NEHRU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)

Affiliated to Bharathiar University Reaccredited with "A+" Grade by NAAC,
ISO 9001:2015 (QMS) 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, India.
E-mail: nascoffice@nehrucolleges.com. Web Site: www.nehrucolleges.net.

Department of Information Technology &

Digital and Cyber Forensic Science

B. Sc Information Technology

Syllabus

2023 – 2026

NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University)
(Reaccredited with "A" Grade by NAAC, ISO 9001:2015& 14001:2004 Certified
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Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

B .Sc Information Technology

POs of B. Sc Information Technology

Students of B. Sc Information Technology undergraduate degree programmes at the time of graduation will be able to:

PO1	**Technical Aptitude:** Learning information Technology emphasizing the knowledge of programming, hardware organization, operating systems, theory of computation and principles of programming language.
PO2	**Analytical Assessment:** The ability to solve problems quickly and effectively, which may involve a methodical approach that allows breaking down complex problems into single and manageable components
PO3	**Effective Communication:** Employees in the digital age must be able effectively convey and receive messages. Good communication skills will help get hired and be successful throughout the career.
PO4	**Moral Philosophy:** Incorporating human values and morality by responsibly accepting the roles to work for the sustainable development of self and society.
PO5	**Being self and Adaptability:** Acquire the ability to survive in the environment of rapid technological changes through dynamic learning.
PO6	**Modern Tool Usage:** Gain and improve knowledge on programming to build software applications and to solve real time problems.
PO7	**Individual and Team Work :** Function and Communicate effectively as a team member or a leader to accomplish a common goal in a multidisciplinary team using a range of modalities including written, oral and graphical.
PO8	**Life Long Learning:** Engage in independent and life-long learning for continued professional development.

PSOs of B. Sc Information Technology

By the completion of Information Technology program the student will be able to:

PSO1	Understand the programming concepts, methodology and the functionality of hardware and software aspects of computer systems.
PSO2	Provide the structure and development methodologies of software systems, acquire professional skills and knowledge of software design process. Familiarity and practical competence with a broad range of programming language and open source platforms.
PSO3	Apply mathematical methodologies to solve computation task, model real world problem using appropriate data structure and suitable algorithm.
PSO4	Comprehend and write effective project report in multidisciplinary environment in the context of changing technologies.
PSO5	The ability to employ in modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

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Scheme of Examination

Programme Name: B. Sc., Information Technology
Programme Code : UIT
(Applicable to the students admitted during the year 2023-2024 onwards)

Semester	Part	Sub. Code	Name of the Subject	Instruction hours / week	Duration of Examination	Examination Marks			Credits
						CIA	ESE	Total	
I	I	**23U1TAM101/ 23U1HIN101 / 23U1MAL101/ 23U1FRN101**	**Elanthamizh Rachnathmak Hindi Kadhayum Samskaaravum Le Français Fondamental - I**	4	3	20	55	75	3
	II	**23U2ENG101**	**Professional English I**	4	3	20	55	75	3
	III	23U3CKC101	Core Paper I: Python Programming	5	3	25	75	100	4
		23U3CKC102	Core Paper II: Digital Fundamentals and Computer Architecture	5	3	25	75	100	4
		23U3ITP101	Core Paper III: Practical in Python Programming	4	3	40	60	100	4
		23U3MIA101	Allied Paper I: Mathematics for Computer Science	5	3	25	75	100	4
	IV	**21U4ENV101**	***@ Ability Enhancement Compulsory Course Environmental Studies**	2	3	50	-	50	2
		22U4HVY201	**@ Value Education : Human Values and Yoga Practice**	1	-	-	-	-	-
				30	-	-	-	600	24
II	I	**23U1TAM202/ 23U1HIN202/ 23U1MAL202/ 23U1FRN202**	**Pynthamizh Sanchar Hindi Novalum Bhashaapadanavum Le Français Fondamental - II**	4	3	20	55	75	3
	II	**23U2ENG202**	**Professional English II**	4	3	20	55	75	3
	III	23U3CKC203	Core Paper IV: Java Programming	5	3	25	75	100	4
		23U3CKC204	Core Paper V: Data Structures	5	3	25	75	100	4
		23U3ITP202	Core Paper VI: Practical in Java Programming	4	3	40	60	100	4
		23U3MIA202	Allied Paper II: Discrete Mathematics	5	3	25	75	100	4
	IV	**21U4HRC202**	***@ Ability Enhancement Compulsory Course Human Rights and Constitution of India**	2	3	50	-	50	2
		22U4HVY201	**@ Value Education : Human Values and Yoga Practice**	1	2	50	-	50	2

				30	-	-	-	650	26
III	I	**23U1TAM303/ 23U1HIN303 / 23U1MAL303/ 23U1FRN303**	**Arunthamizh Sahityak Hindi Kavithayum Smarannayum Le Français General - III**	4	3	20	55	75	3
	II	**23U2ENG303**	**Communicative English - I**	4	3	20	55	75	3
	III	23U3CKC305	Core Paper VII: Operating Systems	4	3	20	55	75	3
		23U3ITC303	Core Paper VIII: Software Engineering	4	3	20	55	75	3
		23U3ITP303	Core Paper IX: Practical in Operating System	4	3	20	30	50	2
	III	23U3MIA303	Allied Paper III: Operations Research	3	3	25	75	100	4
	IV	23U4ITZ301	Skill Based Paper I: Case Tools Lab	3	3	30	45	75	3
		22U4NM3BT1 / 22U4NM3AT1 / 22U4NM3CAF / 22U4NM3GST / 22U4NM3WRT	**# @Basic Tamil - I / ##Advanced Tamil- I / * NME: Consumer Affairs / Gender Sensitization / Women's Rights**	**2**	**2**	**50**		**50**	**2**
		SBOEC	**Skill Based Open Elective Courses - Extra Departmental Course**	**2**	**3**	**-**	**50**	**50**	**2**
		23U4CDVALC	**Skill Enhancement- Add on Course – Institute Industry Linkage**	**-**	**-**	**-**	**-**	**-**	**-**
				30				625	25
IV	I	**23U1TAM404/ 23U1HIN404 / 23U1MAL404/ 23U1FRN404/**	**Muththamizh Prayogik Hindi Drisykala Sahithyam Le Français General - IV**	4	3	20	55	75	3
	II	**23U2ENG404**	**Communicative English-II**	4	3	20	55	75	3
	III	23U3CKC406	Core Paper X: RDBMS & MySQL	4	3	20	55	75	3
		23U3ITC404	Core Paper XI: Computer Networks	4	3	20	55	75	3
		23U3ITP404	Core Paper XII: Practical in RDBMS and MySQL	4	3	30	45	75	3
		23U3ITA404	Allied Paper IV: Robotics	4	3	25	75	100	4
	IV	23U4ITZ402	Skill Based Paper II: Practical in Multimedia	**3**	**3**	**30**	**45**	**75**	**3**
		22U4NM4BT2 / 22U4NM4AT2 / 22U4NM4GEN	**# @Basic Tamil- II / ##Advanced Tamil- II / General Awareness**	**2**	**2**	**50**		**50**	**2**
		VBOE	**Value Based Open Elective Courses – Intra School Course**	**2**	**3**	**-**	**50**	**50**	**2**
		23U4CDVALC	**Skill Enhancement Add on Course – Institute Industry Linkage**	**-**	**-**	**-**	**-**	**-**	**Grade**
				30				650	26
V	III	23U3CKC509	Core Paper XIII: PHP Programming	5	3	20	55	75	3
		23U3CKC510	Core Paper XIV: Artificial Intelligence	5	3	20	55	75	3
		23U3ITP505	Core Paper XV: PHP Programming Lab	6	3	40	60	100	4

	III	23U3ITP506	Core Paper XVI: Practical in Web Technology	4	3	30	45	75	3
		23U3CKE501/ 23U3CKE502/ 23U3CKE503/ 23U3CKC504	Discipline Specific Elective I	6	3	25	75	100	4
		23U3ITV509	In-Plant Training	-	-	50	-	50	2
	IV	23U4ITS503	**Skill Based Paper III :** Cyber Law	**4**	**3**	**20**	**55**	**75**	**3**
				30				**550**	**22**
VI	III	23U3CKC611	Core Paper XVII: Data Mining	6	3	25	75	100	4
		23U3ITV610	Project and Viva-Voce	6	-	40	60	100	4
VI	III	23U3CKE605/ 23U3CKE606/ 23U3CKE607/ 23U3CKE608	**Discipline Specific Elective II**	6	3	25	75	100	4
		23U3ITE610/ 23U3ITE611/ 23U3ITE612/ 23U3CKE613	**Discipline Specific Elective III**	6	3	25	75	100	4
	IV	23U4ITZ604	**Skill Based Paper IV -** Practical in Kotlin	6	3	30	45	75	3
	V	**22U5EXT601**	**Extension Activities**	-	-	50	-	50	2
				30				525	21
Total								**3600**	**144**
Additional Credit (Optional)			Semester II - VI						10 $

 # Basic Tamil -Students who have not studied Tamil upto 12th standard.

##**Advanced Tamil** – Students who have studied Tamil language upto 12th standard and chosen other languages under part I of the 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 & CGPA Calculation

List of Elective papers (Choose any one of the paper)

Elective	Subject Code		Name of the Subject
Discipline Specific Elective – I	23U3CKE502	**A**	Blockchain Technology
	23U3CKE502	**B**	Next Generation Networks
	23U3CKE503	**C**	Internet of Things
	23U3CKE504	**D**	Big Data Analytics
Discipline Specific Elective – II	23U3CKE605	**A**	Software Quality Assurance
	23U3CKE606	**B**	Information Security
	23U3CKE607	**C**	Cloud Computing
	23U3CKE608	**D**	Cyber Security
Discipline Specific Elective - III	23U3ITE610	**A**	Intellectual Property Rights and Privacy Laws

	23U3ITE611	**B**	Information Technology for Management
	23U3ITE612	**C**	Ethical Hacking
	23U3CKE613	**D**	Digital Marketing

Extra Departmental Course offered by the Department to other Department Students

S.No.	Subject Code	Name of the Subject
1	22U4IT3ED1	Practical in Libreoffice Suite
2	22U4IT3ED2	GIMP

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

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

S. No.	Subject Code	Name of the Subject
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	

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

Self Study Paper offered by Department of Information Technology

S. No.	Semester	Course code	Course Title
1	Semester II to V	22UITSS01	Practical in Word Press
2		22UCKSS02	Quantitative Aptitude

