, configure and access database by using data source controls and XML classes
CO-5	Create secure web applications using security controls

UNIT I

The C# Language: C# Language Basics – Variables and Data Types – Variable Operations – Object Based Manipulation – Conditional Logic – Loops – Methods – Types, Objects, and Namespaces : Basic about Classes – Building a Basic Class – Various Types and Reference Types – Understanding Namespaces and Assemblies – Advanced Class Programming.

UNIT II

Creating websites – Exploring the Anatomy of a Web Form – Writing Code – Debugging – Understanding the Anatomy of an ASP.Net Application - Introducing Server Controls – Using the Page Class – Configuring ASP.Net Application – An Interactive Web Page – Handling Exceptions – Using Page Tracing – Using Cookies – Managing Session State.

UNIT III

Understanding Validation – Using the Validation Controls – The Calendar – The AdRotator – Creating Views – Showing a View – Using Wizard Events – Validating with the Wizard – Styles – The CSS Properties Window – Style Inheritance – Themes – URL Mapping and Routing – The SiteMapPath Control The Menu Control.

UNIT IV

Understanding Databases – Configuring Database – Using Direct Data Access – Introducing Data Binding – Working with Data Source Controls – The Grid View – File System Information – Reading and Writing with Streams – The XML Classes – XML Validation.

UNIT V

Authentication and Authorization – Windows Authentication – The Membership Data Store – The Security Controls – Understanding AJAX – Working with ASP.Net AJAX control Toolkit – ASP.Net Applications and the Web Server – IIS – Managing Websites with IIS.

TEXTBOOK

"Begining ASP .NET 4.5 in C# by Mathew MacDonald, 2012, Apress Publications

REFERENCE BOOK

1. "The complete reference ASP .NET" by Mathew Macdonald, 2002, Tata McGraw Hill Publications.
2. "Microsoft ASP. NET Step by step" by G. Andrew Duthie, 2002, Prentice Hall India Publications.

Course Outcomes

CO	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the Microsoft .NET Framework and ASP.NET page structure	1	Understanding
CO-2	Design web application with variety of controls	2	Analyzing
CO-3	Access the data using inbuilt data access tools	3	Creating
CO-4	Use Microsoft ADO.NET to access data in web Application	3	Evaluating
CO-5	Configure and deploy Web Application	5	Evaluating

Relationship Matrix

Semester	Course Code		Title of the Course			Hours			Credits	
V	21UCIT52		DOT NET PROGRAMMING			60			4	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓					✓				
CO-2	✓	✓					✓			
CO-3	✓	✓						✓		
CO-4	✓	✓						✓		
CO-5	✓	✓								✓
	Number of matches (✓) = 14 Relationship = Low									

SEMESTER – V

Course Title	**DATA MINING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT53**
Course Type	**DSC-XIII**
Credits	**4**
Marks	**100**

General Objective:

Analyse large amount of data either by automatic or semi-automatic manner.

Course Objectives:

CO	The learners will be able to:
CO-1	Describe the fundamentals, applications, techniques in data mining.
CO-2	Explain and evaluate the performance of different kind of algorithms.
CO-3	Categorize various types of classification methods.
CO-4	Focus on mining the data using cluster analysis techniques and the data in the web by using web data mining methods.
CO-5	Summarize the functionality of search engine, design of warehouse and the usage of OLAP software.

UNIT I

Introduction: What is Data Mining - Data Mining Applications – Data Mining Techniques - **Data Understanding and Data Preparation** - Introduction-Data Collection and Pre-Processing - Types of Data - Displaying Data Graphically

UNIT II

Association Rules Mining: Basics – The task and a Naïve Algorithm – The Apriori Algorithm – Improving the efficiency of the Apriori Algorithm – Apriori - TID – Direct hashing and pruning – Dynamic itemset counting – Mining frequent patterns without candidate generation – Performance evaluation of algorithms – Software for association rule mining.

UNIT III

Classification: Decision tree – Building a decision tree – The tree induction algorithm – Split algorithm based on information theory – Split algorithm based on the Gini index – Over fitting and Pruning – Decision tree rules – Naïve Bayes Method – Estimating predictive accuracy of classification methods – Improving accuracy of classification methods – Other evaluation criteria for classification methods – Classification software.

UNIT IV

Cluster analysis: Introduction- Desired features of cluster analysis –Types of cluster analysis methods – Partitional methods – Hierarchical methods – Density-based methods – Dealing with large databases – Quality and validity of cluster analysis methods – Cluster analysis software - **Web Data Mining**: Web terminology and characteristics – Locality and hierarchy in the Web – Web content mining – Web usage mining – Web structure mining –-Web Data Mining – Web terminology and characteristics – Locality and hierarchy in the Web – Web content mining – Web usage mining – Web structure mining – Web mining software

UNIT V

Search Engines and Query Mining: Introduction-Search Engine Functionality-Search Engine Architecture - Ranking of Web pages - Search Query Mining - Data Warehousing introduction-Data warehouse design - Data warehouse Metadata – **OLAP**: Introduction-Multi dimensional View and Data Cube-OLAP Software

.

Textbook

"Introduction to Data Mining with Case Studies" by G.K. Gupta, 2nd Edition, 2008, Prentice Hall Publications.

Reference Book

"Data Mining Techniques" by Arun K Pujari, 1st Edition, 2001, Universities Press(India) Private Limited.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the basics of data mining besides collect, process and display the data of various types.	1,3	Understanding
CO-2	Apply and improve the efficiency of various mining algorithms.	1,3,5	Applying
CO-3	Estimate and improve the accuracy of different types of classification methods and algorithms.	1,3,4	Analyzing
CO-4	Experiment cluster analysis and web data mining techniques using software..	1,2,3	Analyzing
CO-5	Evaluate search engine, query mining and the application of OLAP software.	1,3,5	Evaluating

Relationship Matrix

Semester	Course Code		Title of the Course			Hours				Credits
V	21UCIT53		DATA MINING			60				4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓			✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		✓
CO-3	✓	✓	✓		✓	✓		✓	✓	
CO-4	✓	✓	✓		✓	✓	✓	✓		
CO-5	✓	✓	✓	✓		✓		✓		✓
	Number of matches (✓) =34 Relationship = High									

SEMESTER – V

Course Title	Computer Graphics and Multimedia Practicals
Total Hrs.	60
Hrs./Week	4
Course Code	21UCIT5P1
Course Type	PRACTICAL-VII
Credits	2
Marks	100/2

General Objective:

1. To understand and create graphics animations, 2D , 3D concepts.
2. To create and develop interactive and enhanced graphics animations.

Course Objectives:

CO	The learners will be able to:
CO-1	Create line and circle drawing algorithms.
CO-2	Create and develop graphics applications
CO-3	Develop Text and graphics animations using objects.
CO-4	Build their own arts and animations
CO-5	Make Interactive animation works for industry.

1. Program to draw line using DDA Algorithm
2. Program to draw line using Bresenham's Algorithm
3. Program to draw circle using Bresenham's Algorithm
4. program to draw an object and fill it using various styles
5. program using any filling algorithm
6. program to use transformations
7. Animate a Character
8. Create Sprite Animation
9. Create a flying bat animation
10. Create a script to glide the sprite along the sides of a triangle
11. Create a game using Archery
12. Program for Sum of n numbers

Course Outcomes

CO. No.	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive level
CO-1	Create lines using different algorithms	1,2,3	Understanding
CO-2	Creating Animations	1,2,3	Applying
CO-3	Creating Text Effects	1,2,3	Creating
CO-4	Creating visual effects	1,2,3,4	Creating
CO-5	Moving objects	1,2,3,4	Evaluating

Relationship Matrix

Semester	Code	Title of the course	Hours	Credits
V	21UCIT5P1	COMPUTER GRAPHICS AND MULTIMEDIA PRACTICALS	60	2

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓	✓	✓	✓	✓		
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		
CO-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Number of matches (✓) = 42 Relationship = High									

SEMESTER – V

Course Title	**DOT NET PROGRAMMING PRACTICALS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT5P2**
Course Type	**PRACTICAL -VIII**
Credits	**2**
Marks	**100/2**

General Objective:

- To improve the programming skills of the students in web application development with different types of controls and techniques.

