

NEHRU ARTS AND SCIENCE COLLEGE

(Autonomous)

(Reaccredited With "A" Grade by NAAC, ISO 9001: 2008 & 14001: 2004 Certified Recognized by UGC with 2(f) & 12(B) and Affiliated to Bharathiar University) Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.



DEPARTMENT OF COMPUTER APPLICATIONS

PROGRAMME OUTCOMES

On successful completion of the programme, the graduates will have

PO1	Critical Thinking: Understand the fundamental concepts of Computers, Business environment and IT application and business.
PO2	Design/Development of Solution: Understand & analyze technical data to reach actionable conclusions, including technological solutions to the business.
PO3	Modern Tool Usage: Learn technologies & Programming languages in addressing problems.
PO4	The Social interaction: Develop competent technical writing skills so as to enable the graduate to have effective communication in business.
PO5	Environment and Sustainability: Gain the attitude of continuous learning and deriving innovative ideas.
PO6	Ethics: Apply ethical principle and commit to professional ethics responsibilities as per the norms of the IT industry
PO7	Individual and Team Work: Adopt team building environment and will be a good team player.
PO8	Communication: Create improved communication and business management skills, especially in providing technical support.
PO9	Project management and finance: Attain clarity on both conceptual and application-oriented skills in commerce, Finance & Accounting and IT Applications in Business context.
PO10	Lifelong learning: Update technologies continuously.



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PROGRAMME SPECIFIC OUTCOMES (PSOs)

After the successful completion of the programme, the students are expected to

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



NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University) (Reaccredited with "A" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified Recognized by UGC with 2(f) &12(B), Under Star College Scheme by DBT, Govt. of India) Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.



Scheme of Examination BACHELOR OF COMPUTER APPLICATIONS Programme Code: UCA

(Applicable to the students admitted during the year 2022-2023)

rer		Code	apo CO apo Name of the Course			lxami Ma	natio rks	n	
SEMES	Part	Course (Name of the Course	Instructi hours / w	Duration Hours	CIA	ESE	Total	Credits
	Ι	22U1TAM101/ 22U1HIN101/ 22U1MAL101/ 22U1FRN101	Elanthamizh Rachnathmak Hindi Kadhayum Samskaaravum Le Francais Fondamental -I	5	3	50	50	100	4
-	II	22U2ENG101	Professional English - I	5	3	50	50	100	4
		22U3CKC101	Core Paper I: Python Programming	4	3	50	50	100	4
Ι	III	22U3CKC102	Core Paper II: Digital Fundamentals and Computer Architecture	4	3	50	50	100	4
		22U3CAP101	Core Paper III: Practical in Python Programming	4	3	50	50	100	4
		22U3MIA101	Allied Paper I: Mathematics for Computer Science	5	3	50	50	100	4
		21U4ENV101	@Ability Enhancement Compulsory Course: Environmental Studies	2	3	50	-	50	2
	IV	22U4HVY201	Value Education: Human Values and Yoga Practice	1	-	-	-	-	-
				30				650	26
	Ι	22U1TAM202/ 22U1HIN202/ 22U1MAL202/ 22U1FRN202	Pynthamizh Sanchar Hindi Novalum Bhashaapadanavum Le Francais Fondamentale -II	5	3	50	50	100	4
	II	22U2ENG202	Professional English - II	5	3	50	50	100	4
II		22U3CJC201	Core Paper IV: Java Programming	4	3	50	50	100	4
п	III	22U3CKC204	Core Paper V: Data Structures	4	3	50	50	100	4
		22U3CAP202	Core Paper VI: Practical in Java and Network Programming	4	3	50	50	100	4
		22U3MIA202	Allied Paper II: Discrete Mathematics	5	3	50	50	100	4

	IV	21U4HRC202	@ Ability Enhancement Compulsory Course: Human Rights and Constitution of India	2	3	50	-	50	2
		22U4HVY201	@ Value Education: Human Values and Yoga Practice	1	2	50	-	50	2
				30				700	28
	Ι	22U1THA303/ 22U1HND303/ 22U1MLA303/ 22U1FEN303	Narunthamizh Prernathmak Hindi Sanchaarasaahithyam Le Francais Preliminaire	3	3	30	45	75	3
	II	22U2ELS303	Technical English - I	3	3	30	45	75	3
		22U3CKC305	Core Paper VII: Operating Systems	4	3	30	45	75	3
	III	22U3CJC302	Core Paper VIII: Relational Database Management Systems	4	3	30	45	75	3
		22U3CAP303	Core Paper IX: Practical in SQL and PL/SQL	3	3	25	25	50	2
III		22U3MIA303	Allied Paper III: Operations Research	4	3	50	50	100	4
		22U3CAP304	Core Paper X: Practical in LINUX	2	3	25	25	50	2
		22U4CAZ301	Skill Based Paper I: Practical in Excel Macro	3	30	45	75	3	
	IV	22U4NM3BT1 / 22U4NM3AT1/ 22U4NM3CAF/ 22U4NM3GST/ 22U4NM3WRT	 # @Basic Tamil – I / ##Advanced Tamil – I / * NME: Consumer Affairs / Gender Sensitization / Women's Rights 	2	3	50		50	2
		SBOEC	Skill Based Open Elective Courses - Extra Departmental Course	2	3	-	50	50	2
		22U4CAVALC	Skill Enhancement: Value Added Course - Institute Industry Linkage	-	-	-	-	-	-
				30				675	27
	Ι	22U1THA404/ 22U1HND404/ 22U1MLA404/ 22U1FEN404	Senthamizh Vaicharik Hindi Drisyakalayum Computarum Le Francais Elementaire	3	3	30	45	75	3
	II	22U2ELS404	Technical English - II	3	3	30	45	75	3
		22U3CAC405	Core Paper XI: .Net Programming	5	3	30	45	75	3
	III	22U3CKC408	Core Paper XII: Software Engineering	3	3	30	45	75	3
		22U3CAP406	Core Paper XIII: Practical in .Net Programming	4	3	25	25	50	2
		22U3BAA404	Allied Paper IV: Financial Accounting	5	3	30	45	75	3

IV		22U4CAZ402	Skill Based Paper II: Practical in Multimedia Systems	3	3	30	45	75	3
	IV	22U4NM4BT2 / 22U4NM4AT2/ 22U4NM4GEN	# @Basic Tamil – II / ##Advanced Tamil - II / General Awareness	2	3	5	50		2
		VBOEC	Value Based Open Elective Courses – Intra School Course	2	3	-	50	50	2
		22U4CAVALC	Skill Enhancement: Value Added Course - Institute Industry Linkage	-	-	-	-	-	Grade
				30				600	24
		22U3CAC507	Core Paper XIV: Computer Networks	5	3	30	45	75	3
		22U3CAC508	Core Paper XV: Ethical Hacking	5	3	30	45	75	3
	III	22U3CKC509	Core Paper XVI: PHP Programming	5	3	30	45	75	3
		22U3CAP509	Core Paper XVII: Practical in PHP Programming	5	3	30	45	75	3
V		22U3CKE501/ 22U3CKE502 22U3CKE503/ 22U3CKE504	Discipline Specific Elective Paper – I	6	3	30	45	75	3
		22U3CAV510	In-plant Training	-	-	50	-	50	2
	IV	22U4CAZ503	Skill Based Paper III: Practical in Internet of Things	4	3	30	45	75	3
				30				500	20
		22U3CKC611	Core Paper XVIII: Data Mining	6	3	50	50	100	4
		22U3CAV611	Project and Viva-Voce	6	-	50	50	100	4
VI	III	22U3CKE605/ 22U3CKE606/ 22U3CKE607/ 22U3CKE608	Discipline Specific Elective Paper - II	6	3	30	45	75	3
		22U3CAE609/ 22U3CAE610/ 22U3CAE611/ 22U3CAE612	Discipline Specific Elective Paper - III	6	3	30	45	75	3
	IV	22U4CAZ604	Skill Based Paper IV: Practical in R Programming	6	3	30	45	75	3
	V	22U5EXT601	Extension Activities	-	-	50	_	50	2
				30				475	19
			Total					3600	144
			Additional Credit Optional (II-VI)						8 \$

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

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

* NME – Student shall choose any one course out of three courses.

@ No End Semester Examinations. Only Continuous Internal Assessment (CIA)

\$ - Not included in Total marks and CGPA Calculation

** Examination and Evaluation for value added course shall be conducted by the Industry and the marks shall be submitted to the Controller of Examination for the award of the degree.

ELECTIVE PAPERS:

Elective Papers	Course Code	Name of the Course
	22U3CKE501	Blockchain Technology
Elective Demon	22U3CKE502	Next Generation Networks
Elective Paper - I	22U3CKE503	Internet of Things
	22U3CKE504	Big Data Analytics
	22U3CKE605	Software Quality Assurance
Election Demon II	22U3CKE606	Information Security
Elective Paper - II	22U3CKE607	Cloud Computing
	22U3CKE608	Cyber Security
	22U3CAE609	Artificial Intelligence
Elective Demon III	22U3CAE610	Software Project Management
Elective Paper - III	22U3CAE611	Bioinformatics
	22U3CAE612	Mobile Application Development

EXTRA DEPARTMENTAL COURSE

S. No.	Semester	Course Code	Course Title
1	TIT	22U4CK3ED1	Multimedia Tools - Practical
2	111	22U4CK3ED2	Web Development using HTML - Practical

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

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

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

Self-Study Paper offered by Department of Computer Applications:

S. No.	Semester	Course code	Course Title
1	Somester II to V	22UCASS01	Problem Solving and Programming
2	Semester II to v	22UCASS02	Web Design Using HTML

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Board of Studies in Computer Applications Nehru Arts and Science College Coimbatore. BoS - Chairman Department of Computer Applications, Nehru Arts and Science College, Thirumalayampalayam, Coimbatore - 941105



Cou	irse Code	Title										
22U1 21U	TAM101 / 1TAM101		PART-I - El	anthamizh (இளந்தமிழ்)							
Ser	nester: I		Credits: 4	CIA:	50 Marks	ESE: 50 Marks						
			(Common to all U	nes)								
Course	Objective	மொழ மாண	،மாழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்.									
Course	Category	Skill	l Development (மாணவர்களின்	மொழித்திறனை	ன ஊக்குவித்த	ல்)						
Develop	pment Needs	Regi	Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)									
Course	Description	மாண மொį	ாவர்களின் மொழித்திறனை ஊக் ழியின் அவசியத்தை உணர்த்துத	குவித்தல் ம <u>ர்</u> நல்	றும் உலக அ	ளவில் தமிழ்						
Course	Outcomes			Teaching	g Methods	Assessment Methods						
CO 1	சங்க இ சீா்திருத்தச்	லக்கிய சிந்	பங்கள் வாயிலாக சமூகச் சிந்தனைகள் பெறப்படும்.	விரி காணொளிப்	வுரை/ பட விளக்கம்	ஒப்படைவு						
CO 2	அற இல வாழ்வியல்	க்கியா பண்பு	ங்களின் வழி தமிழர்களின் களைக் கற்று அறிதல்.	விர	പ്പഞ്ഞ	குழுத்திட்டம்						
CO 3	பெண்ணியச் மாணவர்கஞ	க் க நக்கு உ	விஞர்களின் படைப்புத்திறனை உணர்த்துதல்	விரி காணொளிப்	வுரை/ பட விளக்கம்	கருத்தரங்கு						
CO 4	சிறுகதைகள மாணவர்களு	ளின் நக்கு	வழி சமூக கருத்துகளை அறிவுறுத்தல்	விரிவுரை / (தழு விவாதம்	ஒப்படைவு						
CO 5	தமிழ் இலக	கிய	வரலாற்றுத்திறனை வளர்த்தல்	விரிவுரை/ கு	நழு விவாதம்	கருத்தரங்கு						
Offered	l by இளந்தம	βġ										
Course	Content இள	ந்தமிழ்	റ (முதற்பருவம்)		Instructional	Hours / Week : 5						
Unit	Descriptio	n	Text Book		С	hapters						
Ι	சங்க இலக்கி	யம்	1. ஐங்குநூறு 2. பதிற்றுப்பத்து 3. பத்துப்பாட்டு - முல்லைப்பா 4. சிறுபாணாற்றுப்படை	கிள்ளைப்பத்து (281-290) பாடல்கள் இரண்டாம் பத்து (11 -15 ஐந்து பாடல்கள்) முல்லைப்பாட்டு முழுவதும் (1-103 வரிகள்) சோநாட்டின் வனமை								
			Instruction	onal Hours		15						
Suggest	ted Learning I	Metho	ods: நாடக முறையில் கலந்துறை	ரயாடல்								
п	அற இலக்கிய நீதிநூல்கள்	வ்ப	 அறன் வலியுறுத்தல் புகழ் வாய்மை நாலடியார்-பொருட்பால் நான்மணிக்கடிகை 		31- 40 குறட 231 - 240 (291 - 300 (11 ஆவது . (கூடா நட்பு முதல் ஐந்த	பாக்கள் தறட்பாக்கள் தறட்பாக்கள் அதிகாரம் 1-10) பாடல்கள்						
G			Instruction	onal Hours		15						
Suggest	ted Learning I	vietho	ous: கலந்துரையாடல் 1 அண்டாள் பிரியகர்சினி									
III	பெண்ணியக் கவிதைகள்		1. ஆண்டாள் பாய்தாசன் 2. கவிஞர் இளம்பிறை 3. சுகிர்தராணி 4. அ. வெண்ணிலா		பூசசிவாழ்க்கை தொட்டிச்செடி அம்மா நீரில் அலையுப்	் சுயம் பேசும் கிளி ம் முகம்						
~			Instruction	onal Hours		15						
Suggest	ted Learning I	Metho	ods : புதுக்கவிதை எழுதும் திறஎ	ர் பெற்றமை								

	UG						NASC	2022
				1. குட்டி ரேவதி			நிறைய அறைகள்	உள்ள வீடு
				2. ஜெயமோகன்			 யானை டாக்டர்	-
IV சிறுகதைக		தகவ	ή	3. ச.தமிழ்ச்செல்	ാഖൽ		வெயிலோடு போய்	I
		•		4. வண்ணநிலவ	ன்		எஸ்தர்	
				5. உமாமகேஸ்	வரி		மரப்பாச்சி	
					Instructio	onal Hours	15	
Sugges	ted Lear	ming	g Method	s:சிறுகதை ப	டைக்கும் திறன்	பெற்றமை		
			1	. புதுக்கவிதையில	ன் தோற்றமும்			
X 7	தமிழ் இலக்கிய வரலாறு			வளர்ச்சியும்	_		ட லில் ைர்ரி	
v				. சிறுகதையின் (தோற்றமும் வளர்	ச்சியும்	தமழ இலகக	പംബംവെന്ന
			3	. படிமம், குறியீ	்டு பற்றிய —	விளக்கம்		
					Instructi	onal Hours	15	
Suggest	ted Learn	ing I	Methods :	குழு விவாதம்				
]	Cotal Hours	75	
Tex	t Books		இளங்கள தொகுப்	லை முதலாம் அ பு: தமிழ்த்துறை	ஆண்டு தமிழ் ம ,நேரு கலை ட	ாணவர்களுக் மற்றும் அறிவ	குரிய பாடநூல்'' இ ியல் கல்லூரி, கே	ாந்தமிழ்'' 1யம்புத்தூர்.
சங்க Reference Books நிறை வீதில			சங்க இ இரா.இள நிறைய வீதிவீதி,	லக்கியம்- உரை ங்குமரனார்,முன அறைகள் உள் சென்னை.	ரயாசிரியர் ஓள னவர்.பி.தமிழகள ளவீடு - குட்டி	வை துரைசாப ர் தமிழ் மன் ரவதி எழுத்த	மிப்பிள்ளை, பதிப்ப எ அறக்கட்டளை, (ஏ பிரசுரம்,11மாடல்	ாசிரியர்கள் சென்னை.17 நகர்,10 வது
Web	b. URLs		https://y	outu.be/2SMM	5LvZYo0			
		•		Tools for Assess	sment (50 Mark	s)		
CL	A I	(CIA II	CIA III	Seminar	Assignmer	nt Group Project	Total

CIA	CIA I		CIA II		CIA III		Se	Seminar		Assignment		Group Project		Total				
8	8		8		10			8	8		8			8		50		
Mapping																		
PO / CO	PO1	PO2	PO3	PO4	PO5	РО	6 P	07	PO8	P	SO1	PSO	2	PSO3	PSO4	PSO5		
CO1	-	-	Н	-	Н	Н	N	1	Н	H -		-		-		-	-	-
CO2	-	-	Μ	-	Н	L	. н н		Н		-	-		-	-	-		
CO3	-	-	L	-	Μ	Μ	I	ł	Н		-	-				-	-	-
CO4	-	-	Н	-	Н	Μ	N	1	L		-	-		-	-	-		
CO5	-	-	Н	-	Н	L	I	I	Н		-	-		-	-	-		
H-High; N	M-Medi	um; L-l	Low															
		Course	e desigi	ned by				Verified by										

Cours	e Code						
22U1H	HIN101		Part - 1 : F	Rach	nathmak Hindi		
Seme	ster: I		Credits: 4	CIA	: 50 Marks	ESE: 50	Marks
		I	(Common to all UG P	rog	rammes)		
Course	Objectiv	ve	हिंदी भाषा का अच्छा ज्ञान प्राप्त करने	के '	लिए।		
Course	Categor	y	Skill Development				
Develop	pment N	eeds	Regional				
Course	Descrip	tion	Improved accuracy & quality,	imp	proved communic	ation	
Course	Outcom	es			Teaching Methods	Assessme	nt Methods
CO 1	नाटक आसपार	से रच स की द	नात्मकता का विकास होता है। यह ह इनिया को समझने में भी मदद करता है	मारे ।	Lecture / Video Methods	Ass	ignment
CO 2	कहानिर जगाने	गं में म	छात्रों की कल्पना और जिज्ञासा दद करती हैं।	ा को Case studies Group I			
CO 3	व्याकरप समझने लेखन शक्ति इ	ग हिंदी ⁻ में म छात्रों को विव्	भाषा को सही ढंग से बोलने, लिखने दद करता है। विज्ञापन लेखन और कह को उनके रचनात्मक लेखन और कल जसित करने में मदद करेगा।	और ड़ानी पना	Lectures / Video Lessons) Se	eminar
CO 4	अनुवाद बनाता	ं सभी है।	लोगों के बीच प्रभावी संचार को स	क्षम	Lecture / Video Methods	Ass	ignment
CO 5	गद्यांश संदर्भ दें में आप	ं लेखन के आध की बुद्	। लिखित पाठ के सार को समझने ार पर आपके निष्कर्षों का अनुमान ल धिमता का आकलन करता है।	और गाने	Lecture / Dumb Charades	Se	eminar
Offered	l by Hi	ndi					
Course	Content	;			Instruct	ional Hour	s / Week : 5
Unit			Description			Text Book	Chapters
Ι	नाट	क लड़ा	ई - 1979 - सर्वेश्वर दयाल सक्सेना			1	All
					Instruction	nal Hours	15
Suggest	ted Lear	ning l	Methods : Visual Learning				
п	कहा 1. मज 2. ठाकु 3. चीफ 4. भोल	ना - बूरी' - र का र र की द गराम व	मन्नू भंडारी कुआँ - मुंशी प्रेमचंद ावत - भीष्म साहनी ग जीव -हरिशंकर परसाई			1	1 to 4
	I				Instruction	nal Hours	15
Suggest	ted Lear	ning I	Methods : Auditory				

III	1. अब् कर 2. वि 3. दिग	नुप्रयुक्त जा। ज्ञापन ले र गए स	व्याकर ोखन ांकेतों से	ण - स कहानी	नंज्ञा, सर्वन लेखन।	ाम, क्रि	या और	विशेष	ाण की प	नहचान	1	1	,2,3
•									Instr	ructio	nal Hour	s	15
Suggeste	ed Lea	rning I	Metho	ds : Co	mprehens	ive writi	ng						
IV	अनुवा	द : अंग्रे	ज़ी से वि	हेंदी (अनुवाद अध	म्यास -	3)1-	- 10 3 1	ानुच्छेद		3		1,2
									Instr	ructio	nal Hour	s	15
Suggeste	ed Lea	rning I	Metho	ds : Au	uditory, Vi	isual							
V	पारिभ	ाषिक श	ब्दावली	, गद्य	ांश लेखन						5		1,2
									Instr	ructio	nal Hour	s	15
Suggeste	ed Lea	rning l	Metho	ds: Co	omprehens	sive writ	ing						
			1							To	otal Hour	S	75
			1	. नाटक	ন্ লड़াई - '	1979 -	सर्वेश्वर	दयाल	सक्सेना				
			2	. 2. व	कहानी संग्र	ह							
T	(D 1		3.	. अनुव	ाद अभ्यास	-3 द	क्षिण भ	रित हिं	दी प्रचार र	सभा,	चेन्नई -17		
Tex	t BOOK	.S	4	. Bhar	ratdarshar	1.co.nz							
			5	. भाषाः	शास्त्र का प	गरिभाषिव	क श ब्द	कोश -	राजेंद्र द	विवेदी			
			6	. श्री रा	ामदेव , व्य	ाकरण प्र	दीप, लो	क भार	ती प्रकाशव	` न, इला	हाबाद		
				संदर्भ	ग्रंथ		- ,				<u> </u>		
			1	ਵਿੰਟੀ	 नाटक भौग	जंगमंत्र	_ ਦੱਹ	ाम का	गर तर्मा				
Refere	nce Bo	oks	2	. ਾਰਪਾ ਇ_ਰੀ	णाटनः आर् ग अच्छोनचा	रगणप	- ७२ गालिक १	ाण पुरु उ	गर पणा ने नेनन्द्री				
			2	. ৷চল্বা ১০০৫ চ	। जलायना २ - 6 कि -	471 4 10	א משפוור אד ד		।। - ५५२७ म	ਆ - 			
XX/-L TT	<u>.</u> т.		3.	आधु	नक हिदा व	व्याकरण	आर रय	1न। - ९	ज्ञ. वास <u>ु</u> दव	লবল	प्रसाद		
web. UI	XLS			T]			0 1/-	1)				
				1	OOIS IOF <i>A</i>	Assessn	nent (S		rks)		C		
CIA	Ι	CL	A II	0	CIA III	Ass	signme	ent	Semina	ar	Group proiect	To	tal
8			8		10		8		8		8	5	0
						Map	ping						
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO	2 PSO3	PSO4	PSO5
CO1	-	-	Н	M	M	L	-	-					
CO2	-	-	Н	L	L	Н	-	-					
CO3	-	-	-	L	М	Н	-	-					
CO4	-	-	М	М	Н	L	-	-					
CO5	-	-	L	М	Н	L	-	-					
H-High;	M-Me	dium; I	L-Low										
		Cour	se desi	gned b	ру					Veri	fied by		

Course	e Code					
22U1M	AL101		Part - 1 Kadhayun	n Samskaaravum		
Semes	ster: I		Credits: 4 CI	A: 50 Marks	ESE: 50 N	Marks
		1	(Common to all UG Pr	ogrammes)		
Course	Objectiv	ve	ആധുനികകാലത്തെ മലയാള കുറിച്ചും അവബോധം ഉണ്ട	കഥകളെ കുറിച്ചും ഭാക്കുന്നു	ം സംസ്കാം	രത്തെ
Course	Categor	у	Skill Development			
Develop	ment No	eeds	Regional			
Course	Descrip	tion	Improved accuracy & quality, in	mproved communica	tion	
Course	Outcom	es		Teaching Methods	Assessmen	nt Methods
CO 1	കഥയു അഭിര	ടെ ന റൂചിെ	vംവേദനം ആസ്വാദകന്റെ യ പൂർത്തിയാക്കുന്നു	Lecture / Video Methods	Assi	gnment
CO 2	പ്രക്യര കഥാപ	പ്പത്വത് പര്വസ	മായി ബന്ധപ്പെടുന്ന രം	Case studies	Group	p Project
CO 3	ഭക്ഷണ കൂട്ടായ	റവും ഗ്മ ഉ	അതിന്റെ സംസ്കാരവും ഉണ്ടാക്കുന്നു	Lectures / Video Lessons	Se	minar
CO 4	ഭക്ഷണ അർത	റത്തിര മവത	ന്റെ മൂല്യം താക്കുന്നു	Lecture / Video Methods	Assi	gnment
CO 5	ആശയ	ം പി	പുലനം	Lecture / Dumb Charades	Se	minar
Offered	by De	epartr	nent of Malayalam	•	ł	
Course	Content			Instruct	ional Hours	/ Week : 5
Unit			Description		Text Book	Chapters
	ചെ	റുകഥ	രകൾ - സമകാലിക കഥകഗ	δ		
I	1. 6 2. 6 3. 6 4. 6 5. 6	പരുന പാലാ കുളവ മരണ കക്കു	ത് - E .സന്തോഷ്കുമാർ ാഴിമഥനം - K .രേഖ വാഴ - വി .എം .ദേവദാസ് മുണ്ടാക്കിക്കളിക്കാം - പി .വ കളി - ഫ്രാൻസിസ് നൊറോണ	ി ഷാജികുമാർ n	1	1 to 5
				Instructio	nal Hours	15
Suggest	ed Lear	ning N	Methods : Visual Learning			
II	1. 6 2. 6 3. 6 4. 6 5. 8	പാലാ വെള്ള മരപ്പാ മാണി ജന്മദിം	വംഘയ്യ ളപ്പൊക്കത്തിൽ - തകഴി യാത്ര - കേശവദേവ് വെകൾ - കാരൂർ ക്കൻ - ലളിതാംബിക അന്ത നം - ബഷീർ	ർജനം	1	6 to 10
				Instructio	nal Hours	15
Suggest	ed Lear	ning N	Methods : Auditory			

	സ	ംസ്കാ	ര പഠ	nuo -	കേരള	ളത്തിെ	ല രു.	ചിഭേ	ദങ്ങൾ					
	1. ക	ംാസർേ	കാടും	കന്നം	യാളവ	പും ഒ	ദെവറ	വിപ്ലര	പത്തിന്	റെ				
тт	ക	ണ്ണൂരും	o								1	1	22	
111	2. ແ	ບວັຂັ້ງທີ	രി ,മ	ുട്ടമാല	പ,എര	തന്ത് ,ശ്ര	മ്പാഹ്മ	ണാൾ) –		1	1	,2,3	
	(0	കാഴി	ക്കാട്)										
	3. Ø	ലപ്പുറം	റ കേ(ളത്ത്	തിന്െ	റ അ	റബ്യ							
									Inst	ructiona	al Hou	rs	15	
Suggest	ed Lea	arning I	Metho	ds : Co	ompre	hensive	e writi	ng						
	സ	ംസ്കാ	ര പഠ)Mo	കേര	ളത്തി	ല രു.	ചിഭേ	ദങ്ങൾ					
IV	1. ເ	ചട്ടായി	യെ	ഇത്	ശൂരാ	<u></u> ξο - ((തിശൂർ	5			1		4,5	
	2. එ	ംരിമ്പന	കളുടെ	ຣ	ിൽ	- പാല	ക്കാട്							
									Inst	ructiona	al Hou	ſS	15	
Suggest	ed Lea	arning I	Metho	ds : A	uditor	y, Visu	al							
V	ന	പമാധ്യ	മങ്ങഗ	ð - Ó	വിവര	ർത്തനം)				1	1	,2,3	
									Inct	ructions	I Hom	•C	15	
Suggest	ed Les	rning I	Metho	ds · C	omnre	hensiv	e writi	nσ	11150		<u>ii iitui</u>		15	
Duggest	tu Lti	••••••• <u>•</u> ••	vicino.		ompit			<u>"6</u>		Tota	al Hom	rs	75	
		1. ചെ	റുകഥക	ൾ	-	(10	ചെറു	കഥക	(ፊ)	1000				
T (D		2. സം	സ്കാര	പഠന	o - (നാടൻ (കേരള്	എക്	സ്പ്രസ്സ്					
Text Bo	OOKS	ഡോ	ວ.ໜີ. ເ	ഗണേഷ്	ັ, ທຳດ	ർ ബുക	ດັໜ <u>ັ</u> 🛛	ൢഁൢഺ	8					
		3. നവ	മാധ്യമ	ങ്ങൾ	- ടി.െ	ക .സരേ	ന്താഷ്ക്	കുമാർ	ഡി.സ	ഗി.ബുക്ക്	സ് കോ	ട്ടയം		
	1. എം അച്യുതൻ - ചെറുകഥ ഇന്നലെ ഇന്ന് - ഡി.സി.ബുക്സ് കോട്ടയം 2. ചെറുകഥയുടെ ഉരന്ദസ്- വി രാജകാഷ്ണൻ മാതാഭാമി ബാക്സ് കോഴിക്കോട്													
2. ചെറുകഥയുടെ ഛന്ദസ്- വി. രാജകൃഷ്ണൻ മാതൃഭൂമി ബുക്സ് കോഴിക്കോട് 3. പുതിയ കഥ പുതിയ വായന - ഫിഡി : ഡോ.ഷീബാ ദിവാകരൻ														
Defense	Reference 3. പുതിയ കഥ പുതിയ വായന - എഡി : ഡോ.ഷീബാ ദിവാകരൻ													
Refere	Reference Books													
DUUr	Books 4. കേരള സംസ്കാരം - എ .ശ്രീധര മേനോൻ നാഷണൽ ബുക്ക്സ് കോട്ടയം													
		5. ന്യൂ	ၮၟၴ ၟၟၟ႞	മിന്റെ	അക	വും പ	ുറവും	-	ബി.ആ	ർ .പി.ഭ	ാസ്കർ	ഗ്രീൻ		
		ബും	കസം	മ്പ്രൂറ്ര)									
Web. U	RLs	http://v	www.k	eralac	ulture	.org>li	teratu	re						
				То	ols for	Assess	ment	(50 M	arks)					
CIA	I	CI	A II	C	IA III	As	signme	ent	Semina	ar G	roup roiect	То	tal	
8			8		10		8		8		8	5	0	
						Maj	oping							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	-	-	Н	Μ	Н	Η	-	-						
CO2	-	-	Н	L	Н	M	-	-						
CO3	-	-	-	Μ	Μ	Н	-	-						
CO4	-		L	Μ	L	H	-	-						
<u>CO5</u>	-	<u> </u>		-	Н	-	-	-						
H-High;	M-Me	edium; I	L-Low							X 7 • 00	11			
		Cours	e desig	ned by	y					Verifie	d by			

Cou	rse Code		Title		
22U1 21U	lFRN101/ 1FRN101	Part - I LE FRA	ANÇAIS FONDAMI	ENTAL - I	
Sen	nester: I	Credits: 4 C	IA: 50 Marks	ESE: 50	Marks
		(Common to all UG	Programmes)		
Course	Objective	Acquisition of standard French	ı through fundamenta	l French gra	ammar.
Course	Category	Skill Development			
Develop	oment Needs	Global			
Course	Description	This course has basic knowled a solid foundation in the acqui fundamental French grammar	ge of the French gran sition of standard Fre	nmar and ai nch through	ms to build 1
Course	Outcomes		Teaching Method	s Assessm	ent Methods
CO 1	Learn basic I French civili	French grammar along with sation	Lecture	As	signment
CO 2	Knows the g	ender of nouns	Word game/ Lecture	S	eminar
CO 3	Learn Negati usage of prep	on, articles, and understand the positions.	Lectures / Video Lessons)	Quiz
CO 4	Learn Futur	proche, Pronominal verb,	Tutorial / Case Studies	As	signment
CO 5	Know to self sentences	-introduce and translate simple	Lecture /	Gro	up project
Offered	by French		·		
Course	Content		Instruc	tional Hou	rs / Week : 5
Unit		Description		Text Book	Chapters
Ι	Mes cinq sens	en action		1	0
~			Instruction	al Hours	15
Suggest	ed Learning I	Methods: Worksheets , Readin	g practice	1	1
11	S'ouvrir aux a	autres	T		15
Suggest	ed Learning I	Methods: Kaboot Ann Works	Instruction heets	al Hours	15
III	Partager son	lieu de vie		1	2
			Instruction	al Hours	15
Suggest	ed Learning I	Methods : Audio & Visual, Spo	eaking practice		
IV	Vivre au quot	idien		1	3
I			Instruction	al Hours	15
Suggest	ed Learning I	Methods : Comprehensive Wr	iting,		
V	S'ouvrir à la cu	llture		1	4
			Instruction	al Hours	15
Suggest	ed Learning	Methods: Translating simple s	sentences, comprehe	nding the	
pubbugu	•		Tot	al Hours	75

Text B	ooks		Saiso Olive	on 1 Me eira, De	éthode orothée	de Fra Dupl	ançais – eix (Un	Ma it 0 t	rie to 4	-Noëlle 4)	Coct	ton,	Anoucl	hka De	
Refere	nce boo	ks	A11	Echo N	léthod	e de F	rançais								
Web. U	J RLs		Ling	gua.cor	n, TV	5 app,									
				T	ools fo	r Ass	essmen	t (50	M	larks)					
CL	A I	CI	A II	C	IA III	Α	ssignm	ent		Semina	ar		Quiz	То	tal
	8		8		10		8			8			8		50
				•		Ma	pping								
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	РО	8	PSO1	PSC	02	PSO3	PSO4	PSO5
CO1	-	-	Н	М	Н	Η	-	-		-	-		-	-	-
CO2	-	-	Н	L	Н	М	-	-		-	-		-	-	-
CO3	-	-	-	М	М	Н	-	-		-	-		-	-	-
CO4	-	-	L	М	L	Н	-		-	-	-		-	-	-
CO5	-	-	L	-	Н	-	-	-		-	-		-	-	-
H-High	n; M-Me	edium; l	L-Low												
		Cours	e desig	ned by	y						Ver	ifie	d by		