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Coimbatore

Course Code	Title		
23U1TAM101	Part - I : Elanthamizh		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	nkhop ,yf;fpaj;jpd thapyhf mwk rhh gz;G kw;Wk MSikkpf;f khzth;fis cUthf;Fjy;.		
Course Category	Skill Development (khzth;fspd nkhopj;jpwid Cf;Ftpj;jy;)		
Development Needs	Regional (cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy)		
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy kw;Wk cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	rq;f ,yf;fpaq;fs; thapyhf r%fr rPh;jpUj;jr; rpe;jidfs; ngwg;gLk;.	tpupTiu/ fhnzhspg;gL tpsf;fk	xg;giLT
CO 2	mw ,yf;fpaq;fspd top jkpoHfspd tho;tpay; gz;Gfisf; fw;W mwpjy;.	tpupTiu	FOj;jpLLk
CO 3	ngz;zpaf; ftpQHfspd giLg;Gj;jpwid khztHfSf;F czHj;Jjy;	tpupTiu/ fhnzhspg;gL tpsf;fk	fUj;juq;F
CO 4	rpWfijfspd top r%f fUj;Jfis khztHfSf;F mwpTWj;jy	tpupTiu / FO tpthjk;	xg;giLT
CO 5	jkpo ,yf;fpa tuyhw;Wj;jpwid tsHj;jy	tpupTiu/ FO tpthjk;	fUj;juq;F

Offered by	jkpo;j;Jiw

Course Content : Elanthamizh			Instructional Hours / Week : 4
Unit	Description	Text Book	Chapters
I	rq;f ,yf;fpak	1. Iq;FWE}W 2. gjpw;Wg;gj;J 3. gj;Jg;ghLL - Ky;iyg;ghLL 4. rpWghzhw;Wg;giL	fps;isg;gj;J (281-290) ghLy;fs; ,uz;Lhk; gj;J (11 -15 Ie;J ghLy;fs;) Ky;iyg;ghL;L KOtJk; (1-103 thpfs;) NruehL;bd tsik
		Instructional Hours	12
Suggested Learning Methods: ehLf Kiwapy fye;JiuahLy;			
II	mw ,yf;fpak ePjpE}y;;fs;	1. mwd typAWj;jy 2. Gfo 3. tha;ik 4. ehybahH·nghUL;ghy; 5. ehd;kzpf;fbif	31- 40 FwL;ghf;fs; 231 - 240 FwL;ghf;fs 291 - 300 FwL;ghf;fs 11 MtJ mjpfhuk; ($Lh eL;G 1-10) Kjy Ie;J ghLy;fs;
		Instructional Hours	12
Suggested Learning Methods : ;fye;JiuahLy;			
III	ngz;zpaf; ftpijfs	1. MzLhs; gphpajh;\;d; 2. ftpQH ,sk;gpiw 3. RfpHjuhzp 4. m. ntz;zpyh	G+r;rptho;f;if · Rak NgRk fps; njhL;br;nrb mk;kh ePhpy miyAk Kfk
		Instructional Hours	12
Suggested Learning Methods : GJf;ftpij vOJk; jpwd ngw;wik			

IV	rpWfijfs	1. FL;b Nutjp 2. n[aNkhfd 3. r.jkpo;r;nry;td 4. tz;zepytd 5. ckhkNf];tHp	epiwa miwfs cs;s tPL ahid Lhf;Lh; ntapNyhL Ngha; v];jh; kug;ghr;rp
		Instructional Hours	**12**
Suggested Learning Methods : rpWfij giLf;Fk; jpwd ngw;wik			
V	jkpo ,yf;fpa tuyhW	1. GJf;ftpijapd; Njhw;wKk tsHr;rpAk 2. rpWfijapd Njhw;wKk tsHr;rpAk 3. gbkp FwpaPL gw;wpa – tpsf;fk;	jkpo ,yf;fpa tuyhW
		Instructional Hours	**12**
Suggested Learning Methods : FO tpthjk;			
		Total Hours	**60**

Text Books	,sq;fiy Kjyhk Mz;L jkpo khztHfSf;Fhpa ghLE}y;"„se;jkpo" njhFg;G: jkpo;j;Jiw NeU fiy kw;Wk mwptpay; fy;Y}hp Nfhak;Gj;J}H.
Reference Books	rq;f ,yf;fpak- ciuahrphpah Xsit Jiurhkpg;gps;is> gjpg;ghrphpah;fs; ,uh.,sq;Fkudhh;> Kidth;.gp. jkpokfd jkpo kz mwf;fLLis> nrd;id.17 epiwa miwfs cs;stPL - FL;bNutjp vOj;J gpuRuk;> 11 khLy; efH> 10tJ tPjp nrd;id.
Web. URLs	https://youtu.be/2SMM5LvZYo0

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code			
23U1HIN101	Part : I – Rachnathmak Hindi (रचनात्मकता हिन्दी)		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	हिंदी की भाषा का अच्छा ज्ञान प्राप्त करने के लिए।
Course Category	**Skill Development**
Development Needs	**Regional**
Course Description	**Improved accuracy & quality, improved communication**

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	नाटक से रचनात्मकता का विकास होता है। मह हभाये आसनास की दनु नमा को सभझने भें बी भदद कयता है।	Lecture / Video Methods	Assignment
CO 2	कहानीमाो छात्राेां की कल्पना औय जजज्ञासा को जगाने भें भदद कयती हैं।	Case studies	Group Project
CO 3	वर्णनात्मक हिंदी भाषा को सही ढंग से पढ़ने, लिखने औरसभझने भेंं भदद करता है। विज्ञापन लेखन औय कहानी लेखन छात्रों को उनके रचनात्मक लेखन औय कल्पना शक्ति को विकसित करने भेंं भदद करेगा।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सबकी रोगाेां के पीछे प्रबावी सोचाय को सभझ पनाता है।	Lecture / Video Methods	Assignment
CO 5	गदमाोश लेखन लिखित नाठ के साय को सभझने औय सोदबभ के आधाय नय आनके ननष्कषोां का अनुभान रगाने भेंं आनकी पुवि भत्ता का आकरन कयता है।	Lecture / Dumb Charades	Seminar

Offered by	**Hindi**

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	नाटक रउाई - 1979 - सिद्धेश्वय दमाय सतसेना	**1**	**All**
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			
II	कहानी - 1. भजफूयी' - भन्नू बोडायी 2. ठाकुय का कुआ - भुोशी प्रेभचोद 3. चीप की दाित - बीष्भ साहनी 4. बोरायाभ का जीि -हरयशोकय नयसाई	1	1 to 4
		Instructional Hours	**12**

Suggested Learning Methods : Auditory	

III	1. अनुप्रमुतत वमाकयण - सोदाहरण, सिभनाभ, गिमा औय विशेषण की नहचान कयना। 2. विचाननन रेखन 3. हदए गए सोके तोंं से कहानी रेखन।	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	अनुिाद : अोग्रेजी से हहदी ी (अनुिाद अभ्मास - 3) 1 - 10 अनुच्छेद	3	1,2
		Instructional Hours	12
Suggested Learning Methods : Auditory, Visual			
V	नारयबावषक शब्दाियी , गदमाोश रेखन	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. नाटक रडाई - 1979 - सिेश्िय दमार सतसेना 2. 2. कहानी सोग्रह 3. अनुिाद अभ्मास - 3 दक्षण बायत हहदी ी प्रचाय सबा , चेन्नई -17 4. Bharatdarshan.co.nz 5. बाषाशास्त्र का नारयबावषक शब्द कोश - यजेंद्र दविेदी 6. श्री यभदेि , वमाकयण प्रदीन, रोक बायती प्रकाशन, इराहाफाद
Reference Books	सोदबभ ग्रोथ 1. हहदी ी नाटक औय योगभोच - डॉ याभ कु भाय िभाभ 2. हहन्दी अरोचना की नयीबावषक शब्दाियी - नेनयफकैं 3. आधुनक हहदी ी वमाकयण औय यचना - डॉ. िासुदेि नोदन प्रसाद
Web. URLs	

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code			
23U1MAL101	Part : I - Kadhayum Samskaaravum (ക ഥ യ സ സ്ക ര വ)		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	ആധ □ന□ക ക □□□□ □□□□ള ക ഥ ക□ള □□□□□□ച□ സ □□□□□□□□ □□□□□□ച□ അ വ □b□യ□ ഉ □□□□□ക്ക□□□□
Course Category	Skill Development
Development Needs	Regional
Course Description	Improved accuracy & quality, improved communication

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	ക ഥ യ□□□ സ □□വ ദ ന □ ആസ്വ □ദ □□□□ □□□□□□□□□യ പ □ര് □□□□□□ക്ക□□□□	Lecture / Video Methods	Assignment
CO 2	□□□□□□□□□മ □യ □ b□□□□□□□□□□ ക ഥ□□□□□സ □□□	Case studies	Group Project
CO 3	□□□ഷ്ണ വ □□ അത □□□□ സ □□□□□□□വ □□ ക □□□□□□മ ഉ □□□□□□ക്ക□□□□	Lectures / Video Lessons	Seminar
CO 4	□□□ഷ്ണ □□□□□ □□ല യ□ □□□□□വ □□□□ക്ക□□□□	Lecture / Video Methods	Assignment
CO 5	ആ ശയ വ □□□□□□	Lecture / Dumb Charades	Seminar

Offered by	**Malayalam**
Course Content	**Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	□ച റ □□□ക ൾ --------- സ മ ക □ല □ക ക ഥ ക ൾ 1. പ ര □□□□ ------------ ഇ .സ □□□□□□ക □മ □ര് 2. പ □ല □ഴ □മ ഥ ന □ ---- □ക .□ര ഖ 3. ക □ള വ □ഴ - വ □ .എ □ .... □ദ വ ദ □ന □ 4. മ ര ണ മ □□□□□□□□□□□□ള □□□□□□ - പ □ ....വ □ ഷ □ജ □ക □മ □ര് 5. ക □□□ക ള □ ---------- □ര □ൻ സ □ന □ □ന □□റ □ണ	1	1 to 5
	Instructional Hours		12
Suggested Learning Methods : Visual Learning			
II	ന □വ □□□ല □ന ക ഥ ക ൾ 1. □വ □□ള □ച □□□□□□□□ൽ - ത ക ഴ □ 2. ബ സ □ യ □ത ----------- □ക ശ വ □ദ വ □ 3. മ ര പ □വ ക ൾ --------- ക □ര □ര് 4. മ □ണ □□□□ൽ ------------ ല ള □ത □□ബ □ക അ □□□ര് ജ ന □ 5. ജ □□ദ □ന □ ---------------- ബ ഷ □ര്	1	6 to 10
	Instructional Hours		12
Suggested Learning Methods : Auditory			

Unit	Content		
III	സ സ ക ര പ ഠ ന - ക ര ള ല ര ച ശ 1. ക സ ർ ക s ക യ ള വ ß വ വ വ റ ക ത്ര 2. സ മ ത ര , മ മ ല , എ ര , ബ ണ ശ - (ക ഴ s) 3. മ ല പ റ ക ര ള ൻ റ അ റ ബ ക്ക	1	1,2,3
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive writing			
IV	സ സ ക ര പ ഠ ന - ക ര ള ല ര ച ß ശ 1. ച ശ യ ഉ ശ ര - ത ർ 2. ക ര ന ക ള s ന ൽ - പ ല s	1	4,5
	Instructional Hours		**12**
Suggested Learning Methods : Auditory, Visual			
V	ന വ മ ധ ക്ഷ ശ - വ വ ർ ന	1	1,2,3
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive writing			
	Total Hours		**60**