Course Objectives:

CO	The learners will be able to:
CO-1	Identify the implementation of conditional structures, loops and server controls in programs.
CO-2	Write programs using login controls and session to develop web forms.
CO-3	Classify various types of controls besides their use in creating web pages.
CO-4	Analyze exceptions with its tackling methods and store user information using cookies.
CO-5	Estimate database manipulations with controls and techniques like Ajax.

1. Create a web form using conditional statements and loops
2. Create a web form to add server controls
3. Demonstrate use of login controls with web forms for login, create user, password recovery in a web page
4. Create a web page with session
5. Demonstrate the use of validation control in a web page
6. Create a web form with calendar control
7. Create a web form with sitemappath control
8. Create a web form with menu using menu control
9. Create a web form to handle user defined exceptions
10. Create a web form with cookies
11. Create a web form with database operations using grid view control
12. Create a web page to display news from database using Ajax

Course Outcomes

CO	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the usage control structures, Looping statements and server controls.	1,2,3	Understanding
CO-2	Develop web pages with login controls and session.	1,2,3	Applying
CO-3	Experiment the applications of different type of controls.	1,2,3,4	Analyzing
CO-4	Explain the ways to handle exceptions and apply cookies in web pages.	1,2,3,5	Analyzing
CO-5	Evaluate web application with database operations and displaying effective results using AJAX.	1,2,3,5	Evaluating

Relationship Matrix

Semester	Course Code	Title of the Course	Hours	Credits
V	21UCIT5P2	DOT NET PROGRAMMING PRACTICAL	60	4

Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓		✓	✓	✓	✓		
CO-2	✓	✓	✓		✓	✓	✓	✓		
CO-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓	✓	✓	✓	✓		✓
	Number of matches (✓) = 41 Relationship = High									

SEMESTER – V

Course Title	**ARTIFICIAL INTELLIGENCE**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT51A**
Course Type	**DSE I-A**
Credits	**3**
Marks	**100**

General Objective:

This course provides a way to understand the searching methods, logical thinking methodologies of machines through predefined algorithm designed and implemented.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the concept of Artificial Intelligence.
CO-2	Learn various peculiar search strategies for AI.
CO-3	Acquaint with the fundamentals of mobile robotics.
CO-4	Understand the knowledge representation and logics of machines.
CO-5	Know about the path planning, sensing and mapping of robot.

Unit I

Artificial Intelligence: Introduction, Typical Applications. State Space Search: Depth Bounded DFS, Depth First Iterative Deepening. **Heuristic Search:** Heuristic Functions, Best First Search, Hill Climbing, Variable Neighborhood Descent, Beam Search, Tabu Search. **Optimal Search:** A* algorithm, Iterative Deepening A*, Recursive Best First Search, Pruning the CLOSED and OPEN Lists.

Unit II

Problem Decomposition: Goal Trees, Rule Based Systems, Rule Based Expert Systems. **Planning:** STRIPS, Forward and Backward State Space Planning, Goal Stack Planning, Plan Space Planning, A Unified Framework For Planning. **Constraint Satisfaction :** N-Queens, Constraint Propagation, Scene Labeling, Higher order and Directional Consistencies, Backtracking and Look ahead Strategies.

Unit III

Knowledge Based Reasoning: Agents, Facets of Knowledge. Logic and Inferences: Formal Logic, Propositional and First Order Logic, Resolution in Propositional and First Order Logic, Deductive Retrieval, Backward Chaining, Second order Logic. Knowledge Representation: Conceptual Dependency, Frames, Semantic nets.

Unit IV

Natural Language Processing: Introduction, Stages in natural language Processing, Application of NLP in Machine Translation, Information Retrieval and Big Data Information Retrieval. Learning: Supervised, Unsupervised and Reinforcement learning. **Artificial Neural Networks** (ANNs): Concept, Feed forward and Feedback ANNs, Error Back Propagation, Boltzmann Machine.

Unit V

Robotics: Fundamentals, path Planning for Point Robot, Sensing and mapping for Point Robot, Mobile Robot Hardware, Non Visual Sensors like: Contact Sensors, Inertial Sensors, Infrared Sensors, Sonar, Radar, laser Rangefinders, Biological Sensing. Robot System Control: Horizontal and Vertical Decomposition, Hybrid Control Architectures, Middleware, High-Level Control, Human-Robot Interface.

Textbooks:

1. Deepak Khemani, A First Course in Artificial Intelligence, McGraw Hill Education(India), 2013. Elaine Rich, Kevin Knight and Nair, Artificial Intelligence, TMH.
2. Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Third edition, Pearson, 2003.
3. Michael Jenkin, Gregory, Computational Principals of Mobile Robotics, Cambridge University Press, 2010.

Reference Books:

1. Nilsson Nils J , Artificial Intelligence: A new Synthesis, Morgan Kaufmann Publishers, San Francisco.
2. Patrick Henry Winston, Artificial Intelligence, Addison-Wesley Publishing Company.
3. Andries P. Engelbrecht, Computational Intelligence: An Introduction, 2nd Edition-Wiley India.

Course Outcomes

CO. No.	Upon Completion of this course, students will be able to:	PSO Addressed	Cognitive level
CO-1	Demonstrate the search methods in Artificial Intelligence	1,3	Understanding
CO-2	Solve the problems by decomposition and develop the planning	2,4	Creating
CO-3	Make uses of knowledge based reasoning	1,3,5	Applying
CO-4	Explain the applications of Natural Language Processing	1,2,3	Applying
CO-5	Outline the hardware and sensors for Robot	1,4,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits	
V	21UEIT51A			ARTIFICIAL INTELLIGENCE		60			3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓		✓	✓		✓	✓	✓
CO-2	✓	✓	✓				✓		✓	✓
CO-3	✓	✓	✓	✓	✓	✓		✓	✓	✓
CO-4	✓	✓	✓						✓	✓
CO-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Number of matches (✓) = 42 Relationship=High									

SEMESTER – V

Course Title	**ROBOTICS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT51B**
Course Type	**DSE I B**
Credits	**3**
Marks	**100**

General Objective:

To understand the speed, consistency and the necessary characters to be implemented for Robotics.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the introduction for Robotics, and its classification.
CO-2	Indentify the mechanism and homogeneous transformations for Robotics.
CO-3	Identify the kinematics principles of robotics.
CO-4	Examine the differential motions and position analysis.
CO-5	Analyze the latest sensors and actuators.

UNIT I

Introduction to Robotics

Introduction to Robots-Classification of Robots-History of Robotics-Robot Components-Robot Coordinates-Programming modes-Robot Characteristics-Robot Languanges-Robot Applications

UNIT II

Robot Kinematics :Position Analysis

Robots as Mechanisms-Matrix Representation-Homogeneous Transformation Matrices-Representation of Transformation-Inverse of Transformation Matrices-Forward and Inverse kinematics of Robots

UNIT III

Differential Motions and velocities

Introduction-Differential Relationships-Jacobian-Differential motions of a frame-Interpretation of the differential Change-Differential Changes between frames-Calculation of Jacobian-Jacobian and Differential Operator-Inverse Jacobian.