Course	Code]	ſitle			
22U2E	NG101		Part II -	- Profe	essional Englis	sh I		
Semes	ter: I		Credits: 4	CIA	: 50 Marks		ESE: 50 1	Marks
		1	(Common to all	UG Pi	rogrammes)			
Course	Objectiv	ve	To help students to imbibe	e, deve	lop, practice ar	nd use	e the LSRV	V skills and
			fine tune their productive s	kills.				
Course	Categor	y	Skill Development					
Develop	oment N	eeds	Global					
Course	Descrip	tion	SD: Helps to develop LSR	W skil	1			
Course	Outcom	es			Teaching Met	hods	Assessme	nt Methods
CO 1	Recog throug	nize 1 h the	istening, and reading profici prose discourses.	iency	Lecture/Tute	orial	Assi	gnment
CO 2	Use an skills t	nd int hroug	erpret imaginative, and cre h the poetic genre.	eative	Lecture/Tute	orial	Assi	gnment
CO 3	Enhan effecti	ce tl velv tl	he students to use En hrough short story.	nglish	Lecture/Tute	orial	Sp	eaking
CO 4	Execut acader	te and nics a	d exercise grammatical skil	lls in	Lecture/Tute	orial	Re	eading
CO 5	Evalua	te the	LSRW skills through literat	ture.	Lecture/Tute	orial	W	riting
Offered	by De	epartr	nent of English					
Course	Content	;			Inst	ructio	onal Hours	s / Week : 5
Unit			Description				Text Book	Chapters
I	Prose Leigh Rajago A.G. C Listen	Hunt palac Gardin ing A	– Getting Up On Cold Morn hari – Tree Speaks er – On the Rule of the Road ctivity – Comprehension pra	ing d actice f	from Prose		1	1-3
					Instru	ctiona	al Hours	15
Suggest	ed Lear	ning I	Methods : Cooperative Lea	arning				
	Poetry	7						
	John N	Ailton	 On His Blindness 					
II	Maya .	Angel	ou -Phenomenal Women				1	4-6
	A. K. 1	Ramai	nujan – A River	_				
	Speak	ing A	ctivity – Group Discussion I	Forum				
0	17	• •		•	Instru	ctiona	al Hours	15
Suggest	ed Lear	ning I	Methods : Inquiry Based Lo	earnin	lg			
ш	O. Hei R. K. I Oscar Readi from S	nry – 7 Naray Wilde ng A Short-s	The Last Leaf an – The Missing Mail - The Happy Prince ctivity – Pronunciation pra	actice	and enhancem	ient	1	7-9
					Instru	ctiona	al Hours	15
Suggest	ed Lear	ning I	Methods : Classroom Activ	vity				

IV	Gram Parts o Tenses Kinds o Writin	mar f Speed of Sent	ch ences vity –	Paragr	aph W	riting 1	ising g	ramm	nar Comp	onents	1	10)-13
I		8	,				00		Inst	ruction	al Hour	s	15
Suggest	ed Lea	rning I	Metho	ds : Di	irect M	Iethod							
V	Writin Letter Notice Memo Minut	ng Skil Writin , Writi , Adve es of th	ls g (Forn ng Ciro rtisemo ne Mee	mal & cular ent ting	Inform	ual)					1	14	4-17
									Inst	ruction	al Hour	s	15
Suggest	ed Lea	rning l	Metho	ds : Ao	ctivity	Based	Learr	ing					
										Tot	al Hour	S	75
Text Bo	oks		Com	piled b	by the l	Depart	ment o	f Eng	glish, NAS	SC.			
Referen	ce Boo	ks	CLII TAN the s	L (Co ISCHE tudent	ntent E NOT s by th	& La E: (Tez e depa	nguage kt: Pres rtment	e Int cribe and t	egrated d chapter he college	Learnir s or pa e)	ng) – N ges will I	Iodule be giver	by 1 to
Web. U	RLs												
				Т	ools fo	or Asse	essmen	t (50	Marks)				
CIA	I	CL	A II	C	IA III	As	ssignm	ent	Speaki	ng R	eading	To	tal
8			8		10		8		8		8	5	50
						Ma	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO	8 PSO1	PSO2	PSO3	PSO4	PSO5
CO1	М	L	Н	L	М	М	Н	Μ	H	Н	М	Н	М
CO2	Μ	L	Н	L	Н	М	Н	Μ	H	Н	М	Η	М
CO3	Μ	L	Н	L	Н	Η	Η	Η	Н	Н	М	Н	М
CO4	Μ	L	Н	L	Н	L	Н	Η	Н	Н	М	Н	Н
CO5	Н	М	Н	L	Н	Н	Н	Η	Н	Η	Н	Н	М
H-High;	M-Me	dium; l	L-Low										
		Cours	e desig	ned by	y					Verif	ied by		

2022

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Course	Code			r	ſitle						
21U3C	KC101		Core Paj	per I: Py	ython Programmin	g					
22U3C	KC101										
Semes	ter: I		Credits: 4	CIA	: 50 Marks	ESE: 50	Marks				
9	<u></u>		(Common to B. Sc	•. IT / A	IML / BCA)		1 .				
Course	Objectiv	e	To develop algorithmic s Python	solutions	s to simple comput	ational prol	olems using				
Course	Category	y	Employability								
Develop	ment Ne	eds	Global								
Course	Descript	ion	Python is a versatile prog fields, such as software of science, arts, education, an	rammin levelopn nd others	g language that can nent, government a s	be used in Iministratio	a variety of n, business,				
Course	Outcome	es			Teaching Methods	Assessme	nt Methods				
CO 1	Underst simple	tand pytho	the basics of Python and n program.	l write	Lecture / Demonstration / Flipped Classroom	Assi	gnment				
CO 2	Develoj Stateme	p Py ent and	thon programs with C d List method.	Control	Demonstration / Constructivist Approach/ Tutorial	Se	minar				
CO 3	Apply develop	Tuple simp	Functions and Set Iterators to applications Use A Set Iterators to A Set Iterators to A Demonstration / Video Lessons Use A Set Iterators (Constraint)								
CO 4	Apply Excepti	Pythe	on Strings, Multithreadin or problem solving.	g and	Tutorial / Demonstration / Case Studies	Program	n Execution				
CO 5	Manipu	late F	iles and perform Event Har	ndling.	Lecture / Demonstration / Class Projects	Program	n Execution				
Offered	by Inf	forma	tion Technology								
Course	Content			Iı	nstructional Hours	/ Week : 4					
Unit			Description			Text Book	Chapters				
I	Fundame Applicati Memory Python- Styles: D Evaluation	damentals of Python Programming: Introduction – Features – lications – Installation-Sample Program-Python Virtual Machine- nory management in Python-Comparison between C, Java and non- Keywords, Identifiers, Statements, Indentation. Syntax and es: Data Types – Literals – Variables-Operators and Expressions- luation of Expression-Sample Programs.11,2									
C				411	Instruction	al Hours	12				
II	Control Controll - Condit Arrays-S Keyboar	Flow ed Lo tion C Sequented-Acc	r: If – While – For – Bre op - Exit Controlled Loop Controlled Loop - Nested nces - Python Lists: Re cessing Elements of a List-	eak – C – Counto Loop - ead a I - Modify	ontinue-Pass-Entry er Controlled Loop Sample Programs. List type from a ying Elements of a	1,2	3,4,5,9				
	List – Ba	asicOj	perations - Built-in Function	ns – Pytl	hon List Methods.		10				
Suggest	ed Learn	List – BasicOperations - Built-in Functions – Python List Methods. Instructional Hours 12 1 Learning Methods: Practice using Flow Charts									

ш	Tuples progra Dictio Sampl Passin Argun Passin of Loc	s-Need ms.Dic nary eProgra g Argu nents-V g Argu cal and	of a T tionarie Operat ams. F iments- ariable ments- Global	uple-Se es:Maki ions unction Keywon Length Anonyn Variabl	equence ng a – Se s: Def rd Argu n Argun nous Fu es.	of Un Dicts-Itera ining l uments- ments-F unctions	packing ctionary tors a Function Default Return S S-Recurs	g – Met -Basic and (ns-Calli Argun Stateme sive Fu	thods –S Opera Generator ng Func nents-Rea ents-Nesti nctions-	ample tions- 's – tions- quired ng of Scope	1	6	,7,8
									Inst	uctiona	al Hour	s	12
Suggest	ed Lear	ning N	Iethod	ls: Dev	velop s	mall p	rogran	imes u	sing tur	les			
IV	Strings Iteratin Excepti	s in Py g throuions – 1	v thon: ugh a Multith	Readin String reading	ng – A - Bui g	ccessii ld-in S	ng – M String	lodifyii Functio	ng – Fin ons.Erro	ding - rs and	2		8
•	-			-	-				Inst	ructiona	al Hour	s	
Suggest	ed Lear	ning N	Iethod	ls: Dev	velop s	mall a	pplicat	ions					
v	Files Readi Iterati Deser Event	and D ng/Wri ing thr ialization names	irector ting Op ough a on. Eve - Keył	y Acce peration a File nts: Ev poard ev	ss: File s in a - Spli ent Obj vents - I	es and File - (itting V ects - H Mouse	Streams Other o Words Binding Events -	 - Ope peration - Seria callbac Sampl 	ening a F ns in a F alization ks to eve e Prograt	ile - ile - and nts - ns	1	13	3,17
									Inst	uctiona	al Hour	s	12
Suggest	ed Lear	ning N	Iethod	ls: Lab	orato	ry prac	ctice						
										Tota	al Hour	s 60	Hrs
Text Books 1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, Python Programmin, University Press Pvt. Ltd.2018. 2. Dr.S.A.Kulkarni, Problem Solving and Python Programming, 2nd Edition Yesdee Publishing,2018 1. Allen B. Downey, Think Python: How to Think Like a Computer Scientis 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers,2016 2. Guido van Rossum and Fred L. Drake Jr, An Introduction to Python – Revise and updated for Python 3.2, Network Theory Ltd.,2011.												ion, tist, ised	
Web. U	KLS								• `				
	T	07	A TT	To	ols for	Asses	sment	(50 Ma	arks)		• •	T	4.1
		CL	A II	C	<u>IA III</u>	As	signm	ent	Semina	ır	Quiz	10	tal
8			8		10		<u>ð</u>		δ		δ	3	U
	D 04			201		Ma	pping		RCOL	D 204		7001	D 20
$\frac{CO/PO}{CO1}$		PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2		PSO4	PSO5
	п	п М	п М	L M	H	M	-	-	H	<u>п</u> Н	П	M	H
CO2	H	L	M	H	M	M	-	-	M	H	H	M	M
CO4	М	Н	L	М	L	L	-	-	Н	М	Н	Н	М
CO5	М	М	Н	Н	М	Н	-	-	Н	Н	М	Н	Н
H-High;	M-Med	lium; L	Low										
		Cours	e desig	ned by	7					Verifie	ed bv		

2022

Course	e Code]	ſitle		
21U3Cl 22U3C	KC102/ KC102		Core Paper II: Digital Fund	lam	entals and Com	outer Archite	ecture
Semes	ster: I		Credits: 4	CIA	: 50 Marks	ESE: 50	Marks
		1	(Common to B. Sc. C	CS/	IT / BCA)		
Course	Objectiv	ve	To enable the students to kn	ow	about the Opera	ions in digita	al computer,
Course	Categor	V	Skill Development /Fmployal	ectu: vility	re, memory desig	n and its func	tionality
Develor	ment Ne	y peds	Global	/III)		2	
Course	Descript	ion	Understand Number Conversi circuits.Analyze memory orga computers.	on, miza	the concept of I/C ation and multipro	organization ocessor in dig	and logic ital
Course	Outcom	es			Teaching Metho	ls Assessme	nt Methods
CO 1	Perform logic ga	n nun ates.	nber conversion and identify	he	Lecture, Proble Based Teachin and Tutorial	n	Quiz
CO 2	Design	basic	combinational logical circuit.		Lecture Demonstratio	1	Quiz
CO 3	Unders	tand t	he concept of I/O organization		Video Lesson	s Ass	ignment
CO 4	Apply 1 transfer	priorit :	ty to interrupts and use it for d	ata	Lecture, Tutoria	1 Ass	ignment
CO 5	Analyse multipr	e ocess	memory organization a organization a organization or a computers.	nd	Lecture, Tutoria	1 Se	eminar
Offered	by Co	omput	ter Science				
Course	Content				Instru	ctional Hou	rs / Week: 4
Unit			Description			Text Book	Chapters
I	Digital L Number Hexadeci represent Circuits: Serial Ac Digital L	ogic - Syst imal B ation, Half Ider, H ogic:	- Digital Operations - Digital Co em and Binary Codes: Dec inary addition, Multiplication, Di Complements, BCD, Excess3, C adder, Full adder, Parallel bina Ialf subtractor, Full subtractor, Pa The Basic Gates –NOR, NAND, X	mpu cima visio Gray ry a ralle COR	tters. l, Binary, Octal on – Floating point Code. Arithmetic dder, BCD adder l binary subtractor- Gates.	1,2	1,3,4
		Sugar	ested Learning Mathada, Nun	har	Instruct	ional Hours	12
	Combina	ationa	I Logic Circuits: Boolean alg	gebra	a-Karnaugh map		
Π	Canonica combinat Sequentia Demultip	al form tions al circ olexers	1 – Construction and properties - Product of sum, Sum of products: Flip-Flops: RS, D, JK, a – Decoder -Encoder – shift regist	-Imp oduo nd 7 ers-0	olicants – Don't can cts, simplification Γ - Multiplexers Counters	e 5. 1,2	2,5,6
			C		Instruct	ional Hours	12
	Input -	- Out	Suggested Learni put Organization: Input – output	inte	erface – I/O Bus an	d	
III	Interfac Mapped Strobe	ce – I/ d I/O <u>Contro</u>	O Bus Versus Memory Bus – Iso – Example of I/O Interface. Asy ol and Handshaking- Modes of Tra	olateo nchr unsfe	d Versus Memory onous data transfe er	- 3	11
					Instruct	ional Hours	12
			Suggested Learnin	g M	lethods: Report	Preparation	

	Priorit Interru	y Interpreter Interpreter Interpreter Interpreter Interpreter International Internatio	errupt ect Me	Dais	y- Ch Access:	aining DMA	Priori Contro	ty, l oller,	Parallel I DMA Ti	Priority ansfer			
IV	Input	– Oi	utput	Proces	ssor:	CPU-I	OP C	omm	unication	-Seria	1 3		11
	Comm	unicati	on-Cha	racter	Orient	ted Pr	otocol,	Data	a Transpa	arency	,		
	Bit Ori	ented I	rotoco	l.					T		1.11		10
				0		1 7	•		Ins	tructio	nal Hour	s	12
	M	0	· •	<u>S</u>	uggest	ed Lea	rning	Vleti	<u>iods: Rej</u>	oort P	reparation	n	
	Memo.	ry Or	ganiza	uon:	Memo	ry Hi			Main M	Base	-		
	Associ	antive in	lemory	: Haro		Organ	ization,	Ma	ch Logic	, Real	1		
V	Operat		nie O				emory: Casha I	ASS		Direct	, 3		12
	Set-ass Multin		e Map	onna –	writing tionStr	g mio v	Lache I	mula	IIZation.	ntion			
	Interpro	Cessor	Commi	inicatio	n and S	vnchro	nization	00055	SOI AIUIII	ation,			
	interpre	003301	Commit	meano		ynem o	mzation	•	Inst	tructio	nal Hour	s	12
				S	uggest	ed Lea	rning	Metl	10ds - Vi	deo Pr	esentatio	n	
				2						T	otal Hour	s i	60
			1. V.	K. Puri	&Heni	y Digi t	tal Elec	tron	ics Circu	its an	d Systems	, TMH.	1997.
Text Bo	oks		tectur	e, PHI pul	olication	ns,2000.							
Referen	Reference Books1. M. Carter, Computer Architecture, Schaum'1996.												TMH,
Web. U	RLs		https:	//www	educt.	a.com	/digital	-com	puter-fun	damer	<u>tals/</u>		
				То	ols for	Asses	sment	(50 N	Marks)				
CLA	I	CI	A II	C	IA III	As	ssignme	ent	Semin	ar	Quiz	To	tal
8			8		10		8		8		8	5	0
						Ma	pping						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PSO1	PSO	2 PSO3	PSO4	PSO5
CO1	Н	Н		М	М		М	Н	Н	Н	Н	М	М
CO2	Н	Н		М	М		М	Н	Н	Н	Н	М	М
CO3	Н	Н		М	М		М	Н	Н	Н	Н	Н	Н
CO4	Н	Н		М	М		М	Н	Н	Н	Н	Н	Н
CO5	Н	Н		М	М		М	Η	Н	Н	Н	Н	Н
H-High	M-Mea	dium; I	L-Low										
		Cours	e desig	ned by	y					Veri	fied by		

Course	e Code				Title				
21U3C	AP101		Core Pener III	· Pract	ical in Python Pr	ogramming			
22U3C	AP101								
Semes	ter: II		Credits: 4	CIA	: 50 Marks	ESE: 50 Mar	ks		
			(Bachelor of Com	puter A	Applications)				
Course	Objectiv	/e	Γο introduce the concepts of python programming constructs.						
Course	Categor	y	Skill Development /Emplo	oyabilit	y/Entrepreneursh	ip			
Develop	oment No	eeas	Γο development skill set in python programming and apply the concepts to						
Course	Descript	tion	develop applications in o	order to	meet the Local a	nd Global needs.			
Course	Outcom	es			Teaching Metho	ods Assessment Me	ethods		
CO 1	Develo	op sin	ple Python programs.		Program Demonstration Projects	Program Cre	eativity		
CO 2	Under statem	stand ents.	and apply the concept of co	ontrol	Program Demonstratio	n Debugg	ing		
CO 3	Apply function	the co ons fo	oncept of looping constructs r solving basic programs.	s and	Laboratory Practice,	Application of	of Logic		
CO 4	Develo Lists, '	op pro Tuple	grams for sorting of Strings s and File handler.	S,	Constructivis learning, Cod review	t Program Deve e	elopment		
CO 5	Create Search	prog Tech	rams using Linear and Bina miques	ry	Demonstration Projects	n, Program Deve	elopment		
Offered	by Co	omput	ter Applications			·			
Course	Content				Inst	ructional Hours /	Week: 4		
Unit			Lis	st of Pr	actical				
1	Write a p number,	oython Colleg	program that displays the foll ge name, Course subjects.	lowing i	nformation: Your	name, Full Address M	lobile,		
2	Write a operator	pytho ∵	n program to find the larges	st three	integers using if-	else and conditional	I		
3	Write a should e display	pytho enter a the nu	n program that asks the use negative number to signal mbers in order and their su	r to ento the end m.	er a series of posi of the series) and	tive numbers (The u I the program shoul	ıser d		
4	Write a	pytho	n program to find the produ	ict of tw	vo matrices.				
5	Write re	cursiv	ve functions for GCD of two	o intege	rs.				
6	Write re	cursiv	ve functions for the factorial	l of pos	itive integer.				
7	Write re	cursiv	e functions for Fibonacci S	lequenc	e up to given nur	nber n.			
8	Write re	cursiv	ve functions to display prin	ne numl	per from 2 to n.				
9	Write a p	oython	program that writes a series of	of randoi	n numbers to a file	from1 to n and displ	ay.		
10	Write a	pytho	n program to sort a given se	equence	: String, List and	Tuple.			
11	Write a	pytho	n program to make a simple	e calcul	ator.				

12	Write a	a pytho	n prog	ram fo	r Linea	r Sear	ch and I	Bina	ry	Search.				
13	Write p function	ython p 1 prints	rogram the stri	in whi ng para	ch a fui imeters	nction (given t	with sin o functi	gle s on.	trir	ng param	eter)is de	fined and	calling	that
14	14 Write python program in which a class is define, the n create object of that class and call simple print function define in class.													
Total Hours 60												50		
Suggested Learning Methods: Solving Case studies, Program development, Code														
								<	R	Review a	ind Peer	Coding		
					ools fo	r Asse	ssment	(50	M	arks)				
Applic: of Lo	ation gic	Prog Crea	e- gram tivity	e- P Det	e- Program Debugging		Test 1		ן	Fest 2	Observation Note Book		Total	
8			8		8		10			10	(5	50	
						M	apping							
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO)8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	-	Μ	Н	-	Μ	H	[Η	Н	Н	Μ	Μ
CO2	Н	Н	-	Μ	Н	-	Μ	H	I	Н	Н	Н	Μ	Μ
CO3	Н	Н	-	Μ	Н	-	Μ	H	[Н	Н	Н	Н	Н
CO4	Н	Н	-	Μ	Η	-	Μ	H	I	Н	Н	Н	Н	Н
CO5	Н	Н	-	Μ	Η	-	Μ	H	[Η	Н	Н	Н	Н
H-High;	M-Mee	dium; I	L-Low											
	Course designed by								Verified by					

2022

Course	Code		Title									
22U3M	IA101		Allied Paper I : N	Mathen	natics for Comput	er Science						
Semes	ter : I		Credits : 4	CIA	: 50 Marks	ESE : 50) Marks					
			(Common to B. Sc. D	CFS /	CS / IT / BCA)							
Course	Objectiv	'e	To enable the students Methods used in Compute	to lear er applic	n concepts of Stations.	atistical an	istical and Numerical					
Course	Category	y	Skill Development									
Develop	ment Ne	eeds	Regional									
Course	Descript	ion	This course covers a Numerical Analysis; it Mathematics and Comput	mix of covers er scien	f applied linear s a central poin ce.	algebra, S t of cont	tatistics and act between					
Course	Outcom	es			Teaching Methods	Assessm	ent Methods					
CO 1	Know t	the con	ncepts of Matrices and solv	e the	Lectures / Video	Prob	lem solving					
	problem	n usin	g Eigen values.		Lectures		Skill					
CO 2	equatio	ns.	aneous Linear argeoraic		Tutorial	As	signment					
CO 3	Relate	variou	s formulae in Numerical		Lectures / Video	S	eminar					
00.4	Evaluat	te the	Measures of central tenden	Lectures / Peer	Prob	lem solving						
CO 4	and dis	persio	n.	Teaching		Skill						
CO 5	Analys	e Cor	relation and Regression	Lecture / Tutorial		Quiz						
Offered by Mathematics												
Course	Content				Instruct	ional Hou	rs / Week : 5					
Unit			Description			Text Book	Chapters					
	Matrice	es: Int	roduction – Types of Matr	rices –N	latrix Operations -							
Ι	Determi	nation	– Inverse of a matrix – Ra	nk of a	Matrix.	1,3	4					
	Eigen va	lue Pro	oblems.									
Suggest	d Loarr	ning N	lethods: Problem Solving	Practi	Instruction	al Hours	15					
Buggest	System	of Si	multaneous Linear Alge	braic	Equations: Gaus	5						
п	Eliminat	tion, (Gauss Jordon, Gauss Jaco	obi Me	thod, Gauss Seida	1 2	4					
	method	(up to	3x 3 matrices).									
					Instruction	al Hours	15					
Suggest	ed Learn	ning N	Iethods: Class Test									
	Numeri	cal D	Differentiations: Newton	's forw	vard Difference -							
ш	Backwar	rd Dif	ference – Stirling's formula	a.	rd	2	9					
	Numeri	cal In	tegration: Trapezoidal Ru	le - Sin	npson's 1/3 ^{ra} rule&	2	,					
	Simpsor	n's 3/8	^w rule.									
~					Instruction	al Hours	15					
Suggest	ed Learn	ning N	Iethods: Problem Solving	, Practi	ce							

	Measu	res of	Cent	ral Te	ndenc	v: M	ean M	edian	and Mo	ode –			
	Empirio	cal Rel	ations	hip bety	ween r	nean. n	nedian	and m	ode.				
IV	Measu	res of]	Disper	sion:	Range	Ouart	ile dev	iation			3	7	,8
	and Sta	ndard	deviati	on	runge	, Q uur	iie ac i	lution					
		induru	ue viut						Instri	ictiona	l Hours	1	5
Suggeste	ed Lear	ning N	Aetho	ds : O	uiz				111,501 (liittuis		
88	Correl	ation:	Intro	duction	, Sca	tter Di	iagram	- Ka	arl Pear	son's			
	Correla	tion ar	nd Spe	arman'	s Rank	c Corre	lation.						
V	Regres	sion:	Regr	ession	equa	tion o	of var	iables	– Li	near	3	10	,11
Regression.													
Instruction											l Hours	1	.5
Suggested Learning Methods: Problem Solving Practice													
			1							Tota	l Hours	7	'5
1. P. Kandasamy, K.Thilgavathy, K. Gunavathy, En									thy, En	gineering	Mather	natics,	
				Volu D V	Ime_{1}	S.Chanc	l Comp	any, 20	006.	.1	N	• • • • •	4 1
Тех	t Book	S	2	. P.Ka	indasan	ny, K.T Tommor	hilagav	athy a	ind K.Gi	inavathy	, Numer	ical Me	sthods,
S. Unandæ Company L1D, Kevised 2005. 2. S. D. Constanting and Mathematical Mathematical Mathematical \mathcal{L}										on			
5. S. F. Gupta, Statistical Methods, Sultan Chand & Sons, Fourth edition, Reprint 2017										ΟΠ ,			
1 E Balagurusamy Numerical Methods Tata McGraw Hill publishing													
			-	com	bany I	LTD. R	eprint. 2	2008.	1001104.5,	Tutu T		ini puo	iisiiig
Refere	ence Bo	oks	2	. P.A.	Navani	tham, I	Busines	s Mat	hematic	s and S	Statistics,	(Part]	II), Jai
				Publ	ishers,	Trichy	- 21.						
We	b. URL	s	1	. https	://yout	u.be/M	G7t6SW	/BnwA			4		
			2	To	ols for		sment	(50 M	v=11111 arks)	UUJFINU	+		
				10		Pro	hlem		ai K5)				
CIA	I	CIA	II	CIA I	II	Solvin	g Skill	s A	ssignm	ent S	Seminar	Total	
8		8		10			8		8		8	5	0
				1		Ma	pping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	М	М	М	М	L	Н	Н	Н	Н	Н
CO2	Н	Н	L	М	М	М	М	L	М	М	Н	М	М
CO3	Н	М	L	М	М	М	М	L	М	L	Н	Н	М
CO4	Н	М	L	М	М	М	М	L	Н	М	Н	М	Н
CO5	Н	М	L	М	М	М	М	L	Н	М	Н	Н	М
H-High;	M-Med	ium; L	-Low							X 7 • 0			
		Course	e desig	ned by	7					Verifi	ed by		

Course Code	Ti	tle						
21U4ENV101	Ability Enhancement Compulsor	Ability Enhancement Compulsory Course - Environmental Studies						
Semester : I	Credits : 2	CIA : 50 Marks						

(Common to all UG Programmes)

Course Objective:

This course enables the students to recognize the interconnectedness of multiple factors in environmental challenges and communicate clearly and competently matters of environment concern.

Course Outcomes:

On completion of course the students will be able to

CO 1	Understand key concepts from economic, political, and social analysis as they pertain to
COT	the design and evaluation of environmental policies and institutions.
CO^{2}	Understand concepts and methods from ecological and physical sciences and their
02	application in environmental problem solving.
CO 3	Solve the ethical, cross-cultural, and historical context of environmental issues and the
003	links between human and natural systems.
CO 4	Reflect critically about their roles and identities as citizens, consumers and environmental
004	actors in a complex, interconnected world.
<u>CO 5</u>	Apply systems concepts and methodologies to analyse and understand interactions
05	between social and environmental processes.

Course Content

Instructional Hours / Week : 2

Unit	Description	Text Book	Chapter
Ι	Natural Resources: Forest resources, Water resources, Mineral resources, Food resources, Energy resources and Land resources.	1	2
	Instructional 1	Hours	6
II	 Ecosystems: Concept of an ecosystem, Structure and function; Introduction, types, characteristic features, structure and function of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). Activity: Prepare an album on types of Ecosystem. 	1	3
	Instructional	lours	6
III	 Environmental Pollution: Definition Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution and Noise pollution, Solid waste management. Activity: Discuss the solutions for water pollution 	1	5
	Instructional 1	Hours	6
IV	Social Issues and the Environment: Water conservation, rain water harvesting, watershed management, Environmental ethics - Issue summits' and possible solutions and Public awareness. Activity: Identify and analyse a Social Issue and an Environment issue in your locality.	1	6
	Instructional	Hours	6

V	Disaster Management: Floods, Earthquakes, Cyclones, Landslides: From management to mitigation of disasters: The main elements of a mitigation and measures of strategy: Floods, Earthquakes, Cyclones and Landslides	2	16				
Instructional Hours							
Field	Work: Visit to local area to document Environmental assets (River / Fe	orest /					
Grass	land / Mountain), Visit to local polluted site (Urban / Rural /indus	trial /					
Agricultural), Study of common plants, insects, birds, Study of simple ecosystem:							
Pond, River, Hill slopes.							
	Total I	Hours	30				

Text Book(s):

- 1. Shashi Chawla. A Text Book of Environmental Studies, Tata McGraw-Hill, 2012.
- 2. From UGC website: https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

Reference Book(s):

- 1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd., Bikaner.
- Jadhav, H & Bhosale, V.M. 1995 Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
- 3. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions
- 4. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
- Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt. Ltd., 345 p.

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

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

Tools for Assessment (50 Marks)

H-High; M-Medium; L-Low

Course designed by	Verified by				

Cou	ırse Code		Title						
22U1 21U	TAM202 / 1TAM202	Р	PART - I - PYNTI	HAMIZH (பைந்தமிழ்)				
Sen	nester: II	Credits: 4 C	CIA: 50 Marks	ESE: 50 Marks					
		(Common to	all UG Program	nes)					
Course	Objective	மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்.							
Course	Category	Skill Development (மாணவர்க	களின் மொழித்திறக	னை ஊக்கு	யித்தல்)				
Develo	pment Needs	Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)							
Course	Description	மாணவர்களின் மொழித்திறனை மொழியின் அவசியத்தை உன	ா ஊக்குவித்தல் ம गர்த்துதல்	ற்றும் உலக	5 அளவில் தமிழ் 				
Course	Outcomes		Teaching	Methods	Assessment Methods				
CO 1	பக்தி இல நெறிகளை ம	லக்கியங்கள வழி வாழ்வி மாணவர்களுக்கு எடுத்துரைத்தல்	ணொளிப்பட 5கம்	ஒப்படைவு					
CO 2	சிற்றிலக்கியா வாழ்க்கை சு	ங்களின் மூலம் தமிழர்கவ ஹகளை எடுத்துரைத்தல்	ரரை	குழுதிட்டம்					
CO 3	தமிழ் நா சிந்தனைகனை	வல்களின் வழி சமுதா ளக்கூறுதல்	ணொளிப்பட கம்	கருத்தரங்கு					
CO 4	இலக்கண அ	றிவை வளர்த்தல்	ரை	ஒப்படைவு					
CO 5	தமிழ் இலக்க அடையச் செ	ிய வரலாற்றுத்திறனை மேம்பா(⁼ய்தல்	டு விரிவுரை விவா	்குழு கருத்தரங்கு தம்					
Offered	Offered by பைந்தமிழ்								
Course Content பைந்தமிழ் (இரண்டாம்பருவம்) Instructional Hours / Week : 5									
Unit		Description		Text Book & Chapters					
I	பக்தி இலக்கியங்க	 திருமந்திரம் - மூன்றா (அதிகாரம் 2) நாலாயிரத் திவ்வியப்ப பெரியாழ்வார் மாணிக்கவாசகர்-எட்டா திருநாவுக்கரசர்- திருவ 	ாம் தந்திரம் பிரபந்தம்- пம்திருமுறை வரங்கமாலை	அட்டமாசித்திகள் திருப்பல்லாண்டு அச்சோப்பதிகம் நான்காம்திருமுறை - தேவாரம்					
		Inst	ructional Hours		15				
Sugge	sted Learning	Methods: ஆன்மிக சிந்தனைத்	த்திறன் பெற்றமை		2 Hrs				
п	சிற்றிலக்கியங்	 கலம்பகம் - நந்திக்க பள்ளு – முக்கூடற்பு குறவஞ்சி – திருக்குற பிள்ளைத்தமிழ் - மீன பிள்ளைத்தமிழ பட்டினத்தார்பாடல்கள் 	91 -100 பாடல்கள் 350 – 360- செய்யுள்கள் 1-10- செய்யுள்கள் 1 -10- செய்யுள்கள் 358 – 367 பாடல்கள்						
9		Inst		15					
Sugges	ted Learning N	Alethods : கலந்துரையாடல்			02 Hrs				
III	நாவல்	1. இமையம் (வெ.அண்ன	ளமலை)	செல்லாதபணம்					
		Inst	ructional Hours		15				
Sugges	ted Learning N	/lethods : நாவல் எழுதும் திறன	ர் பெற்றமை		02 Hrs				

IV	ଭୂର)க்க6	னம்	1. வல் 2. வல் 3. யா (எடு 4. பாச	റ്റിഞ്ഞ് റ്റിഞ്ഞ് പ്പിൽ ഉ ഉத்து (വിൽ ഖ	தமிழ்	தமிழ் இலக்கணம்							
								Ins	truction	nal Hou	rs	15		
Suggest	ed Lea	rnin	g Metho	ds:	ിழെപി	ன்றி த	மிழ் எயு	ழதுதல			0	02 Hrs		
v	V தமிழ் இலக்கிய வரலாறு 1. சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 2. புதினத்தின் தோற்றமும் வளர்ச்சியும் 3. பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 4. விண்ணப்பங்கள்,மடல்கள்,எழுதச் செய்தல்								தமிழ் இல	தமிழ் இலக்கிய வரலாறு				
Instructional Hours												15		
Suggested Learning Methods: குழு விவாதம்											0	15 2 Hrs 75 பாடநூல் அறிவியல்		
Total Hours										rs	75			
1. இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்ச Text Books " பைந்தமிழ்" தொகுப்பு: தமிழ்த்துறை, நேரு கலை கல்லூரி, கோயம்புத்தூர்.									களுக்குரிய ல மற்றும்	<u>, , , , , , , , , , , , , , , , , , , </u>				
 திருமந்திரம் - மாணிக்கவாசகர் அருளிய திருவாசகம் - சித்தாந்த பண்டிதர் திரு.ப.இராமநாத பிள்ளை விளக்க உரையுடன் கழக வெளியீடு, திருநெல்வேலி, தமிழண்ணல்-புதிய நோக்கில் தமிழ் இலக்கியவரலாறு, மீனாட்சி புத்தகநிலையம் மதுரை. 									து நீடு, சி					
vv eD.	. UKLS		F	T	ola for		mont (5	0 Mani	r a)					
CIA	I		ста п			ASSESS	Seminal	r Viari	ss) Scianm	ent G	oun Project	То	təl	
8	L		8		<u>10</u>		<u>8</u>		<u>1551g1111</u> 8		8	5		
		1	_		-		Mappin	g			-		-	
PO / CO	PO1	PO	2 PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	-	-	Н	-	Н	Н	М	Н	-	-	-	-	-	
CO2	-	-	Μ	-	H	L	Н	H	-	-	-	-	-	
CO3	-	-	L	-	Μ	Μ	H	H	-	-	-	-	-	
<u>CO4</u>	-	-	<u>H</u>	-	H	M	M		-	-	-	-	-	
CO5	- <u>-</u>	<u> </u>		-	H	L	H	H	-	-	-	-	-	
H-High;	M-Medi	um;	L-LOW	nod by						Vorif	ind by			
Course designed by										v ci li				