Text Books	1. ക മ ക ശ --------------- (10 ക മ ക ശ) 2. സ ക്ക പ ഠ ന ----- ന s ൻ ക ര ള എ സ പ M. . ണ ഷ, ഗ ൻ ബ സ ത ർ 3. ന വ മ ധ ക്ഷ ശ - s . ക ......സ ക മ ർ ഡ .സ .ബ സ ക യ
Reference Books	1. എ . അ ത ൻ - ക മ ഉ ഉ – M. . . b 2. ച റ ക മ യ s ഛ സ – വ . ര ജ ക ണ ൻ മ ത മ ബ സ ക ഴ s 3. പ ത യ ക മ പ ത യ വ – എ M : M. b ß വ പ ത ക ല പ സ ക ര ണ ക ഴ s 4. ക ര ള സ സ ക ര - എ .ശ ധ ര മ ന ൻ ന ഷ ണ ൽ ബ സ ക യ 5. ന ക്ക സ റ മ റ അ ക വ പ റ വ ---------- ബ .ആർ .പ . സ ക ർ ഗ ൻ ബ സ ത ർ
Web. URLs	**http://www.keralaculture.org>literature**

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	French

Course Content	Instructional Hours / Week : 4

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U2ENG101	Part – II : Professional English – I		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	To help students to imbibe, develop, practice and use the LSRW skills and fine tune their productive skills.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

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

Offered by | **Department of English**

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

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC101	Core Paper I: Python Programming		
Semester: I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. IT / AIML / BCA / DCFS)			
Course Objective	To develop algorithmic solutions to simple computational problems using Python		
Course Category	Employability		
Development Needs	Global		
Course Description	Python is a versatile programming language that can be used in a variety of fields, such as software development, government administration, business, science, arts, education, and others		

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

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

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

III	Tuples-Need of a Tuple-Sequence of Unpacking – Methods – Sampleprograms.Dictionaries:Making a Dictionary-Basic Operations-Dictionary Operations – Sets-Iterators and Generators – SamplePrograms. Functions: Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments-Default Arguments-Required Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions- Scope of Local and Global Variables.	1	6,7,8
		Instructional Hours	15
Suggested Learning Methods: Develop small programmes using tuples			
IV	**Strings in Python:** Reading – Accessing – Modifying – Finding - Iterating through a String - Build-in String Functions. Errors and Exceptions – Multithreading	2	8
		Instructional Hours	
Suggested Learning Methods: Develop small applications			
V	**Files and Directory Access:** Files and Streams - Opening a File - Reading/Writing Operations in a File - Other operations in a File - Iterating through a File - Splitting Words - Serialization and Deserialization. Events: Event Objects - Binding callbacks to events - Event names - Keyboard events - Mouse Events - Sample Programs	1	13,17
		Instructional Hours	15
Suggested Learning Methods: Laboratory practice			
		Total Hours	**75Hrs**

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

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC102	Core Paper II: Digital Fundamentals and Computer Architecture		
Semester: I	Credits: 4	CIA:25 Marks	ESE:75 Marks
(Common to B. Sc. CS / IT / BCA)			
Course Objective	To enable the students to know about the Operations in digital computer, Boolean algebra, CPU Architecture, memory design and its functionality		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	Understand Number Conversion, the concept of I/O organization and logic circuits. Analyze memory organization and multiprocessor in digital computers.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Perform number conversion and identify the logic gates.	Lecture, Problem Based Teaching and Tutorial	Quiz
CO 2	Design basic combinational logical circuit.	Lecture Demonstration	Quiz
CO 3	Understand the concept of I/O organization	Video Lessons	Assignment
CO 4	Apply priority to interrupts and use it for data transfer.	Lecture, Tutorial	Assignment
CO 5	Analyse memory organization and multiprocessor in digital computers.	Lecture,Tutorial	Seminar

Offered by Computer Science

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

Unit	Description	Text Book	Chapters
I	**Digital Logic – Digital Operations - Digital Computers.** **Number System and Binary Codes:** Decimal, Binary, Octal, Hexadecimal Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. Arithmetic Circuits: Half adder, Full adder, Parallel binary adder, BCD adder, Serial Adder, Half subtractor, Full subtractor, Parallel binary subtractor- Digital Logic: The Basic Gates –NOR, NAND, XOR Gates.	1,2	1,3,4
		Instructional Hours	**15**
	Suggested Learning Methods: Number System Problem Solving		
II	**Combinational Logic Circuits:** Boolean algebra-Karnaugh map – Canonical form 1 – Construction and properties –Implicants – Don‘t care combinations - Product of sum, Sum of products, simplifications. Sequential circuits: Flip-Flops: RS, D, JK, and T - Multiplexers – Demultiplexers – Decoder -Encoder – shift registers-Counters	1,2	2,5,6
		Instructional Hours	**15**
	Suggested Learning Methods: Video Presentation		
III	**Input – Output Organization:** Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. Asynchronous data transfer: Strobe Control and Handshaking- Modes of Transfer	3	11
		Instructional Hours	**15**
	Suggested Learning Methods: Report Preparation		

IV	**Priority Interrupt:** Daisy- Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication-Serial Communication-Character Oriented Protocol, Data Transparency, Bit Oriented Protocol.	3	11
		Instructional Hours	**15**
	Suggested Learning Methods: Report Preparation		
V	**Memory Organization**: Memory Hierarchy – Main Memory- Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization. **Multiprocessor: Interconnection** Structure, Interprocessor Arbitration, Interprocessor Communication and Synchronization.	3	12
		Instructional Hours	**15**
	Suggested Learning Methods - Video Presentation		
		Total Hours	**75**

Text Books	1. V.K. Puri&Henry**Digital Electronics Circuits and Systems**, TMH, 1997. 2. M. Morris Mano, **Computer System Architecture**, PHI publications,2000.
Reference Books	1. M. Carter, Computer **Architecture**, Schaum'S Outline Series, TMH, 1996.
Web. URLs	https://www.educba.com/digital-computer-fundamentals/

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITP101	Core Paper III: Practical in Python Programming		
Semester: I	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective	To introduce the concepts of python programming constructs.
Course Category	Skill Development /Employability/Entrepreneurship
Development Needs	Global
Course Description	To development skill set in python programming and apply the concepts to develop applications in order to meet the Local and Global needs.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To develop proficiency in creating based applications using the Python programming Language.	Program Demonstration, Projects	Program Creativity
CO 2	To be able to understand the various data structures available in Python programming language and apply them in solving problems.	Program Demonstration	Debugging
CO 3	To be able to do testing and debugging of code written in Python.	Laboratory Practice,	Application of Logic
CO 4	Analyze the different types of logics in python	Constructivist learning, Code review	Program Development
CO 5	Able to create a software by using python	Demonstration, Projects	Program Development

Offered by Information Technology

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

Unit	List of Practical
1	Write a python program to find the square root
2	Write a python program to find the largest among three numbers.
3	Write a user-defined function in a python to check whether the given number is prime or not.
4	Write a python program to check Armstrong number.
5	Write a python program to find the sum of elements in an array using functions
6	Write a python program to print the list of numbers using range and for loop
7	Write a python program to find the factorial of a number.
8	Write a python program to find the frequency of characters occurring in a string
9	Write a python program to let user enter some data in string and then verify data and print
10	Write a python program in which a function is defined and calling that function to print *Python Programming*
11	Write a python program in which a function (with single string parameter) is defined and calling that function to print the string parameters given to function.
12	Write a python program in which a class is define, then create object of that class and call simple print function define in class.

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

Tools for Assessment (40 Marks)

Application of Logic	e-Program Creativity	e- Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	3	10	10	7	**40**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3MIA101	Allied Paper I : Mathematics for Computer Science		
Semester: I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B.Sc CS, IT,DCFS / BCA)			
Course Objective	To enable the students to learn concepts of Statistical and Numerical Methods used in Computer applications.		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	This course covers a mix of applied linear algebra, Statistics and Numerical Analysis; it covers a central point of contact between Mathematics and Computer science.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Know the concepts of Matrices and solve the problem for Eigen values and Eigen vectors.	Lectures / Video Lectures	Problem solving Skill
CO 2	Solve Simultaneous Linear algebraic equations.	Lectures / Tutorial	Assignment
CO 3	Relate various formulae in Numerical Differentiation and Integration	Lectures / Video Lectures	Seminar
CO 4	Evaluate the Measures of central tendency and dispersion.	Lectures / Peer Teaching	Problem solving Skill
CO 5	Analyse Correlation and Regression	Lecture /Tutorial	Quiz

Offered by	Mathematics
Course Content	Instructional Hours / Week :5

Unit	Description	Text Book	Chapters
I	**Matrices:** Introduction – Types of Matrices –Matrix Operations - Determination – Inverse of a matrix – Rank of a Matrix. Characteristic equation of a Matrix – Condition for consistency - Tests for consistency of linear equation - Eigen values and Eigen vectors – Cayley – Hamilton theorem.	1	4
	Instructional Hours		**15**
Suggested Learning Methods: Problem Solving Practice			
II	**System of Simultaneous Linear Algebraic Equations:** Gauss Elimination, Gauss Jordon, Gauss Jacobi Method, Gauss Seidal method (up to 3x 3 matrices).	2	4
	Instructional Hours		**15**
Suggested Learning Methods: Class Test			
III	**Numerical Differentiations:** Newton's forward Difference - Backward Difference – Stirling's formula. **Numerical Integration:** Trapezoidal Rule - Simpson's $1/3^{rd}$rule& Simpson's $3/8^{th}$ rule.	2	9
	Instructional Hours		**15**
Suggested Learning Methods: Problem Solving Practice			
IV	**Measures of Central Tendency:** Mean Median and Mode –	3	7,8

	Empirical Relationship between mean, median and mode. **Measures of Dispersion:** Range, Quartile deviation and Standard deviation.		
		Instructional Hours	**15**
Suggested Learning Methods : Quiz			
V	**Correlation:** Introduction, Scatter Diagram - Karl Pearson's Correlation and Spearman's Rank Correlation. **Regression:** Regression equation of variables – Linear Regression.	3	10,11
		Instructional Hours	**15**
Suggested Learning Methods: Problem Solving Practice https://youtu.be/fNLeogEjMmM			
		Total Hours	**75 Hrs**

Text Books	**1.** P. Kandasamy and Thilagavathy, **Mathematics for B.Sc. Branch I–Vol.II** (For B. Sc - I Semester), S.Chand and Company Ltd, New Delhi, 2004. Unit I- Chapters 1,2,3,4 - Pg.No : 03-972. 2. P.Kandasamy, K.Thilagavathy and K.Gunavathy, **Numerical Methods**, S.Chand& Company LTD, Revised 2005. Unit II : Chapter 4, Section: 4.1- 4.2.1, 4.7-4.9 Pg.No : 112-121, 145-159 Unit III: Chapter 9, Sections: 9.1 - 9.4, 9.7, 9.9, 9.13, 9.14 Pg.No : 281-297, 299-317. 3. S. P. Gupta, **Statistical Methods**,Sultan Chand & Sons, Fourth edition, Reprint 2017. Unit IV: Chapter 7 (only Mean, Median and Mode), Chapter 8 (only Range, Q.D and S.D) Pg.No : 181-189,198-222,275-280,287-293. Unit V : Chapter 10 & 11, Pg.No : 393-405,414-423,457-488.
Reference Books	1. E. Balagurusamy, **Numerical Methods**, Tata McGraw Hill publishing company LTD, Reprint, 2008. 2. P.A.Navanitham, **Business Mathematics and Statistics**, **(Part II),** Jai Publishers, Trichy – 21.
Web. URLs	1. https://youtu.be/MG7t6SWBnwA 2. https://www.youtube.com/watch?v=1MiT06JFNo4