UNIT IV

Actuators

Introduction-Characteristics of Actuating Systems-Comparison of Actuating Systems-Hydraulic Devices-Microprocessor control of electric motors-Electric Motors-Magnetostrictive Actuators

UNIT V

Sensors

Introduction-Sensor characteristics-Position Sensors-Velocity Sensors-Acceleration sensors-Force and pressure sensors-Torque sensors-Microswitches

Textbook

Introduction to Robotics Analysis, Systems, Applications Saeed B. Niku Mechanical Engineering, Prentice Hall Upper Saddle River, NJ 07458.

Course Outcomes

CO No.	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Classify the various generations of ROBOTICS.	1	Understanding
CO-2	Analyze the kinematics and position analysis	1,5	Applying
CO-3	Explain the concepts of velocities.	1,5	Analyzing
CO-4	Inspect the various issues related to security to protect communication systems.	1,5	Analyzing
CO-5	Summarize thethe sensors.	1,4,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours			Credits
V	21UEIT51B			ROBOTICS			60			3
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO1	PLO2	PLO3	PLO4	PLO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓		✓	✓		✓				
CO-2	✓		✓	✓		✓				✓
CO-3	✓		✓	✓		✓				✓
CO-4	✓		✓	✓		✓				✓
CO-5	✓	✓	✓	✓	✓	✓			✓	✓
	Number of matches (✓) = 27 Relationship = Medium									

SEMESTER – V

Course Title	**MACHINE LEARNING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT51C**
Course Type	**DSE- I -C**
Credits	**3**
Marks	**100**

General Objective:

To understand the fundamentals of Machine Learning, Data Science and Analytics with Python and Hadoop,Deep Learning concepts

Course Objectives:

CO	The learners will be able to:
CO-1	Knowing the importance of Machine Learning
CO-2	Learning basic Machine learning algorithms
CO-3	Introducing Data Science and Analytics with Python
CO-4	Analyzing Big data using Hadoop
CO-5	Gaining the Knowledge on Deep Learning

Unit: I: Fundamentals of Machine Learning: Process of Machine Learning, Types of Common Machine Learning Algorithms, Common Machine Learning Algorithms, Machine Learning Workflow, Performance Metrics.

Unit: II: Essential concepts for Machine Learning: Artificial Learning and Machine Learning, Data Pre-processing, Basic Mathematical Concepts for Machine Learning, Statistical Concepts for Machine Learning, Regression Concepts, Classification, Clustering.

Unit: III Python for Analytics: Data Science and Analytics- an overview, Python Installation Setup, Mathematical and Scientific Computing, Data Manipulation Operations, Data Visualization, Machine Learning.

Unit: IV Python and Hadoop: Hadoop for Big Data, ECOsystem of Hadoop, Integrating Python with HDFS, Using Hadoop Streaming, Python with Spark. Web Scraping.

Unit: V Deep Learning Concepts: Perceptron, Activation Functions, Gradient Descent Rule, Back Propagation,Convolution Neural Networks, Recurrent Neural Networks, Deep Learning Applications- Image Processing, Natural Language Processing, Spec Recognition, Video Analytics, Tensor Flow.

Course Outcomes

CO No.	Upon Completion of this course, students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Knowing the importance of Machine Learning	1	Understanding
CO-2	Learning basic Machine learning algorithms	1,2	Applying
CO-3	Understanding Data Science and Analytics with Python	1,2,3,4	Applying
CO-4	Analyzing Big data using Hadoop	2,3	Analyzing
CO-5	Gaining the Knowledge on Deep Learning	1,5	Analyzing

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits	
V	21UEIT51C			Machine Learning			60		3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓				
CO-2	✓		✓	✓		✓	✓			
CO-3	✓	✓	✓	✓		✓	✓	✓	✓	
CO-4	✓		✓	✓			✓	✓		
CO-5	✓	✓	✓	✓	✓	✓				✓
	Number of matches (✓) = 30 Relationship = MEDIUM									

SEMESTER – V

Course Title	**CLOUD COMPUTING**
Total Hrs.	**60**
Hrs./Week	**12**
Course Code	**21UEIT52A**
Course Type	**DSE II-A**
Credits	**3**
Marks	**100**

General Objective:

This course provides an understanding about Private, Public, Hybrid cloud environments, virtualization, security and cloud storage.

Course Objectives:

CO	The learners will be able to:
CO-1	Study the Basics of cloud computing and Different Cloud Computing services
CO-2	Familiarize themselves with the lead players in cloud.
CO-3	Understand the key concepts of virtualization, Cloud Implementation, Programming and Mobile cloud computing
CO-4	Identify the security mechanisms in cloud.
CO-5	Understand an Amazon storage systems

UNIT I

UNDERSTANDING CLOUD COMPUTING

Cloud Computing - Definition, History - Cloud types - the cloud cube model - The Cloud Reference Model - characteristics of cloud computing - Benefits of Cloud Computing - Disadvantages of Cloud Computing – Architecture – Architectural Design Challenges - Deployment Models: Public, Private and Hybrid Clouds.

UNIT II

DEVELOPING CLOUD SERVICES

Understanding Private, Public and Hybrid cloud environments – communication as a Service (CaaS) - Infrastructure as a Service (IaaS) – On-demand, Amazon's Elastic, Amazon EC2, Mosso – Monitoring as a Service (MaaS) –Platform as a Service (PaaS) – On-Premises model, new cloud model – Software as a Service (SaaS) – implementation issues, characteristics, SaaS model.

UNIT III

VIRTUALIZATION AND CLOUD APPLICATIONS

Virtualization – Characteristics of Virtualized Environments – Types - Taxonomy of Virtualization Techniques – Virtualization and Cloud Computing – Pros and Cons of Virtualization – Implementation Levels of Virtualization – Tools and Mechanisms: Xen, VMWare, Microsoft Hyper -

V, KVM, Virtual Box-Applications: the Google cloud – Google Analytics – Google translate - Google Toolkit – Google APIs-Windows Azureservice – Windows Azure App fabric

UNIT IV

CLOUD SECURITY

Security Overview – Cloud Security Challenges – Cloud security Mechanisms- Software – as – a - Service Security – Virtual Machine Security – Cloud security protocols and standards - Cloud Security Management - Strategies and Practice.

UNIT V

CLOUD STORAGE

Cloud storage – unmanaged cloud storage – managed cloud storage – creating cloud storage systems – working with Amazon storage systems: Amazon Elastic compute cloud(EC2) - Amazon simple storage system(S3) – Amazon Elastic block store(EBS) - cloud front -security issues.

Textbooks:

BarrieSosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd, New Delhi, 2012.

ThomasErl, ZaighamMahood, Ricardo Puttini, Cloud Computing, Concept, Technology &Architecture, Prentice Hall, 2013.

Reference Books:

Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pvt. Limited, July2008.

Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Second Edition, Que Publishing, August 2008.

Course Outcomes

CO. No.	Upon Completion of this course, students will be able to:	PSO Addressed	Cognitive level
CO-1	Explain the characteristics and benefits of cloud computing	1,2,3	Understanding
CO-2	Classify the public, private and Hybrid clouds	2,4	Applying
CO-3	Demonstrate the virtualization of cloud computing	1,3,5	Analyzing
CO-4	Recall the securities in networks	1,5	Analyzing
CO-5	Explain the storage space in cloud	1,4,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course				Hours		Credits
V	21UEIT52A			CLOUD COMPUTING				60		3
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓	✓	✓
CO-2	✓			✓	✓	✓	✓	✓		✓
CO-3	✓	✓	✓		✓	✓			✓	✓
CO-4	✓	✓			✓	✓		✓		✓
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
	Number of matches (✓) = 40 Relationship=High									

SEMESTER - V

Course Title	**INTERNET OF THINGS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT52B**
Course Type	**DSE IIB**
Credits	**3**
Marks	**100**

General Objective:

- To learn the interconnection, integration of the physical world and cyber space and to develop IoT devices.