Course	e Code			T	itle					
22U1H	IIN202		Part - 1	: 5	Sanchar Hindi					
Semes	ter: II		Credits: 4	CIA	A: 50 Marks		ESE: 50 I	Marks		
			(Common to all UG I	Prog	grammes)					
Course	Objectiv	ve	पाठ्यक्रम संवादी हिंदी में पारंगत होने	में व	मदद करता है।					
Course	Categor	у	Skill Development							
Develop	oment No	eeds	Regional							
Course	ourse Description Improved accuracy & quality, improved communication									
Course	Outcom	es			Teaching Meth	ods	Assessme	nt Methods		
CO 1	कविता समझें। अंतर्निहि	की मूत मुक्त इत साम्	म शब्दावली और व्यावहारिक तत्वों को छंद और कविता के पारंपरिक रूपों में गान्य तकनीकों को समझें।		Lecture / Vic Methods	leo	Assi	gnment		
CO 2	छात्र वि में प्रदर्शि व्याख्या सक्षम ह	भिन्न रीत कर करने डोंगे	प्रकार की संवादात्मक स्थितियों में हिंदी ने, चित्रित करने, नाटक करने और के लिए अर्जित कौशल को लागू करने	ो में	Case studies		Grou	p Project		
CO 3	छात्र औ होंगे।	पचारिव	क और अनौपचारिक पत्र लिखने में सक्ष	म	Lectures / Vie Lessons	deo	Se	minar		
CO 4	अनुवाद बनाता	सभी है।	लोगों के बीच प्रभावी संचार को सक्ष	ाम	Lecture / Vid Methods	leo	Assi	gnment		
CO 5	छात्र हिंग विषय प होंगे ।	दी भाष ार विधि	ा के वक्ता के साथ किसी भी सामान्य नेन्न स्तरों पर बातचीत करने में सक्षम		Lecture / Dur Charades	mb	Seminar			
Offered	l by Hi	ndi								
Course	Content			I	nstructional H	ours	/ Week : 5			
Unit			Description				Text Book	Chapters		
Ι	आधुनिक	हिंदी व	नव्य : रश्मिरथी , रामधारी सिंह 'दिनक	न् र'			1	All		
0		• •	<i>K</i> (1 1		Instruc	ction	al Hours	15 02 H		
Suggest	lea Leari	ning I	vieulous : Visual Learning					02 Hrs		
Π	एकांर्क 1. शिवार 2. औरंग 3. रीढ़ व 4. सिपाई	जे संग्रह जी का जेब की की हड्ड ही की	: : सच्चा स्वरूप - (सेठ गोविंददास) ो आखिरी रात - रामकुमार वर्मा ो - (जगदीशचंद्र माथुर) माँ - (मोहन राकेश				1	1 to 4		
					Instruc	ction	al Hours	15		
Suggest	ed Lear	ning I	Methods : Auditory					02 Hrs		

III	पत्र लेज नौकरी वे	ा लेखन : (छुटटी पत्र , संपादक को पत्र , पुस्तकों के लिए आदेश पः करी के लिए आवेदन पत्र , निजी पत्र)										1	1	,2,3
										Inst	ructio	nal Hou	irs	15
Suggest	ed Lea	rning l	Metho	ds : Co	mprehens	sive w	vriting	5					02	2 Hrs
IV	अनुवाद	: हिंदी ः	से अंग्रेज	गि (अनु	वाद अभ्या	स -	3)1	- 1() pass	ages		3		1,2
										Inst	ructio	nal Hou	irs	15
Suggest	ed Lea	rning I	Metho	ds : A	uditory, V	'isual							02	2 Hrs
v	V बोलचाल की हिन्दी : 1. शिक्षक - विद्यार्थी 2. ग्राहक-दुकानदार 3. डॉक्टर - रोगी, 4. साक्षात्कार 5. दो यात्री 6. माँ - बेटा 5										1,2			
Instructional Hours												irs	15	
Suggest	ed Lea	rning I	Metho	ds: C	omprehen	sive v	writing	g					02	2 Hrs
											Т	otal Hou	irs	75
1. रश्मिरथी / रामधारी सिंह "दिनकर" - Reference Books 2. सरस एकांकी नाटक : डॉ. रामकुमार द 3. अनुवाद अभ्यास - 3 दक्षिण भारत 1									कविता वर्मा हेंदी प्रच ———	कोश ार सभा	, चेन्न	5 -1		
Referen	ce Boo	ks	2. बो 3. हिं	लचाल : दी व्याव	पं० अयोध नरण निबंध	ध्या नि ग और	सेंह उप पत्र त	पाध्या लेखन	य -डॉ. ए	ਜ. एल. उ	माथुर			
Web. U	RLs		WWW	webd	unia.con	n								
				T	ools for A	Asse	ssme	ent (5	50 Mai	rks)				
CIA	I	CL	A II	0	CIA III		Assig mer	gn nt	S	eminar		Group project	То	tal
8			8		10		8			8		8	5	0
						M	appir	ng						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO	6 F	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	Н	М	L	М	[-	-					
CO2	-	-	Н	L	Н	Н	[-	-					
CO3	-	-	L	L	М	Н	[-	-					
CO4	-	-	М	М	L	L		-	-					
CO5	-	-	L	М	М	Μ	[-	-					
H-High;	M-Me	dium; I	L-Low											
Course designed by											Veri	fied hv		
		Coul	se uco	Snear	<i>J</i>						, (11	neu by		

Course	e Code									
22U1M	AL202		Part - 1: Novalum Bl	nashaapadanavui	n					
Semes	ter: II		Credits: 4 C	A: 50 Marks		ESE: 50 1	Marks			
			(Common to all UG Pr	ogrammes)						
Course	Objectiv	/e	വിദ്യാർത്ഥികളിൽ മലയാള സാഹിത്യത്തിൽ നോവലുകൾ വർദ്ധിപ്പിക്കുന്നു	ഭാഷയുടെ ർക്കുള്ള സ്ഥാന	വിക നവും	ംാസവും വായം	മലയാള നാശീലവും			
Course	Categor	у	Skill Development							
Develop	evelopment Needs Regional									
Course Description Proper guidance, opportunities and encouragement that help them achie their ambitions										
Course	Outcom	es		Teaching Meth	ods	Assessme	nt Methods			
CO 1	സമ ജീറ	ൂഹര പിതം	ത്തിലെ ഒരു വിഭാഗത്തിന്റെ	Lecture / Vic Methods	leo	Assi	gnment			
CO 2	പ്രം മാറ്റ	ക്യതി റങ്ങഗ	യും മറ്റു ജീവജാലങ്ങളുടെയും ർ	Case studie	s	Group Project				
CO 3	(പർ (പ(കൃതി വർത	നാശത്തിനെതിരായി ഒന്നിച്ചു തിക്കുന്നു	Lectures / Vie Lessons	deo	Se	minar			
CO 4	സമ തിര	ൂഹര റിച്ചറ	ത്തിലെ ഭാഷാസങ്കല്പം റിയുന്നു	Lecture / Vic Methods	leo	Assi	gnment			
CO 5	നല്ല മന	്രഭാപ സ്സില	ഷ എങ്ങനെ സ്വഷ്ടിക്കാമെന്ന് ാക്കുന്നു	Lecture / Dur Charades	mb	Seminar				
Offered	by Ma	alaya	lam							
Course	Content			Instructional Hou	ırs / V	Week:5				
Unit			Description			Text Book	Chapters			
Ι	നോവര	n - b	എൻമകജെ			1	1 to 16			
	1.7			Instru	ctiona	al Hours	15			
Suggest	ed Lear	ning I	Methods : Visual Learning				02 Hrs			
II	നോ	വൽ	- എൻമകജെ			1	17 to 34			
a	1 7	• -		Instru	ctiona	al Hours	15 02 H			
Suggest	ed Leari	ning I	Viethods : Auditory				02 Hrs			
III	നോ	വൽ	- എൻമകജെ			1	35 to 51			
C	1 *	• -		Instru	ctiona	al Hours	15			
Suggest	ed Lear	ning I	Viethods : Comprehensive writing				02 Hrs			
ÍV	ഭാഷ	ചാപറ	യം - തെളിമലയാളം			1	1,2,3			
				Instru	ctiona	al Hours	15			

Suggest	ed Lea	rning I	Methods	: Audi	tory, Vis	ual						02	02 Hrs	
V	ഭാഷാം	പഠനം	- തെ	ളിമലര	മാളം						1	2	4,5	
L									Instr	uctiona	l Hours	5	15	
Suggest	ed Lea	rning I	Methods	: Com	prehensi	ve writir	ng					02	Hrs	
			-							Tota	l Hours	5 75	Hrs	
Tex	t Book	S	1. അ മ. പ മ. പ	1. അംബകാസുതന്ന മാങ്ങാട - എന്നമകജെ - ഡി.സി.ബുകസ കോട്ടയം 2. എം.എൻ.കാരശ്ശേരി - തെളിമലയാളം - ഡി.സി.ബുക്സ് കോടയം										
Refere	ence Bo	ooks	1. റെ 2. പ്ര 3. പ്ര 4. പ	പ്രാഫ.ഹ കാട്ടയം ഡാ. പ പരിത്രം ഡാ.കെ പസ്ഥാന വിരുമേല ഗി.സി.ഒ	എൻ.ക ിന്മന ര - ഡി. .എം. ശ ാങ്ങളില ചി - മ വുക്സ്	്പഷ്ണപ്പ റാമചന്ര സി.ബു ജോർജ് പൂടെ - ലയാള കോട്ട	പ്പിള്ള ദൻ ന ക്സ് ' - ആ ഡി.ന ഡാപ ഡോപ ഡം	- ഒൈ യേർ കോട്ടം ഡുനിം വിത്യം റിത്യം	കരളിയു - സമ്പൂ യം ക മലയ ക്സ് ഹേ കാലം	ുടെ കഥ ൂർണ്ണമഭ യാള സ കാട്ടയം ഘട്ടത്തി	മ - ഡി ചയാള മാഹിത്യ ലൂട -	l.സി.ബ സാഹ് ്രചരി	്വുക്സ് ിത്യ ത്രം	
We	b. URL	.S	http:// http://	www.ko www.m Too	<mark>eralacu</mark> anoran Is for A	l <mark>ture.o</mark> naonlin Assessm	rg>liten ne.com nent (50	rature) Mar	ks)					
CIA	I	C	IA II	CL	A III	Assig	gnment		Seminar	. G pi	roup roject	То	tal	
8			8	-	10		8		8		8	5	0	
						Mapp	oing							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	-	-	Н	Η	Η	Η								
CO2	-	-	Н	Μ	Н	М								
CO3	-	-	Μ	М	М	Η								
CO4	-	-	L	Н	L	Н								
CO5	-	-	L	М	L	Η								
H-High;	M-Mee	dium; I	L-Low											
Course designed by							Verified by							

Cou	rse Code			Title						
22U1 21U1	FRN202/ IFRN202	Part-I LE F	FRANÇ	ÇAIS FONDAME	NTAL - II					
Sem	ester: II	Credits: 4	CIA	: 50 Marks	ESE: 50	Marks				
		(Common to all	UG P	rogrammes)						
Course	Objective	This course is comprised of the grammatical structures co	deep st orrectly	tudy of grammar cat	egories and	aims to apply				
Course	Category	Skill Development								
Develop	ment Needs	Global								
Course	Description	This course aims to develop communicative competence of the students in French, to create cultural awareness, to promote autonomy in learning French.								
Course	Outcomes			Teaching Methods	S Assessm	ent Methods				
CO 1	Acquire an use the basic	understanding of French cu foundation of verbs.	ılture,	Lecture	As	signment				
CO 2	Describe a j adjectives.	place, learn pronom en,	y and	Tutorial / Case Studies	S	Seminar				
CO 3	Recall the te	nses and learn Imparfait ten	se	Lectures / Video Lessons		Quiz				
CO 4	Write about COD,	the weather and learn pr	onom	Word game / Lecture	As	signment				
CO 5	Write sho Comprehend COI	rt passages and tran the passage and learn pr	nslate, ronom	Lecture	Gro	up project				
Offered	by Departu	ment of French								
Course	Content			Instructional Hours / Week : 5						
Unit		Description		Text Book Chapte						
Ι	Goûter à la ca	impagne			1	5				
~				Instruction	nal Hours	15				
Suggest	ed Learning I	Methods: Worksheets, TV:	5 App		1	6				
11	voyager dans	sa ville		Instruction	1 1 Hours	0				
Suggest	ed Learning [Methods: Kahoot App. Du	olingo	instruction						
III	Faire du neuf	avec du vieux	8-		1	7				
I				Instruction	nal Hours	15				
Suggest	ed Learning I	Methods : Comprehensive	Writi	ng						
IV	Changer d'air	r 1 8								
C	ad I		XX 7*4*	Instruction	nal Hours	15				
Suggest	Devenir ása	vienious : Comprenensive		ilg	1	0				
v				Instruction		15				
Suggest	ed Learning N	Methods : Translating sim	ple sen	tences and short	assages	10				
~	Suggested Learning Methods : 1 ransiating simple sentences and snort passages Total Hours 75									

Text	t Book	s	Sa O	aison 1 liveira	Métho , Dorot	ode de thée D	Françai upleix (is – 1 Unit	Marie t 5 to	e-Noë 9)	elle Coo	ton, And	ouchka l	De
Refere	nce Bo	oks	A1 Echo Méthode de Français											
Web	b. URL	S	Lingua.com, TV 5 app, Learn French by podcast (spotify)											
Tools for Assessment (50 Marks)														
CIA I CI			A II	C	IA III	As	ssignme	ent	Se	emina	ır	Quiz	То	tal
8	8		8		10		8			8		8	50	
	Mapping													
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 P	SO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	Н	Μ	Η	Η	-	-		-	-	-	-	-
CO2	-	-	Н	L	Н	Μ	-	-		-	-	-	-	-
CO3	-	-	-	Μ	Μ	Н	-	-		-	-	-	-	-
CO4	-	-	L	Μ	L	Н	-	-	-	-	-	-	-	-
CO5	-	-	L	-	Н	-	-	-		-	-	-	-	-
H-High;	M-Meo	lium; I	L-Low											
		Course	e desig	ned by	y						Verifi	ed by		

Cot	urse Code	Title												
22 U	2ENG202	Part II - Pr	ofessional English	II										
Sen	nester: II	Credits: 4	CIA: 50 Marks	ESE:	50 Marks									
		(Common to all UG P	rogrammes)	1										
Course	Objective	To equip the students with the Eacilitate the insight and taste of	language skills and Literature	d its functi	onal usage.									
Course	e Category	Skill Development												
Develo	pment Needs	Global												
Course	Description	SD: Helps to develop LSRW skil	11											
Course	Outcomes		Teaching Methods	Assessme	ent Methods									
CO 1	Mastering li	fe skills through prose discourse.	Lecture/Tutorial	/Tutorial Assign										
CO 2	Acquire eth genre.	nics and values through poetic	Lecture/Tutorial	Ass	ignment									
CO 3	Recognise t through shot	he nuances of English language rt stories.	Lecture/Tutorial	Sp	eaking									
CO 4	Enhance flu confidence.	nency over language with self-	Lecture/Tutorial	Re	eading									
CO 5	Examine h literature an	ow the language is used in develop LSRW Skills	Lecture/Tutorial	W	riting									
Offered	d by Depart	nent of English												
Course Content Instructional Hours / Week : 5														
Unit		Description		Chapters										
I	Prose E.M. Forster Mahatma Gar Issac Asimov Listening Ac	- Tolerance ndhi - Women Not the Weaker Sex - The Fun They had tivity – Comprehension practice fr	om Prose.	1	1-3									
			Instruction	al Hours	15									
Sugges	ted Learning	Methods : Cooperative Learning	5											
п	Poetry Robert Frost - William Blak Alexander Po Speaking Ac	Poetry Robert Frost - Stopping by Woods on a Snowy Evening William Blake - A Poison Tree Alexander Pope – Ode on Solitude												
		· · · ·	Instruction	al Hours	15									
Sugges	ted Learning	Methods : Inquiry Based Learnii	ng											
ш	I Short Stories Mark Twain - The Cat and the Painkiller Japanese Folk Tale - The Envious Neighbour Hector Hugh Munro (Saki) – The Open Window Reading Activity – Pronunciation practice and enhancement from Short-stories													
										Instr	ructiona	l Hour	S	15
--	---	--	----------------------------------	----------------------------	--------------	----------------------------	------------------	----------------	------------------	--------------------------	-----------------------------	---------------------	--------------------	------------
Suggest	ed Lea	rning I	Metho	ds : Cl	assroo	om Act	tivity							
IV	Gram Article Concor Active Direct Writin	mar es rd and Pa and Ind ng Acti	assive V direct S vity – 1	Voices Speech Paragr	aph W	riting u	ising g	gramr	nar	· Compo	onents	1	1()-13
Suggest			Matha.	Jain	ma of N	[1			Instr	uctiona	I Hour	s	15
Suggested Learning Methods : Direct Method Writing Skills Resume Writing Email Writing Dialogue Writing Testimonial Writing Creative Writing										14	4-17			
										Instr	ructiona	l Hour	s	15
Suggest	ed Lea	rning l	Metho	ds : Ao	ctivity	Based	Lear	ning						
											Tota	l Hour	S	75
Referen	ice Boo RLs	ks	CLII TAN the s	L (Co SCHE	ntent NOT	& La E: (Tex e depai	nguag kt: Pre	e In scribe	teg ed the	rated chapter college	Learning s or page ()	g) – M es will l	Iodule se giver	by 1 to
				Т	ools fo	or Asse	essmei	nt (50) M	larks)				
CIA	I	CL	A II	C	IA III	As	signn	nent	S	Speakin	ng Re	eading	Το	tal
	8		8		10		8			8		8		50
						Ma	pping							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PC)8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	М	L	Н	L	Μ	Μ	Н	N	[Н	Н	М	Н	М
CO2	М	L	Н	L	Н	Μ	Η	M	[Н	Η	Μ	Н	М
CO3	М	L	Н	L	Η	Н	Η	Н		Н	Η	Μ	Н	М
CO4	Μ	L	Н	L	Η	L	Η	Η		Н	Н	Μ	Н	Н
CO5	Η	Μ	Н	L	Η	Н	Η	Η		Η	Η	Η	Η	Μ
H-High:	M-Me	dium; l	L-Low											
	Course designed by							Verified by						

Course	e Code	de Title										
22U3C	JC201		Core Paper	IV: Java Programmi	ng							
Semes	ter: II		Credits: 4	CIA: 50 Marks	ESE: 50	Marks						
			(Common to B. Sc.	AIML / BCA)								
Course	Objectiv	ve	To gain knowledge about ba java programs and under inheritance, polymorphism a	sic Java language synta rstand the principles nd packages.	x and seman of classes	tics to write , methods,						
Course	Categor	y	Skill Development /Employa	bility/Entrepreneurship								
Develop	oment Ne	eeds	Global									
Course	Descript	eloping prog ceptional Ha	grams using ndling,									
Course	Outcom	Assessmen	t Methods									
CO 1	Remem	ber th	ne fundamental concepts of	Lecture /	Class Pa	articipation						
	Develor	orient	ble Java programs with	Demonstration		•						
CO 2	Control	state	ments and arrays.	Constructivist learning	(Quiz						
CO 3	Apply t interfac	he pri	nciples of packages and	Constructivist learning Demonstration	Se	minar						
CO 4	Design concept Multith	Java a ts of E readir	application using the Exception Handling and ng.	Lecture, Constructivist learning,	Se	minar						
CO 5	Develop and AV	p appl VT.	ications using IO Streams	Problem-based Teaching, Constructivist learning	Assi	gnment						
Offered	by Co	mput	ter Science		_							
Course	Content			Instruc	ctional Hour	rs / Week: 4						
Unit			Description		Text Book	Chapters						
Ι	Fundar Oriente Program Applica History Internet simple Java Vi	nenta d Pa nming tion (– Fea – Ja Java rtual I	Is of Object-Oriented P aradigm – Basic Concept g – Benefits of Object-Oriented Programm tures – How Java differs from va and www –Web Browser program – Structure – Java Machine-Command Line Argu	rogramming: Object- s of Object-Oriented ented Programming – ning. Java Evolution: n C and C++ – Java and rs. Overview of Java: Tokens – Statements – iments.	1	1,2,3						
			Suggested Les	Instruction	onal Hours	12						
	Constan	ts, V	ariables, Data Types, Opera	ators and Expressions.								
п	Decision Making and Branching: if, ifelse, nested if, switch,? :4,5,6,7Operator, Decision Making and Looping: while, do, for – Jumps1in Loops - Labelled Loops, Classes, Objects and Methods. Arrays:8One Dimensional Array-Creating an Array- Two Dimensional Array.8											
				Instruction	onal Hours	12						
	Interf	ICes.	Suggested Lea Multiple Interface-Introduct	inning Methods: Code	Debugging							
III	Extend Variab System Access	1	10,11 & 12									

	Package-Hiding Classes-Static Import.												
									Inst	ruction	al Hour	s	12
		Su	iggeste	d Lea	rning I	Metho	ds: Sin	nple A	pplicati	on Dev	elopmen	t	
IV	Except Classe Except Multin of Th Thread Deadlo	tion H s- Ty tions-H thread read-R d's Li bock-Int	Landlin pes (landling ed Pro cunnabl fe Cyo er T Resumi	g: Fu of Ex g Exce gram e Int cle-Th hread	ndame ception-l ption-l ming: erface- read Cor	ntals-H n –E User D The Ja Threac Schedu mmuni	lierarcl xceptic efined va Thi Clas Iling-S cation-	ny of on C Except read M s-Thro ynchro Joinir	the Exce class-Unc otion. Model-Co ead Cre onization ng Thu	eption aught ncept ation- and reads-	2	10	& 11
Instructional											al Hour	s	12
Suggested Learning Methods: Simple Application Dev										elopmen	t		
Input/Output Classes: Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer.2VApplets: Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. Java Networking -INetaddress-User Datagram Protocol, Internet Control Protocol, UDP Programming in Java Transmission Control Protocol, Multithreading & TCP Sockets Programming in Java.2										6,18 &19			
									Inst	ructior	al Hour	s	12
		Su	Iggeste	d Lea	rning I	Metho	ds: Sin	nple A	pplicati	on Dev	elopmen	t	
			00		0			•	••	To	tal Hour	s	60
Text Bo	oks ce Bool		1. 2. 3.	E. H McC ISRI Thro Java Patrio McG	Balagun Fraw H D Gro ough J Networ ck Naug raw Hil	rusamy ill Pub up, In ava , T <u>ck Prog</u> ghton& Il Public	r, Prog lication trodue data Mc rammin Hebert cation, 2	gramm n, 3 rd 1 ction Graw g, 4th Schild 3 rd Edit	ning wi Edition, 2 to Obje Hill Pub Edition,O It, The Co ion, 2002	th Jav 2007 ect Or lication rielly Pu omplete	a – A iented I , Forth R iblication Reference	Primer Program eprint 2 e Java 2	r, Tata nming 2008. 2, Tata
			2.	John Publi	R. E	lubbarc 2 nd Edi	l, Pro s tion 20	Programming with Java , Tata McGraw Hill					
Web. Ul	RLs		ht	tps://w	<u>ww.</u> w3	school	<u>s.com/j</u>	ava/de	efault.asp				
				То	ols for	Asses	sment	(50 M	larks)				
CIA	Ι	CL	AII	C	IA III	As	signm	ent	Semina	ır	Quiz	To	tal
8			8		10		8		8		8	5	0
						Ma	pping						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н		М	Н		Μ	Η	Н	Н	Н	М	М
CO2	Η	Н		М	Н		Μ	Η	Н	Н	Η	М	M
CO3	Н	Н		Μ	Н		Μ	Η	Н	Η	Н	Н	Н
CO4	Н	Н		Μ	Н		Μ	Η	Н	Н	Н	Н	Н
CO5	H	H		М	Н		Μ	Η	H	Н	Н	Н	Н
H-High;	M-Me	edium;	L-Lov	V									
		Cours	e desig	ned by	y					Verifi	ed by		

Course	e Code				Title				
21U3C 22U3C	KC204 KC204		Core I	Paper V	7: Data Structures				
Semes	ter: II		Credits: 4	CIA	: 50 Marks	ESE: 50	Marks		
			(Common to B.	Sc. CS	/ IT / BCA)				
Course	Objectiv	e	To enable the students to Linked list, Searching and	o under Sorting	stand about the var g, apply them to sol	rious techniques such as ve complex programs.			
Course	Categor	y	Skill Development /Emplo	oyabilit	y/Entrepreneurship				
Develop	oment Ne	eeds	Global						
Course	ues, Linked roblem usin	list, g appropriate							
Course	Outcom	Teaching Methods	Assessme	nt Methods					
CO 1	Unders Stacks	tand ti and Q	he representation of Arrays, ueues.	,	Smart Board / Demonstration	Group	Discussion		
CO 2	Solve the	he pro	blems using Queues and Li	st.	Smart Board / Demonstration		Quiz		
CO 3	Demon represe	strate ntatio	different types of Tree n and Graph.	Demonstration	S	eminar			
CO 4	Design of Sorti	Algoı ng.	rithm to perform different ty	Video Lessons	S	eminar			
CO 5	Illustrat and app appropri	te Syn oly to riate E	nbol, hash and File organiza solve real world problem us Data Structure.	ation sing	Smart Board / Demonstration	Ass	signment		
Offered	by Co	mput	ter Science						
Course	Content				Instru	ctional Hou	ırs / Week: 4		
Unit			Description			Text Book	Chapters		
Ι	Introdu Arrays Arrays. Express	iction : Axi Stack	: Overview - create Program omatization - Sparse Mat s & Queues: Fundam Multiple Stacks and Queue	ms - An rices - entals es.	alyse Programs. Representation of - Evaluation of	1	1,2,3		
	Suga	actod	Looming Mothoday White	Algon	Instructio	nal Hours	12		
	Recursi	on: R	Recursive definition and pr	rocess	- recursion in C -	e Scenario			
п	Writing Recursive program - simulating Recursion - efficiency of recursion. Queues and List: The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure.								
	0				Instructio	nal Hours	12		
	Sugg	ested	Learning Methods: Write	e Algor	ithms for Real tim	e Scenario			
III	algorit applica	Bina hm - tions entatio	ry free - Binary free repr representing list as B - Game trees. Graphs: A l on of Graph - Graph traversa	resentat inary - Flow pr <u>al a</u> nd s	Trees and their oblem - The linked panning forests		5,8		
	•		· •		Instructio	nal Hours	12		
			Suggested Le	earning	Methods: Group	Discussion			

IV	Intern Heap K-Way Polyph	al Sor Sort - y Merg nase M	ting: I - Shell ging.So erge.	nsertio Sort orting	on Sort Extern With	e Sort - rices - Sorts -	1	7,	8				
I	- J I-		0						Inst	ruction	al Hours	1	2
					Sugge	sted L	earnin	g Met	hods: G	roup D	iscussion		
V	Symbo Hash 7 Files: F File Or Linked	I Table Tables: Tables, Que Tables, Q	e: Stati Hashi ueries a tion: S zation.	c Tree ng Fur nd Seq Sequent	Tables actions uential tial Org	s - Dyr - Overf Organi ganizati	namic T flow Ha zations- on- Rai	ree Ta ndling Index ndom	ables. g. Techniqı Organiza	ues - tion-	1	9,	10
									Inst	ruction	al Hours	1	2
				S	uggest	ed Lea	arning 1	Metho	ods - Vid	leo Pres	entation		
Te											al Hours	e	50
Text Boo	Text Books1. Ellis Horowitz &SartajSahni, Fundamentals of Data Structures, Galgoti Publication.2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J.Augenstein Data Structure using C, Pearson Education, 2009.											algotia enstein,	
Reference Books1. Ellis Horowitz, Sartaj Sahni&SanguthevarRajase Computer Algorithms, Galgotia Publications Pvt L 2. Jean-Paul Tremblay and Paul G.Sorenson, As Structures with Applications, Second Edition, Tat 3. Mark Allen Weiss, Data Structures and Algorit International University, Pearson Education, Second									Rajaseka Pvt Ltd n, An on, Tata I lgorithn econd E	uran, Fun , 1999. Introduc: MaGraw H I Analysis dition, 199	tion to fill,2008 fin C, 07.	als of Data Florida	
Web. UI	RLs		ht	tps://v	www.p	rograi	<mark>miz.co</mark> n	n/dsa					
				Te	ools for	r Asses	ssment	(50 M	Iarks)				
CIA	Ι	CL	AII	CL	A III	Part	Class ticipatio	on ²	Assignm	ent Seminar		Total	
8			8	-	10		8		8		8	5	0
						Ma	apping						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	М	М	М	-	М	Н	Н	Н	Н	М	М
CO2	Н	Н	М	М	М	-	М	Н	Н	Н	Н	М	М
CO3	Н	Н	Μ	М	Μ	-	М	Н	Н	Н	Н	Н	Н
CO4	Н	Н	M M M - M H H						Н	Н	Н	Н	
CO5	Η	Н	М	Μ	М	-	Μ	Н	Н	Н	Н	Н	Н
H-High;	M-Mec	lium; L	L-Low										
		Cours	e desig	ned by	y			Verified by					
			0	•							¥		

Course	e Code			Title								
22U3C	AP202		Core Paper VI: Practio	cal in Java and Network	Programming							
Semes	ter: II		Credits: 4	CIA: 50 Marks	ESE: 50 Marks							
			(Bachelor of Comp	uter Applications)								
Course	Objectiv	/e	To enable the students to ability in Java language.	develop problem solving	skills and programming							
Course	Categor	y	Skill Development /Employ	ability/Entrepreneurship								
Develor Course	Descript	eeds	To make the students to und design technique, syntax.	derstand the object-oriented paradigm,								
Course	Outcom	es		Teaching Methods	Assessment Methods							
CO 1	Develop programs to implement the string, array and multiple inheritance concepts.			Problem Based Teaching, Constructivist learning	Program Creativity							
CO 2	Implem handlin probler	nent th g con	ne multithreading, exception cepts to solve real world	Constructivist learning, Code Review	Debugging							
CO 3	Apply t	the co	ncept of package to sability.	Constructivist learning	Application of Logic							
CO 4	Create application for file handling.			Problem Based Teaching, Constructivist learning	Program Development							
CO 5	Create Networking Applications using Java Network Programming concepts			Problem Based Teaching, Constructivist learning	Program Development							
Offered	ered by Computer Applications											
Course	Content			Instruc	ctional Hours / Week: 4							
Unit			List	of Practical								
1	Write a string.	Java A	Applications to extract a porti	on of a character string an	d print the extracted							
2	Write a	Java p	program to insert an element ((specific position) into an	array.							
3	Write a	Java I	Program to implement the cor	ncept of Interfaces.								
4	Write Ja	iva pro	ogram to implement overload	ing of methods.								
5	Write a	progr	am to implement the concept	of Exception Handling.								
6	Write ja	va pro	ogram to demonstrate runtime	e polymorphism using ove	rriding.							
7	Write Ja	iva pro	ogram to add two matrices.									
8	Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them.											
9	Write a	Java p	program to import classes from	m user defined package ar	d creating package.							
10	Write a	Java p	program to process text file.									
11	Write a	Java I	Program to find the IP Addres	ss of the Machine								
				Write a Java Program to implement TCP Protocol.								