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Problem Solving Skills	Assignment	Seminar	Total
5	5	6	3	3	3	25

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

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

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

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

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

Tools for Assessment (50 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

(Common to all UG Programmes)

Course Objective:

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

Course Outcomes:

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

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

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

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

Text book:

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

Tools for Assessment

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

Mapping

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

H-High; M-Medium; L-Low

Course Designed by	Verified by HOD	Checked by	Approved by

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

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

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U1HIN202	Part – I : Sanchar Hindi		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	नाट्यक्रम सोवादी हृदो ी मेंं नारोगत होने मेंं मदद करता है।
Course Category	Skill Development
Development Needs	Regional
Course Description	Improved accuracy & quality, improved communication

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	कवतिा की मूर शब्दावरी और व्यावहारिक तत्वोंं को समझेंं। मुक्त छोद और कवतिा के नारोनरिक रूनोंं मेंं अोतर्निहित सामान्य तकनीकोंं को समझेंं।	Lecture / Video Methods	Assignment
CO 2	छात्र वभिन्न प्रकार की सोवादात्मक स्थथर्तियोंं मेंं हृदो ी मेंं प्रदशित करने, वि्रत करने, नाटक करने और व्याख्या करने के रए अर्जित कौशर को रागू करने में संम होंगे	Case studies	Group Project
CO 3	छात्र औनि्रारिक और अनौनि्रारिक नर रखने मेंं सम होंगे।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सि्री रोगोंं के बी प्रि्रावी सोि्रार को सम बनाता है।	Lecture / Video Methods	Assignment
CO 5	छात्र हृदो ी ि्रषा के वक्ता के साथ कसी ि्री सामान्य वषय नर वभिन्न थतरोंं नर बाति्रीत करने मेंं सम होंगे ।	Lecture / Dumb Charades	Seminar

Offered by	**Hindi**

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

Unit	Description	Text Book	Chapters
I	आधुनिक हृदो ी कावि्य : रश्मिरथी , रामधारी सिंहो 'दिनकर'	1	All
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			
II	एकोकी संग्रह : 1. शवाजी का सच्चि्रा थवरूप - (सेठ गोविंददो दास) 2. औरोगजेब की आखरी रात - रामकु मार वमाि 3. रीढ़ की हड्डी - (जगदीशि्रोद्र माथुर) 4. सनाही की मा - (मोहन राके श	1	1 to 4

Instructional Hours	**12**
Suggested Learning Methods : Auditory	

III	पत्र लेखन : (छुट्टी पत्र , सोपपादक को पत्र , पुस्तकों के लिए आदेश पत्र ,नौकरी के लिए आवेदन पत्र , रिपजी पत्र)	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	अनुवाद : हिंदी से अंग्रेजी (अनुवाद अभ्यास - 3) 1 – 10 passages	3	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			
V	बोलिचाल की हिन्दी : 1. शंकर - विद्यार्थी 2. ग्राहक-दुकानदार 3. डॉक्टर -रोगी, 4. संपादक 5. दो यात्री 6. माँ - बेटा	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**
Reference Books	1. रश्मिरथी / रामधारी सिंह "दिनकर" - कविता कोश 2. सरस एकांकी नाटक : डॉ. रामकुमार वर्मा 3. अनुवाद अभ्यास - 3 दक्षिण भारत हिंदी प्रचार सभा , चेन्नई -1		
Reference Books	1. श्रेष्ठ हिन्दी एकांकी -डॉ विजयपाल सिंह 2. बोलिचाल : नं० अयोध्या सिंह उपाध्याय 3. हिंदी व्याकरण रिनबोध और पत्र लेखन -डॉ. एन. एल. माथुर		
Web. URLs	**www.webdunia.com**		

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code			
23U1MAL202	Part – I : Novalum Bhashaapadanavum		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	[illegible]
Course Category	Skill Development
Development Needs	Regional
Course Description	Proper guidance, opportunities and encouragement that help them achieve their ambitions

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	[illegible]	Lecture / Video Methods	Assignment
CO 2	[illegible]	Case studies	Group Project
CO 3	[illegible]	Lectures / Video Lessons	Seminar
CO 4	[illegible]	Lecture / Video Methods	Assignment
CO 5	[illegible]	Lecture / Dumb Charades	Seminar

Offered by	**Malayalam**

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	[illegible] – [illegible]	1	1 to 16
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			
II	[illegible] – [illegible]	1	17 to 34
		Instructional Hours	**12**
Suggested Learning Methods : Auditory			
III	[illegible] – [illegible]	1	35 to 51
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	[illegible]	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			

V	[illegible]	1	4,5
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. [illegible] ---------------- [illegible] 2. [illegible] ---------------- [illegible]
Reference Books	1. [illegible] 2. [illegible] 3. [illegible] 4. [illegible]
Web. URLs	http://www.keralaculture.org>literature http://www.manoramaonline.com

Tools for Assessment (20 Marks)

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

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	H	H	H							
CO2	-	-	H	M	H	M							
CO3	-	-	M	M	M	H							
CO4	-	-	L	H	L	H							
CO5	-	-	L	M	L	H							

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U1TAM202	Part – I : Pynthamizh		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	nkhop ,yf;fpaj;jpd thapyhf mwk rhh gz;G kw;Wk MSikkpf;f khzth;fis cUthf;Fjy;.		
Course Category	Skill Development (khzth;fspd nkhopj;jpwid Cf;Ftpj;jy;)		
Development Needs	Regional (cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy;)		
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy kw;Wk cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	gf;jp ,yf;fpaq;fs top tho;tpay; newpfis khztHfSf;F vLj;Jiuj;jy	tpupTiu/fhnzhspg;gl tpsf;fk;	xg;gilT
CO 2	rpw;wpyf;fpaq;fspd %yk jkpoHfspd tho;f;if $Wfis vLj;Jiuj;jy	tpupTiu	FOjpl;lk
CO 3	jkpo ehty;fspd top rKjhar rpe;jidfisf;$Wjy	tpupTiu/fhnzhspg;gl tpsf;fk;	fUj;juq;F
CO 4	,yf;fz mwpit tsHj;jy	tpupTiu	xg;gilT
CO 5	jkpo ,yf;fpa tuyhw;Wj;jpwid Nkk;ghL milar; nra;jy	tpupTiu/ FO tpthjk;	fUj;juq;F

Offered by	jkpo;j;Jiw

Course Content : Pynthamizh	Instructional Hours / Week : 4

Unit	Description		Text Book & Chapters
I	gf;jp ,yf;fpaq;fs;	1. jpUke;jpuk; - %d;whk; je;jpuk; (mjpfhuk; 2) 2. ehyhapuj; jpttpag;gpuge;jk-nghpaho;thh 3. khzpf;fthrfh;-vl;lhk;jpUkiw 4. jpUehTf;furh- jpUthq;fkhiy	ml;lkhrpj;jpfs; jpUg;gy;yhz;L mr;Nrhg;gjpfk; ehd;fhk;jpUkiw - Njthuk;
		Instructional Hours	12
Suggested Learning Methods: Md;kpf rpe;jidj;jpwd ngw;wik			
II	rpw;wpyf;fpaq;fs	1. fyk;gfk - ee;jpf;fyk;gfk 2. gs;S – Kf;$lw;gs;S 3. FwtQ;rp – jpUf;Fw;whyf;FwtQ;rp 4. gps;isj;jkpo - kPdhl;rpak;ik gps;isj;jkpo 5. gl;bdj;jhHghly;fs;	91 – 100 ghly;fs; 350 – 360 – nra;As;fs; 1 – 10 – nra;As;fs; 1 – 10 – nra;As;fs; 358 – 367 ghly;fs;
		Instructional Hours	12
Suggested Learning Methods : fye;Jiuahly;			
III	ehty;	1. ,ikak (nt.mz;zhkiy)	nry;yhjgzk
		Instructional Hours	12
Suggested Learning Methods : ehty; vOJk; jpwd ngw;wik			

IV	,yf;fzk;	1. ty;ypdk; kpFk; ,lq;fs; 2. ty;ypdk; kpfh ,lq;fs; 3. ahg;gpd cWg;Gfs; (vOj;J Kjy njhil tiu) 4. ghtpd tiffs;	jkpo ,yf;fzk
		Instructional Hours	**12**
Suggested Learning Methods : gpioapd;wp jkpo vOJjy			
V	jkpo ,yf;fpa tuyhW	1. rpw;wpyf;fpaj;jpd Njhw;wKk tsHr;rpAk; 2. Gjpdj;jpd Njhw;wKk› tsHr;rpAk; 3. gf;jp ,yf;fpaj;jpd Njhw;wKk› tsHr;rpAk; 4. tpz;zg;gq;fs;>kly;fs;>vOjr; nra;jy;	jkpo ,yf;fpa tuyhW
		Instructional Hours	**12**
Suggested Learning Methods : FO tpthjk;			
		Total Hours	**60**
Text Books	1. ,sq;fiy Kjyhk Mz;L jkpo khztHfSf;Fhpa ghlE}y; “ige;jkpo” njhFg;G: jkpo;j;Jiw› NeU fiy kw;Wk; mwptpay fy;Y}hp› Nfhak;Gj;J}H.		
Reference Books	1. jpUke;jpuk; - khzpf;fthrfH mUspa jpUthrfk; - rpj;jhe;j gz;bjH jpU.g.,uhkehj gps;is tpsf;f ciuAld fof ntspaPL› jpUney;Ntyp› 2. jkpoz;zy;-Gjpa Nehf;fpy; jkpo ,yf;fpatuyhW› kPdhl;rp Gj;jfepiyak kJiu		
Web. URLs	Ht https://youtu.be/cL89sSZq_FI		

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by | **Department of English**

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

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC203	Core Paper IV: Java Programming		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc CS / IT and BCA)			
Course Objective	To gain knowledge about basic Java language syntax and semantics to write programs and understand the principles of classes, methods, inherita polymorphism and packages.		
Course Category	Employability, Skill Development		
Development Needs	Global		
Course Description	Primarily Java programmers are the main force behind designing, developing & managing the java code before running it on all Java supported platforms. The larger an organization, the wider the role.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamental concepts of Object-oriented Programming.	Lecture / Flipped Classroom	Assignment
CO 2	Develop simple Java programs with Control Statements and Arrays.	Constructivist Approach/ Tutorial	Seminar
CO 3	Apply the principles of packages and interfaces.	Lectures / Video Lessons	Quiz
CO 4	Design Java Applications using the concepts of Exception Handling and Multithreading.	Tutorial / Case Studies	Program Execution
CO 5	Develop applications using IO Streams and AWT.	Lecture / Class Projects	Program Execution