Course Objectives:

CO	The learners will be able to:
CO-1	Observe the basic concepts and different applications of IoT.
CO-2	Determine the design issues and constraints to develop IoT in real world.
CO-3	Illustrate the issues in protocol standardization and the different kind of protocols used in IoT.
CO-4	Explain logical design and building blocks of IoT device besides python programs.
CO-5	Summarize different software management tools and web services.

UNIT I

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with NETCONF-YANG- IoT Platforms Design Methodology

UNIT II

Real world design constraints - Applications - Asset management - Industrial automation - smart grid - Commercial building automation - Smart cities - participatory sensing

UNIT III

Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFID Protocols – Unified Data Standards – Protocols – IEEE 802.15.4 – BACNet Protocol – Modbus– Zigbee Architecture – Network layer – 6LowPAN - CoAP - Security.

UNIT IV

Building IOT with RASPERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry Pi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT V

Data Analytics for IoT – Introduction – Apache Hadoop – Using Hadoop MapReduce for Batch Data Analysis - Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT - Amazon Web Services for IoT

Tebbook

1. "Internet of Things: A Hands-On Approach" by ArshdeepBahga, Vijay Madisetti, 2014, ArshdeepBhaga& Vijay Madisetti Publisher

2. "From Machine-to-Machine Internet of Things Introduction to a New Age of Intelligence" by Jan Holler, VlasiosTsiatsis, Catherine Mulligan, StamatisKarnouskos, Stefan Avesand, David Boyle, 1st Edition, 2014, Academic Press is an imprint of Elsevier.

Course Outcomes

CO	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive Level
CO-1	Understand the design and designing methodology to develop IoT platform.	1,3	Understanding
CO-2	Explain the Real world design constraints of IoT in various types of applications.	1,2,3	Applying
CO-3	Choose protocols based on domain and constraints in IoT.	1,3,5	Analyzing
CO-4	Analyze IoT devices such as Respberry pi by developing python programs.	1,2,3,4	Analyzing
CO-5	Evaluate tools in data analytics and real time services for IoT.	1,3,4,5	Evaluating

Relationship Matrix

Semester	Course Code		Title of the Course			Hours			Credits	
V	21UEIT52B		INTERNET OF THINGS			60			3	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓			✓		✓		
CO-2	✓	✓	✓		✓	✓	✓	✓		
CO-3	✓	✓	✓	✓		✓		✓		✓
CO-4	✓	✓	✓		✓	✓	✓	✓	✓	
CO-5	✓	✓	✓	✓	✓	✓		✓	✓	✓
	Number of matches (✓) = 36 Relationship = High									

SEMESTER - V

Course Title	**VIRTUAL REALITY**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT52C**
Course Type	**DSE-IIC**
Credits	**3**
Marks	**100**

General Objectives:

This course is designed to introduce students to the field of virtual reality (VR) and provide students with hands-on experience developing applications for modern virtual reality.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand the fundamental concepts relating to Virtual Reality
CO-2	Create simple computer generated environments for virtual exploration
CO-3	Program interactive elements for virtual experiences
CO-4	Exploring the concept of 2d and 3d techniques
CO-5	Use immersive effects of visual and audio assets to VR experiences and evaluate implementation methods.

UNIT I

Introduction: what is Virtual Reality – Modern VR Experience – History Repeats - **Birds-eye view** - Hardware - Software – Human Physiology and perception - **The Geometry of Virtual Worlds**: Geometric models – Chaining Position and Orientation - Axis-angle representations – Viewing Transformation – Chaining the Transformation

UNIT II

Light and Optics: Basic Behavior of Light – Lenses – Optical Aberrations – The Human Eye – Cameras – **The Phylosophy of Human Vision:** From the Cornea to Photoreceptors – From Photoreceptors to the Visual Cortex – Eye Movements – Implications of VR

UNIT III

Visual Perception: Perception of Depth – Perception of Motion - Perception of Color – Combining Sources of Information – **Visual Rendering:** Ray Tracing and Shading Models – Rasterization – Correcting Optical Distortion – Improving Latency and Frame Rate – Immersive Photos and Videos – **Motion in Real and Virtual World :** Velocities and Accelerations – The Vestibular System – Physics in the Virtual world – Mismatched Motion and Vection

UNIT IV

Tracking: Tracking 2D Orientation – Tracking 3D Orientation – Tracking Positions and Orientation – Tracking Attached Bodies – 3D Scanning Environments – **Interaction:** Motor Programs and Remapping – Locomotion – Manipulation – Social Interaction – Additional Interaction Mechanisms

UNIT V

Audio: The Physics of Sound – The Physiology of Human Hearing – Auditory Perception – Auditory Rendering – **Evaluating VR Systems and Experiences:** Perceptual Training – Recommendations for Developers – Comfort and VR Sickness – Experiments on Human Subjects – **Frontiers:** Touch and Proprioception – Smell and Taste – Robotic Interfaces – Brain – Machine Interface.

TEXTBOOK:

"Virtual Reality" by Steven M. LaValle, 1st Edition, 2017, Cambridge University Press.

REFERENCE BOOKS:

1. "Foundations of Sensation and Perception" by George Mather , 2nd Edition, 2009, Psychology Press Publication.
2. "Fundamentals of Computer Graphics" by Peter Shirley, MichaelAshikhmin, and Steve Marschner, 3rd edition, 2009, A K Peters/CRC Press.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Demonstrate an understanding of techniques, processes, technologies and equipment used in immersive virtual reality	1,3	Understanding
CO-2	Exploit the characteristics of materials and processes in an individual and conceptually developed way	1,2	Understanding
CO-3	Show critical awareness of historical and theoretical contexts relevant to immersive virtual reality	1,2	Applying
CO-4	Apply critical, analytical and self-reflective practice	1,2,3	Applying
CO-5	Identify and develop personal topics for individual research in immersive virtual reality	1,2,5	Analyzing

Relationship Matrix

Semester	Course Code		Title of the Course			Hours		Credits		
V	21UEIT52C		Virtual Reality			60		3		
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓		
CO-2	✓	✓	✓	✓	✓	✓	✓			
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓			
	Number of matches (✓) = 36 Relationship = Medium									

SEMESTER – VI

Course Title	**MOBILE APPLICATION DEVELOPMENT**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT61**
Course Type	**DSC-XIV**
Credits	**4**
Marks	**100**

General Objective:

This course provides an understanding about an Android operating system, design the pages, using animation with interacting events.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the structure of files and directories in Android Applications.
CO-2	Design the buttons, menus and dialogs.
CO-3	Define the views and layouts
CO-4	Create an animation in text, shapes using an emulator
CO-5	Examine the widgets, event listeners and content providers.

UNIT I

Introducing the Android Software Development Platform: The Directory Structure of an Android Project - Common Default Resources Folders - The Values Folder - Leveraging Android XML: Screen Sizes - Desktop Clocks - Using Your Android Application Resources: Bitmap Images - Launching Your Application - Launching Eclipse - Creating an Android Project - Inspecting and Editing the Android Application Files: Opening the HelloActivity.java Activity - Opening the UI Definition - Opening the Strings Resource File - Setting a Variable Value in strings.xml - Adding an Application Icon - Adding Transparency.