13	Write a	ı Java l	Prograi	n to ill	ustrate	the Lo	ocal Loo	op in	the	e netwo	rk.			
14	Write a	ı Java	Progra	am to i	mplem	ent UI	OP Proto	ocol.						
15 Write a Java Program to implement Stop and Wait Protocol														
Suggested Learning Methods: Solving Case studies, Peer tutoring and pair programming														
Total Hours											6	50		
Tools for Assessment (50 Marks														
Applica of Lo	cation Logice- Program Creativitye- Program DebuggingTest 1Test 2Observation Note Book										Total			
8			8	8 10 1						10		6	5	0
						Μ	apping							
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Μ	Μ	-	Μ	Μ	-	-	Η		М	Η	Н	М	М
CO2	Μ	Н	-	Μ	Μ	-	Μ	Η		М	Н	М	Н	М
CO3	Μ	Н	-	Μ	Μ	-	-	Η		Н	М	М	М	Н
CO4	Η	Н	-	Μ	Μ	-	-	Η		М	Н	Н	Н	М
CO5	Η	Н	-	М	Μ	-	-	Η		Н	М	Н	М	Н
H-High; M-Medium; L-Low														
Course designed by											Verifie	ed by		

(Common to B. Sc. CS /

<i>BB, III, D EI</i>		111							
Title									
Allied Paper II : Discrete Mathematics									
Credits: 4	CIA: 50 M	arks	ESE: 50 Ma	rks					
ommon to B. Sc. CS / DS / IT / AIML / DCFS / BCA)									
To learn about the Discret	e Structure for	Computer Ba	ased Applicati	ion.					
Skill Development									
Regional									
This course is to understand and use abstract discrete structures that are backbones of Computer Science. In particular, this course meant to introduce logic, proofs, sets, relations, functions, counting, and graphwith an emphasis on applications in Computer Science.									
	Г	eaching	Assessment	Mathada					

Course (Dutcomes	Methods	Assessment Methods
CO 1	Learn the basic concepts of Set theory	Lectures / Peer Teaching	Assignment
CO 2	Implement the basic ideas of Mathematical Logic in Computer Science	Lectures / Tutorial	Seminar
CO 3	Classify different types of Relations and Functions	Lectures / Video Lectures	Assignment
CO 4	Infer the concepts of Grammar and Automata theory.	Lectures / Tutorial	Work Sheet
CO 5	Know the concepts of Graph theory	Lectures / Video Lectures	Quiz
000 1			

Offered by | Mathematics

Course Content

Course Code

22U3MIA202

Semester: II

Course Objective

Course Category

Development Needs

Course Description

Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters				
Ι	Set Theory:Introduction-Set & its Elements-Set Description- Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory. 1 I Fundamental products- Partitions of sets – Minsets- Algebra of sets and Duality-Inclusion and Exclusion Principle 1						
	Instruction	al Hours	15				
	Suggested Learning Methods:Problem Solving	Practice					
п	Mathematical Logic:Introduction- prepositional calculus –BasicIogical operations- Tautologies-Contradiction – Argument-PDNF& PCNF - Method of proof.						
	Instruction	al Hours	15				
	Suggested Learning Methods: C	lass Test					
ш	Relations: Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations. Functions – Types of functions – Invertible functions – Composition of functions.	1	3,4				
	Instruction	al Hours	15				

B. Sc. CS, IT, DS, AIML, DCFS/ BCA

NASC

	Suggested Learning Methods: Assignments												
IV	Langua regular Gramn state ma NDFA	ages:O langua nar:Ty achine into Dl	peratic ges. pes of –Finite FA.	gramn gramn e State	langua nars – (Autom	ges – F Gramn 1ata- D	Regular nar Con FA- NI	Expr struct DFA-	essions a tion-Fini Convers	nd te ion of	1	15	
									Instr	uctional	Hours	1	5
			Su	ggeste	d Lea	rning I	Method	ls:Pr	oblem Se	olving F	Practice		-
V	Graph – Sub g Trees –	Theor raphs - Propert	y: Bas – Type ies of ti	sic tern s of gra rees – E	ninolog aphs. Binary t	gy – pa rees-Tr	aths, cy	cle & of Bin	Connec ary Trees	tivity	1	9,	10
Instructional Hours												1	5
Suggested Learning Methods:Problem Solving Practice													
			1							Tota	Hours	75]	Hrs
Text Boo	t Books 1. J.K. Sharma, Discrete Mathematics, Macmillan India Ltd, 2nd edition, 2005.												
Reference Books 1. 5. 7. Tremolay, R. Manonar, Discrete Mathematics Structures with Applications to Computer Science, McGraw Hill International Edition. 2005. 2. T.Veerarajan, Discrete Mathematics with Graph Theory and Combinatories, McGraw Hill International Edition, 2008 1. https://www.youtube.com/watch?v=oaOm2pnKkyY											n .ion,		
Web. Uk	RLs		2.	<u>http</u>	s://yout	tu.be/ty	DKR4	FG3Y	W				
				Too	ols for	Assess	ment (<u>50 M</u>	arks)				
CIA	Ι	CL	A II	CL	A III	Ass	ignmer	nt	Semina	ar	Quiz		tal
8			8]	10		8		8		8	5	0
						Map	oping						
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO 4	PSO 5
CO1	Н	Н	L	Μ	Н	М	Μ	M	Н	Н	Н	М	М
CO2	Н	Н	L	М	Н	М	М	Н	Н	Н	Н	М	М
CO3	Н	Н	L	М	Н	Μ	М	Н	Н	Н	Н	Н	Н
CO4	Н	Н	L	М	М	М	Μ	M	Н	Н	Н	Н	Н
CO5	H	Н	L	Η	Μ	М	М	Н	H	Н	H	Н	Η
H-High;	M-Med	ium; L	-Low										
		Course	e desig	ned by	7					Verifie	ed by		
				U							·		

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

(Common to all UG Programmes)

Course Objective:

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

Course Outcomes:

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

Course Content

Instructional Hours / Week : 2

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

Text Book:

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

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

Tools for Assessment (50 Marks)

Mapping

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

H-High; M-Medium; L-Low

Course Designed by	Verified by

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

(Common to all UG Programmes)

Course Objective:

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

Course Outcomes:

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

Course Content Instructional Hours / Week : 1 (For Semesters I and Semesters I						
Unit	Description					
	Human Values - Introduction - Definition of Ethics and Values - Character and					
Ι	Conduct - Nature and Scope of Ethics. Individual and Society - Theories of Society -					
	Social Relationships and Society - Empathy: Compassion towards other beings.					
	Instructional Hours 4					
	Self-realization and Human Values-Self-realization and Harmony-Rules and Regulations-					
II	Rights and Duties-Good and Obligation-Integrity and Conscience. Obligation to Family-					
	Trust and Respect-Codes of Conduct.					
	Instructional Hours 5					
	Character Formation Towards Positive Personality: Truthfulness, Constructivity,					
Ш	Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision. Refinement of					
111	vorries: Neutralization of anger-Intelligent quotient(IQ), Emotional quotient(EQ), Spiritual					
	Quotient (SQ)					
	Instructional Hours 5					
	rower of Meditation- Development of mind in stages - Mental Frequencies Methods for					
TX 7	Concentration. Meditation Practices - Surya Namaskar.					
1 V	Physical Exercises -Kayakalpa Practices Training for Potentialising the Mind.					
	Instructional Hours 6					
\mathbf{V}	ASANAS					
v	tanding Posture: Tadasana, Utkattasana, arthaKadi Chakrasana, Trikonasana, Artha					

Chandrarasana, Padahastasana, Virabhadrasana, Vrikshasana, Artha, Natarajasana.
Sitting posture: Padmasana, Gomukasana, Ustrasana, ArdhaMatsyendrasana, Patchimottanasana.
Prone posture: Bhujangasana, shalabhasana, Dhanurasana, Chakrasana.
Supine posture: Sarvangasana, Halasana, Matsyasana, Shanti asana
Pranayama: Bhastrika, Bhramari, NadiShodhan

Instructional Hours	10
Total Hours	30

Text book:

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

Tools for Assessment

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

Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
C01	-	-	-	Н	L	М	Н	Н					
CO2	-	-	-	L	М	Н	М	Н					
CO3	-	-	-	L	М	Н	S	Н					
CO4	-	-	-	L	L	Н	М	Н					
CO5	-	-	-	L	L	Н	М	Н					

H-High; M-Medium; L-Low

Course Designed by	Verified by

Cour	rse Code		Title									
21U3 22U3	CKC305/ CKC305		Core Pape	r VII: Operating Syste	ems							
Seme	ester: III		Credits: 3	CIA: 30 Marks	ESE: 4	5 Marks						
			(Common to B. Sc. (CS / IT / BCA)								
Course	Objective		To understand the importance manage resources of Compute	e of Operating Systems er and Peripherals.	and its fu	nctionalities to						
Course	Category		Employability									
Develop	pment Need	5	Global									
Course	Description	L	Operating System describes o	f types,States,Paging,Se	ons.							
Course	Outcomes			Teaching Methods	Assessment Methods							
CO1	Recognize system	the	e basic concepts of operating	Lecture / Flipped Classroom		Assignment						
CO2	Understand scheduling	d tł ; of	e concepts of processes and process.	Lecture / Tutorial		Assignment						
CO3	Explain th deadlock a	e te Ind	echniques of managing the memory	Lecture		Seminar						
CO4	Illustrate the Page Replacement	ne S ace	Segmentation of Paging and ment policies.	Lecture / Tutorial		Quiz						
CO5	Apply vari	ou	s file system implementation	Lecture / Case Stud	es	Quiz						
Offered	l by Comp	out	er Applications									
Course Content Instructional Hours												
Unit			Description		Text Book	Chapters						
I	Introduction the Compu Processing systems – System – N	n: A iter sys Rea Iod	Abstract views of an OS – Goa System – Classes of Oper stems – Multiprogramming sy al Time Operating System – lern Operating systems	lls of an OS – OS and rating System: Batch stems – Time sharing Distributed Operating	1	1,2						
	· · ·			Instructio	nal Hour	rs 12						
Suggest	ed Learning	Me	thods: Assignment and Seminar	Preparation								
II	of Process Co and Termir Preemptive	ntro ntro iolo scl	Controlling Processes – Proce ol Block – Process Scheduling ogy – Fundamental Technique heduling policies - Preemptive	ess State Transitions – g: Scheduling Concepts s of scheduling – Non scheduling policies	1	3,4						
	1			Instructio	nal Hour	rs 12						
Suggest	ted Learning	g N	Iethods: Assignment and Semi	nar Preparation								
III	Deadlock: deadlocks Prevention dynamic M of Memory Memory Al	Def – I em y – loc	Inition – Deadlocks in Resour Deadlock Detection and Deadlock Avoidance. Memory ory Allocation – The Memory - Contiguous Memory alloca cation.	Resolution – Handli Resolution - Deadlo Management: Static a Allocation Model – reu ttion – Non Contiguo	ng ck nd 1 ise 1 bus	11						
	· · · · · ·			Instructio	nal Houi	rs 12						
Suggest	ted Learning	g N	Iethods:Preparing Procedure f	or Deadlock and Memor	У							

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IV	Paging Basics prelimi segmen	 Segn Der naries nation 	mentat nand I – Pag	ion – S Paging ge repl	Segmer – Ove acemer	ntation erview nt poli	with P of Pag cies –	aging. ging – Virtua	Virtual Demano al Memo	Memory 1 Pagin ry usin	/: g 1		5
									Instr	uctiona	l Hour	s	12
Suggeste	ed Lear	ning N	Aethod	ls:Prep	oaratio	n for Q	uiz						
V	Layers Organiz – Files director OS (Se	of the zation - and Fil ry Stru lf Stud	Input C – Disk le Oper ctures - y)	Dutput Schedu rations – Case	Contro uling. I – Funo study	l Syste File sys lament on LIN	m (IOC stems: I al File UX OS	CS) – (File Sy organi S ,UNI	Overview stem and zations – X OS, Ar	of I/O IOCS ndroid	1		7
									Instr	uctiona	l Hour	s	12
Suggeste	ed Lear	rning N	Aethod	ls: Cas	se Stud	lies on	Latest	Opera	ating Sys	stems			
			1							Tota	l Hour	S	60
Text Bo	oks		1. D 2^{1}	M Dh nd Editi	amdhe	re, "O 06.	peratir	ng Syst	tems- A	Concep	t –Base	d Appr	oach",
Reference Books1. William Stallimgs, "Operating Systems Internals and Des Principles", Seventh Edition, Pearson Education Inc.2012.2. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, "Operating System Concepts", Seventh Edition, Pearson 2009.												Design	
Web. Ul	RLs		https:	://www	.geeks	forgee	ks.org/o	operati	ng-syster	ns			
				To	ols for	· Asses	sment	(30 M	arks)				
CIA	I	CL	A II	C	IA III	As	signm	ent	Semina	r (Quiz	Total	
4			4		7		5		5		5	3	0
						Ma	pping						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	М	М	М	L	М	Н	Н	Н	Н	М	М
CO2	Н	Н	М	М	М	L	М	Н	Н	Н	Н	М	Μ
CO3	Н	Н	Μ	Μ	Μ	L	Μ	Н	Н	Н	Н	Н	Н
CO4	H	Н	M	M	М	L	М	H	H	H	H	H	H
<u>CO5</u>	H	Н	M	М	М	L	М	H	H	Н	Н	Н	H
H-High;	M-Med	lium; L	L-Low										
		Cours	e desig	ned by	V					Verifie	ed by		

Course	rse Code Title										
22U3C	JC302		Core Paper VIII: Relation	nal Database Man	agement Syster	ns					
Semest	er: III		Credits: 3 C	IA: 30 Marks	ESE: 45 N	/Iarks					
			(Common to BCA	B. Sc. AIML)							
Course	Objectiv	e	To inculcate fundamental knowl manipulate information with the	edge in RDBMS con real time datasets.	cepts and make t	hem to create,					
Course	Categor	y	Skill Development								
Develop	oment Ne										
Course	Descript	ion	of relational dat tabase structure	tabases using es, modelling							
Course	Outcom	es		Teaching Methods	Assessme	nt Methods					
CO1	Rement of data	iber th base.	e Data types and fundamental	S Lecture / Flipped Classroom	Assig	nment					
CO2	Unders Various	tanding s queri	g the concept of Database and es in SQL.	l Lecture / Tutorial	Assig	nment					
CO3	Applyin retrieve	ng the inform	e concept in various tables to mation.	D Tutorial	Se	eminar					
CO4	Unders cursors	tandin;	g the concept of PL/SQL using	g Lectures / Tutorial	Lectures / Se Tutorial						
CO5	Able to in PL/S	evalu QL.	ate the errors and write trigger	S Lecture / Flipped Classroom	Lecture / Flipped Quiz Classroom						
Offered	by	Comp	outer Applications								
Course	Content			Instructional H	Iours / Week :	4					
Unit			Description		Text Book	Chapters					
	Introdu Models System	ction: – Data Structı	Database - Purpose of Datab base Language – Transaction M ire.	ase Systems - Data anagement - Overal	1 1						
Ι	A Relati – Integr Design: Depende Normali	ional a ity Ru Data ency - zation	pproach: Relationships –Relation les – Theoretical Relational L Modelling and Normalization -Normal forms – Dependency	onal Database Mode anguages. Databas : Data Modelling - Diagrams – De -		1					
				Instruc	tional Hours	12					

Sugges	ted Learning M	Iethods: Video lectures about the basics of Database		
II	Oracle9 <i>i</i> :Orac – Errors & Hu Naming Rules Creating Oracl an Existing T Table Types –	le9i an introduction – SQL –SQL *Plus Commands elp – Alternate Text Editors. Oracle Tables. DDL: and conventions – Data Types – Constraints – le Table – Displaying Table Information – Altering able – Dropping, Renaming, Truncating Table – Spooling – Error codes.	1	3,4
		Instruct	ional Hours	12
Sugges	ted Learning M	Iethods: SQL Query Writing		
ш	Working with Adding a new Rows/Records with WHERE – DEFINE cor Built-in function Multiple Tabl	Table: Data Management and Retrieval: DML – Row/Record – Updating and Deleting an Existing – Retrieving Data from Table -Restricting Data clause – Sorting – Revisiting Substitution Variables nmand – CASE structure. Functions and Grouping: ons – Grouping Data. es: Joins and Set operations: Join – Set operations.	1	5,6
		Instruct	ional Hours	12
Sugges	ted Learning M	Iethods: SQL Query Writing		
IV	PL/SQL: A F Block Structu Assignment op Printing – Arit Control Struct Nested Block Transaction Co Cursors – Impl loops – SELF clause – Curso Types of Except	Programming Language: History – Fundamentals – re – Comments – Data Types – Declaration – beration – Bind variables – Substitution Variables – hmetic Operators. ctures and Embedded SQL: Control Structures – s – SQL in PL/SQL – Data Manipulation – ontrol statements. PL/SQL Cursors and Exceptions: licit & Explicit Cursors and Attributes – Cursor FOR ECTFOR UPDATE – WHERE CURRENT OF r with Parameters – Cursor Variables – Exceptions – ptions.	1	10, 11&12
		Instruct	ional Hours	12
Sugges	ted Learning M	Iethods: Video lectures about the basics of PL/SQL		
v	PL/SQL Com Named Block Data Dictionar	 posite Data Types: Records – Tables. s: Procedures – Functions – Packages – Triggers – ry Views 	1	13,14
		Instruct	ional Hours	12
Sugges	ted Learning M	Iethods: Writing PL/SQL Procedures		
		r -	Fotal Hours	60
Text B	ooks	 Nilesh Shah ,"Database Systems Using Oracle Abraham Silberschatz, Henry F.Korth, S. Suda Concepts", 3rd Edition, McGraw – Hill Compan 	", 2nd edition, rshan , " Datal ies, inc.	PHI. base System

Referenc	Reference Books1. Arun Majumdar & FSystems", TMH, 2007.2. Gerald V. Post , "Databa"									arya, " Systema	Databas s", 3rd E	e Man dition, T	agement `MH.		
Web. UF	RLs		https	://www	.tutori	alspoir	nt.com/	sql/sql	-rdbms-	concep	ts.htm				
]	Cools f	or Ass	essmei	sment (30 Marks)							
CIA I CIA II CIA III Assig					gnmen	nent Seminar			Quiz	Total					
4	Ļ	2	1	7			5		5		5	30			
						M	apping	5							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М		
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М		
CO3	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н		
CO4	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н		
CO5	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н		
H-High; M-Medium; L-Low															
		Course	desig	ned by						Veri	fied by				

B. C. A

NASC

Cours	ourse Code Title									
22U3	3CAP303	Core Paper IX	X: Practical in SQ	L and PL	/SQL					
Seme	ster: III	Credits: 2 C	CIA: 25 Marks ESE: 25 Marks							
		(Bachelor of Compute	er Applications)							
Course	Objective	To acquire fundamental knowl	edge Relational D	atabase M	anagement System					
Course	Category	Skill Development								
Develop	ment Needs	Global								
Course]	Description	To make the students to unders	stand Relational D	atabase M	anagement System					
Course	Outcomes	concepts using ordere and usic	Teach Metho	ing ods	Assessment Methods					
CO1	Apply the I Engineering	Programming and Software g skills and techniques using SQL	. Demonst	tration	Application of Logic					
CO2	Analyze the and feasible	e relational data model with optime solutions	al Demonst	ration	Program Development					
CO3	Apply the F Engineering	rogramming and Software g skills and techniques using SQL	. Demonst	tration	Program Creativity					
CO4	Analyze the and feasible	e relational data model with optime e solutions	al Demonst	ration	Program Development					
CO5	Evaluate th	e Optimal Solutions	Demonst	ration	Program Development					
Offered	by Comp	uter Applications	1							
Course	Content			Instruction	nal Hours / Week: 3					
Progr am		List of	Practical							
1	Create an E	nployee table with primary key, f	oreign key and In	sert the Va	lues.					
2	Alter the ext Verb.	sting table with an appropriate qu	ery, Update the v	alues and r	retrieve using Select					
3	Create a tab	le and perform various DCL & TO	CL Commands							
4	Perform var	ious Single – row and Grouping f	unctions using SQ	QL.						
5	Create an ap	propriate table and perform vario	us Join Operation	s.						
6	Create suita	ble table and perform various Set	Operations.							
7	Write a PL/SQL program to check whether the given string is palindrome or not.									
8	Write a PL/SQL Cursor for referencing fields in a record.									
9	Write a PL/SQL to raise the exceptions in Bank Account Management table									
10	Write a PL/S	SQL program to find factorial of r	numbers using fun	ction and J	procedure.					

11	Write a	PL/SC	QL to h	andle	packag	je.								
12	Write a	PL/SO	QL trig	ger for	enteri	ng ma	ırk in t	he stuc	lent ta	able.				
·											Total	Hours	4	45
Suggeste Review a	d Lear and Pee	ning M r Codi	lethod ing	s: Solv	Progr	am d	evelo	pment, C	ode					
				T	ools fo	r Ass	essmei	nt (25	Mark	ks)				
Applicat Log	ion of ic	Pro Crea	gram tivity	Pr Deb	ogram ougging	l g	Test	1	Tes	t 2	Observ Note B	ation look	То	otal
4	4 4 4								5		3		2	25
						Ν	Iappin	g						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	' PO	8 PS	SO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Η	L	М	Η	L	Μ	Н		H	Н	Н	Н	Н
CO2	Н	Η	L	Μ	Н	L	Μ	Н		H	Н	Н	Н	Н
CO3	Н	Н	L	Μ	Н	L	Μ	Н		Н	Н	Н	Н	Н
CO4	Н	Н	L	М	Н	L	Μ	Н		H	Н	Н	Н	Н
CO5	Н	Н	L	М	Н	L	Μ	Н		Н	Н	Н	Н	Н
H-High;	M-Medi	ium; L	-Low											
	(Course	e desig	ned by	7						Verified	l by		

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Course	e Code			Т	itle				
22U3M	IA303		Allied Pape	r III : (Operations Rese	earch			
Semeste	er: III		Credits : 4	CIA	: 50 Marks	ESE:	50 Mar	·ks	
			(Common to all U	G Prog	grammes)				
Course	Objectiv	ve	On successful completion mathematical applications environment	of the in ind	e course the s lustries, decisio	students n mak	s to lea ting for	arn various real time	
Course	Categor	y	Skill Development						
Develop	oment N								
Course	oblem- of orga	-solving nization	skill and s.						
Course	Outcom	es		Teaching Met	hods	Assess Metho	ment ds		
CO 1	Classif advanta	y diffe ages ir	erent OR models and knowing a decision making environment	g their nt	Group learni Lectures	ng /	Ass	signment	
CO 2	Recogn assignm solution	nize nent p n.	and formulate transport problems and derive their op	tation, ptimal	Peer Teachi Lectures	ng /	U	nit Test	
CO 3	Gain replace	know] ment	orial	S	eminar				
CO 4	Outlini	ng the	Queuing Theory concepts.	Group learni Lectures	ng /	Ass	signment		
CO 5	Constru schedu	uct Ne ling th	etwork models (PERT & CPM he project.	M) for	Video Lectur Lectures	res /		Quiz	
Offered	by M	athem	natics						
Course	Content	;			Instruction	al Hou	rs / We	ek : 4	
Unit			Description			Text	Book	Chapters	
I	Linear using G	progra raphic	amming – Mathematical For al Method-Canonical and Sta	rmulati ndard f	on-Solving LPF orm of LPP .	•	1	2, 3	
	Simplex	x Meth	od - Big-M Method, Principle	es of D	uality.		1	4, 5	
~					Instruc	tional	Hours	12	
Suggest	ted Lear	ning N ortoti	Alethods : Problem Solving	Practic Initial	Pagia Eagsible	1			
п	solution Corner Method MODI I	Rule, - U Metho	Balanced Transportation Pro- Least Cost Method , Vo Unbalanced Transportation Pro- d (Non Degeneracy).	oblem ogel's roblem	: North West Approximation - Optimality –		1	10	
	Assignment Problem:Introduction – Hungarian Assignmentmethod – Maximization in Assignment problem - Unbalanced1Assignment problem-Travelling salesman problem.								
~					Instruc	tional	Hours	12	
Suggest	ted Lear	ning N	Aethods : Seminar	Grad C	motocios Col:	ng)			
III	Gan 2 m Graj	atrix v phical	with and without saddle poin Method - Dominance Property	2 & 2 x m gan	ng 2 x nes by	1	17		

	Replacement models: Elementary Replacement Models - Present													
	Va	lue - R	late of	Retur	n - De	precia	tion -	Indiv	vidual	l Rep	lacemer	ıt –	1	18
	Gr	oup Re	placem	ent.										
										Ins	truction	nal Ho	urs	12
Suggeste	ed Lea	rning N	Viethoo	ls : Gi	roup D	iscuss	ion	\ T						
	Queur	ng The	eory (L	Perivat	tions n	ot inc	luded): Int	roduc	ction	– Eleme	ents		20
	OF Que	euing S	ystem	– Ope	erating	Chara	icteris	tics o	I Que	euing	system	s –	1	20
IV	Prodat	\mathcal{D}	Istribut	1011S 11	1 Queu	ing Sy	stems	- Birt	.n dea	un pro	ocess.			
-	Classi	fication	of Ou	leuing	Mode	ls: Sin	gle S	erver	- fini	ite an	d infini	te	1	20
	popula	ation mo	odels. (Model	l I , Mo	del II	& Mo	del II	I) – P	Proble	ms only	' .	1	
										Ins	truction	nal Ho	urs	12
Suggeste	ed Lea	rning N	Metho	ls : ht	tps://y	outu.b	e/xGl	kpXk	-AnV	VU				
v	Netwo Constr Floats PERT	ork Sch ruction: - Practi ': Critic	Forwa Forwa cal Pro	ard Pas oblems - Pro	itical F ss – Ba in Net obabilit	Path M ckwar workin y of co	ethod d Pass ng Me omple	- Pr s com ethods tion c	incipl putati	les of ions – ject-I	TNetwo - Types Differen	rk of ce	1	21
	betwee	en PER	I and (CPM.										
										Ins	truction	nal Ho	urs	12
Suggeste	ed Lea	rning N	Metho	ls : Pr	oblem	Solvin	ng Pra	actice						
											То	tal Ho	urs	60
Text Books1.Kanti Swarup, P.K. Gupta, Man Mohan, Operations Research Chand & Sons, 1997.												search	ı, S.	
Referen	ce Boo	ks	1. H 2. M	Hamd all of I J. K. S IacMil	y A Ta India P Sharma lan Ind	ha, Op VT.LT , Oper lia Ltd,	Derati TD, 8t ration , 2008	ons R h edit s Res 3.	ion, 2 earch	rch – 2008. 1 The	An intr ory and	oducti l Appli	on, Pre	s,
Web. UI	RLs		1. htt	ps://yo	utu.be	4U3B	5lr-M	qM.(I	ntrod	luction	n to OR)		
			2.http	os://ww	ww.you	tube.co	om/wa	atch?v	/=2A	OhCV	WhwOK	o (PEF	CT con	cepts)
				T	ools fo	r Asse	ssmei	nt (50	Mar	·ks)				
CIA I		CIA I	Ι	Mod	lel	5	Semin	ar	Assi	ignmo	ent Pe Qu	riodica uizzes	d	Total
8		8	8		10		8			8		8		50
						M	appin	ıg			·			
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 P	SO1	PSO2	PSO3	PSO ₄	PSO5
CO1	М	L	-	Μ	М	-	М	H		L	L	М	L	L
CO2	Μ	М	-	- M M - M				H		L	М	Μ	L	М
CO3	Μ	М	-	Μ	Μ	-	Μ	Н		Μ	Μ	Μ	L	М
CO4	Μ	М	-	Μ	Μ	-	Μ	Н		М	М	Μ	L	М
CO5	Μ	М	-	Μ	Μ	-	M	Η		М	Μ	Μ	L	Μ
H-High;	M-Me	dium; I	L-Low											
		Course	e desig	ned by	V						Verifi	ed by		
			8											