Offered by	Information Technology

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine-Command Line Arguments.	1	1,2,3
		Instructional Hours	**15**
Suggested Learning Methods : Seminar Preparation and Presentation			
II	Constants, Variables, Data Types, Operators and Expressions, **Decision Making and Branching:** if, if...else, nested if, switch,? : Operator, **Decision Making and Looping:** while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods. **Arrays:** One Dimensional Array-Creating an Array- Two Dimensional Array.	1	4,5,6,7 & 8
		Instructional Hours	**15**

Suggested Learning Methods : Quiz Participation			
III	**Interfaces: Multiple Interface –** Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import.	1	10,11 & 12
		Instructional Hours	**15**
Suggested Learning Methods : Assignment			
IV	**Exception Handling:** Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-Suspending, Resuming and Stopping Threads - JDBC	2	10 & 11
		Instructional Hours	**15**
Suggested Learning Methods : Journaling and Library			
V	**Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes – RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. **Abstract Window Toolkit:** AWT - AWT Classes-Hierarchy of Classes in Java.awt Package-Control Fundamentals-Component Class-Basic Component Classes - Container Class -Various Container Class.	2	16,18 & 19
		Instructional Hours	**15**
Suggested Learning Methods : Project Development			
		Total Hours	75 Hrs

Text Books	1. E. Balagurusamy, **Programming with Java – A Primer**, Tata McGraw Publication, 3rd Edition, 2007 2. ISRD Group, **Introduction To Object Oriented Programming Thr Java**, Tata McGraw Hill Publication, Forth Reprint 2008.
Reference Books	**1.** Patrick Naughton& Hebert Schildt, **The Complete Reference Java 2,** McGraw Hill Publication**,** 3rd Edition , 2002 2. John R. Hubbard, **Programming with Java**, Tata McGraw Hill Publication, 2nd Edition, 2009
Web. URLs	**https://www.youtube.com/watch?v=MyCL2PnyFJg**
Tools for Assessment (25 Marks)	

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC204	Core Paper V: Data Structures		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc CS / IT and BCA)			
Course Objective	To enable the students to understand about the various techniques such as Linked list, Searching and Sorting, apply them to solve complex programs.		
Course Category	Employability, Skill Development		
Development Needs	Global		
Course Description	Extensive use of Data Structure in globally ensures high employment, increases the compensation and helps individuals to connect with the advanced technologies.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the representation of Arrays, Stacks and Queues.	Lecture / Flipped Classroom	Assignment
CO 2	Solve the problems using Queues and List.	Constructivist Approach/ Tutorial	Seminar
CO 3	Demonstrate the different types of Tree representation and Graph.	Lectures / Video Lessons	Quiz
CO 4	Design algorithm to perform different types of sorting.	Tutorial / Case Studies	Program Execution
CO 5	Illustrate Symbol, Hash and File organization and apply to solve real world problems using appropriate Data Structure.	Lecture / Class Projects	Program Execution

Offered by	Information Technology

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction:** Overview - How to create Programs - How to Analyze Programs. **Arrays:** Axiomatization - Sparse Matrices - Representation of Arrays. **Stacks & Queues:** Fundamentals - Evaluation of Expressions - Multiple Stacks and Queues.	1	1,2,3
	Instructional Hours		15
Suggested Learning Methods : Seminar Preparation and Presentation			
II	**Recursion:** Recursive definition and process - recursion in C - Writing Recursive program - simulating Recursion - efficiency of recursion. **Queues and List:** The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure.	2	3.4
	Instructional Hours		15
Suggested Learning Methods : Quiz Participation			
III	**Trees:** Binary Tree - Binary Tree representation - the Huffman algorithm - representing list as Binary - Trees and their applications - Game trees. **Graphs:** A Flow problem - The linked representation of Graph - Graph traversal and spanning forests	2	5,8

		Instructional Hours	15
Suggested Learning Methods : Assignment			
IV	**Internal Sorting:** Insertion Sort - Quick Sort - 2-Way Merge Sort - Heap Sort - Shell Sort. **External Sorting:** Storage Devices - K-Way Merging- **Sorting with Tapes:** Balanced Merge Sorts - Polyphase Merge.	1	7,8
		Instructional Hours	15
Suggested Learning Methods : Blended Learning			
V	**Symbol Table:** Static Tree Tables - Dynamic Tree Tables - **Hash Tables:** Hashing Functions- Overflow Handling. **Files:** Files, Queries and Sequential Organizations- Index Techniques - **File Organization:** Sequential Organization- Random Organization- Linked Organization.	1	9,10
		Instructional Hours	15
Suggested Learning Methods : Program Development			
		Total Hours	75 Hrs

Text Books	1. Ellis Horowitz &SartajSahni, **Fundamentals of Data Structures**, Galgotia Publication. 2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J.Augenstein, **Data Structure using C**, Pearson Education, 2009.
Reference Books	**1.** Ellis Horowitz, SartajSahni & Sanguthevar Rajasekaran, **Fundamentals of Computer Algorithms**, Galgotia Publications Pvt Ltd, 1999. 2. Jean-Paul Tremblay and Paul G.Sorenson, **An Introduction to Data Structures with Applications**, Second Edition, Tata MaGraw Hill,2008 3. Mark Allen Weiss, **Data Structures and Algorithm Analysis in C**, Florida International University, Pearson Education, Second Edition, 1997.
Web. URLs	**https://www.youtube.com/watch?v=qH6yxkw0u78**

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITP202	Core Paper VI: Practical in Java Programming		
Semester: II	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective	To enable the students to develop problem solving skills and programming ability in Java Language
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	Primarily Java programmers are the main force behind designing, developing & managing the java code before running it on all Java supported platforms. The larger an organization, the wider the role.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Apply the concepts of string, array and multiple inheritance.	Demonstration Method	Laboratory Experiments
CO 2	Implement multithreading, exception handling concepts.		
CO 3	Apply the concept of package.		
CO 4	Develop the programs for the concepts of Applets and AWT.		
CO 5	Implement the concept of file operations.		

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 4

Programme	Description
1	Write a Java Applications to extract a portion of a character string and print the extracted string
2	Write a Java program to insert an element (specific position) into an array.
3	Write a Java Program to implement the concept of multiple inheritance using Interfaces
4	Write a program to implement the concept of Exception Handling using predefined exception.
5	Write a Java Program to create an Exception called payout-of-bounds and throw the exception.
6	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.
7	Write a Java Program to draw several shapes in the created windows.
8	Write a Java program to import classes from user defined package and creating package.
9	Write a Java Program to create a frame with four text field's name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields.
10	Write a Java Program to create a frame to implement checkbox group.

11	Write a Java Program to read the data from the file using DataInputStream.
12	Write a Java Program to write the data to the existing file using BufferedOutputStream.

Instructional Hours	**60**

Tools for Assessment (40 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	3	10	10	7	**40**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3MIA202	Allied Paper II : Discrete Mathematics		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective	To learn about the Discrete Structure for Computer Based Application.
Course Category	Skill Development
Development Needs	Regional
Course Description	This course is to understand and use abstract discrete structures that are backbones of Computer Science. In particular, this course meant to introduce logic, proofs, sets, relations, functions, counting, and graph with an emphasis on applications in Computer Science.

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

Offered by	**Mathematics**

Course Content	Instructional Hours / Week : 5

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

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

Text Books	1. J.K. Sharma, **Discrete Mathematics**, Macmillan India Ltd, 2nd edition, 2005.
Reference Books	**1.** J. P. Tremblay, R. Manohar, **Discrete Mathematics Structures with Applications to Computer Science**, McGraw Hill International Edition, 2005. 2. T.Veerarajan, **Discrete Mathematics with Graph Theory and Combinatories**, McGraw Hill International Edition, 2008
Web. URLs	1. https://www.youtube.com/watch?v=oaOm2pnKkyY 2. https://youtu.be/tyDKR4FG3Yw

Tools for Assessment (25 Marks)

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

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO 4	PSO 5
CO1	H	H	L	M	M	M	M	L	H	H	H	H	H
CO2	H	H	L	M	M	M	M	L	M	M	H	M	M
CO3	H	M	L	M	M	M	M	L	M	L	H	H	M
CO4	H	M	L	M	M	M	M	L	H	M	H	M	H
CO5	H	M	L	M	M	M	M	L	H	M	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by

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

(Common to all UG Programmes)

Course Objective:

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

Course Outcomes:

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

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

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

Text Book:

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

Tools for Assessment (50 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course Designed by	Verified by	Checked by	Approved by

Course Code	Title		
23U1TAM303	Part – I : Arunthamizh		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	jkpo;f; fhggpaq;fspd top mwk rhHe;j rpejidfis cUthf;Fjy		
Course Category	Skill Development (khzth;fspd nkhopj;jpwid Cf;Ftpj;jy;)		
Development Needs	Regional (cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy;)		
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy kw;Wk cyf mstpy; jkpo nkhopapd mtrpaj;ij czHj;Jjy		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	jkpo E}y;fspy mzpeyk mwpjy> mwk rhHe;j rpe;jidfis tsHjjy;.	tpupTiu/ fhnzhspg;gl tpsf;fk;	xg;gilT
CO 2	jkpo ,yf;fpa tiffisf $Wtjd%yk jkpopd ,yf;fpa tsjij czur;nrajy.	tpupTiu	FOj;jpl;lk
CO 3	khztHfspilNa fhyjjpw;Nfw;g nkhoptsHrrpia cUthf;Fjy.	tpupTiu/ fhnzhspg;gl tpsf;fk;	xg;gilT
CO 4	ehlbd rpwe;j Fbkf;fshf khztHfis cUthf;Fjy;.	tpupTiu/ FO tpthjk;	fUj;juq;F
CO 5	khztHfspd kdeyjij tshjjy.	tpupTiu/ FO tpthjk;	fUj;juq;F

Offered by	jkpo;j;Jiw

Course Content : Arunthamizh			Instructional Hours / Week : 4
Unit	**Description**	**Text Book**	**Chapters**
I	fhggpaq;fs	1. rpyggjpfhuk; 2. kzpNkfiy 3. rPtfrpejhkzp 4. fkguhkhazk	milf;fyf;fhij (kJiuf;fhz;lk – gFjp – 15) gPbiff fz;Lgpwg;Gzh;ejf fhij – gFjp – 9) 1.3 g+kfs ,ykgfk (gFjp – 11–2347–2377 ghly;fs) 1.4 Re;jufhzlk (flyjhTgglyk 1 – 10 ghly;fs;)
			Instructional Hours 12
Suggested Learning Methods: ehlf Kiwapy fye;Jiuahly;			
II	irt> itzt> Rtbapay;	1. Njthuk 2. ehyhapuj;jpttpag; gpugejk 3. Rtbapay;	jpUeyY hhg ngUkzk (ghly vz – 4137 – 4146) Mzlhs jpUgghit (ghly vz – 474 – 483) Rtbapay; – mwpKfk irtk; jkpOf;F nra;j njhz;L itztk; jkpOf;F nra;j njhz;L
			Instructional Hours 12
Suggested Learning Methods : gf;jp ghRuq;fs;> fye;Jiuahly;			