UNIT II

Android Framework Overview: The Foundation of OOP - Providing Structure for Your Classes: Inheritance - Defining an Interface - Bundling Classes in a Logical Way - An Overview of XML - The Anatomy of an Android Application - Android Application Components: Android Activities - Android Services - Broadcast Receivers - Content providers - Android Intent Objects - Android Manifest XML

UNIT III

Screen Layout Design: Android View Hierarchies - Nesting Views - Defining Screen Layouts - Setting Up for Your Screen Layout - Using Linear Layouts - Editing the activity_main.xml File - Using Relative Layouts - Sliding Drawer - Using Padding and Margins with Views and Layouts - Setting Padding in Views - Setting Margins in ViewGroups - UI Design: Buttons, Menus, and Dialogs - Using Menus in Android - Adding Dialogs

UNIT IV

An Introduction to Graphics Resources in Android - Using Bitmap Images in Android - Creating animation in Android - Controlling Frame-Based Animation via Java - Running the Frame-Based Animation App in the Emulator - Tween Animation in Android - Creating the text_animation.xml File - Controlling Tween Animation via Java - Using Transitions.

UNIT V

Adding Interactivity: An Overview of UI Events in Android - Handling onClick Events - Key Event Listeners - Context Menus in Android - Controlling the Focus in Android - Understanding Content Providers: An Overview of Android Content Providers - Defining a Content Provider - Working with a Database - Understanding Intents and Intent Filters - Intent Resolution: Implicit Intents and Explicit Intents - Using Intents with Activities.

Textbooks:

Wallace Jackson, Android Apps for Absolute Beginners, Apress Publications, Second Edition, 2012.

Reference Books:

Joseph Annuzzi, Jr. Lauren Darcey, Shane Conder, Introduction to Android Application Development, Addison Wesley Publications, 4th Edition, 2014.

Reto Meier, Professional Android 4 Application Development, John Wiley and Sons Publications2012.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Describe Android platform, Architecture and features.	1,2	Understanding
CO-2	Recall the foundation of OOP and XML	1,2,3	Remembering
CO-3	Demonstrate the screen layout design and User Interface designs	1,4	Applying
CO-4	Extend the Java concepts to Animation	1,5	Analyzing
CO-5	Evaluate the interactions using events	1,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits
VI	21UCIT61			MOBILE APPLICATION DEVELOPMENT			60		4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓		✓	✓		✓	✓	
CO-2	✓	✓	✓	✓			✓	✓	✓	✓
CO-3	✓		✓	✓	✓	✓		✓	✓	✓
CO-4	✓	✓	✓	✓			✓	✓	✓	
CO-5	✓		✓	✓	✓	✓			✓	✓
	Number of matches (✓) = 37 Relationship=High									

SEMESTER – VI

Course Title	**PHP PROGRAMMING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT62**
Course Type	**DSC-XV**
Credits	**4**
Marks	**100**

General Objective:

The objective of this course is to Gain ability to make your pages dynamic based upon user interaction, learn to interact with HTML forms and store and retrieve information from local data sources which include a database.

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Course Objectives:

CO	The learners will be able to:
CO-1	To impart familiarity with basic concepts of PHP
CO-2	know about how access expression and performing condition based operations
CO-3	To create their own functions, to implement in built functions and array concepts
CO-4	To learn to handle and manipulate files, and also know about database mysql
CO-5	To impart familiarity with manipulating data source, creating session and cookies in their web page

UNIT I

Introduction to PHP: The Structure of PHP-Using Comments -Basic Syntax -Variables -Operators -Variable Assignment -Multiple-Line Commands -Variable Typing -Constants -Predefined Constants -The Difference Between the echo and print Commands -Functions -Variable Scope.

UNIT II

Expressions and Control Flow in PHP: Operators -Operator Precedence - Associativity -Relational Operators - **Conditionals :**The if Statement -The else Statement -The elseif Statement -The switch Statement -The ? Operator -**Looping :**while Loops -do...while Loops -for Loops -Breaking Out of a Loop-The continue Statement.

UNIT III

PHP Functions and Objects: PHP Functions -Defining a Function -Returning a Value -Returning an Array -Do Not Pass Arguments by Reference -Returning Global Variables

PHP Arrays:Numerically Indexed Arrays -Associative Arrays -Assignment Using the array Keyword -The foreach...as Loop -Multidimensional Arrays -Using Array Functions-Date and Time Functions.

UNIT IV

File Handling : Checking Whether a File Exists -Creating a File -Reading from Files - Copying Files -Moving a File -Deleting a File-Updating Files -Locking Files for-Multiple Accesses -Reading an Entire File -Uploading Files. **Accessing MySQL Using PHP:** Querying a MySQL Database with PHP -The Process-Creating a Login File -Connecting to a MySQL Database-Deleting a Record - Displaying the Form -Querying the Database Running the Program

UNIT V

Practical MySQL : Creating a Table -Describing a Table -Dropping a Table -Adding Data - Retrieving Data -Updating Data -Deleting Data -Using AUTO_INCREMENT **Using Cookies in PHP**-Setting a Cookie -Accessing a Cookie -Destroying a Cookie - **Using Sessions** -Starting a Session -Ending a Session -Setting a Time-Out - Session Security

Textbook

Robin Nixon - Learning PHP, MySQL & JavaScript With jQuery, CSS & HTML5 - Published by O'Reilly - 2015,

Reference Book

VikramVaswani - PHP A Beginner's Guide , The McGraw-Hill - 2009

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Describe PHP as a server side programming language and learn to create dynamic webpage	1,3	Understanding
CO-2	Demonstrate how to control the flow of program using conditional and looping statement	1,3	Analyzing
CO-3	Understand the uses of various regular expression, PHP library functions	1,3	Analyzing
CO-4	Analyse the usage of cookies and session and manipulate files and directories.	1,3	Analyzing
CO-5	Outline the principles behind using MySQL as a backend DBMS with PHP	1,3	Analyzing

Relationship Matrix

Semester	Code			Title of the course		Hours			Credits
VI	21UCIT62			PHP Programming		60			4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		
CO-3	✓	✓	✓	✓		✓		✓		
CO-4	✓	✓	✓	✓		✓		✓		
CO-5	✓	✓	✓	✓		✓		✓		
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – VI

Course Title	**SOFTWARE ENGINEERING**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT63**
Course Type	**DSC-XVI**
Credits	**4**
Marks	**100**

General Objective:

This course provides a way to understand the characteristics of software, software process model, design process of software, testing methodologies of software and software quality.

Course Objectives:

CO	The learners will be able to:
CO-1	Understand the software characteristics.
CO-2	Define the software design and construction.
CO-3	Understand the software requirements and modelling.
CO-4	Explain the quality assurance and project management.
CO-5	Define the software testing and quality standards.

UNIT I

The Evolving Role of Software - Software Characteristics - Software Applications - Software Myths - Software Process Models: The Linear Sequential Model - The Prototyping Model - The RAD Model - Evolutionary Software Process Models - The Incremental Model - Spiral Model.

UNIT II

Computer-Based Systems - The System Engineering Hierarchy - System Modeling - System Simulation - Business Process Engineering: An Overview - Product Engineering: An Overview - Requirements Engineering - Requirements Elicitation - Requirements Analysis and Negotiation - Requirements Specification - System Modeling - Requirements Validation - Requirements Management - System Modeling

UNIT III

The Elements of the Analysis Model - Data Modeling - Data Objects- Attributes and Relationships - Data Flow Diagrams - The Data Dictionary - Other Classical Analysis Methods - The Design Process – Modularity - Functional Independence - Cohesion – Coupling - Design Documentation - Software Architecture - User Interface Design - Component-Level Design.

UNIT IV

Software Testing Fundamentals - Testing Case Design - White-Box Testing – Black Box Testing - Testing for Specialized Environments - Testing Strategies - Unit Testing - Integration Testing - Validation Testing - System Testing – Case Study.

UNIT V

Quality Concepts - COst of Quality - Software Quality Group (SQA) - SQA Activities – Role and Responsibilities of SQA Group - Formal Technical Reviews - Quality Standards - Software Reliability.

Textbooks:

Roger S Pressman, Software Engineering A Practitioner's Approach, McGraw Hill Publications, 5th Edition, 2009.