Course	Code				Title					
22U3C	AP304		Core Pap	er X:	Practical in LI	NUX				
Semest	er: III		Credits: 2	CIA	A: 25 Marks	ES	E:25 Marks			
Course	Objectiv	ve 🛛	To know about the basics	of She	Shell Script programming language					
Course	Categor	y	Employability / Skill Deve	elopm	nent					
Develop	ment Ne	eeds	Global							
Course	Descript	ion	This course examines the and implementation.	impoi	rtant techniques	in operat	ting system design			
Course	Outcom	es			Teaching Me	thods	Assessment Methods			
CO 1	Apply t	he she	ell programming commands		Demonstratio	n	Program Creativity			
CO 2	Able to	o appl	y various scripting concep	ot in	Demonstratio	n	Program			
~~~	progran Gain I	ns. Knowl	edge about OS types.	Path	Demonstratio	m	Debugging Program			
CO 3	setting,	direct	ories				Creativity			
CO 4	Create concept	shell	programming manipula	ting	Demonstratio	n	Program Development			
CO 5	Develo	p appl	ications using various scrip	oting	Demonstratio	n	Program			
Offored	language.   Development									
Course	Course Content									
Progra						uctional				
mme		1 11		Descrij	ption		11. 11.00			
1	Write	a shell	script to stimulate the file of	comm	ands: rm, cp, cat	t, mv, cm	p, wc, split, diff.			
	Write	a shell	script to show the followin	ıg syst	em configuratio	n :				
	a. curr	ently l	ogged user and his log nam	ie	~					
2	b. curi workii	rent sl ng dire	ectory directory, Oper	ating	System type, c	urrent Pa	th setting, current			
	c. show	v curr	ently logged number of user	rs, sho	w all available s	shells				
	d. show	w CPU	J information like processor	r type,	speed					
	e. show	w men	nory information							
3	Write	a Shel	l Script to implement the fo	llowir	ng: pipes, Redire	ection and	l tee commands.			
4	Write a shell script for displaying current date, user name, file listing and directories by getting user choice.									
5	Write	a shell	script to implement the filt	er con	nmands.					
6	Write	a shell	script to remove the files w	vhich	has file size as z	ero bytes				
7	Write	a shell	script to find the sum of the	e indi	vidual digits of a	a given nu	umber.			

BCA

8	Write line a	a shel rgume	ll scrip nts.	t to fin	d the	greates	t amon	g the g	given se	t of num	bers usi	ng com	nmand	
9	Write	a shel	l script	for pa	lindroi	me che	cking.							
10	Write	a shel	l script	to prin	nt the r	nultipl	ication	table o	f the gi	ven argu	ment us	ing for	loop.	
Suggeste Review an	ggested Learning Methods: Solving Case studies, Program development, Code view and Peer Coding													
										Tota	l Hours	3	0	
	Tools for Assessment (25 Marks)													
Applica	cation Program		Pr	Program		est 1	1 Test 2		Observ	ation	То	tal		
of Log	gic	Crea	ativity	Det	Debugging					Note E	600K			
4			4		4		5	5		3		25		
						Maj	pping							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	Н	М	Н	Μ	Μ	Μ	Н	Η	Н	Н	М	Н	Н	
CO2	Н	М	Н	Μ	Μ	Н	Н	Μ	Μ	Н	Н	Μ	Η	
CO3	Η	L	Н	Н	Н	Н	L	Н	Η	L	Н	Η	Н	
CO4	Н	L	Н	Н	H H H L		L	Η	Η	L	Н	Н	Н	
CO5	Н	L	Н	Н	Н	Н	L	Η	Η	L	Н	Н	Η	
H-High;	M-Mec	lium; I	L-Low											
	Course designed by									Vorifio	d by			

Course designed by	Verified by

Course	Code		Title	e		
22U40	CAZ301	Skill Based Pa	aper I: P	ractical in Exc	el Macro	
Semest	er: III	Credits: 3	CIA	: 30 Marks	ESE:45 M	larks
Course Ol	ojective	To acquire fundamental knowle concepts.	edge Rela	ational Database	e Management S	System
Course Ca	ntegory	Skill Development /Employabilit	ty			
Developm Needs	ent	Global/Local				
Course Descriptio	n	To enable the students to de applications using various built i	evelop m n functior	acros for imp	lementing real preadsheet.	world
Course Ou	itcomes			Teaching Methods	Assessment Methods	
CO1	Develo	p the program using Basic Control	Demonstrati	ion Application	on of c	
CO2	Implem	nent the concepts of with application	Demonstrati	ion Creatin Applicat	ng tion	
CO3	Gain K	nowledge in using various operato	Demonstrati	on Progra Creativ	am vity	
CO4	Analyz	he how to extract different parts of	Demonstratio	on Progra Develop	am ment	
CO5	Evalua	te the Optimal Solutions		Demonstratio	on Progra Develop	am ment
Offered by	y Compu	uter Applications				
Course Co	ontent		Instr	uctional Hours	/ Week : 3	
Program		Des	scription			
1	Write a Si	imple Macro programs using Butto	on and Me	essage box.		
2	Write an I	Excel Macro Program to work with	h Books a	nd Sheets using	loops.	
3	Write an I	Excel Macro Program to find Area	of Shape	s.		
4	Write an I	Excel Macro Program to Perform A	Arithmetic	c and Logical O	perations.	
5	Write an I name.	Excel Macro Program to implemer	nt case con	nversion, split fi	rst name and las	t
6	Write an I values.	Excel Macro Program to calculate	variation	and standard de	viation forth give	en
7	Write an I	Excel Macro Program to generate S	Sales Calo	culator.		
8	Write an I	Excel Macro Program to Prepare c	harts for l	ResultAnalysis.		
9	Write an I	Excel Macro program to perform S	String Ma	nipulation.		
10	Write an I	Excel Macro Program to Count nu	mber of w	vords in a given	sentence.	
11	Write an I maximum	Excel Macro Program to Perform ( values	Credit Pol	icy for finding r	ninimum and	
12	Write an I	Excel Macro Program to Perform (	Cash flow	Estimation.		

Sug	ggested	Lear	rning Me	thods: S	Solvi	ing	Case S	Studi	es	and A	pplicati	on Dev	elopmer	nt		
												Τα	otal Ho	urs	45	Hrs
				Т	ools f	for	Assess	men	t (:	30 Mai	rks)					
Application of LogicCreating ApplicationQuizTest1Test2Observ Note I						Observation Note Book			Total							
	5		:	5			5			6	6		3			30
	Mapping															
CO \ PO	PO1	PO2	2 PO3	PO4	РО	05	PO6	PO	7	PO8	PSO1	PSO2	PSO3	PSC	04	PSO5
CO1	Н	Μ	Н	Μ	Μ	1	М	Η		Н	Н	Η	Μ	H	[	Н
CO2	Н	Μ	Н	Μ	Μ	1	Η	H		Μ	М	Η	Η	Μ	[	Н
CO3	Н	L	Н	Н	H	I	Η	L		Н	Н	L	Η	H	[	Н
CO4	Η	L	Н	Η	H	I	Η	L		Н	Η	L	Η	H	[	Н
CO5	Η	L	Н	Η	H	I	Η	L		Η	Η	L	Η	H	[	Н
H-High	i; M-Me	ediun	n; L-Low													
	Course designed by											Verifi	ed by			

Cour	se Code		Title		
22U3	CAC405	Core Paper X	I: .Net Program	ming	
Semeste	er: IV	Credits: 3 CIA:	: 30 Marks	<b>ESE:</b> 4	5 Marks
Course	Objective	To inculcate programming algori ASP.Net.	ithm process and	d structure o	of VB.Net and
Course	Category	Employability			
Develop	ment Need	s Global			
Course	Descriptior	To understand the concept of GU controls in VB.NET by coding Basic .NET.	I Design Tool, a programs and de	lso to make velop interfac	them aware of ce using Visual
Course	Outcomes		Teaching Methods	Assessm	nent Methods
CO 1	Remember	r the .Net Controls and statements	Lecture /Flipped Classroom	Ass	signment
CO 2	Understan	d the Structures and OOPs Concepts	Lecture / Tutorial	Ass	signment
CO 3	Develop a web-based	nd implement windows, console and l application	Lecture	S	eminar
CO 4	Examine v for Databa	vebpage, file management, ADO.Net use Connection	Lecture / Tutorial	S	eminar
CO 5		Quiz			
Offered	by Con	puter Applications			
Course	Content	Ins	structional Hour	s / Week : 5	
Unit		Description		Text Book	Chapters
I	VisualStud Studio.Netl and Op Decision St	io.Net:Beginning: Programming Environment- Working with erations- Writing Methods Applying Se tatements – Using IterationStatements	withVisual variables cope - Using	1	1
			Instructi	onal Hours	15
Suggest	ed learning	methods:Video lectures about the basic	cs of Visual Studio	.Net	
п	What is wi variablesan <b>Inheritanc</b> Abstraction	Classification? -What is Encapsulat thConstructors and thenewKeyword d Classes.Using ref and outParameters. e and Interface: Inheritance – Multi- n – Encapsulation – Polymorphism.	ion? - Working – Copying int iple Inheritance -	1	6
			Instruction	onal Hours	15
Suggest	ed learning Windows F	methods: Video lectures about the basic	cs of OOPs Conce	ots	
III	Runtime - ( ADO.Net? - Dataset Con	Controls – Data Access with ADO.Net: – The ADO.Net ArchitectureNet Data apponent.	why do we need a Provider – The	1	22,23,27
		•	Instruction	onal Hours	15
Suggest	ed learning	methods:Write Programs for Forms us	sing Database Con	nectivity	

IV	What Progr types ASP. Serve	is ASI amming – Oper Net obje er object.	P.Net? Basic ators - cts and	<ul> <li>Setting</li> <li>Basing</li> <li>Communication</li> <li>Interact</li> </ul>	ng up f ics of P non ASI ivity- Tl	or ASI rogram P.Net P ne Resp	P.Net ming age Sy oonse o	– An – ASP yntax – bject –	Overvie Net Da Built- The As	ew ata -in SP	2	33,34		
									Instruc	tional	Hours	15	5	
Sugges	sted lea	rning m	ethods	S:Video l	ectures a	bout th	e basics	s of AS	P. Net					
V	Web I ASP.N Sessio Comp	Forms and Net and on Object onents at	d ASP.1 state- 7 st – T nd Cont	Net – We The Appl he Scrip rols– Mo	b Forms - ication S ting Obj re Active	– ASP.N Scope – ject Mo Server	let and ASP S odel – Compos	Config Session Active nent.	uration – s – The e Server		2	33,34	1,35	
									Instruc	tional	Hours	15	5	
Sugges and W	sted lea riting S	rning m Simple F	ethods rogra	s: Video ms using	lectures g ASP. N	s about Net	the ba	sic of .	ASP.Ne	t Objec	ts			
										<b>Total</b>	Hours	75	5	
Text B	ooks		1. An	drew Tro	belsen" <b>F</b>	Pro VB	2008 a	and the	e .NET	3.5 Plat	form"	aw Hill	Fifth	
			Repri	nt 2008.		JI .I (Cl.	AD	giinei	5 Gui	uc, ia		aw 1111	, 1 1111	
Refere	nce Bo	oks	Mridu	ılaPariha	Wiley I	India Ed	ition, Re	eprint 20	07.					
Web. U	URLs		https:	//www.j	avatpoin	t.com/v	b-net-o	dot-net	-framev	vork-inti	oduction			
				Тс	ools for A	Assessn	nent (3	80 Mar	:ks)					
Prog Debuş	ram gging	Prob Solv	lem ing	Mini P	roject	Te	st 1 Test 2 Obser Note			ervation te Book	n Total			
4	ŀ	4		7	7	4	5	5 5			5	30		
						Map	ping							
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO 4	PSO5	
CO1	Н	Н	L	Μ	Н	L	М	Н	Н	Н	Н	Μ	Μ	
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M	
CO3	H	H	L	M	H		M	H	H	H	H	H	H	
CO4	H U	H U		M	H U		M	н u	H U	H U	H U		H U	
H-High	n; M-M	edium; I	L-Low	IVI	п		11/1	п	п	п	п	п	п	
		Cours	e desia	med by						Verified	l hv			
		00015	- 40016	,						, erniet	~ ~ J			

Cour	se Code		Title									
21U30 22U30	CKC408/ CKC408		Core Paper XII : S	Software Engin	eering							
Seme	ster: IV		Credits: 3 CIA: 30	MARKS	ES	SE: 45	MARKS					
		L	(Common to B. Sc. CS / B. S	Sc. IT / BCA)								
Course	Objective		To gain knowledge about basic concepts	s of Software Er	ngineering							
Course	Category		Skill Development / Employability									
Develo	pment Nee	eds	National / Global									
Course	e Descriptio	0 <b>n</b>	This course introduces students to the d phases used in developing, delivering, a also acquire basic software developme used in the software engineering profess	lifferent softwar and maintaining ent skills and u sion	e develop software nderstand	ment l produc comr	ifecycle (SDLC) cts. Students will non terminology					
Course	Outcome	5		Teaching Meth	nods	Ass	essment Methods					
CO 1	Recogniz Process n	e the l nodels	basics of Software Engineering and	Lecture			Assignment					
CO 2	Understan develop t	nd the he sof	requirements and data modeling to tware	Tutorial			Assignment					
CO 3	Distingui develop t	sh bet he sof	ween various designs techniques to ware.	Lecture			Seminar					
CO 4	Understa	nd the	Types of testing and testing tools	Lecture/Tutor	rial		Seminar					
CO 5	Use of Ri Concepts	sk Ma	nagement and Reengineering Le	ecture/Flipped Cla	assroom	Cas	e StudyAnalysis					
Offered by Computer Science												
Course	Content				Instructi	o <mark>nal</mark> E	Iours / Week :3					
Unit			Description		Te Bo	ext ok	Chapters					
I	<b>Software</b> Engineerii myths.	and S ng-Th	oftware Engineering: The nature of software e software process-Software Engineering prac	e – Software ctice- software	1	L	1					
	Process M Specialize	/lodels d proc	: A Generic process model -Prescriptive ess models - The Unified Process.	e process models	s - 1	L	2					
	•	•		Instru	ctional H	ours	9					
	Suggested	Lean	ning Methods : Video lectures about the	basics of Softwa	re Engine	ering						
	Requirem	ents -	Requirement Modeling: Requirements Ana	alysis.	¹¹ g ]		5					
11	Data Moo	deling	Concepts - Class - Based Modeling.		1	Ĺ	6					
	Flow oriented modeling - Creating a behavioral model.   1   7											
	Suggester	Lea	rning Methods: Video lectures about the	Instrue basics of Softwa	ctional H	ours	9					
	Design C	oncen	ts: Design Concepts - The design model		i e Engine	1	8					
	Architect	tural I	<b>Design:</b> Software Architecture - Archite	ecturalStyles -		1	9					
III	Compon Based Co	ent -	Level Design: Component - Designing	g Class -		1	10					
	User Int Interface	erfac Desi	e Design: User Interface Analysis and I gn steps.	Design -		1	11					

										Instr	ructiona	al Hours		9
	Sugges	sted Lea	rning I	Metho	ds : Vi	deo lec	tures abou	t the b	oasic	s of Softv	ware En	gineering		
	Testi	<b>ng:</b> Vali	dation	testing	; - Sys	tem te	sting - Sof	ftware	e test	ingfund	amental	s		
	- Wh	ite box	testing	- Con	trol str	ructure	testing -					1	1	7,18
IV	Black	box Tes	ting					D						
	Test	ng Tools	S: Test	Planni	ng - Te	est Me	trics And	l'est R	lepor	ts -		2		13
	Quan	tative Ai	id Quai	ititauv	e Anai	ysis.				Inctr				Λ
	Su	agested	Loorni	ng Ma	thade	·Vide	alacturas	about	tha l		Softwar	al Hours		9
	Risk	ggesieu Manage	ment.	Softw:	are Ris	ke - R	ick Identif	ication	$\frac{110}{10}$	iskProje	Soliwar	re resung		
	Risk	Refinem	ent - R	isk Mi	tigatio	n. Mor	itoring an	d	11 - 11					28
v	Mana	gement.	UIIC	101 1.1	uguus			u				1		20
	Reen	gineerin	g: Ree	enginee	ering -	- Soft	ware Ree	nginee	ering	<u> </u>				20
	Reven	se Engin	eering.	Čase	stu <u>dy:</u>	SRS f	or Banking	g Syst	em.					29
										Instr	uctiona	al Hours		9
						S	uggested	Learn	ning	Method	ls : Cas	e Studies		
			,								Tota	al Hours		45
			1. Ro	ger S I	Pressm	an, So	ftware En	ginee	ring	a Pract	titioner	's Appro	ach, Sev	enth
Toyt B	ooka		Ed	ition, I	McGra	w Hill,	Internatio	nal Ec	ditio	n, 2013.		~ 11		
	UUKS		2. M	G Lim	ave, S	oftwar	e Testing I	Princip	bles,	Technic	ues and	l Tools, T	'ata	
			McGı	awHil	l Com	oanies,	I st Edition	, 2009	9.		1	,		
			1. Rio	chard F	Fairley,	Softw	vare Engi	neerii	ng C	oncepts	, Tata 1	McGraw-	Hill	
Rofero	nco Rod	alze	Pu	blishin	gCom	pany L	imited, 20	10.						
Muut	IICE DO	JK5	2. W	aman	S. Jaw	adekar	, Softwar	e Eng	inee	ring – I	Princip	les and <b>F</b>	ractice,	
			Tata	McGra	ıw Hill	Publis	shing Com	pany l	Limi	ted, 201	1.			
Web. U	U <b>RLs</b>		https:	//www	youtu	be.con	n/watch?v=	=tZrea	aH_F	FyMs&li	st=PLV	8vIYTld	Snat3WC	CO9jfeht
			Z	yjnxb/	4wm									
					Тоо	ls for .	Assessmer	nt (30	Mai	rks)		~ -	_	
CL	ΑI	CLA	II	C	[A III		Assignmer	nt	S	Seminar	C	ase Study	′ <b>1</b>	otal
	1		1		7		5			5	A	<u>Analysis</u>		20
	+	2	ŀ		1		J Monnin	<u>α</u>		3		5		30
CO								5			_ ~ ~ ~ ~			
PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PC	)8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	М	М	М	L	М	H	I	Н	Η	Н	М	М
CO2	Н	Н	М	М	М	L	М	H	I	Н	Η	Н	Μ	М
CO3	H	H	M	M	M	L	M	H	ł	H	H	H	H	H
CO4	H	H	M	M	M	L	M		<u> </u>	H	H	H	H	H
CO5				М	H	L	M	H	1	H	H	H	H	H
H-Higr	n; M-Me	Course	-LOW	a a d hav							Varifia	J h		
		Course	e aesigi	nea by							verifie	a by		

Cours	e Code Title									
21U3C 22U3C	AP406/ AP406		Core Paper XIII:	Practical in .Net Pro	gramming					
Semes	ter: IV		Credits: 2	CIA: 25 Marks	ESE: 25 Marks					
Course	Objecti	ve	To inculcate the programmi and ASP.Net.	ng algorithm, process	, and structure of VB.Net					
Course	Categor	у	Skill Development /Employa	bility/Entrepreneurship	р					
Develo	pment N	eeds	Global							
Course	Descrip	tion	To development skill set in .l develop applications using	using GUI controls						
Course	Outcom	ies		<b>Teaching Methods</b>	Assessment Methods					
CO 1	Apply based	the st and V	ructure to design window Veb Base Applications.	Demonstration	Application of Logic					
CO 2	Analy soluti	rse the	optimal and feasible	Demonstration	Program Creativity					
CO 3	Apply based	the st and V	ructure to design window Veb Base Applications.	Demonstration	Application of Logic					
CO 4	Analy	rse the	optimal and feasible	Demonstration	Program Debugging					
CO 5	Evalu be im	ate the pleme	e feasibility of the solution to nted.	Demonstration	Program Development					
Offered by Computer Applications										
Course	Content	t		Instructional Hou	rs / Week: 4					
Progr am			List o	of Practical						
1	Write V	B.Net	program to develop a calculator v	vith basic operations.						
2	Write V	B.Net	program to create menus in a	form using menu edito	or.					
3	Design box.	a form	n in VB.Net using common dia	log control to display	the save and open dialog					
4	Develop	p a VE	B.NET Programbyimplementir	ng Concept of Inherita	nce.					
5	Write V	VB.Ne	t program for a various font a	pplication						
6	Write V	B.Net	program to use a tool bar to s	et editor properties.						
7	Write V	B.Net	program to create and reading	g text file.						
8	Write V	B.Net	program to implement a binar	ry search using collecti	on class.					
9	Design College Website using ASP.Net.									
10	Write ASP.Net Program to create online examination system.									
11	Write ASP.Net Program to develop website for online mobile shop.									
12	Design	Onlin	e Registration Form using ASI	P.Net						

Suggest	ed Lea	arning	Metho	ds: S	olving	Case s	tudies,	Prog	ram Dev Review a	elopmer nd Peer	nt, Code Coding		
										Tota	l Hours	6	0
				Т	ools fo	r Asse	ssment	(25 N	/larks)				
ApplicationProgramof LogicCreativity			I	Program Debugging		Test 1		Test 2	Observation Note Book		Total		
4	4		4		4		5		5	,	3		5
	Mapping												
CO/PO	<b>PO1</b>	PO2	PO3	<b>PO4</b>	PO5	<b>PO6</b>	<b>PO7</b>	PO8	B PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO3	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
CO4	Н	Н	L	М	Н	L	М	Η	Н	Н	Н	Н	Н
CO5	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
H-High; M-Medium; L-Low													
		Course	e desig	ned b	y					Verifie	ed by		

Course	Code				Title					
22U3BA	A404		Allied Pap	er – IV	: Financial Acco	ounting				
Semest	er: IV		Credits: 3	CL	A: 30 Marks	F	ESE: 45 Marks			
Course	Objectiv	/e:	To gain the knowledg procedures of Branch a Hire Purchase and Insta	ge on v accounts alment	various systems o s, Departmental ad System.	of accounts,	nting and accounting Royalty accounts and			
Course	Categor	y:	Employability							
Develop	ment No	eeds:	National							
Course	Descript	tion:	Financial Accounting p and the basic use of f strength and viability.	Financial Accounting provides the basis for understanding financial reporting and the basic use of financial information to assess a company's financial strength and viability.						
Course	Outcom	es			Teaching Met	hods	Assessment Methods			
CO 1	Find v	various sy	stems of accounting		Lecture / Flij Classroor	pped n	Work Sheet			
CO 2	Prepar	re hire pu	rchase and installment sy	ystem	Lecture / Tut	orial	Assignment			
CO 3	Interp: branch	ret and nes	explain the performan	ce of	Lecture / Tut	orial	Assignment			
CO 4	Prepar perfor	re Depa mance	rtmental Accounts an	d its	Lecture / Tut	orial	Work Sheet			
CO 5	Grasp issue, endors of dra	the acco acceptan sement o wer and o	ounting treatments relation theorem of the second structure of the second stru	ing to ty and books	Lecture / Flip Classroom	oped	Class Participation			

## **Course Content**

## **Instructional Hours / Week : 5**

Unit	Description	Text Book	Chapters						
Ι	I Single Entry System – Meaning – Definition – Ascertainment of Profit – Difference Between Single Entry system and Double entry system – Net worth Method – Conversion Method								
Instructional Hours									
Suggested Learning Methods:									
Π	Hire Purchase and Installment Purchase system – Calculation of Interest - Default and Repossession – Hire Purchase Trading Accounts	2	18						
	Instructional	Hours	15						
Sugges	ted Learning Methods :								
III	Branch Accounts - Meaning, Features and Types of Branch Accounting - Debtors System – Final Accounts - Wholesale Branch System - Stock & Debtors System	2	16						
	Instructional Hours								
Sugges	ted Learning Methods :								

bugges	Total	Hours	75
Sugges	ted Learning Methods ·		
	Instructional	Hours	15
V	Royalty Accounts - Lease (Excluding Sublease) – Bills of exchange (Trade Bills only)	2	20, 25
Sugges	ted Learning Methods		
	Instructional	Hours	15
IV	Departmental accounts – Meaning – Objectives – Advantages – Distinction between branch and department - Transfers at cost or selling price – Interdepartmental Transfer	2	17

### **Text Books :**

- 1. S.P. Jain and K.L. Narang., "Advanced Accounting", Kalyani Publishers, 2015.
- 2. T.S Reddy and A. Murthy., "Financial Accounting", Margham Publications, 2015.

### **Reference Books :**

- 1. R.L. Gupta and Radhasamy, "Advanced Accounting", Sultan Chand and Sons, 1994.
- 2. M.C. Shukla, T.S. Grewal and S.C. Gupta, "Advanced Accounts", S. Chand and Company Pvt. Ltd., 2016.
- 3. R.L. Gupta, "Advanced Accounting", Sultan Chand & Sons, New Delhi, 2012.
- 4. M.C.Sukla, T.S.Grewal and S.C Gupta, "Advanced Accounting", Sultan Chand &Sons, New Delhi, 2015.R.L.

	Tools for Assessment (30 Marks)											
CIA I	CIA II	CIA III	Assignment	Work Sheet	Class Participation	Total						
4	4	7	5	5	5	30						

#### Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code		Title									
22U4C	AZ402		Skill Based Paper II: Practical in Multimedia Systems								
Semes	ter: IV		Credits: 3	CIA: 30 Marks	ESE: 45 Marks						
Course Objective			To make the students to be a proficient in a broad range of design skills and animation								
Course Category			Skill Development /Employability/Entrepreneurship								
<b>Development Needs</b>			Global								
Course Description			multimedia and the web, as well as the technological decisions that are needed to deploy them. Students learn how various tools are used to create a rich, dynamic Image/visual experience for users in many different formats. Emphasis is given to understanding current, new, and emerging technologies and the impact they have on web-based media. Basic computer skills are required.								
Course Outcomes				Teaching Methods	Assessment Methods						
CO 1	Apply functi	the gons us	raphical designs and sing Photoshop & CorelDraw	, Laboratory Practice	Program Creativity						
CO 2	Create	e Profe	essional design & animation	Laboratory Practice	Program Creativity						
CO3	Frame and fu	e banı ınctioi	ner using graphical designs	³ Laboratory Practice	Program Creativity						
CO4	Devel anima	op Pro tion	ofessional design &	Laboratory Practice	Program Creativity						
CO5 Create Anin			nated Objects	Laboratory Practice	Program Creativity						
Offered	l by C	ompu	ter Applications								
Course	Course Content Instructional Hours / Wee										
Unit	List of Practical for Photoshop&CorelDraw										
1	Combine aspects of several images into one professional images using Photoshop.										
2	Animate Plane Flying the Clouds using Photoshop.										
3	Create I	Plastic	Surgery for Nose using Pho	toshop.							
4	Create 3D shapes and text using Photoshop										
5	Create Web Page using Photoshop.										
6	Create College Seminar Brochure										
7	Create a 3D text in Corel Draw										
8	Create a logo for your department in Corel Draw.										
9	Create an advertisement for a Textile company in Corel Draw.										
10	Using Corel Draw, design a business card for a company.										

11	Using Corel Draw, design a banner for a marriage function.														
12 Create New year Monthly Calendar															
Suggested Learning Methods: Creative theme and poster development.															
Total Hours												45 Hrs			
Tools for Assessment (30 Marks)															
Designing		Theme develop ment			Poster Presentati on		Test I		Test II	Observati on		Total			
	5		5		5		(	5	6	3		30			
	Mapping														
CO/PO	P01	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М		
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М		
CO3	Η	Н	L	Μ	Н	L	М	Н	Н	Н	Н	Н	Н		
CO4	Н	Н	L	Μ	Н	L	М	Η	Н	Н	Н	Н	Н		
CO5	Н	Н	L	М	Н	L	Μ	Н	Н	Н	Н	Н	Н		
H-High; M-Medium; L-Low															
Course designed by									Verified by						
Co	Course CodeTitle22U3CAC507Core Paper XIV: Computer Networks														
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22U	BCAC507Core Paper XIV: Computer Networksnester: VCredits: 3CIA: 30 MarksESE: 45 Marks														
Se	mester: V	Credits: 3 CIA	A: 30 Marks	ESE: 4	5 Marks										
Course	e Objective	To equip the students with an expo	sure towards data con	mmunica	tion strategies										
		with the fundamental concepts of co	omputer networks.												
Course	e Category	Skill Development													
Develo	pment Needs	Global													
Course	e Description	The course introduces main co	ncepts of networkin	ng, appl	ication areas,										
		TCD protocols, transmission env	ironment, routing alg	gorithms,	IP, UDP and										
	_	TCP protocols, application protocol	s and network securit	у.											
Course	e Outcomes		Teaching Methods	Assessm	ent Methods										
CO1	Understand a	bout Network Hardware, Software	Lecture	A	ssignment										
	and uses of co	omputer networks.			0										
CO2	Wireless Tr	ansmission and Communication	Lecture/ Flipped		Sominor										
02	Satellites	ansinission, and Communication	Classroom	1	Seminar										
	Understand	Error Detection and Correction.													
CO3	Elementary D	ata Link Protocols.	Tutorials	A	ssignment										
CO4	Apply variou	s Transport Protocols and Routing	Lecture		Seminar										
04	algorithms.		Lecture		Seminar										
CO5	Understand th	e concept of DNS and Cryptography.	Tutorials		Quiz										
Offere	d by Compu	iter Applications													
Course	e Content		Instruction	al Hours	/ Week : 5										
Unit		Description		Text Book	Chapters										
I	Uses of Co Applications - Personal Area Networks - W Protocol Hiera Oriented and Relationship of Reference Moo OSI and TCP/I	mputer Networks: Business App Mobile Users - Social Issues. No Networks - Local Area Networks - ide Area Networks - Internetworks. archies - Design Issues for the La Connectionless Services - Service of Services to Protocols. Reference del - The TCP/IP Reference Model- A P Reference Models.	etwork Hardware: Metropolitan Area Network Software: yers - Connection- Primitives - The Models: The OSI Comparison of the	1	1										
			Instructional	Hours	15										
Sugges	sted learning n	nethods: Report Presentation													
п	Physical Lay Twisted Pair – Electromagneti Transmission – Communicatio Orbit Satellites	er: Guided Transmission Media: Coaxial Cable – Fiber Optics. Wireles Coaxial Cable – Fiber Optics. Wireles Constant – Radio Transmiss Infrared and Millimeter Waves – Light Son Satellites: Geostationary Satellite – Low-Earth Orbit Satellites – Satellit	Magnetic Media – ss Transmission: The sion – Microwave htwave Transmission. tes - Medium-Earth es versus Fiber.	1	2										
			Instructional	Hours	15										
Sugges	sted learning n	nethods: Video Presentation													
III	Sted learning methods: Video Presentation       Iteration         Data Link Layer: Data Link Layer Design Issues: Services provided to the Network Layer - Framing - Error Control - Flow Control. Error Detection and Correction: Error-Correcting Codes - Error-Detecting Codes. Elementary Data Link Protocols: An Unrestricted Simplex Protocol - A Simplex Stop-and-Wait Protocol - A Simplex Protocol for a Noisy Channel. Sliding Window Protocols: A One-Bit Sliding Window Protocol – A Protocol using Go Back N – A Protocol using Selective       1       3														

									Instr	uctiona	l Hours	1	5	
Sugges	ted lear	ning n	nethods	: Repor										
IVShortest Path Routing - Flooding - Distance Vector Routing - Link State Routing - Hierarchical Routing - Broadcast Routing - Multicast Routing - Routing for Mobile Hosts - Routing in Ad Hoc Networks. Transport Layer: Elements of Transport Protocols: Addressing - Connection Establishment - Connection Release - Flow Control and Buffering - Multiplexing - Crash Recovery. The Internet Transport Protocols UDP: Introduction to UDP. The Internet Transport Protocols TCP: Introduction to TCP - The TCP Service Model - The TCP Protocol - The TCP Segment Header - TCP Connection Establishment - TCP Congestion Release - Modeling TCP Connection Management - TCP Congestion Control - TCP Timer Management.Instructional Ho												5,6		
									Instr	uctiona	l Hours	1	5	
Suggested learning methods: Video Presentation														
V	Applic Name Archite Messag Crypte Transp Crypto	ation I Space - ecture a ge Tr ography osition graphic	Layer: 1 - Resou and Servansfer y: Introc Cipher Princip	DNS - rce Rec vices - - Fi luction rs - ( les.	The D cords - The U inal I to Cryj One-Tin	omain Name Jser Ag Deliver ptograp ne Pa	Name Server gent - y. N hy - S ds -	Syste s. Ele Messa (etwor ubstitu Two	em: The ectronic M age Form k Secu ation Ciph Fundam	DNS <b>Jail:</b> ats - <b>rity:</b> ers - ental	1	7.	,8	
Instructional Hou												15		
Sugges	ted lear	rning n	nethods	: Grou	p Discu	ission							-	
										Tota	l Hours	75	Hrs	
Text Bo	ooks		1. And	rew S. 7	Fanenba	aum, "C	Compu	ter Net	tworks", 4	th Editi	on, PHI.			
Referer	nce Boo	ks	<ol> <li>Achy</li> <li>Uyle</li> <li>Editi</li> </ol>	yut God ss Blac on, PH	lbole, " k, "Co I	Data Computer	ommur Netw	orks:	n and Net Protocols,	works", Standa	2007, TM rds and I	1H. nterface	s", 2 nd	
Web. U	RLs		https://	www.g	eeksfoi	geeks.	org/bas	ics-co	mputer-ne	tworkin	g/			
				To	ols for	Asses	sment	( <b>30</b> M	larks)					
CLA	I	CI	AII	C	IA III		Quiz		Assignm	ent S	eminar	То	tal	
4			4		7		5		5		5	3	0	
						Ma	nning							
CO/	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	B PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	Н	М	Н	М	Н	L	М	Н	Н	Н	М	Н	М	
CO2	Μ	Н	М	Н	Μ	Н	Μ	Μ	M	Н	Н	М	М	
CO3	L	М	Н	L	Μ	Μ	Н	L	Н	М	Н	Н	Н	
CO4	H	M	М	M	Н	L	Μ	Η	M	Н	M	H	М	
CO5		H	M	М	М	L	Μ	Μ	H	М	H	M	H	
H-High	; M-Me	dium; I	L-LOW											
		Cour	se desig	ned by	7					Verifi	ed by			

NASC | 2022

Cou	Course CodeTitle22U3CAC508Core Paper XV: Ethical Hacking										
22U	3CAC508	Core	Paper XV	: Ethical Hackin	ng						
Sen	nester: V	Credits: 3	CIA: 3	30Marks	ESE: 451	Marks					
Course	Objective	To acquire knowledge on social engineering, port sca It enables students to under	ethical hac anning, hac stand the b	king methodolo king web server asic IP detecting	gy, the foot s and hackin & blocking	printing & ng wireless. concepts.					
Course	Category	Skill Development /Employ	yability/Ent	trepreneurship							
Develop	oment Needs	Global									
Course	Description	Description about Course c	ategory and	d Development N	leeds						
	C	Course Outcomes		Teaching Methods	Assessmen	t Methods					
CO 1	Explain the ha and social engi application and	cking methodology, foot printi neering to apply port scann l its vulnerabilities	ng concept ing, we	Lecture / Flipped Classroom	Assignme	nt					
CO 2	Applytheproces eeps.	ssofportscanningtoolsandtarget	Lecture / Tutorial	Seminar							
CO 3	Elucidate above wireless netwo	ut process of hacking webser orks to apply cryptography to	Lectures	ctures Seminar							
CO 4	Explain wirel apply the proc networks.	ess authentication technolog cess of hackingweb services,	Lecture / Tutorial	Group Dis	cussion						
CO 5	Gain knowled Shell commar hacking.	ge on the networking concepndson payload for sniffing an	ots and d	Lecture / Flipped Classroom	Assignme	nt					
Offered	l by Artificie	el Intelligence and Machine	Learning	Γ							
Course	Content			Instructional H	Iours / Wee	ek : 5					
Unit		Description			Text Book	Chapters					
Ι	Ethical Hacki of TCP/IP, IP Network and Computers, Pr networks and c	ng Overview: Introductionto Addressing, Overview of Numb Computer Attacks: Malicio cotecting against malware at omputers, Addressing Physical	Ethical Hac bering System us Software tack, Intrud Security	king, Overview m. Networks and ler Attacks on	1	1 & 3					