III	nkhojjwd (,yf;fzk;)	1. ed;D}y; 2. njhy;fhg;gpak	E}y; tuyhW (Kjy; E}y; to E}y; rhh;G E}y;) khzhf;fH tuyhW MrphpaH tuyhW vz;tif nka;g;ghLfs;	
			Instructional Hours	12
Suggested Learning Methods : nkhojjwd thapyhf gpioapd;wp vOJk jpwd ngw;wik				
IV	[illegible]	ehl;Lg;Gwtpay	gonkhofs tpLfijfs 4.3 [illegible] 4.4 [illegible] 4.5 [illegible] ([illegible])	
			Instructional Hours	12
Suggested Learning Methods : ehl;Lg;Gwtpay; to ehl;Lg;Gwkf;fspd tho;tpaiy mwpar;nra;jy				
V	,yf;fpa tuyhWj jjwd	jkpo ,yf;fpa tuyhW	1. fhggajjd Njhw;wKk tsHr;rpAk 2. gfj ,yf;fpajjd Njhw;wKk tsHr;rpAk 3. jkpof ehl;Lg;Gwtay; tuyhW	
			Instructional Hours	12
Suggested Learning Methods : lj;jpl;lj;jpy; nfhLf;fg;gl;Ls;s ,yffpatuyhw;wpid czHj;Jjy				
			Total Hours	60

Text Books	1. ,sq;fiy ,uz;lhk Mz;L jkpo khztHfSf;Fhpa ghlE}y "mUe;jko" njhFg;G: jkpo;j;Jiw ›NeU fiy kw;Wk mwptpay; fy;Y}hp› Nfhak;Gj;J}H.
Reference Books	1. ehl;Lg;Gwtpay Xh; Ma;T : lhflh R.rf;jpNty;› tj[ah gjpg;gfk› nrd;id jkpozzy - GjpaNehf;fpy; jkpo ,yf;fpatuyhW› kPdhl;rp Gj;jf epiyak;kJiu– 625 001.
Web. URLs	-

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U1HIN303	Part -- I : Sahityak Hindi		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	चनु नदों ा कविताओं के भाध्मभ से हहदों ी कविता की उत्ऩत्तत औय विकासको सभझना। सोंकरन भें उऩरब्ध कयाए गए सिोत्तभ नभूनों का उऩमोग कयते हुए कविता कीसयाहना।
Course Category	Skill Development
Development Needs	Global
Course Description	Improved accuracy & quality, improved communication

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हहदों ी बाषा से अच्छी तयह ऩरयचित हो सकेंगे।	Smart boards and Role play	Assignment
CO 2	व्मत्ततगत अनुबिों की ऩहचान कयें त्जनका उऩमोग कविताए लरखते सभम ककमा जा सकता है।	Group learning Acting and Story Narration	Seminar
CO 3	कविता की भूर शब्दािरी औय व्माकयणणक तत्िों को सभझें।	Smart boards and YouTube Videos	Assignment
CO 4	छात्रों को यचनात्भक रेखन भें अच्छा अभ्मास लभरेगा।	Group learning and Work sheets	Group Project
CO 5	ऩाठ्मक्रभ सोंिादी हहदों ी भें ऩायोंगत होने भें भदद कयता है।	Worksheets and Exercises	Seminar

Offered by Hindi

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

Unit	Description	Text Book	Chapters
I	नाटक - सत्मभेि जमते - (श्री सम्ऩूणा नन्द)	1	3
	Instructional Hours		**12**
Suggested Learning Methods : Visual Learning			
II	प्राचीन काव्म : कफीय के दोहे (10 दोहा), सूयदास के ऩद (4 ऩद) (काव्म प्रमोग)	1	2
	Instructional Hours		**12**
Suggested Learning Methods : Auditory			
III	1) आधुननक काव्म : ऩुष्ऩ की अलबराषा - भाखनरार चतुिेदी , जलरमािारा फाग भें फसोंत - सुबद्राकुभायी चौहान, शत्तत औय ऺभा - याभधायी लसोंह हदनकय 2) सोंऻा,सिानाभ,वििेषण,कक्रमा,कारयका, नकायात्भक तथा वियोधाथी शब्द	1	3

Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing	

IV	अरोकाय : 1) अथय अरोकाय औय शब्द अरोकाय, 2) हदए गए चचत्र नय कु छ िाितम तरखनाा ।	1	2
	Instructional Hours		**12**
Suggested Learning Methods : Auditory, Visual, Comprehensive			
V	गदमाांश रेखन, िाितम शुवि, शब्द शुवि, अनेक शब्द के तरए एक शब्द	1	4
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive writing			
	Total Hours		**60**

Text Books	1. नाटक - सत्मभेि जमते - (श्री सूमम ायामण भूतय) 2. काव्म सुभन - याजनाय ऐंड सन्स
Reference Books	1. हहदी ी नाटक औय योगभांच - डॉ याभ कु भाय िभाय 2. आोकाय नाथ िभाय , साभानम हहदी ी अयहोत प्रकाशन इांडमा तरतभटेड
Web. URLs	1. www.webdunia.com 2. https://www.hindikunj.com 3. www.bhashaindia 4. Www.hindisamay.com

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U1MAL303	Part – I : Kavithayum Smaranayum		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	[illegible]		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Creating Imagination and Self confidence		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	[illegible]	Lecture / Video Methods	Assignment
CO 2	[illegible]	Group Learning	Seminar
CO 3	[illegible]	Peer Teaching	Assignment
CO 4	[illegible]	Group learning	Group Project
CO 5	[illegible]	Worksheets / Dumb Charades	Assignment

Offered by	Department of Malayalam

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	നവ കവിത - പഠ്യകവിതകൾ	1	4
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			
II	നവ കവിത - പഠ്യകവിതകൾ	1	3
		Instructional Hours	12
Suggested Learning Methods : Auditory			
III	[illegible]	1	3
		Instructional Hours	12
Suggested Learning Methods : Comprehensive writing			

IV	ക [illegible]	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			
V	ക [illegible]	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. [illegible] 10 [illegible] . 2. [illegible] 3. [illegible]
Reference Books	1. [illegible] 2. [illegible] 3. [illegible] 4. [illegible]
Web. URLs :	1. http://www.keralaculture.org>literature

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by Department of French

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	Department of English

Course Content	Instructional Hours / Week : 4

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC305	Core Paper VII: Operating Systems		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to B. Sc. CS / IT / BCA)			
Course Objective	To understand the importance of Operating Systems and its functionalities to manage resources of Computer and Peripherals.		
Course Category	Employability		
Development Needs	Global		
Course Description	Operating System describes of types,States,Paging,Segmentations.		

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

Offered by | **Computer Applications**

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

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITC303	Core Paper VIII: Software Engineering		
Semester: III	Credits:3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	To gain knowledge about basic concepts of Software Engineering and Testing.
Course Category	Employability and Entrepreneurship
Development Needs	Global
Course Description	The Software Engineering course syllabus is designed to impart knowledge about Computer Programming, Web Development, Data Structures, Project Management, etc.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Able to understand the nature of the software and different types of process models	Video Lecture	Assignment
CO 2	Gains knowledge about the requirements stage development of the software	Brainstorming	Seminar
CO 3	Analyze the different types of architectural designs of the software	Flipped Classroom	Quiz
CO 4	Setting the context on Software Development and Evaluates different testing strategies of the software	Jigsaw	Assignment
CO 5	Understand the testing types and test automation	Flipped Classroom	Seminar

Offered by	**Information Technology**

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

Unit	Description	Text Book	Chapters
I	**Introduction to Software Engineering:** Evolving role of software – Software- The changing nature of Software- Software Myths. A Generic view of Process- A Layered Technology **Software Process Models:** Prescriptive models- The Waterfall Model - Incremental Process Models- Evolutionary Process Models.	**1**	**1** **3**
		Instructional Hours	**12**
Suggested Learning Methods : Video Lecture			
II	**Requirements Engineering:** Requirements Engineering Tasks- Initiating the Requirements Engineering Process- Eliciting Requirements- Building the Analysis Model. **Building the Analysis Model:** Scenario-Based Modelling- Flow Oriented Modelling.	1	7 6
		Instructional Hours	**12**

Suggested Learning Methods : Brainstorming			
III	**Design Engineering:** Design Concepts -The design model. **Creating an Architectural Design:** Representing the System in Context- Defining Archetypes- Refining the Architecture into Components- Describing Instantiations of the System. **Modelling Component-Level Design:** What is a Component – Designing Class-Based Components. **User Interface Design:** User Interface Analysis and Design- Interface Design steps.	1	9 10 11 12
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Classroom			
IV	**Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation. **White-Box Testing:** Static Testing – Structural Testing. **Black-Box Testing:** How to do Black-Box Testing procedures.	2	2,3,4
		Instructional Hours	**12**
Suggested Learning Methods : Jigsaw			
V	**Integration Testing:** Integration Testing as Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash. System and Acceptance **Testing:** System Testing Overview - Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing. **Performance Testing:** Methodology of Performance Testing – tools for Performance Testing. **Regression Testing:** Regression Testing Overview – Types of Regression Testing - Test Automation.	2	5,6,7,8,16
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Classroom			
VI	**Contemporary Issues:** o Workshop on Software Tools. o Seminar on Various Software Models. o Guest Lecture on Software development Lifecycle		
		Total Hours	**60 Hrs**

Text Books	1. Roger S Pressman, Software Engineering a Practitioner's Approach, Seventh Edition, Mc Graw Hill, International Edition, 2013 2. Srinivasan Desikan, Gopalaswamy Ramesh, "Software Testing Principles and Practices", Pearson, 2006.
Reference Books	1. Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill Publishing Company Limited,2010 2. Waman S. Jawadekar, Software Engineering - Principles and Practice, Tata McGraw Hill Publishing Company Limited,2011
Web. URLs	https://www.tutorialspoint.com/software_engineering/index.htm

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITP303	Core Paper IX: Practical in Operating System		
Semester: III	Credits: 2	CIA: 20 Marks	ESE: 30 Marks

Course Objective	To know about the basics of shell Script programming language
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	This course examines the important techniques in operating system design and implementation.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understanding the shell programming concept	Demonstration Method	Laboratory Experiments
CO 2	To review the file concept in the working environment		
CO 3	Compare the different management techniques		
CO 4	To Apply socket communication in Program		
CO 5	Able to apply various scripting concept in programs		

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 4

Programme	Description
1	Write a shell script to stimulate the file commands: rm, cp, cat, mv, cmp, wc, split, diff.
2	Write a shell script to show the following system configuration : a. currently logged user and his log name b. current shell, home directory, Operating System type, current Path setting, current working directory c. show currently logged number of users, show all available shells d. show CPU information like processor type, speed e. show memory information
3	Write a Shell Script to implement the following: pipes, Redirection and 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 filter commands.
6	Write a shell script to remove the files which has file size as zero bytes.
7	Write a shell script to find the sum of the individual digits of a given number.
8	Write a shell script to find the greatest among the given set of numbers using command line arguments.