Reference Books:

Ian Sommerville, Software Engineering, Pearson Education Publications, 9th Edition, 2011.

James Peter and Pedrycz W, Software Engineering An Engineering Approach, John Wiley& Sons Publications 2007.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Define various software application domains and remember different process model used in software development.	1,3	Understanding
CO-2	Explain needs for software specifications also they can classify different types of software requirements	1,2	Analyzing
CO-3	Convert the requirements model into the design model and demonstrate use of software and user interface design principles.	1,3,5	Creating
CO-4	Classify the testing methods in software testing fundamentals. .	1,5	Applying
CO-5	Distinguish among SCM and SQA	1, 2,4,5	Evaluating

Relationship Matrix

Semester	Code			Title of the course			Hours			Credits
VI	21UCIT63			SOFTWARE ENGINEERING			60			4
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓		✓		✓	✓	✓	✓	✓	✓
CO-2	✓	✓		✓		✓	✓			✓
CO-3	✓		✓		✓	✓	✓	✓	✓	✓
CO-4	✓		✓		✓	✓	✓			✓
CO-5	✓	✓		✓		✓	✓		✓	✓
	Number of matches (✓) = 35 Relationship=Low/Medium/high									

SEMESTER – VI

Course Title	**MOBILE APPLICATION DEVELOPMENT PRACTICALS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT6P1**
Course Type	**PRACTICAL-IX**
Credits	**2**
Marks	100/2

General Objective:

The course provides hands on training to create Android applications with interactive designs by the use of layouts and widgets.

Course Objectives:

CO	The learners will be able to:
CO-1	Create messages and buttons in Android Applications.
CO-2	Build interactive pages with databases.
CO-3	Design the views and layouts.
CO-4	Create the widgets and event listeners.
CO-5	Create custom view components and animation in Android.

1. Basic Android Aplication to display a message
2. Android application to display toast message on button click
3. Android applications using basic user interface controls
4. Android applications to use android specific user inteface controls
5. Android application for login operation
6. Android application to make use of database
7. Android applications to make use of different layouts
8. Android application to implement various Event listeners
9. Android application to display dialog box and alert messages
10. Android application to design style and themes
11. Android application to create custom view components
12. Android application to create animation

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Develop simple Android applications using the codes	1,3	Creating
CO-2	Create user interface controls in Android	1,5	Creating
CO-3	Make use of built in widgets and components to work with the applications	1,3,4	Applying
CO-4	Construct database and data storage in applications	1,2,3	Applying
CO-5	Construct styles and themes in applications	1,5	Evaluating

Relationship Matrix

Semester	Code		Title of the course			Hours			Credits	
VI	21UCIT6P1		MOBILE APPLICATION DEVELOPMENT PRACTICALS			60			2	
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓				✓	✓	✓	
CO-2	✓	✓	✓		✓		✓	✓	✓	
CO-3	✓	✓	✓		✓		✓	✓	✓	✓
CO-4	✓		✓				✓	✓	✓	
CO-5	✓	✓	✓		✓		✓	✓	✓	✓
	Number of matches (✓) = 40 Relationship=High									

SEMESTER – VI

Course Title	**PHP PROGRAMMING PRACTICALS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UCIT6P2**
Course Type	**Practicals- X**
Credits	**2**
Marks	**100/2**

General Objective:

The objective of this course is to Gain ability to make your pages dynamic based upon user interaction, to explore various PHP library functions, and that manipulate files and directories and Learn to interact with HTML forms and store and retrieve information from local data sources which include a database.

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Course Objectives:

CO	The learners will be able to:
CO-1	Build a dynamic web applications
CO-2	Use string and array operation to solve pproblems
CO-3	Create their own functions,to handle errors in web page
CO-4	Create code with a MySQL database to create database-driven HTML forms and to validate the data
CO-5	Learn to implement files, cookies and session concepts in web application

1. Write a PHP program to Create simple webpage using PHP
2. Write a program in PHP to change background color based on day of the week using if else if statements and using arrays
3. Write a simple program in PHP for i) generating Prime number ii) generate Fibonacci series
4. Write a PHP program to remove duplicates from a sorted list
5. Write a PHP Script to print the following pattern on the Screen:
    a. *****
    b. ****
    c. ***

d. **
e. *

6. Write a simple program in PHP for Searching of data by different criteria
7. Write A PHP Program To Perform The Following Operations. (A) Union Of Two Arrays. (B) Traverse The Array Elements In Random Order. (C) Calculate Sum Of Array Elements. (D) Check The Array Element Is Negative Or Not Using Filter.
8. Write a function in PHP to generate captcha code
9. Write a Program to store and read image from Database.
10. Write a program in PHP to read and write file using form control.
11. Write a program in PHP to add, update and delete using student database.
12. Write a program in PHP to Validate Input
13. Write a program in PHP for setting and retrieving a cookie
14. Write a Program to create simple Login and Logout using sessions.
15. Write a program in PHP for exception handling for i) divide by zero ii) checking date format.

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive level
CO-1	Understand the control structure and Looping statements	1,3	Understanding
CO-2	Develop code using String,Array and numeric functions	1,3	Applying
CO-3	Make use of MYSQLi database create a web application	1,3	Applying
CO-4	Build a web application by implementing validation concepts	1,3	Analyzing
CO-5	Construct code using Cookies, session and error handling features	1,3	Evaluating

Relationship Matrix

Semester	Code			Title of the course				Hours		Credits
VI	21UCIT6P2			PHP Programming Practical				60		2
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓		✓		
CO-2	✓	✓	✓	✓		✓		✓		
CO-3	✓	✓	✓	✓		✓		✓		
CO-4	✓	✓	✓	✓		✓		✓		
CO-5	✓	✓	✓	✓		✓		✓		
	Number of matches (✓) = 30 Relationship = Medium									

SEMESTER – VI

Course Title	**REACT JS**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT61A**
Course Type	**DSE-IIIA**
Credits	**3**
Marks	100

General Objective:

Train the students in React JS language and its basic concepts for building user interfacesbased on UI components.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand the fundamentals of React JS.
CO-2	Write and execute React JS Scripts.
CO-3	Use various modules such as Functions, Attributes, Expression.
CO-4	Develop UI components using React JS.
CO-5	Persuade them to pursue advanced React JS concepts.

Unit 1

ReactJS — Introduction-React versions-Features-Benefits-Applications-ReactJS — Installation-Toolchain -The serve static server-Babel compiler-Create React App toolchain - ReactJS — Architecture Workflow of a React-application-Architecture of the React Application-React — Creating a React Application-Using CDN-Using Create React App tool-Files and folders -Source code of the application-Customize the code-Run the application-Using custom solution-Using Rollup bundler-Using Parcel bundler.

Unit 2

React — JSX-Expressions-Functions-Attributes-Expression in attributes-ReactJS — Component-Creating a React component -Creating a class component-Creating a function component -React — Styling -CSS stylesheet-Inline Styling -CSS Modules -React — Properties (props) - Create a component using properties -Nested components -Use components –Component collection.

Unit 3

React — Event management -Introduce events in Expense manager app -React — State Management -What is state? -State management API - Stateless component -Create a stateful component - Introduce state in expense manager app-State management using React Hooks - Create a stateful component -Introducing state in expense manager app -Component Life

cycle -Working example of life cycle API -Life cycle api in Expense manager app -Component life cycle using React Hooks -React children property aka Containment -Layout in component - Sharing logic in component aka Render props -Pagination -Material UI React- Http client programming - Expense Rest Api Server -The fetch() api -React - Form programming -Controlled component -Uncontrolled Component -Formik

Unit 4

React - Routing-Install React Router - Nested routing-Creating navigation - React — Redux

-Concepts - Redux API-Provider component - React — Animation-React Transition Group-Transition – CSS Transition- TransitionGroup- React — Testing - Create React app - Testing in a custom application.