Suggest	ad loorning m	athads: Report Presentatio	m	Instructio	onal Hours	15					
Bugges	Foot printing	Tools for Web									
II	printing, Cond Service zone tra <b>Port Scanning</b> Tools, Conduct	luctingCompetitive intelligen ansfers, Introduction to so to so for the second second second second second second to so the second seco	ice, Using cial engine Scans, Using ng Shell Scri	Domain Name, ering. g Port Scanning pting.	1	4 & 5					
Suggest	ad looming m	athade Video I actures on 1	Social Engi	Instructio	onal Hours	15					
Suggest	Programmin	g for security profession	ionals. In	troduction to							
ш	Computer Pro the HTML Ba	by security profession ogramming, Learning the C sics, Understanding PERL, U Server OS Vulnerabilities	Understanding ing OOP.	1	7&8						

	vulnera for hard	bilities lening	in Win Micros	dows, oft sys	MS OS tem, Li	S vulne inux O	erabilit S vulno	ies, B erabil	est practionities, Rem	ces note			
	remote	attacks	s on Lin S.	lux sys	deni, C	ounter	measu	les ag	amst mu	A			
1									Ins	structi	onal Hou	rs	15
						Sug	gested	learr	ning meth	ods:C	ase Studio	es	
IV	Hacking itsvulner Hacking Understa Understa	g we cabilitie g win anding anding	eb set es, Tools reless wireless war driv	rvices: of web netwo networ ving, Ui	Und attacken <b>rks:</b> k standa nderstar	lerstand rsand se Unders ards, Un nding w	ling ecurityt standing nderstar ireless	webaj ester. g wi ndinga hackii	oplications irelesstech authenticat 1g.	and nology, ion,	1		10 & 11
									Ins	structi	onal Hou	rs	15
Suggeste	d learn	ing me	ethods:	Grou	ıp Disc	ussion	1						
V	Cryptog symmetri KeyInfra Networ Firewall Understa	graphy ric anda astructu k <b>Prote</b> s, Unde anding	: Unders asymmetric, Und cction Symposium erstandin Honey I	standin tric alg erstand ystems ng Intru Pots.	g crypto orithm, ing cryj : Under sion De	ography Unders ptograp standin etection	basics, tanding hy attao g Route and Pr	Unde g publi cks. ers, Un eventi	rstanding ic nderstandin on System	ng s,	1		12 & 13
Instructional Hours 15													
Suggested learning methods: Video Presentation on Network protection sytems													
Total Hours 75Hrs													
Text Bo	Text Books       1. Michael T. Simpson, Kent Backman, and James E. Corley, "Hands-On Ethical Hacking and Network Defense".												
Referen	ce Book	ζS	2nd Ed 2. Raft Press, 3. EC Cenga	ayBolc 2014. -Coun ge Lea	2008. och, – cil, – rning,2	Ethica Ethica 2010.	ll Hac l Hac	king king	and Pene	etration	n Testing	Guide	, CRC hasesl,
Web. Ul	RLs		<u>https://e1578</u>	//www 99505	.pdfdri .html	ve.com	n/hands	s-on-e	thical-hac	king-a	and-networ	rk-defer	<u>1se-</u>
				To	ols for	Asses	sment	(30 N	/larks)				
CIA	Ι	CI	AII	C	IA III	As	signm	ent	Semina	ar	Quiz	To	otal
4			4		7		5		5		5	3	0
				_	_	Ma	pping						
CO/PO	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	PO7	PO	8 PSO1	PSO2	2 PSO3	PSO4	PSO5
CO1	H	H	M	M	H	H	H		M	M	M	M	M
C02			H M		Н	IVI N/	IVI T		IVI T		IVI II	IVI M	H M
CO3	п	н u	IVI T	<u>н</u> м		IVI M	L U	H M			П	М Ц	IVI M
C04	$\begin{array}{c c c c c c c c c c c c c c c c c c c $												IVI M
H. High	<u>п</u> M.Mad			п	IVI	П	L	П	п	11/1	11/1	11/1	1/1
	101-10100	, L	2-LUW										
		Cours	e desig	ned by	7					Veri	fied by		

Cou	rse Code		Т	itle			
22U3	CKC509	Core	Paper XVI:	PHP Programm	ing		
Sem	ester: V	Credits: 3	CIA: 30	) Marks	ESE: 45	Marks	
		(Common to B.	. Sc. CS / IT	/ BCA)			
Course	Objective	To acquire fundamental k	nowledge for	web developmen	t using PHF	).	
Course	Category	Employability/Skill Devel	lopment				
Develop	ment Needs	Global/National /Local/Re	egional				
Course	Description	To understand the concept	tsof PHP Pro	gramming and de	velop webpa	age.	
Course	Outcomes			Teaching Methods	Assessmen	t Methods	
CO 1	Recognize t	ne basic development concep	ts of PHP	Lecture / Flipped Classroom	Group	Discussion	
CO 2	Write a sim	ble program using conditional	l statements	Lecture/ Demonstration	Quiz		
CO 3	Understand	the concepts of functions and	Flipped Classroom	Seminar			
CO 4	Use of Funct	Lecture/ Demonstrat ion	S	eminar			
CO 5	Construct a modifying r	simple database program for ecords	adding and	Lecture/ Demonstration	As	signment	
Offered	by Compu	iter Science					
Course	Content		Instruc	ctional Hours / W	Veek:5		
Unit		Description			Text Book	Chapters	
I	Introducing l Scripts. Usin Understandin	PHP – Basic development C g Variable and Operators - g Data types –Setting and cho	Concepts-Crea Storing Dat ecking variab	ating first PHP a in variable – bles Data types.	1	1,2	
C				Instruction	nal Hours	15 Hrs	
II	Using Cons Program I Writing mo with Loops	tants-Manipulating variables <b>low:</b> Writing Simple Progra re complex Conditional Sta	s with operate ams. Condition atements – R	ors. <b>Controlling</b> onal Statements- epeating Action	1	2,3	
	nal Hours	15 Hrs					
Suggest	ed Learning	Methods: Write Simple Pro	grams with	conditional Stat	ements		
III	WORKING W Arrays:Stor Iterations –U Working wit	In String and Numeric F ing Data in Arrays - Process Jsing Arrays with Forms – W h Dates and Times.	Sunctions - sing Arrays V forking with A	working with with Loops and Array Functions-	1	4	
<b>C</b> (	. 1 T		•	Instruction	nal Hours	15 Hrs	
Suggest	ed Learning	viethods : Write Simple Pro	grams using	Arrays			

IV	<b>Usin</b> Creat Files	<b>g Fun</b> ting Cla –Writin	c <b>tions</b> asses. ng Files	and C Worki 5.	Classes ing wi	: Crea th Fil	ting U es and	ser-Def Direc	fined Fu tories:	inctions- Reading	1		5, 6
•									Ir	nstructio	nal Hours	15	Hrs
Suggest	ed Lear	ning M	lethod	s :Wi	rite Sir	nple P	rograr	ns usin	g Funct	ions			
V	Workin Using N working	ng with MySQL g with se	Datab - Addir essions.	ase and and worki	nd SQI modify ng wit	L: Intro ing Dat h XMI	oducing a - Han	Databa dling E	ase and rrors. coo	SQL - okies –	1	7,	28
•									Ir	nstructio	nal Hours	15	Hrs
Suggest	ed Lear	rning M	lethod	s : Wr	ite Ap	plicati	ons usi	ng Dat	abase a	nd XML	1		
			1							Te	otal Hours	75	Hrs
Text Bo	oks		1. V I 2. J	Vikram Limited ulie C.	Vaswar , 1 st Edi <u>Meloni</u>	ni, <b>PHP</b> tion, No , <b>PHP,</b>	<b>A Begi</b> ew Delł <b>MYSQ</b>	<b>nner's (</b> ii, 2010. <b>L and</b> A	Guide, T Apache, I	'ata McGr Pearson E	aw-Hill Publi ducation,200	shing ( 9	Company
<b>Reference Books</b> 1. Steven Holzner, <b>The PHP Complete Reference</b> , Tata McGraw-Hill         Publishing Company Limited, 1 st edition New Delhi, 2010.         2. Steven Holzer, <b>Spring in to PHP5</b> , Tata McGraw-Hill Publishing Company         Limited, 1 st edition New Delhi, 2010.												mpany	
Web. URLs1. <a href="https://www.w3schools.com/php/php_intro.asp">https://www.w3schools.com/php/php_intro.asp</a> 2. <a href="https://www.tutorialspoint.com/php/index.htm">https://www.w3schools.com/php/php_intro.asp</a>													
				]	<b>Cools f</b>	or Ass	essmer	nt (30 N	(larks)				
CIA I		CIA	I	CIA	III		Quiz		Assign	ment	Seminar	Tota	1
4		4	4	7			5		5		5	30	)
						Ν	Iappin	g	1		•		
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PS O4	PSO5
CO1	Н	М	Н	Μ	М	Н	М	Н	М	Н	М	М	Н
CO2	М	М	Н	Н	Н	Н	М	Н	М	Н	Н	Н	Н
CO3	М	Н	Н	Н	Н	Н	Η	Н	Н	Н	Н	Н	Н
CO4	М	Н	Н	Н	Н	S	Н	Н	Н	Н	Н	Н	S
CO5	Н	Н	Н	М	Н	S	Н	Н	Н	Н	М	Н	S
H-High;	M-Med	lium; L	-Low										
		Course	desig	ned by	,					Verif	ied by		

Course Code Title										
22U3CA	AP509		Core Paper X	XVII: Pra	ctical in PHP Pro	gramming				
Semeste	er: V		Credits: 3	C	IA: 30 Marks	ESE:45 Mai	rks			
Course (	Objective		To acquire fundamental	knowledg	ge web developme	nt using PHP.				
Course	Category		Skill Development /Emp	oloyability	/					
Developm	ent Need	s	Global/Local							
Course D	escriptio	1	To development skill se applications in order to	t in PHP a meet the I	nd apply the conc local and Global n	epts to develop eeds.				
Course Out	comes				Teaching Metho	ds Assessment Methods				
CO 1	Develop function	the p s	program for control struct	ure and	Demonstration	Program Creativity				
CO 2	Develop database	simp conr	ble program to implement nectivity.	,	Demonstration	Debugging				
CO 3	Create a informat	simp ion	ble database program for s	student	Demonstration	Application Logic	of			
CO 4Develop simple program to implement database connectivity.DemonstrationProgram Development										
CO 5Develop Web Page using appropriate toolsDemonstrationProgram Development										
COS     Develop web Page using appropriate tools     Demonstration       Offered by     Computer Applications										
Course Con	tent			Ins	structional Hours	/ Week : 5				
			Program	n List						
1. Write	e a PHP pr	ogra	m to illustrate Conditiona	l and Loo	ping Statements.					
2. Write	e a PHP pr	ogra	m to demonstrate Array F	functions,	string, numeric an	d date functions.				
3. Write	e a PHP pr	ogra	m to create user defined f	unctions.						
4. Write	e a PHP pr	ogra	m for file creation and file	e manipul	ation.					
5. Write	e a PHP pr	ogra	m for creating sessions.							
6. Write	e a PHP pr	ogra	m for creating cookies							
7. Creat	e a Simple	e app	lication using forms in Pl	HP						
8. Write	e a PHP pr	ogra	m for creating tables with	constrain	ts and demonstrate	e table join.				
9. Write a PHP program for Database connectivity, Create, Insertion, Updating and Deleting rows in MySQL tables										
10. Write	e a PHP pr	ogra	m for sorting and searching	ng a data.						
11. Write set op	e a PHP Pi perators.	ogra	m to illustrate the usage of	of sub-que	ries, aggregate fur	ctions,				
12. Write appro	e a PHP pr opriates to	ogra form	m to create a simple web that the output.	page. Val	idate the Input and	apply				

Su	ggested	Lear	rnin	ng Meth	nods: So	olving (	Case stu	dies a	nd Pro	gram de	evelopn	nent		
											Tota	l Hou	rs 75 I	Hrs
					То	ols for	Assessm	ent (3	0 Mar	ks)				
Appli of Log	cation gic			Prog Creat	ram ivity	Pro Deb	ogram ugging	Te	st 1	Test 2	Obs Not	ervatio te Book	n	otal
	5			5			5	6		6		3		30
							Марр	ing						
CO \ PO	PO1	РО	02	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Μ	[	Н	М	М	М	Н	Н	Н	Н	М	Н	Н
CO2	Н	Μ	[	Н	М	М	Н	Η	М	М	Н	Н	М	Н
CO3	Н	L	,	Н	Н	Η	Н	L	Н	Н	L	Η	Η	Н
CO4	Н	L	,	Н	Н	Η	Η	L	Н	Н	L	Η	Н	Н
CO5	Н	L	r	Н	Н	Η	Н	L	Н	Н	L	Η	Н	Н
H-High	n; M-Me	ediun	n; L	L-Low										
		Co	our	se desi	gned by	у					Verifie	ed by		

Cou	irse Code			r	Fitle			
21U3 22U3	3CKE501/ 3CKE501		Elective F	Discij Paper I :	oline Specifi Blockchain T	c Yechnolo	ogy	
Sem	ester: V		Credits: 3	CIA: 30	Marks		ESE:4	15 Marks
			(Common to B. S	Sc. CS / 1	T / BCA)			
Course	Objective	] t	Fo understand the Block chair echnology Techniques.	n techno	logy and e	xplain	about t	he Block chain
Course	Category	E	mployability/Skill Development	t				
Develop Needs	oment	G	ilobal/National /Local/Regional					
Course Descrip	tion	Т	o understand the concepts of Blo	ock chair	n technology	and its	Techni	ques.
Course	Outcomes				Teaching Methods	Ass	sessmen	t Methods
CO 1	Understan chain Tech	Group	Discussion					
CO 2	Identify m existing be domain.	najc twe	or research challenges and technic een theory and practice in crypto of	Lecture/ Tutorial		Group	Discussion	
CO 3	It provides of Block of ledgers, achieved,	s co cha hov anc	onceptual understanding of the f in as a method of securing dist w consensus on their conte d the new applications that they	Lecture/ Flipped Classroom		Assignment		
CO 4	Apply hyp implement	per t th	ledger Fabric and Etheric platt he Block chain Application.	Lecture/ Tutorial		Semina	ar	
CO 5	Understand	l th	e role of Block chain technology		Lecture/ Tutorial		Semina	ar
Offered	by Com	put	ter Science	T				
Course	Content				Inst	ruction	al Hou	rs / Week : 6
Unit			Description			T B	fext Book	Chapters
Ι	INTRODU Blockchain Blockchain Transaction Chain -Cry Block chain function-Ha	C - P 2 s-I pto n, ash	<b>FION TO BLOCKCHAIN</b> Jublic Ledgers, Blockchain as Pu 2.0, Smart Contracts, Block Distributed Consensus, The Cl Docurrency to Blockchain 2.0 - F Cryptographic -Hash Function. pointer and Merkle tree	ublic Leo k in a hain and Permissio , Proper	lgers -Bitco Blockcha the Longe oned Model ties of a ha	in, in, est of sh	1	1
C			<b>1</b> -411 X ⁷² -1 <b>1</b> 4 <b>1</b>	Instruct	ional I	Hours	18 Hrs	
Suggest	BITCOIN A	s IV NI	D CRYPTO CURRENCY	uroauct	IOII TO DIOCK	chain		
п	A basic cry spending, FO Bitcoin P2P Block propa consensus in	ypt OR N gat op	o currency, Creation of coins, TH - the precursor for Bitcoin scri etwork, Transaction in Bitcoin N tion and block relay, Consensus ir pen environments-Consensus in a B	s and doubl tcoin Scripts Block Mining on, Distributed work	e , , 1	1	2	
G	17	-		1 .	Instruct	ional I	Iours	18 Hrs
Suggest	ed Learning	g N	<b>1ethods:</b> Video Lectures on Intr	oduction	to bitcoin s	cripting		

III	<b>BI</b> ' Bit Bit Sta	TCO coin coin ke- F	IN CON Consens PoW, A Proof of	SENSU us, Pro ttacks Burn -	U <b>S</b> oof of on Po Proof	Work W ,m of Ela	(PoW onopol	7)- Has y prob ime - 1	shcash 1 lem- Pr Bitcoin	PoW , oof of Miner,	1	3	3	
	Mi cas cor Dis	ning ses, I ntracts stribu	Difficul Design i s- Conse ted conse	ty, Min ssues i ensus ensus ir	ning P for Pe models n close	Pool-Pe ermissions for d envir	ermissic oned E permis	oned m Blockch sioned t Paxos	nodel an ains, E block	nd use xecute chain-				
									Inst	ruction	al Hours	18 H	[rs	
Suggeste	ed Lea	rning	Method	ls: Gro	up Dis	cussio	n							
IV	<b>DISTI</b> RAFT toleran Algori Fault 7	RIBU Cor It sys thm-H	<b>TED</b> nsensus-l tem-Agro BFT ove nce	Byzanti eement er Asyı	ne ge Proto nchron	eneral col, La ous sy	proble amport- /stems,	m, By Shost Practi	CONSE zantine ak-Peas cal Byz	NSUS fault e BFT cantine	1	4	5	
									Inst	ruction	al Hours	18 I	Hrs	
Suggeste	ed Lea	rning	Method	ls: Gro	up Dis	cussio	n							
v	BLOCK CHAIN APPLICATIONS         Internet of Things-Medical Record Management System-Blockchain         1       7         in Government and Blockchain Security-Blockchain Use Cases –         Finance													
	Financ	10.7	-											
<b>a</b> ,	Instructional Hours 18 Hrs													
Suggeste	Suggested Learning Methods : Apply the techniques with real time data													
			1 D 1	· T			DI	1 1 1	D	Tot	al Hours	90 E	<u>irs</u>	
Text Bo	oks		I. Basi	nir, Imr	an, M	asterii	ng Bloc	KChall	1: Deep	er insigi	nts into de	centraliza	ation,	
Referen	ce Boo	ks	1. Arvi Gold Princ 2. Jose and	nd Nat lfeder. I ceton U: ph Bor crypto	ayanan Bitcoin niversit nneau e	and cr and cr y Press et al, S ncy, IE	ph Bon ph Bon yptocus , 2016. oK: Re EEE Syn	neau, I rrency esearch nposiu	Edward technolo n perspo m on se	Felten, gies: A ectives a curity an	Andrew M comprehens and challer nd Privacy,	iller, and sive introc nges for 2 2015.	Steven luction. Bitcoin	
Web. Ul	RLs		https://	www.c	ourser	a.org/	learn/iı	ntrodu	ction-b	lockcha	in-technolo	ogies		
		•		,	Tools f	for Ass	sessmei	nt (30 I	Marks)					
CIA	I		CIA II	CL	A III	Pa	Class rticipat	tion	Assig	nment	Seminar	Tot	tal	
	4		4		7		5			5	5	•	30	
						N	Mappin	lg						
CO\PO	<b>PO1</b>	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	М	Μ	M	М	Μ	Μ	M	Μ	Μ	M	М	M	M	
<u>CO2</u>	M	M	M	M	M	M	M	M	M	M	M	M	M	
<u>CO3</u>	M	H	H	H	H	M	H	H	M	H	H	H	H	
<u>CO4</u>	M	H		H	H	M	H	H	M	H	H	H	H	
<u>CO5</u>		H		H	H	H	H	H	H	H	H	Н	H	
H-High;	M-Me	dium;	L-Low											
		Cou	rse desig	ned by	7					Veri	ified by			

Course Code Title Discipline Specific										
22U3C	CKE502	Discipl Elective Paper I: Nex	line Specific t Generation Networ	rks						
Semes	ter: V	Credits: 3 CIA	A: 30 Marks	ESE: 45 N	Marks					
		(Common to B. Sc. CS / DCF)	S / IT / BCA)							
Course		To learn the technical, economic and	service advantages	of next	generation					
Objecti	ve	networks. Analyse the evolution of techn	nologies of 4G and be	eyond, to	explore the					
0		NGN framework catering services of end	l user with QoS provi	sioning.						
Course		Skill Development /Employability/Entre	preneurship							
Dovelor	ry mont									
Needs	ment	Global								
Course		Description about Course category and I	Development Needs							
Descrip	tion		1							
		Course Outcomes	Teaching Methods	Assessm	nent Methods					
CO 1	Describe	the issues and challenges of wireless	Lecture	Assi	ignment					
	domain i	n future generation network design			0					
CO 2	beyond	the evolution of technologies of 4G and	Lecture/ Tutorial	Se	eminar					
CO 3	Explore t	the LTE concepts and technologies	Lecture/ Tutorial	Se	eminar					
CO 4	Outline t	Tutorial	Quiz							
CO 5	Explain t	he NGN architectures, management and	Lecture / Flipped	Assignment						
003	standardi	zations	Classroom	A33	Igninent					
Offered	by Co	mputer Applications								
Course	Content		Instructional Hour	s / Week	:6					
Unit		Description		Text Book	Chapters					
	INTRO	DUCTION: Evolution of public mobile s	services -motivations							
	for IP ba	ased services, Wireless IP network archite	ecture -3GPP packet	3	1, 2					
Ι	data net	work architecture. Introduction to next ge	eneration networks -							
	Changes	, Opportunities and Challenges, T	Technologies, Next	2	1					
	Generati	on Society, future Trends.	Instructions		10 Um					
Suggest	ed Learn	ing Methods Report Presentation	Instructiona	1 110015	10 1115					
Duggest	LTE -	<b>Introduction:</b> Architectural Review of	UMTS and GSM.							
	History of	of Mobile Telecommunication Systems, N	eed for LTE.							
п	Archited	cture of LTE Air Interface: Air Interf	face Protocol Stack,	5	1.6					
	Logical,	Transport and Physical Channels, T	The Resource Grid,	5	1, 0					
	Multiple	Antenna Transmission, Resource	Element Mapping,							
	downlin	K/uplink data transfer.	tructional Hours		18 Ura					
Suggest	ed Learn	ing Methods: Video Lectures	n ucuonai mours		10 ПГS					
545600	SDMN-	LTE INTEGRATION: SDN paradigm at	nd applications. SDN							
тт	for wire	less-challenges, Leveraging SDN for 5G	network Ubiquitous	1	3, 4, 5,					
111	connecti	vity-mobile cloud-cooperative cellular n	etwork-restructuring	4	6					
	mobile n	etworks to SDN-SDN/LTE integration be	nefits.							
		In	structional Hours		18 Hrs					
Suggest	ed Learn	ing Methods: Video Lectures and Repor	t Presentation							

IV	NGN required stratum function cable an	ARC ments, , serv n. NG nd inte	CHITE , NGN vice/ co N entiti ernet ev	CTUR function ontent ies, Ne olution	E:Evo onal are layer twork n towar	lution chitectu and o and Se ds NG	towa ure- Tr custom rvice e N.	rds anspo er ter voluti	NGN-Te rt stratun rminal e on -fixed	chnolog n, servic quipmer l, mobile	y e it e,	1	1, 3, 4, 6
								Inst	tructiona	l Hours			18 Hrs
Suggest	ed Lear	ning I	Method	ls:Vide	eo Leci	ture					_ [		
V	NGN required Accoun Service and GS alliance	MAN ments ating, and SI-NG and N	NAGEN on M perfor control N rele NGMN	AENT anager mance mana ases, ]	AN nent-C , devi gemen ETSI-N	D SI ustome ce an t- End IGN c	<b>CAND</b> er, thir d info -toEnd concept	d par ormati QoS and	ZATION ty, Confi ion man and secu releases,	i: NGI aguration agemen rity. ITI NGMI	N n, t. J N	1 2	3,7,8 4
								Ins	tructiona	al Hours	5		18 Hrs
Suggest	ed Lear	ning I	Method	ls: Rep	ort &	Video	Prese	ntatio	n				
		-							Tot	al Hour	S		90 Hrs
Text I Refei Bo Web.	Total Hours1. Jingming Li Salina, Pascal Salina "Next Generation Networks-perspectives and potentials" Wiley, January 2008. 2. Thomas Plavyk, —Next generation Telecommunication Networks, Services and Management, Wiley & IEEE Press Publications, 2010. 3. Jyh-Cheng Chen, National Tsing Hua University, Tao Zhang,Telcordia Technologies - "IP-Based Next-Generation Wireless Networks", Systems, Architectures and Protocols. 4.MadhusangaLiyanage, Andrei Gurtov, Mika Ylianttila, "Software Defined Mobile Networks beyond LTE Network Architecture", Wiley, June 2015. 5. Christopher Cox Director, Chris Cox Communications Ltd, UK, "An Introduction to LTE, LTE-Advanced, Sae, Volte and 4G Mobile Communications".Reference Books1. "Next-Generation Wireless Technologies", Naveen Chilamkurti Sherali Zeadally Hakima Chaouchi.Web LIBLahttps://www.academia.edu/38394302/ ebook 4G LTE LTE Advanced for Mob												
CIA	т	CI	A TT		OIS FOR	· Asses	sment	(30 IV.	larks)		0	Т	4-1
	4				1A 111 7	AS	signm 5	ent	Semina 5	11		10	30
	<b>-</b>		4	1	/	<u></u> М-	nnina		5		5	<u> </u>	50
	DO1	DO1	DO3		DO5		ppng	DOO	DCO1	DSO1	DSO2	DSO4	DGOS
CO/PO	H	н Н	M	<u>г04</u> М	<u>гоз</u> М	L	но/ М	<u>го</u> а Н	H	H	н н н н н н н н н н н н н н н н н н н	M	<u>нзоз</u> М
CO1	H	H	M	M	M	L	M	H	H	Н	Н	M	M
CO3	Н	Н	М	М	М	L	М	Н	Н	Н	Н	Н	Н
CO4	Н	Н	М	М	М	L	М	Н	Н	Н	Н	Н	Н
CO5	Н	Η	М	М	М	L	М	Н	Н	Н	Н	Н	Н
H-High;	M-Med	ium; I	L-Low										
		Cours	e desig	ned by	y					Verifi	ed by		
	Course designed by Vermed by												

Cour	se Code		J	litle					
21U3 22U3	CKE503/ CKE503	Floctivo	Discip Paper - I	line Specific	inge				
2203 Some	CRESUS	Crodits: 3	<u>CIA · 30</u>	Morks	ESE.1	5 Morks			
Sent					LSL.4				
	01.1.4	(Common to B. S	$\frac{c. CS / II}{U}$	(' / BCA)	1				
Course	Objective	To understand the Data and Technology, Understand Sta Design.	Technology, Understand State of the Art – IoT Architecture and Real World IoT Design.						
Course	Category	Employability/Skill Develop	ment						
Develop	ment Needs	Global/National /Local/Regio	onal						
Course l	Description	This Course focuses on han communication. It covers prototypes—including devi communication—to help you	ds-on Io7 the dev ices for develop	C concepts such a relopment of In- sensing, actua skills and experien	as sensing ternet of ation, pr aces.	a, actuation and Things (IoT) rocessing, and			
Course	Outcomes	Assessm	ent Methods						
CO 1	Understand	Class	Participation						
CO 2	Understand I Understand	Quiz							
CO 3	Manager		Assignment						
CO 4	Build state o	state of the art architecture in IoT. Demonstration Assignment							
CO 5	Application Building Constrain	ng Automation and Real World Design Discussion Seminar aints.							
Offered	by Compu	ter Science							
Course	Content			Instructio	nal Hour	s / Week : 6			
Unit		Description			Text Book	Chapters			
Ι	M2M to towards I Characteri	<b>IoT</b> -The Vision-Introduction, oT-the global context, A use istics.	From M2 case ex	M to IoT, M2M ample, Differing	1	2			
a t				Instructiona	l Hours	18 Hrs			
Suggeste	ed Learning N M2M to	Iethods : Group Discussion	tivo Int	roduction Some					
IIIInterviewInterviewIntroduction, SomeIIIIIIInterviewIntroduction, SomeIIIIIIInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIInterviewInterviewInterviewIIIIInterviewInterviewInterview <t< th=""><th>3-4</th></t<>						3-4			
	architectu	ie outine, standarus consideratio	0115.	Instructiona	l Hours	18 Hrs			
Suggeste	ed Learning N	Aethods : Quiz		-					
III	M2M and Local and	I IoT Technology Fundamenta wide area networking, Data ma	als- Devic nagement	ces and gateways,	1	5			
		<b>_</b>		Instructiona	l Hours	18 Hrs			

Suggeste	ed Lear	ning M	lethods	s:Ass	ignme	nt							
IV	Bus IoT	iness p Analyt	rocesse ics, Kn	s in Io lowled	T, Eve ge Ma	rything nagem	g as a S ent.	ervice(	XaaS), I	M2M and	1		5
									Ins	structional	Hours	18	Hrs
Suggeste	ed Lear	ning M	lethods	s : As	signme	ent							
V	IoT Arc arcl	' Archi chitectu nitectur	tecture ire Ref e, IoT 1	e-State erence referen	e of th e Mod ce Mo	e Art el- Intr del.	– Introc oductio	luction n, Refe	, State of erence N	of the art. Nodel and	1	6-7	
									Ins	structional	Hours	18	Hrs
Suggeste	ed Lear	ning M	lethods	s : Sen	ninar								
										Tota	Hours	90 1	Hrs
Text Bo	oks		1.	Jan Holler, Vlasios I statsis, Catherine Mulligan, S StamatisKarnouskos, David Boyle, <b>"From Machine-to-</b> <b>Internet of Things: Introduction to a M</b> <b>Intelligence",</b> Academic Press, 2014.									vesand, to the ge of
Reference Web. UI	Reference Books       1. Vijay Madisetti and ArshdeepBahga, "Internet of Approach)", VPT, 2014.         2. Francis daCosta, "Rethinking the Internet of Approach to Connecting Everything", Apress Pub         Web. URLs       1. <a href="https://www.tutorialspoint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/internet_of_things/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.ppint.com/itelta.ppint.com/itelta.ppint.com/itelta.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppint.ppintt.ppint.ppint.ppint.ppint.ppint.ppint.ppintt.ppint.ppin</th> <th>f Things f Things ublication</th> <th>(A Har s: A So s, 2013 ml</th> <th>nds-on- calable</th>									f Things f Things ublication	(A Har s: A So s, 2013 ml	nds-on- calable	
				,	Tools f	for Ass	sessmer	nt (30 I	Marks)				
C	CIA I		CIA II	CI	A III	Par	Class ticipat	ion	Assign	iment	Semin ar	Total	
· ·	4		4		7		5			5	5		30
						Ν	Aappin	g					
CO \ PO	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	M	M	M	M	M	M	M	M	M	M	M
CO2	M	M	M	M	M	M	M	M	M	M	M	M	M
<u>CO3</u>	M	H	H	H	H	M	H	H	M	H	H	H	H
<u>CO4</u>	M	H	H	H	H	M	H	H	M	H	H	H	H
CO5			H	Н	H	H	Н	Н	H	H	Н	H	Н
H-High;	IVI-IVIed	num; L	LOW										
		Course	design	ned by						Verifie	ed by		

Cours	se Code		Title							
21U3C 22U3C	CKE504/ CKE504	Elective	Discipl e Paper I :	line Specific Big Data	c Analy	tics				
Seme	ster: V	Credits: 3	CIA: 30	) Marks	<b>v</b>	ESE:45	Marks			
		(Common to B.	Sc. CS / I7	( / BCA)						
Course (	Objective	To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSql Map-Reduce and learn fundamental techniques and principles in achieving big data analytics.								
Course (	Category	Employability/Skill Developme	ent							
Develop: Needs	ment	Global/National /Local/Regiona	al							
Course	•	To understand the concepts of	Big Data a	nd analysis	of the	ese data ent	ails along with			
Descript	10 <b>n</b>	ethical and conceptual challeng	jes	Teachin	g					
Course (	Dutcomes			Method	ls	Assessmen	t Methods			
CO 1	Know	about the big data analytics		Jigsav	V	Grou	p Discussion			
CO 2	Tools i	n big data analytics using Hadoo	ased		Quiz					
CO 3	Data m	lodel in big data analytics using I	ation	A	ssignment					
CO 4	Progra	mming	ures	A	ssignment					
CO 5Gain more knowledge about Hadoop streaming with RFlipped Classrooms							Seminar			
Offered	by Comp Depa	puter Science, Computer Techr rtments	nology, Inf	ormation T	'echno	ology and E	SCA			
Course (	Content			Inst	ructio	onal Hours	/ Week : 6			
Unit		Description	·			Text Book	Chapters			
	INTRO	<b>DUCTION TO BIG DATA</b> : In	troduction	to Big Data	, Big					
I	Data ch	aracteristics, types of Big Data	, Tradition	al vs. Big	Data	1	1			
	business	s approach, Bigdata Challenges	, Case Stu	idy of Big	Data					
	Solution	18.		Ten a ferr		al Hanna	10 II.ua			
Suggeste	d Learning	Methods : Group Discussion		Instru	uction	al nours				
Juggeber	HADO	<b>OP:</b> Introducing Hadoop – W	Vhy Hado	op – Why	not					
	RDBMS	S – RDBMS versus Hadoop – H	istory of H	adoop – Ha	doop					
II	Overvie	w – Hadoop Distributed File Sy	vstem (HDI	FS) – Proces	ssing	2	2			
	Data with Hadoop – Managing Resources and Applications with									
	Hadoop	YARN – Interacting with Hadoo	op Ecosyste	em						
				Instru	uction	al Hours	18 Hrs			
Suggeste	d Learning	Methods : Quiz			COL 1					
	NoSQL	DATA MODEL: Introductio	on to NoS	QL – No	SQL					
ш	Busines	s Drivers – NOSQL Data Archite	na Naco	erns – Varia	uons	1	3			
	OI NOS	2L Architectural Patterns – Usi	ng NoSQL	io manage	ыg					
	uata – C	use study of NOSQL		Instru	action	al Hours	18 Hrs			

Suggest	ed Lear	ning M	lethod	s : Ass	ignmer	nt							
	MA	P RE	DUCE	Prog	ramm	ing: I	ntroduc	ction to	o MapR	educe –			
IV	Ma	pper –	Reduce	er – Co	ombine	r – Pai	rtitione	r – Sea	rching -	Sorting	2		4
	- C	ompres	sion										
I									In	struction	al Hours	18	Hrs
Suggeste	ed Lear	ning M	lethod	s: Assi	gnmen	t							
	Had	doop st	treami	ng wit	h R: 1	Unders	tandin	g the b	asics of	Hadoop			
	stre	aming -	- How	to run	Hadoo	op strea	aming	with R	– Under	standing			
V	a M	IapRed	uce app	plicatio	on – U	ndersta	anding	how to	o code ai	nd run a	3		4
	Maj	p-Redu	ce app	licatio	n – h	ow to	explo	re the	output	of Map			
	Red	luce app	plicatio	n									
									In	struction	al Hours	18	Hrs
Suggest	ed Lear	ning M	lethod	s: Sem	inar								
			4 -							Tot	al Hours	<b>90</b> ]	Hrs
			1. ŀ	Radha	S. :	hankar	mani,	M	V Talition	ijayalaksł	nmi, "	Big	Data
			2 F	<b>Snaiyt</b>	ICS ² ,W	11eyPu	blicati(	ons, firs	t Edition	2010 "Big Dot	a and And	lytios"	Wilow
Text Bo	oks		2. C	Publica	tion fi	ya, Sui rst edit	tion $\mathbf{R}$	n Cher	n 2016	Dig Dat	a anu Ana	nyues,	wney
			3. Vignesh Prajapati, "Data analytics with R and Hadoop", Copyright ©										
2013, Packt Publishing.									, copji	-8			
			1. N	Aichae	l Mine	elli, M	ichelle	Cham	bers, an	d Ambig	aDhiraj, "	Big Dat	ta, Big
			A	Analyt	ics: E	mergi	ng Bu	siness	Intellig	gence an	d Analyti	c Tren	ds for
Referen	ce Book	s	]	[oday'	s Busi	nesses	", Wile	y, 2013	3				
			2. Bill Franks, Taming, "The Big Data Tidal Wave: Finding Opportunities In Huma Data Statement With Advanced Analytic, "With										
			1	luge L	Data St	reams	With	Advan	ced Ana	lytics", V	Viley		
Web. Ul	RLs		1. <u>https://www.guru99.com/what-is-big-data.html</u>										
			2.	<u>https://</u>	Techtal	rget.co	m/sear	$\frac{\text{chousin}}{\text{nt}}$	Morks)	/tics/defin	<u>11110n/b1g-a</u>	<u>ata-anar</u>	<u>ytics</u>
					1 0015 1	01 A53	Class	III (30 )	viai KS)				
CIA	I	CI	A II	CL	A III	Par	ticipa	tion	Assig	nment	Seminar	To	tal
	4		4		7		5			5	5		30
						Ν	Ларріі	ng					
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Μ	Μ	Μ	Μ	Μ	Μ	Μ	М	М	М	М	М	Μ
CO2	М	Μ	Н	Η	Н	Μ	Μ	Н	Н	Н	Н	Н	Н
CO3	H	M	H	H	H	H	M	H	H	H	H	H	H
CO4	H	H	H	H	H	H	H	H	H	H	H	H	H
CO5	CO5   H   H   H   H   H   H   H   H   H								H				
H-High;	M-Med	num; L	-Low										
		Course	desig	ied by	•					Verifi	ed by		

Course Code	Title					
21U3CAV511 / 22U3CAV510	In-plant 7	Fraining				
Semester: V	Credits: 2	ESE:50 Marks				

#### **Objective**:

To give optimum exposure on the practical side of industrial society

#### **Guidelines:**

- Duration of the internship training is 20 days during the summer vacation which falls at the end of the 4th semester.
- 2. The departments concerned will prepare on exhaustive panel of institutions, industries and practitioners.
- 3. The individual student has to identify the institution / industry / practitioners of their choice and inform the same to the HOD / staff-in-charge.
- 4. The students hereafter will be called as trainees should maintain a work diary in which the daily work done should be entered and the same should be attested by the section in-charge.
- 5. The departments should prepare an outline of the job to be done, sections in which they have to be attached both in the office as well as in the field.
- 6. The trainees should strictly adhere to the rules and regulations and office timings of the institutions to which they are attached.
- 7. The trainees have to obtain a certificate on successful completion of the internship from the chief executive of the organization.
- 8. Monitoring and inspection by staff on a regular basis.
- 9. Report writing manual and format should be prepared by the respective departments.
- 10. All model forms are to be attached wherever it is necessary.
- 11. Report evaluation: Internal viva-voce examination will be conducted and the maximum mark awarded is 50.
- 12. In-Plant Training has to be carried out only in the approved industries by the department/College
- 13. Report should be submitted in the  $5^{th}$  semester at end of the September

Cours	e Code							Tit	le				
21U4C 22U4C	AZ503 / CAZ503			Ski	ill Base	ed Pap	er III:	Prace	tical in In	ternet o	of Things		
Seme	ster: V			Cred	its: 3		(	CIA: 3	30 Marks		ESE:4	5 Mark	s
				(Bac	helor o	of Con	nputer	Appl	ications)				
Course	Objectiv	ve	On th applic	e succe cations	essful c	comple	tion of	the co	ourse the s	students	will able	to desig	gn IoT
Course	Categor	у	Skill Development /Employability/Entrepreneurship										
Develop	ment No	eeds	Globa	<u>al</u>									