9	Write a shell script for palindrome checking.
10	Write a shell script to print the multiplication table of the given argument using for loop.

Instructional Hours	**60**

Tools for Assessment (20 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	5	2	2	3	20

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	Mathematics

Course Content	Instructional Hours / Week : 3

Unit	Description	Text Book	Chapters
I	Linear programming – Mathematical Formulation-Solving LPP using Graphical Method-Canonical and Standard form of LPP .	1	2, 3
	Simplex Method - Big-M Method, Principles of Duality.	1	4, 5
		Instructional Hours	9
Suggested Learning Methods : Problem Solving Practice			
II	**Transportation Problems**: Introduction – Initial Basic Feasible solutions – Balanced Transportation Problem : North West Corner Rule, Least Cost Method , Vogel's Approximation Method - Unbalanced Transportation Problem- Optimality – MODI Method (Non Degeneracy).	1	10
	Assignment Problem: Introduction – Hungarian Assignment method – Maximization in Assignment problem - Unbalanced Assignment problem- Travelling salesman problem.	1	11
		Instructional Hours	9
Suggested Learning Methods : Seminar			
III	**Game Theory:** Concept of Pure and Mixed Strategies – Solving 2 x 2 matrix with and without saddle point - n x 2 & 2 x m games by Graphical Method - Dominance Property.	1	17

	Replacement models: Elementary Replacement Models - Present Value - Rate of Return - Depreciation - Individual Replacement – Group Replacement.	1	18
		Instructional Hours	**9**
Suggested Learning Methods : Group Discussion			
IV	**Queuing Theory (Derivations not included):** Introduction – Elements of Queuing System – Operating Characteristics of Queuing systems – Probability Distributions in Queuing Systems - Birth death process.	1	20
	Classification of Queuing Models: Single Server - finite and infinite population models. (Model I , Model II & Model III) – Problems only.	1	20
		Instructional Hours	**9**
Suggested Learning Methods : https://youtu.be/xGkpXk-AnWU			
V	**Network Scheduling:** Critical Path Method – Principles of Network Construction: Forward Pass – Backward Pass computations – Types of Floats - Practical Problems in Networking Methods. **PERT:** Critical Path – Probability of completion of project-Difference between PERT and CPM.	1	21
		Instructional Hours	**9**
Suggested Learning Methods : Problem Solving Practice			
		Total Hours	**45**

Text Books	1.Kanti Swarup, P.K. Gupta, Man Mohan, **Operations Research,** S. Chand & Sons, 1997.
Reference Books	1.Hamdy A Taha, **Operations Research – An introduction,** Prentice Hall of India PVT.LTD, 8th edition, 2008. 2.J. K. Sharma, **Operations Research Theory and Applications** , MacMillan India Ltd, 2008.
Web. URLs	1. https://youtu.be/4U3B5lr-MqM.(Introduction to OR) 2.https://www.youtube.com/watch?v=2AOhCWhwOKo (PERT concepts)

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U4ITZ301	Core Paper IX : Case Tools Lab		
Semester: III	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	1. To enable the students to get better understanding and knowledge in the field of CASE tools. 2. To gain practical knowledge on developing case tools 3. To develop UML diagrams for the real time problems
Course Category	Skill Development /Employability
Development Needs	Global/Local
Course Description	Develop simple and complex applications at Global needs.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Prepare the Problem Statement and Requirement Specification for the given Problem.	Program Demonstration	Applicationof Logic
CO 2	Create ERD And DFD for the specification using CASE TOOLs.		ProgramCreativity
CO 3	Design a Software using USE CASE and activity Diagrams		Program Debugging
CO 4	Generate Code from the Class diagram using CASE Tools		Program Creativity
CO 5	Analyze the architecture of the software using the Component and DeploymentDiagram		Program Development

Offered by	**Computer Applications**
Course Content	**Instructional Hours / Week : 3**

Program List

For the Following Real time Systems (Any 3)

a) Payroll Processing System
b) Student MIS
c) Library Management System
d) Hostel Management System
e) ATM Management System
f) Hospital Management System
g) Stock Maintenance System
h) Online Ticket Reservation System
i) Platform Assignment System
E-Mail Client Management System

1. Write the complete problem statement
2. Write the software requirement specification document
3. Draw the entity relationship diagram
4. Design DFD for real time problem

5. Draw use-case diagrams
6. Draw the activity diagram for the given application
7. Construct state chart and sequence diagram for use-case
8. Assign objects in sequence diagram to classes and generate the class diagram andconvert into JAVA/VB CODE
9. Draw the Component Level Diagram
10. Draw the Deployment Diagram
Suggested Learning Methods: **Simple Application development**

Total Hours	**45** Hrs

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	6	6	3	30

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22U4NM3BT1	Part – IV : Basic Tamil – I	
Semester : III	Credits : 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective	jkpo nkhopiaf fwg;gjy–nkhopjjpwid tsHjy;
Course Category	Skill Development (khztHfspd nkhopj;jpwid Cf;Ftpj;jy;)
Development Needs	Regional (jkpo nkhopapd mtrpaj;ij czHj;Jjy;)
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	jkpo vOjJf;fs mwpKfk nrajy kw;Wk thrjjy Mfpatw;wpd gadghL.	FO tpthjk	xg;gilT
CO 2	gpwnkhop fw;wy MHtk J}zLy;	FO tpthjk	fUj;juq;F
CO 3	gpwnkhop mwTj jpwd NkkgLr;nrajy	tpupTiu/ fhnzhspg;gL tpsf;fk	FOj;jLLk
CO 4	thHj;ij mikf;Fk jpwd ngwrnrajy;	tpupTiu/ FO tpthjk	FOj;jLLk
CO 5	ifnaOj;Jjjwd ngwrnrajy;	FO tpthjk	FOj;jLLk

Offered by	jkpoj;Jiw

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

Unit	Description	Text Book	Chapters
I	jkpo nkhopad mbggilf $Wfs	,yf;fzk	1.caHvOj;Jf;fs 2.nka; vOj;Jf;fs 3.caHnka vOj;Jf;fs
		Instructional Hours	6
Suggested Learning Methods : vOj;Jf;fis vOJk kw;Wk thrpf;Fk jpwd ngw;wik			
II	nrhy mikjy;;	,yf;fzk	1.XH vOj;J xUnkhop 2.,uz;Lkjy le;J vOjJr;nrhw;fs 3.jkpo khjq;fs ngah;>fpoikfspd ngaH 4.tzzq;fs ngaH> 5.nrhy Mf;fk;
		Instructional Hours	6
Suggested Learning Methods : vOjJf;fis nfhz;L nrhw;fis cUthfFk gapw;rp ngw;wik			
III	njhLuikg;G	njhLuikg;G	1.vOtha 2.nraggLnghUs
		Instructional Hours	6
Suggested Learning Methods : nrhw;fisf; nfhzL njhLu cUthf;Fk gapw;rp ngw;wik			
IV	Fwpg;G vOJjy	,yf;fzk	1.njhLuikg;G 2.gjp mikg;G
		Instructional Hours	6
Suggested Learning Methods : gjp mikg;G cUthf;Fk jpwd ngw;wik			

V	gpioePf;Fjy	,yf;fzk	1.xw;Wggpio 2.thf;fpag gpio
			Instructional Hours 6
Suggested Learning Methods : ,yf;fzg gpio ,d;wp vOJk jwd ngw;wik			**Total Hours** 30
Text Books	1. ,sq;fiy jko khztHfSf;Fhpa ghLE}y“mhprRtb” njhFg;G: jkoj;Jiw> NeU fiy kWWk mwpt ay fyY}hp>Nfhak;Gj;J}H.		
Reference Books	1. gtzej Kdt>ed;D}y G+yA+Hf;Nfr fd ciu>rhujh gjggfk> nrd;id–40. 2. njhy;fhggak> fNziraH gjg;G>cyfj jkpohuha;r;rp epWtdk> nrd;id -113.		
Web. URLs	-		
Course designed by		**Verified by**	

Course Code	Title	
22U4NM3AT1	Part – IV : Advanced Tamil – I	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		

Course Objective	GJf;ftpij cUthf;Fk jpwd tsHjjy - nkhopjjpwid NkkgLjJjy
Course Category	Skill Development (khzth;fspd nkhopj;jpwid Cf;Ftpj;jy;)
Development Needs	Regional (jkpo nkhopapd mtrpaj;ij czHj;Jjy)
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	gilf;Fk jpwd tsHj;jy	tpupTiu	FOj;jpLLk
CO 2	gilgghf;fjjpwd mwpT ngwrnrajy;	tpupTiu/ FO tpthjk	fUj;juq;F
CO 3	jfty njhLHgpaYf;fhd fbjk;>miikTjjpwd ngwrnrajy;	tpupTiu/ fhnzhspg;gL tpsf;fk	fUj;juq;F
CO 4	nkhopiaggpioapd;wpgNgRk >vOJk jpwd ngwr nrajy	tpupTiu	xg;gilT
CO 5	fbjk vOJjy kw;Wk nkhopawpitg ngWjy.	tpupTiu/ fhnzhspg;gL tpsf;fk	FOj;jpLLk

Offered by	jkpoj;Jiw

Course Content			Instructional Hours / Week : 2
Unit	**Description**	**Text Book**	**Chapters**
I	[illegible]	1. ghujpahH 2. ghujpjhrd	1.1. [illegible] 1.2. [illegible]
		Instructional Hours	6
Suggested Learning Methods : ftpij vOJk jpwd; ngw;wik			
II	[illegible]	,yf;fzk;	nrhwggpio ePf;fk njhLHggpio ePf;fk gjjp vOjr nrajy
		Instructional Hours	6
Suggested Learning Methods : thf;fpaq;fisg gpio ,d;wp vOJk jpwd ngw;wik			
III	,yf;fzg gapw;rp mspjjy	,yf;fzk;	njhif epiyj njhLH njhfh epiyjnjhLH 3.3.MFngaH tiffs
		Instructional Hours	6
Suggested Learning Methods : ,yf;fzg gpio ,d;wp vOJk gapw;rp ngw;wik			

IV	fbjk vOJjy	,yf;fzg gapw;rp VL	ghuhLLf;fbjk ed;wpf;fbjk miog;Gf;fbjk mYtyfffbjk eL;Gf;fbjk
Instructional Hours			6
Suggested Learning Methods : fbjk vOJk jpwd; ngw;wik			
V	,yf;fpa tuyhW	jkpo ,yf;fpa tuyhW	1. த வ [illegible] ந [illegible] 2. க [illegible] ப த [illegible] ழ [illegible]
Instructional Hours			6
Suggested Learning Methods : jkpo ,yf;fpa tuyhw;wpd rpwg;gpid mwpa ngw;wik			
Total Hours			30

Text Books	1. ,sq;fiy jkpo khztHfSf;Fhpa ghLE}y "jpuLL" jkpoj;Jiw. njhFg;G: jkpoj;Jiw> NeU fiy kwWk mwptpay fyY}hp> Nfhak;Gj;J}H.
Reference Books	1. ghujpahH – ghujpahHftpijfs;> mgpuhkpgjpg;gfk;> 7- gpnfhbkuj njU> nrd;id – 013 2. gtze;jpKdptH – ed;D}y> G+ypA+Hf;Nfrpfd cil> rhujh gjpg;gfk;> nrdid - 040
Web. URLs	

Course designed by	Verified by

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

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

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

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

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

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
22U4NM3GST	Non Major Elective : Gender Sensitization	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		
Course Objective	To raise awareness of gender, promote gender equality, and equip learners with key concepts and principles of gender sensitization.	
Course Category	Skill Development, Employability and Entrepreneurship	
Development Needs	Local, National and Global	
Course Description	The course aims an exploration of overview of gender, its social construction, gender issues and challenges in India, and equips learners with key concepts and principles of gender sensitization to promote inclusivity and equity.	