Unit 5

React — CLI Commands-Creating a new application -Selecting a template -Installing a dependency-Running the application-React — Building and Deployment -Building-Deployment-React — Example -Expense manager API-Install necessary modules-State management-List expenses-Add expense.

Textbook

React.js Essentials: A fast-paced journey

Reference Book

React Cookbook

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Understand the Architecture of React JS	1,2	Understanding
CO-2	Creating React application using CDN	1,2	Applying
CO-3	Apply an object-oriented approach such as class and functions to develop UI Components	1,2	Applying
CO-4	Analyze Event Management and Form programming in React JS.	1,2	Analyzing
CO-5	Write React JS scripts to develop different kinds of UI components and evaluate them with different inputs.	1,2	Evaluating

Relationship Matrix

Semester	Course Code		Title of the Course			Hours				Credits
VI	21UEIT61A		React JS			60				3
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓			
CO-2	✓	✓	✓	✓	✓	✓	✓			
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓			
CO-5	✓	✓	✓	✓	✓	✓	✓			
	Number of matches (✓) = 35 Relationship = Medium									

SEMESTER – VI

Course Title	**INTRODUCTION TO DOCKER**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT61B**
Course Type	**DSE-IIIB**
Credits	**3**
Marks	**100**

General Objective:

Train the students in the usage of Docker tools and its basic concepts to develop applications.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Understand about Docker tools.
CO-2	Use the components Image and Containers.
CO-3	Use Docker CLI and Docker Files.
CO-4	Deploy Docker.
CO-5	Implementation of Docker compose.

Unit 1

Docker Introduction -What is Docker-Docker architecture-Why Docker is better than other VM's-Docker use cases-Docker limitations. **Architecture-** What is LXC-CGroups-Union File system-(AUFS)-Kernel Namespaces- Controlled OS-Resources-Docker images-Docker containers-Repositories.

Unit 2

Images & Containers-What are images-What are containers-The difference between the 2-Using Docker hub registry-Building images. **Advanced stuff -** Install Docker-What is Docker file:Building image-from a Docker file- Download and-install Docker-images/containers-Docker as daemon-Docker registry &-Hub-Docker container-Lifecycle-Container lifetime-Container volumes

Unit 3

Docker CLI-Build-Run-Background/Detached-In foreground-Interactive- Expose ports for communication-Commit-Pull-Push-Diff-Tag-Inspect-Logs- And more…..**Docker File-**From-Run-CMD-Expose-Env-Add /Copy-Volume- Entrypoint-Workdir

Unit 4

Docker and Kubernetes-Deploy Docker-containers with K8S-Scale-up-Scale down-Automation-Blue/green deploy-(no downtime)-Networking /Services- Debugging /Logging-Build & Deploy Cluster of Dockers and all required resources

Unit 5

Docker Compose-What is Docker compose-Yml syntax-Services/ multiple containers.

Textbook

Docker: Docker for the Absolute Beginner

Reference Book

Docker: The Ultimate Beginners Guide to Learn Docker Step-By-Step

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Understand the Architecture of Docker.	1,2	Understanding
CO-2	Developing Image from Docker file.	1,2	Applying
CO-3	Apply various commands in CLI.	1,2	Applying
CO-4	Debug, Build and Deploy Cluster of Dockers.	1,2	Applying
CO-5	Apply Docker Compose.	1,2	Applying

Relationship Matrix

Semester	Code			Title of the course			Hours		Credits
VI	21UEIT61B			INTRODUCTION TO DOCKER			60		3
Course Outcomes(COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓	✓		✓	
CO-2	✓	✓	✓	✓	✓	✓	✓		✓	
CO-3	✓	✓	✓	✓	✓	✓	✓		✓	
CO-4	✓	✓	✓	✓	✓	✓	✓		✓	
CO-5	✓	✓	✓	✓	✓	✓	✓		✓	
	Number of matches (✓) = 40 Relationship = High									

SEMESTER – VI

Course Title	**LINUX**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT61C**
Course Type	**DSE-IIIC**
Credits	**3**
Marks	**100**

General Objective:

Train the students in Linux Programming language and its basic concepts to provide exposure to problem-solving through hands-on experience.

Course Objectives:

CO No.	The learners will be able to:
CO-1	Exploring the Linux commands for accessing hardware and software resources
CO-2	Understanding the working concepts of Shell, Pipes and Filters
CO-3	Learning the concepts of Linux file systems
CO-4	Exploring the concept of Process management and Signals
CO-5	Analyzing Inter Process communication

UNIT – I

Introduction to linux and linux utilities: A brief history of linux, architecture of linux,features of linux, introduction to vi editor.linux commands- path, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir,rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip, file handling utilities, security by file permissions,process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask,ulimit, ps, w, finger, arp, ftp, telnet, rlogin. text processing utilities and backup utilities , tail, head ,sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio.

UNIT - II

Introduction to Shells: Linux Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases.

Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste,

Sorting, Translating Characters, Files with Duplicate Lines, Count Characters, Words or Lines, Comparing Files.

UNIT - III

Grep: Operation, grep Family, Searching for File Content.Sed :Scripts, Operation, Addresses, commands, Applications, grep and sed.

UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors,system calls and device drivers.File Management :File Structures, System Calls for File Management – create, open, close, read,write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir,,closedir, mkdir, rmdir, umask.

UNIT – IV

PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, orphan process, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

UNIT – V

INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, and named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

Tex books:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. W. Richard. Stevens (2005), Advanced Programming in the UNIX Environment, 3rd edition, Pearson Education, New Delhi, India.
3. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson

References:

1. Advanced Programming in the UNIX environment, 2nd Edition, W.R.Stevens, Pearson Education.
2. UNIX Network Programming, W.R. Stevens, PHI.
3. UNIX for Programmers and Users, 3rd Edition, Graham Glass, King Ables, Pearson Education

Course Outcomes

CO No.	Upon completion of the course, the students will be able to:	PSO Addressed	Cognitive Level
CO-1	Exploring the Linux commands for accessing hardware and software resources	1,3	Applying
CO-2	Understanding the working concepts of Shell, Pipes and Filters	1,2	Understanding
CO-3	Learning the concepts of Linux file systems	1,2	Understanding
CO-4	Exploring the concept of Process management and Signals	1,2,3	Analyzing
CO-5	Gaining the knowledge on Inter Process communication	1,2,5	Analyzing

Relationship Matrix

Semester	Course Code			Title of the Course		Hours			Credits
VI	21UEIT61C			Linux Programming		60			3
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)			
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓	✓	✓	✓	✓		✓		
CO-2	✓	✓	✓	✓	✓	✓	✓			
CO-3	✓	✓	✓	✓	✓	✓	✓			
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		
CO-5	✓	✓	✓	✓	✓	✓	✓			✓
	Number of matches (✓) = 37 Relationship = Medium									

SEMESTER - VI

Course Title	**PROJECT**
Total Hrs.	**60**
Hrs./Week	**4**
Course Code	**21UEIT62**
Course Type	**DSE-IV**
Credits	**3**
Marks	**100**

GUIDELINES:

1. The project may be done individually or in groups not exceeding five per group.
2. The minimum length of the project should be 30 pages in A4 size.
3. Marks for the project report will be 100 divided as 60% for the project and 40% for Viva-Voce Examination.