Course	Descript	tion	To ma IoT a	ake the	studen	its to u	ndersta	ind Ar	duino, dig	gital met	er, variou	s sensoi	s for
Course	Outcom	es		•				Teach	ing Metho	ods	Assessme	nt Meth	ods
CO 1	Implen	nent th	e desig	n of d	igital n	neter	(	Constru Co	uctivist lear ode Review	rning,	De	bugging	5
CO 2	Design	with 7	Finkerc	ad			Pr	oblem Constru	Based Tea uctivist lea	ching, rning	P Dev	rogram velopme	nt
Offered	by El	ectror	nics										
Course	Content								]	[nstruct	ional Ho	urs / W	eek: 4
Unit List of Practical													
1	Demons	Demonstrate the working of Arduino											
2	Blinkin	nking LED											
3	Design	of dig	gital dc	voltm	eter								
4	Measur	the the	ir hum	idity u	sing se	nsor							
5	Measur	e the t	empera	ature us	sing sei	nsor							
6	Simula	te mot	or cont	rol on '	Tinker	cad							
7	Measur	e the c	listance	e of an	object	using s	sensor						
8	Smart I	Home	Autom	ation s	ystem								
9	Sense t	he ava	ilable r	networl	ζ.								
10	Sense a	finge	r when	it is pl	aced or	1 board	1	10		• .•		407	•
Suggest	ed Leari	ning N	iethod	s: Solv	ing Ca	ise stu	dies ar	id Cre	eate Appl	ications	Hours	101	1rs Irc
				Тс	ools for	: Asses	sment	(30 N	(arks)	1018		001	11.2
Lo Thi	gical nking	Progr Exec	ram ution	Pr So	oblem olving		Test	I	Test II	Obse	rvation	Т	otal
	5		5		5		6		6		3		30
	-		-	_1		Ma	pping						
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	8 PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	Μ	Μ	_	- <u>M</u> <u>M</u> - <u>-</u> <u>H</u> <u>M</u> <u>H</u> <u>H</u>		Μ	Μ						
CO2		H	- T	Μ	Μ	-	M	H	Μ	Н	M	Н	Μ
п-нign;	ivi-iviedi	um; L	-LOW										
		Course	e desig	ned by	7					Verifie	ed by		

Cour	se Code			Title						
22U3	CKC611		Core Paper	XVIII: Data Minin	g					
Semeste	er: VI		Credits: 4 C	IA: 50 Marks	ESE: 5	0 Marks				
			(Common to IT/CS	/BCA)						
Course	Objective		To enable the students to explore data using data mining techniques to solve the business problems.							
Course	Category		Skill Development							
Develop	oment Needs	5	Global							
Course Description			Data mining is the process of sorting through large data sets to identify patterns and relationships that can help solve business problems through data analysis. Data mining can be used to identify telecommunication fraud, improve marketing effectiveness and identify network faults etc.							
Course	Outcomes			Teaching Methods	Assessme	nt Methods				
CO 1 Know the bat Association			ic concept of Data Mining and Rules	Lecture / Demonstration / Video Lecture/	Open	book Test				
CO 2	Understand decision tr	d tl ee	he concepts of Classification and	Demonstration / Video Lecture/ Online Tutorial	Ass	ignment				
CO 3	Apply the various clu	coi iste	ncept of splitting the data into ers	Lectures /Video Lessons / Case Studies	Group	1p Discussion				
CO 4	Analyse va Mining an	ario d T	ous type of Mining like Web Text Mining	Tutorial / Demonstration / Video Lessons	(	Quiz				
CO 5	Assess Int	for	mation Privacy and Data Mining	Tutorial / Demonstration / Case Studies	Se	eminar				
Offered	by Comp	out	er Applications							
Course	Content		I	Instructional Hours	s / Week : 6					
Unit			Description		Text Book	Chapters				
I	<b>Data Minin</b> The Data M Techniques - Association	g: 1 lini - S Rul	ntroduction – What is Data Mining?- ng Process – Data Mining Applicatione Data Mining Case Studies. les Mining: Introduction – Basics – A	Why Data Mining – ions – Data Mining priori Algorithm	1	1,2				
Suggest	ad Loomin	- N/	lathada Vidaa laatuma	Instructio	nal Hours	18 Hrs				
II	Classification tree – The Information Overfitting	1	3							
				Instructio	nal Hours	18 Hrs				
Suggest	ed Learning	<b>y</b> N	Iethods: Online Tutorial	Desired Fastures -f						
ш	Cluster An Cluster An Cluster An – Hierarch	naly naly naly ical	vsis: what is Cluster Analysis? – vsis – Types of Data – Computing sis Methods – Partitional Method – T Methods – Density-Based Methods	Distance – Types of The k-Means Method	1	4				
				Instructio	nal Hours	18 Hrs				
Suggest	ed Learning	g N	Iethods: Case studies							

IV	Web l Charac Mining Mining	Data I teristic ; – Wo ; Softw	Mining s –Loca eb Usa are.	– Iı ality a ıge M	ntroduc nd Hie ining -	rarchy - Weł	– Wel in the Struc	o Te Web ture	erminology – Web C Mining –	y and ontent - Web	1		5
									Instr	uctiona	l Hours	s 18	Hrs
Suggeste	ed Lear	ning N	<b>Iethod</b>	s: Vid	eo Lec	tures							
V	Inforn inforn Privae minin	mation mation cy – Us ng - Pitt	Privacy Privacy ses and falls of l	y and 7? – I Misuse Data M	Data Basic I es of D ining –	Mining Principl ata Min Techno	: Intro es to ning – H logical	ductio produ Prima soluti	on – Wha ict Informa ry aims of ons.	at is ation data	1		9
									Instr	ructiona	d Hours	s 18	Hrs
Suggeste	ed Lear	ning N	<b>lethod</b>	s: Cas	e Stud	ies							
										Tota	l Hours	s 90	Hrs
Text Books1. Introduction to Data Mining a Prentice Hall of India Private							ning and vate Lir	l Cas	e Studies b , New Delh	y G. K. i.	Gupta, P	ublished	l by
Reference Books       1. Data Mining Techniques by Arun K Purari , Published by University Press India Private Limited.         2. Data Mining – A Tutorial-based Primer by Richard J. Roiger& Michael W. GeatzPublished by Pearson Education.								y W.					
Web. Ul	RLs		https://	//www	.tutoria	alspoin	t.com/o	lata_	mining/inc	lex.htm			
				То	ols for	Asses	sment	(50 N	Aarks)				
CIA	I	CL	A II	C	IA III	As	signmo	ent	Seminar	C Part	lass icipati on	Τα	otal
8			8		10		8		8		8	5	<b>60</b>
						Ma	pping						
CO/PO	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PO	8 PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	Н	L	М	М	-	-	М	Н	Н	М	М
CO2	М	М	М	М	Н	Μ	-	-	Н	Н	Н	Μ	Н
CO3	Н	L	М	M H M M M H						Н	Н	Μ	М
CO4	Μ	Н	L	М	L	L	-	-	Н	Μ	Н	Н	М
CO5	M	М	Н	Н	М	Н	-	-	Н	Н	M	Н	Н
H-High;	M-Med	lium; L	-Low										
		Cours	e desig	ned by	7					Verifie	ed by		
				<b>U</b>									

<b>Course Code</b>		Title							
21U3CAV612/	Project	and Viva-Voca							
22U3CAV611	110jeet	rioject and viva-voce							
Semester: VI	Credits: 4	CIA: 50 Marks	ESE: 50 Marks						

### **Course Objective:**

To give project based learning which makes the students to apply practically what they learned.

# Course Outcomes (CO):

CO1	Remember the fundamental concepts of algorithm and designs
CO2	Understand the optimal methods and Software Engineering concepts to be applied
CO3	Apply the knowledge and what they learned
CO4	Analyze the Economical and Technical feasibility
CO5	Develop software based applications and Deployment of software

### **Offered by: Computer Applications**

#### **Course Content**

#### **Instructional Hours/Week: 6**

Project Work and Viva-Voce										
Project Guidelines										
Project shall be Application / System Oriented/ Web enabled online applications										
Individual project is permissible. There should be no team project.										
Report should be in the following sequence										
<ul> <li>Declaration</li> <li>Certificate from the company/organization</li> <li>Bonafide Certificate</li> <li>Guidelines to prepare documentation:</li> <li>The cover should be in the silver gray colour and hard binding</li> </ul>										
<ul> <li>Font type : Times New Roman</li> <li>Font size : 12</li> <li>Sub heading size :14</li> <li>Heading size :16</li> </ul>										
<ul> <li>Margin : top,bottom,right-2.5 cm, left -3 cm</li> <li>Line spacing between two lines - 1.5</li> <li>Every paragraph should start with one tab space.</li> </ul>										

## Sample Templates

Title of the Project

A project report submitted to the Bharathiar University in the partial fulfillment

of the requirements for the award of the degree of

#### BACHELOR OF COMPUTER APPLICATIONS

Submitted by

Name of the Student

(Reg. No.)

Under the Guidance of

Guide Name (Designation)



#### NEHRU ARTS AND SCIENCE COLLEGE

(Autonomous)

(Reaccredited by NAAC with "A" Grade, ISO 9001-2008 & ISO 14001 : 2004 Certified)

RECOGNIZED BY UGC & AFFILIATED TO BHARATHIAR UNIVERSITY

"NEHRU GARDENS", T. M. PALAYAM, COIMBATORE – 641 105.

Month & year

TABLE OF CONTENTS	
CONTENTS	Page No.
DECLERATION	iii
CERTIFICATE FROM THE COMPANY/ORGANIZATION	iv
BONAFIDE CERTIFICATE	V .
STNOPSIS (Abstract of the project)	V1
1. INTRODUCTION	1
1.1. About the project	
1.2. Organization profile	
2. SYSTEM ANALYSIS	
2.1. Existing system	
2.2. Proposed system	
2.2.1. System Study	
<ul> <li>2.3. System specification <ul> <li>2.3.1. Hardware specification</li> <li>2.3.2. Software specification</li> <li>2.3.3. About the software</li> </ul> </li> <li>3. SYSTEM DESIGN <ul> <li>3.1 Design Notations</li> <li>3.1.1 Data flow diagram</li> <li>3.1.2 System flow diagram</li> <li>3.1.3 ER Diagram</li> </ul> </li> <li>3.2 Design Process <ul> <li>3.2.1 Input design</li> <li>3.2.2 Database design</li> <li>3.2.3 Output design</li> </ul> </li> <li>4. SYSTEM TESTING AND IMPLEMENTATION <ul> <li>4.1.Testing methodologies</li> </ul> </li> </ul>	
4.2 System implementation	
5. CONCLUSION & FUTURE ENHANCEMENTS	
Bibliography	
Appendix	
A. Sample Screens	
B. Reports	

#### Declaration

I, (*Student Name*, *Reg.No.*) hereby declare that the project entitled (*Title Of The Project*) submitted to Bharathiar University in partial fulfillment for the award of the Bachelor Degree of Computer Applications is an independent project report done by me during the project duration of the period of study in Nehru Arts and Science College, Coimbatore (Recognized by UGC &Affiliated to Bharathiar University)under the guidance of (*Name Of The Guide*) during the academic year 2022-23.

PLACE: DATE: Signature of the student

## **DEPARTMENT OF COMPUTER APPLICATIONS**

NEHRU ARTS AND SCIENCE COLLEGE

(Reaccredited by NAAC with "A" Grade, ISO 9001-2008 & ISO 14001: 2004 Certified) RECOGNIZED BY UGC & AFFILIATED TO BHARATHIAR UNIVERSITY "NEHRU GARDENS", T. M. PALAYAM, COIMBATORE – 641 105.



# CERTIFICATE

This is to certify that the project report entitled (*Title Of The Project*), is a bonafied work done by (*Student Name, Reg. No.*) in partial fulfillment of the requirement of the award of the degree of Bachelor of Computer Applications, Bharathiar University, Coimbatore during the academic year (Academic Year).

Internal Guide

Head of the Department

Certify that we examined the Candidate in the Project Work / Viva-Voce Examination held at NEHRU ARTS AND SCIENCE COLLEGE on _____

Internal Examiner

External Examiner

**Total Hours: 90 Hrs** 

<b>Review I</b>	Review II	<b>Review III</b>	Document Preparation	Total
10	10	10	20	50

# Tools for Assessment (50 Marks)

# Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	М	М
CO2	Н	Н	L	Μ	Н	L	Μ	Η	Н	Н	Н	М	М
CO3	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	Н	Н
CO4	Н	Н	L	Μ	Η	L	Μ	Н	Н	Н	Н	Н	Н
CO5	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	Н	Н

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD

Cour	se Code		Title					
21U 22U	3CKE605/ 3CKE605	Elective Paper	Discipline Specific II - Software Qualit	y Assurance	,			
Sen	nester: VI	Credits: 3	CIA:30 Marks	ESE:	45 Marks			
		(Common to B.	Sc. CS / IT / BCA)					
Course	Objective	To describe Quality Assurate the quality models.	nce, understand quality	component	s and apply			
Course	Category	Employability						
Develop	ment Needs	Global						
Course	Description	Develop Problem Solving S Global needs.	Develop Problem Solving Skills to solve the computer based problems Global needs.					
Course	Outcomes		Teaching Methods	Assessme	ent Methods			
CO 1	Knowledge Quality As	about the concept, factors, of surance	Video Lecture	Ass	ignment			
CO 2	Understand Assurance	various components of Quality	Case Based	Group	Discussion			
CO 3	Analyze Te Assurance	esting process in Quality	Video Lessons	Se	eminar			
CO 4	Analyze va	rious Software Quality metrics	Case Studies		Quiz			
CO 5	Interpret th Software Q	e various on Standards for uality.	Lecture		Quiz			
Offered	by Comp	uter Science						
Course	Content		Instructional Hour	s / Week : 6	6			
Unit		Description		Text Book	Chapters			
	Softward failures- Software assurance	<b>Quality:</b> Define Software-So Classification of the causes Quality Definition and objecti e and software engineering.	ftware error, faults and of software errors- ves – software quality	,				
I	Softward quality re into soft quality f product t	1	2,3					
G (	17 .		Instructio	nal Hours	18			
Suggeste	ed Learning	wiethods: Assignment	tom and architecture					
п	Pre-proje compone and imp standards Organizi	ents of SQA system : SQA system : SQA system : SQA system components – software ents – Infrastructure component rovement – Management SQA s, system certification and asse ng for SQA – the human compo	project life cycle ts for error prevention components – SQA essment components – onents.	1	4			
			Instructio	nal Hours	18			
Suggeste	ed Learning	Methods: Group Discussion						

Ш	Soft soft Wh Soft Cas prog	tware ware ite box tware e Desi grams.	testing testing testing testing gn – A	g – s strate g – Bla g – im Automa	strateg gies – ick box pleme ated te	gies: softv testin ntatio sting	Definit ware t ng. o <b>n:</b> Tes – Alpł	ion an est clas sting pr na – be	d objects dification ocess – ta site t	ctives- ons – Test- testing	1		9,10
									Instr	uctiona	al Hours	; 1	8
Suggeste	ed Lear	ning N	<b>Iethod</b>	ls : Ser	ninar								
IV	Soft – C Pro Cos Qua	tware lassific duct m at of So ality.	Qualit cation etrics- oftware	y met of soft Imple e Qual	rics: C ware c mentat ity me	bjecti Juality ion of trics-C	ves of metric Softw Classica	quality cs – Pro are Qua al mode	measur ocess m ality me al of Sot	ement etrics- trics – ftware	1		21,22
	Instructional Hours												8
Suggested Learning Methods : Quiz													
v	Quality management standards: scope –Main standards of software quality management - ISO 9000-3 – certification according to ISO 9000-3 standard – Capability Maturity model principles, structure and processes area – Bootstrap1 2Methodology.1										23 4	;	
I									Instr	uctiona	l Hours	; 1	8
Suggeste	d Lear	ning N	<b>Iethod</b>	ls : Ou	iz								
Total Hours												90	Hrs
Text Books1. Daniel Galin, "Software Quality Assurance From Implementation", Pearson education Ltd., 2004. 2. Claude Y. Laporte and Alain April, "Software Quality IEEE Press wiley, 2018.1. Stephen H. Kan, "Metrics and Models in Software Qua Engineering", 2nd Edition, Pearson, 2003.									ce From Quality are Qua Software	Theor Assura lity e Testin	ry to .nce",		
			and	<b>)</b> uality	v Assui	rance:	Theorem	ry and	Practic	e", Johi	n Wiley,	2008	
Web. UI	RLs		Softv	vare Q	uality A	Assura	nce (S	QA) - T	AE (tut	orialan	lexample	e.com)	
				Too	ols for	Asses	sment	(30 Ma	rks)				
CIA	Ι	CI	A II	C	IA III	A	ssignm	nent	Semina	ar	Ouiz	То	tal
4		_	4		7		5		5	-	5	3	0
						Ma	pping						
CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PSO4	PSO
CO1	н	н	н	T	M	М	T	М	M	Ч	н	M	5 M
CO2	M	M	M	M	H	M	M	M	Н	Н	Н	M	H
CO3	Н	I.	M	Н	M	M	I.	H	M	Н	н	M	M
CO4	M	H	Ĭ.	M	T.	I.	Н	M	H	M	H	H	M
C05	M	M	Н	Н	M	н	M	H	Н	H	M	H	H
H-High:	M-Med	ium: L	-Low		1/1		1 11			**			
		, <b>_</b> _								• • • • •			
		Course	e desig	ned by	7					Verifi	ed by		

Cot	irse Code	Title								
21U	3CKE606/	Discipline Sp Elective Denor He Inform	pecific							
Sor	SCREOUO	Credits: 3 CIA: 30 Ma	rka I	CULITY FSF• 15	М	arlza				
50		(Common to P, So, IT / CS / AIMI / I		LOL. 43	1016					
Course	Objective	To enable the students to understand the	various a	aspects	of	Information				
	Objecute	Security in the local and global scenario.	various	aspects	01	information				
Course	Category	Skill Development /Employability/Entrepren	eurship							
Develop	pment Needs	Global								
Course	Course Description         Description about Course category and Development Needs									
	Course Outcomes Teaching A Methods N									
CO 1	Understand the	he basics of Information Security	Smart Bo	ard	Ass	signment				
CO 2	Identify the l Information	egal, ethical and professional issues in Security	Video Le	ssons	Sen	ninar				
CO 3	Survey the st	andards available	Smart Bo	ard	Sen	ninar				
CO 4	Assess the te Security	chnologies essential to provide Information	Case stud Assignme	ly ents	Gro Dis	up cussion				
CO 5	Analyze hack appropriate r	king threats and attacks and determine nethods to combat them	Fishbowl Techniqu	es	Ass	signment				
Offered	l by Artificia	al Intelligence and Machine Learning								
Course	Content		Instructi	onal Ho	ours	; / Week : 6				
Unit Description Text Book										
Ţ	Introduction	to Information security: History-W Security?-Critical Characteristics of Infor	That is rmation,	1		1				
1	Securing the SDLC-The Securing	Components-Balancing Security and Acceleration Components-Balancing Security and Accelerative SDLC.	System, cess-The	1		1				
		Instructio	onal Hours	5		18 Hrs				
	Nood for So	Report Presentation	Attocks							
Π	Legal, Ethic ethics-types of information s	al and Professional Issues: Introduction-L of law-international laws and legal bodies-E ecurity.	Laws and thics and	1		2, 3				
		Instructio	onal Hours	5		18 Hrs				
	Risk Man	Case Study Preparation	and Assa	ssing						
III	Risk-Assess	sing- Control strategies- selecting strategy.	and Asse	ssing	1	4				
		Video Lectures	ional Hou	rs		18 Hrs				
	Planning f	for Security: Introduction-Information Se	curity Po	olicy-						
IV	Blueprint f Continuity documenting	or Security-Security education-training an strategies, Risk appetite, Management disc g results.	nd aware cussion po	ness- oints,	1	5				
		Instruct	tional Hou	irs		18 Hrs				
	Trans Law 4*	Group Discussion								
v	for informati	ion security-Technical and non-technical aspection.	ct manager cts of	ment	1	10, 12				

Information security maintenance: Introduction- Security management models-Maintenance model.														
I								In	str	ructiona	al Hou	rs		18 Hrs
									V	ideo Pr	esenta	tion		
										Tot	al Hou	Irs		90 Hrs
Text Boo	oks		1. Mi Secur Chap	chael E rity" Se ter 2, 3	. Whit econd ; <b>Unit</b>	tman a Editior <b>III:</b> Ch	nd Her n, Thomana and the	rbert mson 4; Un	J. P it	Mattoro ublisher IV: Cha	d, " <b>Pri</b> rs. <b>Uni</b> apter 5	nciples o t I: Chap Unit V: (	<b>f Infor</b> ter 1; <b>U</b> Chapter	<b>mation</b> I <b>nit II:</b> 10,12.
Image: Problem 1, 2011 (1991)1. Surya Prakash Tripathi and RitendraGoel "Introduction to Information Security and Cyber Laws",2014, Dreamtech Press2. V.K. Pachghare, "Cryptography and Information Security", 2nd Revised edition, Prentice-Hall of India Pvt.Ltd										tion ised				
			3. Ma Editic	irk S. N on, Pear	lerkow son Ec	, "Info lucatio	rmatic n	on See	cui	rıty: Pri	ncıples	and. Prac	ctices",	Second
Web. UI	RLs		http:/	/almuh	ammac	li.com/	sultan	/sec_l	bo	oks/Wh	itman.j	<u>odf</u>		
				Το	ols for	Asses	sment	(30 ]	Ma	arks)				
CIA	Ι	CLA	A II	CI	A III	As	signm	ent		Semina	ar	Quiz	To	otal
4		4	1		7		5			5		5	3	0
						Ma	pping							
CO/PO	PO1	PO2	PO3	PO4	PO5	<b>PO6</b>	<b>PO7</b>	PO	8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	М	Μ	Н	Н	Н	Н		М	М	М	М	М
CO2	М	М	Н	Μ	Н	М	М	Μ	[	Μ	Н	Μ	М	Н
CO3	Н	Н	M	Н	М	М	L	H		L	M	Н	М	М
CO4	Н	Н	L	M	Н	Μ	Η	M	[	Н	Н	М	Н	М
CO5	Н	Μ	Μ	Н	М	Н	L	H		Н	Μ	Μ	М	Μ
H-High;	M-Mee	dium; I	L-Low											
		Cours	e desig	gned by	y						Veri	ïed by		

Cour	se Code	Title									
21U 22U	3CKE607/ J3CKE607	Disciplir	ne Sj Cl	pecific Elective 1 oud Computing	Paper	- II:					
Ser	nester: VI	Credits: 3	CIA	A:30 Marks		ESE:	: 45 Marks				
		(Common to B. Sc (	C <b>S /</b> ]	IT / BCA/ AIML	/ <b>DS</b> )						
Course	Objective	To exploring cloud computing of insight into the basics of cloud	drive com	en commercial sy puting along wit	ystems h virtu	and app alization	lications and				
Course	Category	Employability									
Develop Needs	oment	Global									
Course Descrip	tion	of clou stest gr standin er it.	ud comp rowing d ng about	uting along lomain from cloud and							
Course	Outcomes	<u> </u>		Teaching Methe	ods A	ssessme	nt Methods				
CO 1	To make t Computin	he students to understand the Clo g and types,	oud	Lectures		Poster	Presentation				
CO 2	To underst	and the cloud architecture		Tutorial		As	signment				
CO 3	To identif Virtualiza	y the applications of abstraction tion	1 &	Video Lesso	ns	S	eminar				
<b>CO 4</b>	To apply c	loud computing in real-time.		Case Study							
CO 5	To make t Computin		Case Study								
Offered	by Comp	outer Science									
Course	Content		I	nstructional Ho	urs / V	Week : 6					
Unit		Description				Text Book	Chapters				
I	<b>Defining C</b> Types - E Disadvanta Standards. <b>Assessing t</b> The laws Behavioral	<b>Cloud Computing:</b> Defining Clo xamining the Characteristics o ges of cloud computing - Asses <b>he Value Proposition:</b> Measurin of cloudonomics - Cloud co factors relating to cloud adoption	oud C f Cl ssing ng th ompo	Computing - Clor oud Computing the Role of Op ne Cloud's Value uting obstacles	ud ; - en e : -	1	1,				
				Instruct	tional	Hours	18				
Suggest	ed Learning	g Methods: Video lectures			T						
п	Understanding Cloud Architecture :Exploring the Cloud13,4Computing Stack - Connecting to the Cloud.13,4Understanding Services and Applications by Type : Defining Infrastructure as a Service (IaaS) - Defining Platform as a Service (PaaS) - Defining Software as a Service (SaaS) - Defining Identity as a Service (IDaaS) - Defining Compliance as a Service (CaaS).3,4										
G				Instruct	tional	Hours	18				
Suggest	ed Learning	g Methods: Practice using Mod	leis Zirtu	alization •Lla	ing						
п	Virtualizati Understand	on Technologies - Load Balanci ing Hypervisors - Understanding	ing and ng N	and Virtualization Machine Imaging	on - g -	1	5,7				

Porting Applications. <b>Exploring Platform as a Service:</b> Defining Services - Using PaaS Application Frameworks.													
									Instr	uctiona	l Hours	5	18
Suggest	ed Lear	ning	g Methoo	ls : De	velop	small j	progra	mmes	using v	isualiza	tion		
tools	<b>T</b> T <b>1</b>	<u> </u>		<u></u>		- 1	·						
Using Google Web Services: Exploring Google Applications - Surveying the Google Application Portfolio - Exploring the Google1IVToolkit - Working with the Google App Engine. Using Amazon Web Services : Understanding Amazon Web Services - Amazon Web Service Components and Services - Working with the Elastic Compute Cloud (EC2) - Working with Amazon Storage Systems - Understanding Amazon Database Services.												8,9	
~									Instr	ructiona	l Hours	5	18
Suggest	ed Lear	ning	g Methoo	ls : Aj	pply th	ne cono	cept of	web s	ervices	~ 1			
Using Microsoft :Cloud Services - Exploring Microsoft Cloud         Services - Defining the Windows Azure Platform - Using Windows         I         10,12         Understanding Cloud: Security - Securing the Cloud - Securing         Data - Establishing Identity and Presence.											10,12		
									Instr	uctiona	l Hours		18
Suggest	ed Leai	ning	y Metho	ls : cas	se stud	v				<u>ucuoni</u>		, 	10
						-0				Tota	l Hours	s 9	0 Hrs
Text Bo	oks		1. I	Barrie 2011.	Sosins	sky, <b>"C</b>	loud (	Comp	uting B	Bible",W	Viley Pu	ıblishin	g ,Inc.,
Referen	ce Bool	śŚ	1. 2.	Ray J H Arshde <b>Appro</b>	Rafaels ep, Ba <b>ach"</b> , 1	, <b>"Clo</b> hga an 2014.	ud Cor d Vijai	<b>nputii</b> Madis	ng: Fron etti, "Cl	n Begin oud Co	ning to mputing	End", g: A Ha	2015. ands-on
Web. U	RLs		https://w eD80Y/ adurl&y	www.go ABAA ved=2a	oogle.c GgJzZ hUKE	<u>com/ac</u> g&sig= wiNoI	<u>lk?sa=l</u> =AOD6 fozM39	<u>&amp;ai=E</u> 54_34I 9AhXE	ChcSEv 23BK3s 78DoGH	wjs9Yzg q <u>lRPOz</u> IW20C8	zM39Al XJBGvF	hURGy AJkfq3c 6BA@E	<u>sKHSK</u> nQ&q& EAE
				T	ools fo	r Asse	ssment	(30 N	larks)			021182	
CIA	T		TA II	C	IA III		signm	ent	Semin:	ar	Oniz	Т	otal
4			4		7		5		5		5		<u>30</u>
						M	apping						
		P											
CO \ PO	PO1	0 2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	L	M	M	Н	H	M	M
	M	M	M	M	H	M	M	M	H	H	H	M	H
C03	H			H M	M	M		H M	M	H M	H	M 11	M
C04 C05	M	п	 Н	H	L M	L H	М	H	н	H	П	п Н	H
H-High	M-Med	lium	·L-Low	11	141	11	141		11	11	171	11	11
II IIIgil,	111 11100		rse desig	ned by	V					Verif	ied bv		
		204		,~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							~J		

III

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Cou	Course Code Title								
210	J3CKE608/	Disc	cipline S	Specific	•.				
22	U3CKE608	Elective Par	<u>per 11 –</u>	Cyber Secur	ity FSF.	15 Monka			
56	mester: v1	$\frac{\text{Creatis: 5}}{(\text{Common to B Sc CS / IT / A})}$	<u>X: 30 Ma</u> IML / T	arks   DS/BCA)	ESE:	45 IVIAI'KS			
Course	Objective	To make the students to under	stand C	ryptography,	Cyber cr	ime and its			
	•	significance in current scenario o	of IT and	l information	security.				
Course	Category	Employability / Skill Developme	nt						
Develop	pment Needs	Global							
Course	Description	Develop Problem Solving Skills Global needs.	problems at						
Course	Outcomes			Teaching Methods	Assessme	ent Methods			
60.1	Demonstration (1	· · · · · · · · · · · · · · · · · · ·	4	Flipped	Just –	A – Minute			
COT	Remember tr	le information and various represen	tation	Classroom	Pres	entation			
CO 2	Understand to overview of	he concept of computer networks ar internet	nd	Tutorials	Poster I	Presentation			
CO 3	Understand t	he information storage, data	Video	Ass	ignment				
	communicati	on and data modulation techniques	S	Lessons		-8			
<b>CO 4</b>	Cyber Crime	and Information Security	Classroom	Se	eminar				
00.5	Understand t	he importance of Information Security	tance of Information Security			0			
005	Framework	-	5	Lectures		Quiz			
Offered	l by Compu	ter Science							
Course	Content	I	nstructi	onal Hours /	Week:6				
Unit		Description			Text Book	Chapters			
Ι	Image: Control of the image:								
		<u> </u>		Instructiona	l Hours	18 Hrs			
Suggest	ted Learning	Methods : Video lectures about t	he basic	s of Cyber S	ecurity				
II	II Computer Networks and Internet: An overview - What is – computer Network – Basic networking components - what is Internet - Internet Protocols - Internet protocol types - OSI Reference versus TCP/IP Model - OSI model layers - TCP/IP								
G				Instructiona	l Hours	18 Hrs			
Suggest	ted Learning	Methods : Practice using Flow Ch	narts	tion star					
	informat	ion storage and communication:	morma	uon storage					

- purpose of storage - Types of storage Devices - File

organization - Internal file structure - External file structure and

	file	extens	sion _. -	hat is											
	data Ma	a comr	nunica Iodulot	tion -	signal	s - Ba	asic - D	ata Co	ommuni	cation					
	MO	del - M	Iodulat	ion re	cnniqu	es.			Instr	uctions	1 Hound	10	IIng		
Suggest	od I oor	ming N	Anthod		volon	mall	nragran	nmag	n inter	nol filo	I Hours	5 10	nrs		
structu	си Leai 'Р	ining N	iemou	15 . De	verop :	5111411	program	mines							
Siluciu	Crvn	togran	hv Svs	tems [.]	Introdu	ction-(	Tryntogra	aphy S	vstems	Types-					
	Svm	netric (	Cryptog	raphy -	- Asvm	metic	or Public	c Kev.	Cryptog	raphy-					
	Hash	Funct	ions-W	hy thre	e Enc	ryption	n Techni	iques?	– Publ	ic key					
IV	Algorithms – RSA Public Key Algorithm – Digital Signature – Diffie											- 1 5 8			
1 V	Hellman - ElGamal-EDCSA-XTR. Cyber Law and Ethics												5 <b>a</b> 0		
	Intro	duction	to cy	bercrin	ne - 1	Preven	ition - j	prevent	tive ste	ps for					
	Indiv	iduals -	preven	tive ste	eps for	organiz	zations a	nd gov	ernment	- How					
	to pro	otect the	e compu	iter aga	inst thr	eats.			T		1 11	10	TT		
Instruction											I Hours	5 18	Hrs		
Suggest	ed Leai	ning N	lethod	$\frac{ \mathbf{s}  \cdot \mathbf{A} }{ \mathbf{r} }$	pply th	e Cry	ptograp	ohic te	chnique	es in monotomic monotomi	odels				
	Info	ormation	1 secu	rity F	ramew	ork -	Inform	hation	security	y and					
	Fra	acy - mework	Securi – Fran	iy Fia nework	for Ne	k - 1 twork	security a	on sys		control					
V	Тес	hniques	- Com	nuter S	ecurity	and A	Access C	ontrol-	Access	control	1		8&9		
·	Tec	hniques	-Biome	etric A	uthenti	cation-	Authenti	cation	Tokens	-Token					
	type	es and u	isage-D	igital s	ignatur	e-Emb	odiments	s and v	endors-F	Related					
Authentication Technologies.															
									Instr	uctiona	l Hours	s <b>18</b>	Hrs		
Suggested Learning Methods : Case Study															
Tot															
										Tota	l Hours	s <b>90</b>	Hrs		
Text Bo	oks	1. Pank	aj Agar 1 First 1	wal, " Edition	<b>Inform</b> 2010	ation	Security	& Cył	oer Laws	Tota s", Acme	<b>I Hours</b> e Learnin	g Private	<b>Hrs</b> e		
Text Boo	oks	1. Pank Limited 1.Amv	aj Agar 1, First I Rose, I	wal, " Edition Deborat	<b>Inform</b> ,2010 n Arrar	ation	Security stin E. Of	& Cyt	oer Laws Iallov, N	Tota s", Acmo lichael C	<b>l Hours</b> e Learnin G. Solomo	s 90 g Private	Hrs e		
Text Boo	oks ce	1. Pank Limiteo 1.Amy Chappl	aj Agar 1, First I Rose, I e, <b>"Inf</b> o	wal, " Edition Deborat	Inform ,2010 n Arrar on Secu	ation nd, Kris urity II	Security stin E. Ol Iluminate	& Cythhlim, Med", Jo	oer Laws Ialloy, N nes & Ba	Tota s", Acmo fichael C arlett Pul	<b>Hours</b> e Learnin G. Solomo plishers, 2	<b>90</b> g Private on, Mike 2005.	Hrs e		
Text Boo Reference Books	oks ce	1. Pank Limiteo 1.Amy Chappl 2.Lawr	aj Agar l, First I Rose, I e, <b>"Inf</b> o ence C.	wal, " Edition Deboral Deboral Deboral	Inform ,2010 Arrar on Secu , "Cybo	ation and, Kris Ind, Kris Irity II	Security stin E. Of Iluminate urity for	& Cyt hlim, M ed", Joi Dumm	oer Laws Ialloy, M nes & Ba nies", Jol	Tota s", Acmo lichael C arlett Pul hn Wiley	<b>Hours</b> e Learnin G. Solomo plishers, 2 v & Sons,	<b>90</b> g Private on, Mike 2005. Inc.	Hrs e		
Text Boo Reference Books	oks ce	1. Pank Limitec 1.Amy Chappl 2.Lawr https:///	aj Agar l, First Rose, I e, <b>"Inf</b> o ence C.	wal, " Edition Deboration Deboration Miller	Inform ,2010 Arrar on Secu , "Cybo	nation and, Kris Ind, Kris Irity II Ier Secu	Security stin E. Ol lluminate urity for	& Cyt hlim, N ed", Jo Dumm	oer Laws Ialloy, N nes & Ba nies", Jol	Tota s", Acmo lichael C arlett Pul hn Wiley	<b>I Hours</b> e Learnin G. Solomo blishers, 2 v & Sons,	g Private on, Mike 2005. Inc.	Hrs e		
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Cour	rse Code		Title				
21U3	CAE609/	Elect	Discipline Specific	lliconco			
22U3	CAE009	Creditar 2	CIA: 20 Marks	ESE. 4	5 Montra		
Semest	$er: v_1$	Treats: 3	CIA: 30 Marks	ESE: 4	5 Marks		
Course	Objective	techniques.	understand the Artificial Intellig	ence as a Prob.	lem Solving		
Course	e Category	Employability					
Develo	pment Need	s Global					
Course	Description	<b>n</b> The course also contain	ns a balanced look at AI's imp	pact on existi	ng jobs, as well		
		as its potential to create	e new and exciting career field	ls in the futur	e. Students will		
		leave the course with a	a solid understanding of what	Al is, how it	works, areas of		
Course	Outcomes	caution, and what they	Teaching Methods	Assessment	t Methods		
Course	Knowledge	about overview of	Lecture / Demonstration /	ASSESSMEN	i methous		
CO 1	Artificial In	itelligence	Flipped Classroom	As	signment		
	Gain Know	ledge about Problem	Demonstration /				
CO 2	Solving me	thods	Constructivist Approach/	S	eminar		
	Understand	how to represent	I utorial				
CO 3	Knowledge	and its works	Video Lessons		Quiz		
CO 4	Understand	how to use reasoning	Tutorial / Demonstration /	Progra	m Execution		
	methods by	110514					
CO 5	Understand	Progra	Program Execution				
Generation using Learning     Class Projects       Offered by     Computer Applications							
Course	Contont		Instructional	lours / Wool	• 6		
Course				Tort			
Unit		Description	on	Book	Chapters		
-	Introducti	on: What is AI?- The found	dation of AI- AI Problems.	1	1.2		
1	Intelligent	Agent: Introduction-How P	Agent should act-Structure of	2	1		
	Interingent		Instructio	onal Hours	18 Hrs		
Sugges	ted learning	g methods: Video lectures	about the basic of models				
	Problem S	Solving by searching: Prot	blem Solving Agents-				