EVALUATION SCHEME:

The Project will be evaluated by both the Internal and External Examiners. Each Examiner will evaluate for 100 marks. The average mark obtained by the candidate is considered marks for the Project Report. The allocation of marks for Project is as follows:

Scheme of Evaluation:

Project	Internal	External
Word of title / Topic	5	5
Objectives / Formulation including Hypothesis	5	5
Review of Literature	10	10
Methodology / Techniques / Procedures adopted	15	15
Summary / Findings / Summation	10	10
Works Cited / Work Consulted / References / Annexures / Footnotes	10	10
Relevance of project to social needs	5	5
	60	**60**

SEMESTER - VI

Course Title	**CYBER SECURITY**
Total Hrs.	**30**
Hrs./Week	**2**
Course Code	**21USIT61**
Course Type	**SEC-V**
Credits	**2**
Marks	**100**

General Objective:

1. To understand the concepts of cyber crime , network security and encryption and decryption standards.

2. Gain knowledge to improve the society from cyber crime

Course Objectives:

CO	The learners will be able to:
CO-1	Create line and circle drawing algorithms.
CO-2	Create and develop graphics applications
CO-3	Develop Text and graphics animations using objects.
CO-4	Build their own arts and animations
CO-5	Make Interactive animation works for industry.

Unit I

Cryptography: Introduction to cryptography, key principles of security, security mechanisms, security services, threat, attack, the information systems security engineering process;Symmetric cipher model, substitution techniques-Ceasar cipher, Monoalphabetic ciphers, playfair cipher;substitution techniques – Hill cipher;polyalphabetic ciphers – Vigenere Cipher, Autokey system, One- Time pad, Transposition techniques, steganography;Stream ciphers and block ciphers, Feistel cipher

UNIT II

Web Browser and client security, web security, server security;DES(Data Encryption Standard)-ADVANCED ENCRYPTION STANDARD(AES)-Public key algorithm:RSA algorithm-Hash functions : Cryptographic Hash functions-secure hash algorithm512-Digital signature-Elgamal digital signature-hashing in digital signature.

UNIT III

Random number generation:Pseudo random number generators-Fermats theorem-Euler's theorem-Miller Rabin Algorithm

Web threats:Client level threats – server level threats-Service level threats-Viruses and Malware:virus-virus signature-The internet worm-code red-trojan horse-Web bugs-targeted malicious code-Salami attack-Covert channels-

UNIT IV

Threads in network:Categories of attack -Snort:Snort architecture-Security in networks-Groups, Rings and Fields-Digital Signature Algorithm-VPN and Extranet-Elliptic curve-Database security-Email security

UNIT V

-Operating system memory protection-Protection in General Purpose operating system – controlled access-Attacking authentication-Enumerating content and functionality-Packet analysis-Forensic detection-Administering security-Information Privacy concept

Reference:

E-pathshala

Course Outcomes

CO. No.	Upon completion of the course, the students will be able to:	PSOs Addressed	Cognitive level
CO-1	Understand the concepts of Cyber Security	1,5	Understanding
CO-2	Understand the concepts of Cryptography algorithms	1,2,5	Understanding
CO-3	Understand the concepts of Random number generation	1,2,5	Analyzing
CO-4	Understand the concepts of Threads	1,2,5	Analyzing
CO-5	Understand the concepts of email and security	1,5	Analyzing

Rationship Matrix

Semester	Code			Title of the course			Hours		Credits
VI	21USIT61			CYBER SECURITY			30		2
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO1	PSO2	PSO3	PSO4	PSO5
CO-1	✓	✓	✓	✓		✓				✓
CO-2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-3	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-4	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO-5	✓	✓	✓	✓		✓				✓
	Number of matches (✓) = 39 Relationship = High									

THE SCHEME OF EXAMINATIONS UNDER CHOICE BASED CREDIT SYSTEM

- The medium of instruction in all the UG and PG Programmes is English and Students shall write the CIA Tests and the Semester Examinations in English. Three CIA Tests for one hour each will be conducted. For the calculation of CIA Tests marks the average of the best two tests will be taken. The portion for each test can be 1.5 units of the unitized syllabi.
- Two assignments for the Undergraduate Programmes and one assignment and one seminar for the Postgraduate Programmes are compulsory.
- Two Practical Examinations will be conducted for CIA at the end of the semester and the average will be taken.

Distribution of Marks for the Students admitted into the UG and PG Programmes from the academic year 2021-2022

CIA Tests and Semester Examinations

Undergraduate, Certificate, Diploma and Advanced Diploma Programmes						
Course Type	TOTAL MARKS	CIA TESTS MAX.MARKS	SEMESTER EXAMINATION Max. Marks	PASSING MINIMUM		
				CIA	SEM. EXAM	OVERALL
Theory	100	25	75	Nil	30	40
Practical (2Hrs.)	50	20	30	Nil	12	20
Practical (4Hrs.)	100	40	60	Nil	24	40
Project	100	Nil	Report- 60 Marks Viva-Voce- 40 Marks	Nil	Nil	100

Postgraduate Programmes						
Course Type	TOTAL MARKS	CIA MARKS	SEMESTER EXAM	PASSING MINIMUM		
				CIA	SEM. EXAM	OVERALL
Theory	100	40	60	Nil	30	50
Practical	50	20	30	Nil	15	25
Practical (for PG Maths only)	100	40	60	Nil	30	50
Project Report	150	Nil	Project Report- 90 Marks Viva-Voce Examination - 60 Marks	Nil	Nill	150

CIA TESTS

Distribution of Marks

Components	Tests (A)			Assignment (B)	Seminar (C)	Record Note (D)	Total (A+B+C+D)
	I	II	III	5	-	-	25
UG-Theory	20	20	20				
	The Average of the Best Two Tests:20						
PG-Theory	30	30	30	5	5	-	40
	The Average of the Best Two Tests:30						
UG-Practical (2 hrs)	15	15		-	-	5	20
	The Average of the Tests: 15						
UG-Practical (4 hrs)	30	30		-	-	10	40
	The Average of the Tests: 30						
PG-Practical	15	15		-	-	5	20
	The Average of the Tests: 15						
PG-Practical (Maths only)	30	30		-	-	10	40
	The Average of the Tests: 30						

Question Pattern for CIA Test (Theory)

Programme	Question Paper Pattern			Total (A+B+C)
	Part-A	Part-B	Part-C	
UG	MCQs-8x0.5=4 marks	Internal Choice (Either or type). 2x4=8 marks Answer should not exceed 250 words	Internal Choice (Either or type) 1x8=8 marks Answer should not exceed 500 words	20
PG	MCQs-20x0.5=10 marks	Internal Choice (Either or type) 3x4=12 marks Answer should not exceed 250 words	Internal Choice (Either or type) 1x8=8 marks Answer should not exceed 500 words	30

End Semester Examination (ESE)

The students who have put in the required number of days of attendance are eligible to appear for the End Semester Examinations irrespective of whether they have passed in the CIA Tests or not. They have to pay the examination fees for all the current courses and the arrear courses, if any, and submit the application form before the due date specified for the purpose. For any reason, the

dates will not be extended. Hall tickets will be issued only for those who have paid the fees. The question papers for the End Semester Examinations for all the theory courses of the UG and the PG Programmes will be set for 75 marks.

Question Pattern for End Semester Examinations (Theory)

Programme	Question Paper Pattern			Total (A+B+C)
	Part-A	**Part-B**	**Part-C**	
UG	MCQs- 30x0.5=15 marks	Internal Choice (Either or type) 5x4=20 marks Answer should not exceed 250 words	Internal Choice (Either or type) 5x8=40 marks Answer should not exceed 500 words	**75**
PG	MCQs- 30x0.5=15 marks	Internal Choice (Either or type) 5x4=20 marks Answer should not exceed 250 words	Internal Choice (Either or type) 5x8=40 marks Answer should not exceed 500 words	$\left(\frac{x}{75} \text{ x } 60\right)$ **60**

The Question Paper Pattern for the End Semester Examinations (Practical)

The Question Paper Pattern is designed by the respective departments.