II	Formulatin	ng Problems-Examples: 8 q	ueens problem. Search	1	3,5		
	Sualegies-	Game i laying. Willin ax-	Instructio	onal Hours	18 Hrs		
Sugges	ted learning	g methods: Video lectures	about the basic of models				
	Knowledg	ge and Reasoning: A Know	vledge based agent-				
III	Representa	ation, Reasoning and Logic	. Propositional Logic-Very	1	6,7		
		gie- introduction to Pirst Of	Ider Logic. Instructio	onal Hours	18 Hrs		
Sugges	ted learning	methods: Video lectures	about the basic of models				
	Planning:	A simple planning agent –	From Problem solving to				
	Planning –	Basic Representation of Pl	anning – A partial Order				
IV	Learning A	gonum - Example. Learn	– Learning from Decision	1	11		
	Trees.	-Sent madeli te Dourning					
			Instructio	onal Hours	18 Hrs		
Sugges	ted learning	methods: Video lectures	about the basic of models				

VExpert Systems- Definition – Features of an expert system – Organization – Characteristics – Prospector – Knowledge Representation in expert systems – Expert system tools – MYCIN – EMYCIN.											3	1,2		
								Instru	ctional	Hours	18 I	Hrs		
Sugges	sted lea	rning m	ethods	s: Video	lecture	the ba	the basic of models							
								Total Hours				90 Hrs		
			1. Stuart J.Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Prentice Hall Incorporation.											
Text B	ooks		2. Elaine Rich, Kevin Knight, Shivasankar B.Nair, <b>"Artificial Intellignence", Third</b> Edition, Tata-McGraw, 2009.											
			3. Donald A.Waterman, 'A Guide to Expert Systems', Pearson Education											
Refere	ence Bo	oks	1. Deepak Khemani, <b>"A First course in Artificial Intelligence"</b> , McGraw Hill Education Pvt Ltd, 2013.											
Web. URLs https://www.newtondesk.com/								/artificial-intelligence-tutorial-and-study-notes-pdf/						
			· •	Т	ools for	Assess	nent (3	0 Mai	rks)			·	•	
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4		4		7			5		5		5		30	
	Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	Н	Н	L	М	Н	L	М	Η	Н	Н	Н	М	М	
CO2	Н	Н	L	М	Н	L	М	Η	Н	Н	Н	М	М	
CO3	Н	Н	L	М	Н	L	М	Η	Н	Н	Н	Н	Н	
CO4	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н	
CO5	Н	Н	L	М	Н	L	Μ	Н	Н	Н	Н	Н	Н	
H-High; M-Medium; L-Low														
Course designed by								Verified by						
Co	ourse Code	Title												
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210	U3CAE610/	Elective Depend	Discipline Specific											
So	uscaeoiu mostor: VI	Credite: 3	1: Soltware Project Ma	ESE. 4	nt 5 Morks									
Se	mester: vi	Computer Ann	Linetions	ESE: 4										
Course	o Obio otivo	Computer App	incations		nont planning									
Cours	e Objective	evaluation techniques activity	nlanning and risk manage	manager	rinciples									
Cours	e Category	Skill Development	praining and max manag	gement pi	incipies.									
	nment Needs	Global												
Cours	e Description	The course provides an in-dep	th examination of softw	are proje	ct management									
Cours		principles and an overview of p spiral model and COCOMO quality and the techniques to en	project planning. It explained by bottom model. Enlightens the bhance it.	ains the wimportan	vaterfall model, ce of software									
Cours	e Outcomes		Teaching Methods	Assessm	ent Methods									
CO1	Remember the project manage	he importance of software ement.	Lecture	А	ssignment									
CO2	Understand so and risk manag	Demonstration		Seminar										
CO3	Apply activi allocation.	ty planning and resource	Video Lessons	А	ssignment									
CO4	Analyze the ad peoples in Soft	ctivity planning and managing tware environment.	Tutorial	Seminar										
CO5	Understand so	Lecture		Quiz										
Offere	d by Comput	ter Applications												
Cours	e Content		Instructional Hours /	Week :	6									
Unit		Description		Text Book	Chapters									
I	Introduction t Why is software – Software proj by software p software projec <b>Programme M</b> benefit evaluation <b>Planning.</b>	to Software Project Manager e project management important ects versus other types of project roject management – Some v ts – What is Management?. Pro- tanagement: Evaluation of indivi- on techniques – Risk evaluation.	<b>nent:</b> Introduction – ? – What is a project? et – Activities covered ways of categorizing <b>oject Evaluation and</b> vidual projects – Cost- <b>Overview of Project</b>	1	1,2,3									
			Instructional	Hours	18 Hrs									
Sugge	sted learning me	ethods: Video Lectures	anah. Introduction											
п	Choosing methodelivery – The Estimation: T estimation techn model. Risk M for dealing with planning – Ris Applying the Pl	1	4,5,7											
	rpprying the H	Litt wonniguo.	Instructional	Hours	18 Hrs									
Sugge	sted learning mo	ethods: Case Study Preparatio	n and Video Presentati	on	N									

ш	Activit Project Networ forward Resour require schedu	y Plann and ac k plann l pass – ce Alloo ments – e – Cos	ing: In ctivities ing mo - The b cation: - Sche t sched	troduc - Se -	etion – equenc - Form ard pas ature o resou The Sc	Object ing an nulating s – Ide of resou- nces – hedulin	tives – nd sche g a net entifyin nrces – - Publi ng Sequ	Proje edulin work ng cri Ident shing ience	ect sched ng activit c model itical act tifying re g the re	ules - ties - – The ivities source source	- e s. e e	1	6,	8
							· ·		Instr	uctio	nal	Hours	18 I	Irs
Sugges	ted lea	ning m	ethods	: Case	Study	Prepa	ration	and	Video P	resen	tati	on		
IV	Monito data – monito environ right p charact Organiz	ring ar Visua ring – ments: erson fo eristics zational	d Con lizing Chang Organ or the j model structu	trol: ( progre ge con ization ob – 1 . Wo res – L	Creatin ess – ntrol. al beha Motiva <b>rking</b> æaders	g the cost Managavior: a tion – in te hip.	framew monito ging p a backg The O ams:	ork - oring oeopl round oldhar Decis	– Collect – Pric e in so d – Selec m-Hackn sion Ma	ing th oritizin of <b>twa</b> n ting th nan jo king	he ng <b>re</b> he ob	1		
	Instructional Hours 18 Hrs													
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		<b>F</b>							Instr	uctio	nal	Hours	18 ]	Irs
Sugges	ted lea	ning m	ethods	: Case	Study	Prepa	ration	and	Video P	resen	tati	on		
00		0			v	-				To	tal	Hours	90 1	Irs
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Refere	nce Boo	lks	<ol> <li>Kel Hal</li> <li>Joe Pea</li> </ol>	kar.S. l of Ind l Henr rson E	A "Sof dia Pul y "Soff ducatio	ftware olicatio tware P on Pub	Project on, Thir Project I lication	Maı d Edi Mana , Firs	nagemen ition, 201 agement A st Edition	t – A 2. A Rea <u>, 200.</u>	Co 1 W 3.	oncise St Vorld gui	tudy", Pa	rentice ccess",
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						Ma	apping					_ ~ ~ ~	_	_ ~ ~
	) PO1	PO2	PO3	PO4	PO5	PO6	P07	PO	8 PSO1	PSC	<u>J2</u>	PSO3	PSO4	PSO5
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Cour	se Code			Title		
21U30	CAE611/		Elac	Discipline Specific		
Seme	Ster• VI		Credits: 3	CIA: 30 Marks	iaucs FSF·	45 Marks
Course	Objective		To explore the functional	areas of Bioinformatics a	nd to be fa	miliarized with
			Biological Databases.			
Course	Category		Employability			
Develop	ment Need	s	Global			
Course	Description	1	The student will be able to and mathematics to address	apply basic principles of complex biological proble	biology, co ms	mputer science
Course	Outcomes			<b>Teaching Methods</b>	Assessmen	t Methods
CO 1	Understand Bioinform	d th atio	te basic concepts of cs and its applications.	Lecture / Demonstration / Flipped Classroom	Ass	signment
CO 2	To interpro Databases	et v	various Biological	Demonstration / Constructivist Approach/ Tutorial	S	eminar
CO 3	To learn al formats an standards	oou Id d	t the various file lata representation	Lectures / Demonstration / Video Lessons		Quiz
CO 4	To Illustra Searching	te a	about Database Similarity	Tutorial / Demonstration / Case Studies	Program	m Execution
CO 5	To demon sequence a	stra alig	te the working nature of	Lecture / Demonstration / Class Projects	Progra	m Execution
Offered	by Con	ıpu	ter Applications	Γ		
Course	Content			Instructional Hours / W	eek:6	
Unit			Description		Text Book	Chapters
I	<b>Bioinform</b> Scope – A _I Why analy Features o tools and s molecular b	atio opli vses f I oftv oiol	cs: Introduction to Bioinf cations – Limitations – DNA DNA? – Gene Structure & DNA Sequence Analysis. H ware. Data generation; Gene logy data.	ormatics – Goal – Sequence Analysis: & DNA Sequence – Examples of related eration of large scale	1&2	1&5
				Instruction	nal Hours	18 Hrs
Suggest	ed learning	m	ethods : Video lectures abo	ut the basic of models		
п	Classificati and public Types of I Database Nucleic ac and Seco databases	on da Data – id nda	and Presentation of Data. ata sources. Introduction to abase – Biological Database Information retrieval from databases ,Protein database ary). Specialized Genome	Quality of data, private De Biological Databases: e – Pitfalls of Biological Diological databases. es (Primary, Composite, e databases: Structure	1	2
				Instruction	nal Hours	18 Hrs
Suggest	ed learning	m	ethods : Video lectures abo	ut the basic of models		

III	Form special for m Flat vocab Swiss Fuzzy integr effort	tication of ultiple so files, re pularies. Prot). In y, Neigh ration. O s.	Annot of sear- equenc lationa File stroduc boring ntologi	ation: C ch terms e alignm l, objec Format tion to M search. ies, inter	Convention; Comm eent; File t oriento (Genba Metadata The cha change I	ons for on seques for streed data ink, Di and sea llenges languag	databa ience f ructura ibases DBJ, arch; Ir of dat es and	ses inc ile forr l data; and c FASTA dices, a exch standa	lexing a nats; Fi ontrolle A, PDF Boolean ange an ırdizatio	und les ed 3, n, ud on	2	6	
Sugges	4. J 1	••••	ath a da	. Video	1	<b>h</b> 4	the he		Instruc	ctional	Hours	18 H	lrs
Sugges	Dotal	rning m bogo Sin	ethous ailarit	· · · · · · · · · · · · · · · · · · ·	ing. Un	s about	une da	asic oi	f datab				
IV	search BLAS	hing – H h tool ( ST – Dat	Heurist BLAS abase s	ic databa T) – F. searching	ase searces ASTA - g with sr	ching – - Com nith – V	- Basic parisor Vaterm	local local of F an me	alignmo ASTA thod.	ent &	1	4	
									Instruc	ctional	Hours	<b>18</b> H	[rs
Sugges	sted lea	rning m	ethods	: Video	lecture	s about	the ba	asic of	models				
v	Intro Local Pairw seque: large SeqV PyMo relatio	duction t alignme ise align nce align quantitie (STA), 3 1), Anato onshin: R	o Seque ent and ment ( iment ( es of D struc omical equilar	ences, ali Global BLAST Clustal biologica cture view visualiza Expressio	<b>gnments</b> alignme and FAS W algori al data: wers (Ra ation. Re on Hierau	s and Dy ent (alg STA Al thm). M sequen asmol, S epresent rchies a	vnamic orithm gorithm Iethods ce vie PDBv, ation c	Progra and e and for provers ( Chime of patter	amming xample) multiple resenting Artemis c, Cn3D erns and podels	; , , , , , , , , , , , , , , , , , , ,	1	2,38	25
	Telatic	nsiip. K	egulai	Expressio	n, mera	icilies, a	nu Oraj	Jiicai ii	Instruc	rtional	Hours	18 H	[rs
Sugges	sted lea	rning m	ethods	· Video	lecture	s about	the h	asic of	models	lionai	lituis	1011	15
			cmous	• • • • • • • • •	icetui e	5 ubout	ine se		mouch	Total	Hours	90 H	[rs
			1. Jin	Xiong "	Essentia	l Bioin	forma	tics".	Cambri	dge Uni	versity Pi	ress 201	6
Text B	ooks		2. T H Educa	K Attwoo ation 200	od & D J )7.	Parry S	Smith,	"Intro	duction	1 to Bio	informat	ics", Pe	arson
Refere	nce Bo	oks	Jean- Wiley	Michel ( / Compu	Claverie iter Publ	, Cedric ishing 2	: Notre 2009	dame l	Bioinfo	rmatics	– A Beg	inner's	Guide
Web. U	U <b>RLs</b>		https:	//thebiol	ogynote	s.com/c	ategor	y/bioin	<u>formati</u>	<u>cs</u>			
				Τα	ols for A	Assessn	nent (3	0 Mar	·ks)				
Prog Debuş	ram gging	Prob solvi	lem ing	Mini P	roject	Te	st 1	Г	Cest 2	Obse Note	rvation e Book	To	tal
4		4		7	7		5		5		5	3	)
						Map	ping						
CO /	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
C01	Н	Н	L	M	Н	L	М	Н	Н	Н	Н	M	М
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
<b>CO3</b>	Н	Н	L	M	Н	L	М	Η	Н	Н	Н	H	Н
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5		H dium: I	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
п-пigr	1, 1VI-1VI(	zarum; L	-L0W										
		Course	e Desig	ned by						Verifie	d by		

Cour	se Code		Title			
22U	3CAE612	Elective Paner II	Discipline Specific II · Mobile Application	n Develonm	ent	
Sen	nester: VI	Credits: 3	CIA: 30 Marks	ESE:	45 Marks	
Course	Objective	To inculcate programming a ASP.Net.	algorithm process and	structure o	of VB.Net and	
Course	Category	Employability				
Develop	oment Need	s Global				
Course	Description	To understand the concept of controls in VB.NET by cod Basic .NET.	f GUI Design Tool, al ling programs and dev	so to make elop interfac	them aware of ce using Visual	
Course	Outcomes		<b>Teaching Methods</b>	Assessment	Methods	
CO 1	Remember	r the .Net Controls and	Lecture / Demonstration / Flipped Classroom	Ass	signment	
CO 2	Understand Concepts	d the Structures and OOPs	Demonstration / Constructivist Approach/ Tutorial	S	eminar	
CO 3	Develop and web-b	nd implement windows, console ased application	Lectures / Demonstration / Video Lessons		Quiz	
CO 4	Examine v ADO.Net	vebpage, file management, for Database Connection	Tutorial / Demonstration / Case Studies	Progra	m Execution	
CO 5	Understan	d and ability to design ASP Page	Lecture / Demonstration / Class Projects	Program Execution		
Offered	by Con	puter Applications	1			
Course	Content		Instructional He	ours / Week	:6	
Unit		Description		Text Book	Chapters	
I	Introductio Developme Application Tools, Ge Interface Se	n to Mobile Computing, Intro ent Environment, Factors in ns, Mobile Software Engineerin neric UI Development, Androi creen elements, Designing User Int	oduction to Android Developing Mobile ng, Frameworks and id User, Basic User terfaces with Layouts.	1	1-2	
			Instructio	nal Hours	18 Hrs	
Suggest	ed learning	methods : Video lectures about t	he basic of models			
п	of Mobile and Retrie Data, Gett Data, Wor	Applications, Successful Mobile ving Data: Synchronization and l ing the Model Right, Android S king with a Content Provider.	Development. Storing Replication of Mobile storing and Retrieving Communications Via	1	3-5	
	Model, An	droid Networking and Web.				
<b>C</b>			Instructio	nal Hours	18 Hrs	
Suggest	ed learning Gallery, dra Working w Android Ne Mapping, Co Sensor and J	<b>methods : Video lectures about t</b> wing 2D and 3D Graphics and Mul with Animation. Networking, Telep tworking, Web and Telephony API. communication, Identity, Sync and soc Hardware Programming	timedia, Drawing and phony and Location, Search, Location and ial media.	1	6-8	

									Instru	ctional	Hours	18 H	Irs
Sugges	sted lea	rning m	ethods	S:Video	lectures	about	the ba	sic of	models				
IV	Senso applie screet (Cheo and s cours	or and cation. T n in the ck userna elected es in you	Hardw That wi emula ame an option ur colle	vare Pro Il displa itor. Cre d passwo should a ege and c	ogrammi y —Hell ate an a ord), Cre appear in on select	ing, C lo Wor pplicat eate a n n text b ing a pa	reate Idl in t ion with nenu w box. Ch articula	—Hell he mic th logi ith 5 o reate a ar cours	o Wor Idle of f n modu ptions a list of se teach	ldl the ile. und all er-	1	9-13	
	in-ch	arge of t	nat cou	irse snou	la appea	ir at the	botton	n of the	e screen	·	Houng	10 T	Tura
Suggos	stad laa	rnina m	othoda	··Vidoo	locturos	ahaut	the he	sic of	models	cuonai	nours	101	115
V	Conn three chang pop u Delet	ecting D option b ge.Create p the me e and ret	vatabase outtons, e and L essage. trieve o	es with a on select ogin app Create a operation	ndroid, ( cting a bublication an applic	Create a utton co as abov ation to latabase	an appl olour of ve. On o Create e.	ication f the sc succes e, Inser	with creen wi sful logi t, updat	11 in, e,	1	14-1	3
				1					Instru	ctional	Hours	18 H	Irs
Sugges	sted lea	rning m	ethods	:Video	lectures	about	the ba	sic of	models				
										Total	Hours	90 H	Irs
Text Books1. Budi Kurniawan, A Beginner's Tutorial, Android Application ,Brainy Software, 2015												elopmen	t
Reference Books       1. Charlie Collins, Michael Galpin, Matthias Kappler, Android in Pragmanning,2011         2. AnubhavPradhan, Anil V. Deshpande, Composing Mobile Apps: L         Apply using Android,Wiley,Publications,2014.         3. Jeff Mcwherter, Scott Gowell, Professional Mobile Application Detwinsite											d in Prac Apps: Le cation Dev	etice earn,Exp velopme	lore, nt
Web. U	URLs		https:	//www.j	avatpoin	t.com/a	android	l-tutori	al				
				To	ools for A	Assessr	nent (3	30 Mai	rks)				
Prog Debuş	ram gging	Prob solvi	lem ing	Mini P	Project	Те	st 1	st 1 Test 2			ervatio Note Book	То	tal
4	-	4		7	7		5		5		5	3	0
						Map	ping				•		
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO3	Н	Η	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
CO4	H	H	L	M	H	L	M	H	H	Н	H	H	H
<u>CO5</u>		H		М	Н	L	M	Н	Н	Н	Н	Н	Н
H-H1gh	n; M-M	edium; I	L-Low										
		Cours	e desig	gned by						Verifie	d by		

NASC

Course	e Code			Title						
22U4C	AZ604		Skill Based Paper	IV: Practical in R	Progra	mming				
Semest	ter: VI		Credits: 3	CIA: 30 Marks		ESE: 45	Marks			
Course	Objectiv	e	To enable the students to gas used in R and learn to impor	in an in-depth under t/export data using l	standin R.	g of data	structure			
Course	Categor	<b>y</b>	Skill Development /Employ	ability/Entrepreneur	ship					
Develop	oment Ne Descript	eds	Global To make the students to und	erstand the fundame	ntals o	f R Progr	amming			
Course	Outcom	es	To make the students to und	Teaching Meth	nds	Assessm	ent Methods			
	Remem	ber v	arious data types, conditional	Demonstrati		Duran	Constinuitor			
COT	and loo	ping s	tatements	Demonstrati	on	Progra	m Creativity			
CO 2	Unders setup a	tand a ind th	bout R-studio, workspace e various R packages	Demonstrati	on	De	bugging			
CO3	Apply of Matrice Frame	lata S es and in R la	tructures: Vectors, Lists, Arrays and Factors and Data inguage and manipulate	Demonstrati	on		Program Creativity			
CO4	Analyz	e the f	easible logics	Demonstrati	on	(	Program Creativity			
CO5	Evaluat problem	the the	optimal solution of the	Demonstrati	on	(	Program Creativity			
Offered	by Co	omput	ter Applications							
Course	Content			In	structi	onal Hou	rs / Week: 6			
Unit			List o	of Practical						
1	Write a l print ver	R Prog sion c	gram to take input from the us f R installation.	ser (name and age) a	nd disp	olay the va	ulues. Also			
2	Write a l numbers	R Prog from	gram to create a sequence of r 20 to 60 and sum of numbers	number from 20 to 5 from 51 to 91.	0 and f	ind the m	ean of			
3	Write a l	Progra	m to check whether the giver	n number is Armstro	ong Nur	nber or no	ot.			
4	Write a l	R Prog	gram to create a simple bar pl	ot of five subjects m	nark.					
5	Write a l	R Prog	gram to create a list and to app	pend, modify and de	elete the	e elements	in the list.			
6	Write a l	R Prog	gram to find the sum of 'n' na	atural numbers						
7	Write a l	R Prog	gram to multiply two vectors	of integers type and	length	3.				
8	Write a l	Progra	m to create a matrix addition	and subtraction.						
9	Write a Program to check whether the given number is palindrome or not using function.									
10	Write a l	Progra	um to create the Data Frame a	nd extract the value.						
11	Write a l	Progra	m to Find Sum, Mean and Pr	oduct of Vector						
12	Write a l	Progra	um to Sample from a Population	on						
Suggest program	ed Learr mming	ning N	Iethods: Solving Case studie	es, Peer tutoring a	nd pai	r				

NASC

## 2022

											Tota	l Hours	90 1	Irs
				То	ols for	Asses	sment	t (30	Ma	rks)				
Applicat Logi	Application of LogicProgram Creativity		gram tivity	Pro Deb	Program Debugging		Test 1		Test 2		Observation Note Book		Total	
5	5 5		5	5			6			6		3	30	
						Ma	pping	ç.						
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO	80	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Μ	Μ	-	М	М	-	-	H	ł	М	Η	Н	М	Μ
CO2	Μ	Н	-	М	М	-	-	H	I	М	Н	М	Н	М
CO3	Н	Н	-	М	Н	-	-	I	H	Н	Н	Н	Н	Н
CO4	Н	Н	-	М	Н	-	-	I	H	Н	Н	Н	Н	Н
CO5	Н	Н	-	М	Н	-	-	I	H	Н	Н	Н	Н	Н
H-High; l	M-Med	ium; L	-Low											
		Course	e desig	ned by	7						Verifie	ed by		

Cour	se Code	Title										
21U4C	CK3ED1 /	Skill Bas	ed Open Elective Cou	rses Foolg Brook	tiaal							
Seme	ster: III	Credits: 2	CIA:	ESE: 5	0 Marks							
Course	Objective	To make the students to be a	proficient in a broad ra	inge of design	skills and							
Course		animation.		•								
Course	Category	Skill Development / Employ	ability / Entrepreneursh	np								
Develop	intent Neeus	This course introduces the	many applications th	at enhance	the world of							
Course	Description	multimedia and the web, as w to deploy them. Students le dynamic Image/visual experi	well as the technologica arn how various tools ience for users in many	l decisions th are used to different form	at are needed create a rich,							
Course	Outcomes	a ghaine mage, visual experi	Teaching Methods	Assessment	Methods							
CO 1	Apply the guing Photo	graphical designs and functions oshop, CorelDraw and Flash	Laboratory Practice	Program	n Creativity							
CO 2	Create Prot	fessional design & animation	Laboratory Practice	Program	n Creativity							
CO2	Frame ban	ner using graphical designs and	Laboratory	Program	n Creativity							
005	functions		Practice									
CO4	Develop Pr	ofessional design & animation	Laboratory Practice	Program	n Creativity							
CO5	Create Ani	mated Objects	Laboratory Practice	Program	n Creativity							
Offered	by Comp	outer Applications										
	С	ourse Content	Instr	uctional Hou	rs / Week: 2							
Unit		List of Practical for	Photoshop & CorelD	raw								
		List of Practica	ll for Photoshop									
1	Create Sun	Flower using Photoshop.										
2	Animate Pla	ane Flying the Clouds using Pho	toshop.									
3	Create Plast	ic Surgery for Nose using Photo	shop.									
4	Create See t	hru text using Photoshop.										
5	Create Web	Page using Photoshop.										
		List of Practical f	for CorelDraw									
6	Create a 3D	text in Corel Draw										
7	Create a logo for your department in Corel Draw.											
8	Create an ac	lvertisement for a Textile compa	any in Corel Draw.									
9	Using Corel	Draw, design a business card for	or a company.									
10	Using Corel	Draw, design a banner for a ma	rriage function.									
Suggest	ed Learning	g Methods: Creative theme and	d poster development.									
			Т	<b>Fotal Hours</b>	30 Hrs							

Mapping													
CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
C01	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO2	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	М	М
CO3	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
CO4	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
CO5	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
H-High;	M-Mee	dium; L	L-Low										
		Course	e desigi	ned by					I	/erified	by		

Course Code	Title									
21U4CK3ED2 / 22U4CK3ED2	Skill Bas Extra Departmental Cours	sed Open Elective Course e: Web Development usi	es ng HTML -	Practical						
Semester: III	Credits: 2	CIA:	ESE:5	0 Marks						
Course Objective	To enable the student to creat	e the static web pages and	web applicat	tions.						
Course Category	Skill Development /Employal	bility								
<b>Development Needs</b>	Global/Local									
Course Description	To develop skill set in HTML order to meet the Local and C	and apply the concepts to allohal needs	create appli	cations in						
	Course Outcomes	Teaching Methods								
CO 1 Remen	nber about WebPages and Web sites	S. Demonstratio	n Pro	ogram ativity						
CO 2 Under	stand about different HTML Tags	Demonstratio	n Deb	ugging						
CO 3 Apply design	the tags which they understood t web pages and web applications	to Demonstratio	on Applie	cation of ogic						
CO 4 Analy	ze the usage of Web tags	Demonstratio	on Pro Devel	ogram lopment						
CO 5 Evalu	ate website on real world problem ling to dynamic content	ns Demonstratio	on Pro Devel	ogram lopment						
Offered by Com	puter Applications	<b>T</b> ( ) <b>T</b>	/ **/							
Course Content		Instructional Ho	ours / Week	:2						
	Program	List								
1. Develop a HT. document.	AL document which displays the o	entire header tags, it must c	open another	HTML						
2. Write names o	several countries in a paragraph a	and store it as an HTML do	cument, world	d.html.						
Each country n	ame must be a hot text. When you c	click India (for example), it r	nust open ind	ia.html						
and it should p	ovide a brief introduction about Ind L document describing you Assig	1a. n a suitable background des	ion and back	ground						
color and a text	color and Image.	in a suitable background des	ign and back	ground						
4. Write a HTML	program using Marquee Behavior.									
5. Write a HTML	document to print your class Time	Гable.								
6. Develop a Cor	plete Web Page using Frames and	Framesets which gives the	Information a	about a						
Hospital using	TIML.									
<ul> <li>7. Design a HTML document with link to send e-mail messages.</li> <li>8. Write a HTML Program to illustrate the ordered list.</li> </ul>										
9 Write a HTM	Program to print your Bio-Da	ta in the following forma	t NAME R	eligion						
Community St	reet Town District State Address	s PIN Code Office Phone	Residence 1	Mobile						
Educational Qu	alification Degree University / Insti	tute Month & year Grade / M	lark.							
10. Develop a HTM	IL document to display a Registration	on Form for an inter-collegia	te function.							
Suggested Learn	ng Methods: Solving Case studi	es and Program develop	ment							
	al Hours 3	30 Hrs								

						ping							
CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	М	Н	L	М	Н	Н	Η	Н	М	М
CO2	Н	Н	L	М	Н	L	М	Н	Н	Η	Н	М	М
CO3	Н	Н	L	М	Н	L	М	Н	Н	Η	Н	Н	Н
CO4	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
CO5	Н	Н	L	М	Н	L	М	Н	Н	Н	Н	Н	Н
H-High	ı; M-Me	edium;	L-Low										
		Cou	rse desi	igned b	У				Verifi	ed by			

<b>Course Code</b>	Title							
21UCASS01 / 22UCASS01	Self-Study Paper: Problem Solving and Program	nming						
Semester: II - V	Credits: 1	ESE: 50 Marks						

#### **Course Objective**

To understand the basic concepts of problem-solving approaches and develop optimal program structure using conditional and iterative control structures and functions.

Course O	utcomes								
CO1	To understand the basic logics for coding a program								
CO2	To design a computational solution for a given problem								
CO3	To break a problem into logical modules that can be solved (programmed)								
CO4	To transform a problem solution into programs involving programming constructs								
CO5	To write programs using structures, strings, arrays, pointers and files for solving complex computational problem								

# Offered by: Computer Applications Course Content

Unit	Description	Text Book	Chapter
I	Introduction To Computer Problem Solving: Introduction – The Problem Solving aspect – Top down design – Implementation of algorithm – Program Verification – The efficiency of algorithm – The analysis of algorithm.	1	1
п	<b>Programming, Algorithms and Flowcharts:</b> Programs and programming – building blocks for simple programs – programming life cycle phases – pseudo code representation – flow charts – algorithm – programming languages – compiler – interpreter, loader and linker – program execution – classification of programming language – structured programming concept.	2	1
	Basics of 'C', input / output & control statements:		
III	Introduction – identifier – keywords – variables – constants – i/o statements – selection – iteration and repetitive execution – go to statement – nested loops – continue and break statements.	3	2-6
IV	<ul> <li>Arrays, Strings, Functions and Pointers: Array – one dimensional characters arrays – multidimensional arrays – array of strings – two dimensional character array – functions – parameter passing mechanism scope – storage classes recursion – comparing iteration and recursion .</li> <li>Pointers – pointer operators - uses of pointers – arrays and pointers – pointers and strings – pointer indirection – pointers to functions – dynamic memory allocation.</li> </ul>	3	7-10

	V	<b>User-defined data types &amp; files:</b> Structures – initialization – nested structures – structures and arrays – structures and pointers – union – typedef and enumeration types – bit fields – file management in C – files and streams – file handling functions – sequential access file – random access file – command line arguments.	3	13-14
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#### **Text Books:**

- 1. R.G.Dromey, How To Solve It By Computer, Pearson education, fifth edition, 2007.
- 2. Pradip Dey, Manas Ghosh, Fundamentals of Computing and Programming in C, First Edition, Oxford University Press, 2009.
- 3. Kamthane, A.N., Programming with ANSI and Turbo C, Pearson Education, Delhi,2006

#### **Reference Books:**

- 1. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson Edition Publ, 2002.
- 2. Henry Mullish & Huubert L.Coope, The Sprit of C, Jaico Pub. House, 1996.

#### Mapping

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	М	М
CO2	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	М	М
CO3	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	Н	Н
CO4	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	Н	Н
CO5	Н	Н	L	Μ	Н	L	Μ	Н	Н	Н	Н	Н	Н

H-High; M-Medium; L-Low.

Course Designed by	Verified by

Course Code	Title							
21UCASS02 / 22UCASS02	Self-Study Paper: Web Design Using HTM	Self-Study Paper: Web Design Using HTML						
Semester: II - V	Credits: 1	ESE: 50 Marks						

#### **Course Objective:**

To offer students the fundamental knowledge of application development for the internet using HTML.

#### **Course Outcomes:**

CO1	Create an HTML Documents and establish adequate formatting for presentation purposes
CO2	Import, insert and modify images and tables
CO3	Establish and maintain internal and external link to available resources
<b>CO4</b>	Use special effect to make the expressive, evocative documents
CO5	Manager forms (Create forms, call programs)

### **Offered by: Computer Applications**

#### **Course Content:**

Unit	Description	Text Book	Chapter					
	Introduction to HTML: History of HTML, HTML							
Ι	Generations, HTML Documents, Hyper Links.	1	4,5					
	Head and Body: Header Section, Title, Prologue, Links,							
	Comment lines.							
II	Designing the Body Section: Heading Printing, Aligning the	1	6					
	Headings, Horizontal Rule, Paragraph, Tab Setting, Images and							
	Pictures.							
	Ordered and Unordered Listing: Lists, Unordered Lists,							
Ш	Headings in a List, Ordered Lists, Nested Lists.	1	78					
111	Table Handling:         Tables, Table Creation in HTML, Width of the	1	7,0					
	tables and cells, Column Specification, some sample tables.							
	DHTML and Style Sheets: Defining Styles, Elements of Styles,							
IV	Linking a style sheet to a HTML Document, In-line Styles,	1	0.10					
1 V	External Style Sheets, Internal Style Sheets, Multiple Styles.	1	9,10					
	Frames: Frameset Definition, Frame definition, Nested framesets.							
	A Web Page Design Project: Frameset definition, Animals,							
V	Birds, Fish.	1	11 12					
v	Forms: Action attribute, Method attribute, Enctype attribute,	T	11,12					
	Drop Down List, Sample Forms.							

#### **Text Book**:

1. C. Xavier, **World Wide Web Design With Html**, Tata McGraw Hill Education Private Limited, New Delhi.

#### **Reference Books:**

- 1. Special Edition Using Intranet HTML / Mark Surfas, Mark Brown and John Juge
- 2. Dynamic HTML Web Magic / JefDouyer Hayden development group

### Mapping

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

H-High; M-Medium; L-Low.

Course Designed by	Verified by