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

Offered by Department of Costume Design and Fashion

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

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

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

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	Department of Social Work
Course Content	Instructional Hours / Week : 2

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

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

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

23U1TAM404	Part – I : Muthamizh		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	rq;ffhy kf;fsd thotpay thapyhf gz;ghLLf $Wfis czHj;Jjy;		
Course Category	Skill Development (khzth;fspd nkhopj;jpwid Cf;Ftpj;jy;)		
Development Needs	Regional (cyf mstpy jkpo nkhopapd mtrpaj;ij czHj;Jjy;)		
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy kw;Wk cyf mstpy jkpo nkhopapd mtrpaj;ij czHj;Jjy		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	jkpoHfsd thotpay; gz;Gfisf fw;W mwpjy;	tpupTiu/ fhnzhspg;gL tpsf;fk	xg;gilT
CO 2	jkpo ,yf;fpa tiffisf $Wtjd %yk jkpopd ,yf;fpa tsj;ij czur;nra;jy.	tpupTiu	FOjLLk
CO 3	khztHfspiLNa fhyjjw;Nfw;g kdtsHr;rpia cUthf;Fjy;	tpupTiu/ fhnzhspg;gL tpsf;fk	fUj;juq;F
CO 4	ehLbd rpwe;j Fbkf;fshf khztHfis cUthf;Fjy;	tpupTiu	xg;gilT
CO 5	khztHfsd kdeyj;ij tshjjy;	tpupTiu/FO tpthjk	fUj;juq;F

Offered by	jkpo;j;Jiw

Course Content : Muthamizh			Instructional Hours / Week : 4
Unit	Description	Text Book	Chapters
I	vLLjnjhif	1. ew;wpiz 2. FWe;njhif 3. gjpw;Wg;gj;J 4. GwehD}W	1.1 [illegible] 1.2 [illegible] 1.3 [illegible] 1.4. [illegible]
			Instructional Hours 12
Suggested Learning Methods: rq;f ,yf;fpato; gz;Gfis mwpar;nra;jy			
II	gj;JgghLL	1. [illegible]gil 2. FwpQ;rpgghLL 3. [illegible] 4. [illegible]	2.1. [illegible] 2.2 [illegible] 2.3 [illegible] 2.4. [illegible]
			Instructional Hours 12
Suggested Learning Methods : GytHfspd khz;Gfis ntsg;gLj;Jjy			
III	mw ,yf;fpaq;fs	1. ehdkzf;fbif 2. ,daitehwgJ 3. fstoehw;gJ- 4. Mrhuf;Nfhit	tpskgpehfdhh - (1-5 ghLy;fs;) g;jQ;Nrejdhh - (1-5 ghLy;fs;) ngha;ifahH - (11-15ghLy;fs;) ngUthad Ks;spahh (1-5ghLy;fs;)
			Instructional Hours 12
Suggested Learning Methods : mw ,yf;fpaq;fsd; khz;Gfis mwpa ngw;wik			

IV	த ந [illegible] ச சள ல க	jdpj;jkpo	4.1 [illegible] 4.2 ய ல க க 4.3 ச ந [illegible] ச சள ல க 4.4 த ந [illegible] ச சள ல க
		Instructional Hours	**12**
Suggested Learning Methods : த ந [illegible] ச சள ல க gw;wp mwpAk tha;g;G ngw;wik			
V	,yf;fzk	1. ed;D}y 2. ச த [illegible]	5.1 KjwnghUs;fUgnghUs;chpgnghUs 5.2 [illegible] அ ம 5.3 [illegible] க [illegible] 5.4 ஆ [illegible] த ந [illegible] ச ந [illegible]
		Instructional Hours	**12**
Suggested Learning Methods : ,yf;fz khz;Gfis mwpAk jpwd ngw;wik			
		Total Hours	**60**

Text Books	1. ,sq;fiy Kjyhk Mz;L jkpo khztHfSf;Fhpa ghLE}y; njhFg;G: "Kj;jkpo" jkpo;j;Jiw NeU fiy kw;Wk mwptpay; fy;Y}hp> Nfhak;Gj;J}H.
Reference Books	1. rq;f ,yf;fpaq;fs - (vL;Ljnjhif>gj;JgghL;L) fofntspaPL>j;Uney;Ntyp. 2. jdpj;jkpo - ,sRe;juk; tpfLd; gpuRuk; nrd;id
Web. URLs	

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

Course Objective	साहहत्म प्रशंसा औय विश्रेषण के सौंदमय, सांस्कृततक औय साभाजजक नहरुओं के प्रतत छात्रों को संवेदनशीर फनाना। उन्हें विभबन्न कारों के प्रख्मात रेखकों के हहदं ी कथा साहहत्म के फेहतयीन नभूने उऩरब्ध कयाना।
Course Category	Skill Development
Development Needs	Global
Course Description	Improved accuracy & quality, improved communication

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हहदं ी बाषा से अच्छी तयह िाककप हो सकेंगे।	Smart boards and Role play	Assignment
CO 2	नाट्मकृभ संिादी हहदं ी भें नायंगत होने भें भदद कयता है।	Group learning Acting and Story Narration	Seminar
CO 3	छात्र आधुननक हहदं ी साहहत्म का ऻान प्राप्त कय सकेंगे।	Smart boards and YouTube Videos	Assignment
CO 4	छात्रों को ननफंध रेखन भें अच्छा अभ्मास भभरेगा।	Group learning and Work sheets	Group Project
CO 5	छात्रों को उपरब्ध की सभीऺा कयने का अभ्मास भभरेगा।	Worksheets and Exercises	Seminar

Offered by Hindi

Course Content — Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	विरुद्ध उऩन्मास: (भणृ ार नाण्डे)	1	4
	Instructional Hours		12
Suggested Learning Methods : Visual Learning			
II	कथा मारा : रौटना और रौटना (भदृ रुु ा गगग्र), ममता (जयशकर प्रसाद), आदमी का बच्चा (यशपार)	1	3
	Instructional Hours		12
Suggested Learning Methods : Auditory			
III	1. हदए गए अनुच्छेद नय सभीऺा भरखना 2. आधुननक कार: प्रिवृ तमां औय कवि	1	3
	Instructional Hours		12

Suggested Learning Methods : Comprehensive Writing

IV	1. सािभािन्म तनफंध : आधतु नक भशंिा प्रणािरी , भोफाइर काि दषु नरयणािभ, आधतु नक मुिा नीढी 2. हहदं ी भें दी गई कहानी के भरए सायांश भरखना।	1	2
	Instructional Hours		**12**
Suggested Learning Methods : Auditory, Visual, Comprehensive			
V	भसनेभा सभीक्षा : नद्माित	1	4
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive writing			
	Total Hours		**60**

Text Books	1. विरुद्ध उन्नन्मास: (भणृ ार नाणडे) 2. कहानी कंुज , गोविदं प्रकाशन , भथुा 3. हय हाय फेगाने - भद्द रु ा गगय , याजनाय एंड संस , हदल्री 4. भेया नयिाय , रोकबायत प्रकाशन , इराहाफाद
Reference Books	1. संजम चौहान , सभकारीन हहदं ी साहहत्म विचाय औय विवाद , आशा ऩब्रिकेशंस 2. श्री याभदेि, व्माकयण प्रदीऩ, रोकबायती प्रकाशन, अराहाफाद 3. डॉ िासुदेि नंदन प्रसाद, आधतु नक हहदं ी व्माकयण औय यचना, बायती बिन प्रकाशक 4. ओंकाय नाथ िभाय , साभान्म हहदं ी , अरयहंत प्रकाशन बायत भरभभटेड
Web. URLs	1. www.webdunia.com 2. www.hindikunj.com 3. hindi-natak-vikas.html 4. www.bhashaindia 5. www.hindisamay.com 6. https://ebook.pustak.org/

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U1MAL404	Part – I : Drisyakalaa Saahithyam		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			

Course Objective	സ ന മ ഏ [illegible] മ ടു ‍ഡ വ വ ശ [illegible] ആഴ [illegible] ൽ [illegible] ൻ കഴ ഡ ു [illegible]. ഓ ശ [illegible] ണ [illegible] ക ു ദ [illegible] അ ദ [illegible] ല ഭ [illegible].
Course Category	Skill Development
Development Needs	Global
Course Description	Proper guidance, opportunities and encouragement that help them achieve their ambitions

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	[illegible] ഡ [illegible] സ [illegible]	Lecture / Video Methods	Assignment
CO 2	[illegible] വ [illegible] ഏ ല [illegible] അ [illegible] അ ദ ഡ [illegible].	Group Learning	Seminar
CO 3	ക [illegible] ത ക [illegible] ഉ യർ [illegible]	Peer Teaching	Assignment
CO 4	[illegible] ണ [illegible] ൽ	Group Learning	Group Project
CO 5	[illegible] അ വ ത ണ [illegible]	Lecture / Dumb Charades	Assignment

Offered by	**Department of Malayalam**
Course Content	**Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	[illegible] - ണ ടുൻ [illegible] ക ടു ശ ൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			
II	[illegible] - ണ ടുൻ [illegible] ക ടു ശ ൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			
III	[illegible] - ണ ടുൻ [illegible] ക ടു ശ ൻ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			

IV	[illegible] - [illegible]	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Auditory, Visual			
V	[illegible] - [illegible]	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			
		Total Hours	**60**

Text Books	1. [illegible] - [illegible] - [illegible], [illegible] 2. [illegible]
Reference Books	1. [illegible] - [illegible] 2. [illegible] - [illegible] - [illegible] 3. [illegible] - [illegible] 4. [illegible] - [illegible] - [illegible] 5. [illegible] - [illegible] - [illegible]
Web. URLs	1. http://www.keralaculture.org>literature 2. http://www.manoramaonline.com

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

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

Offered by	Department of English

Course Content	Instructional Hours / Week : 4

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

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

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

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23 U3 CKC4 06	Core Paper X : RDBMS and MySQL		
Semester: IV	Credits: 3	CIA: 20 MARKS	ESE: 55 MARKS
(Common to B. Sc. CS / IT)			
Course Objective	To inculcate fundamental knowledge in RDBMS concepts and designed for students towriting SQL queries using My SQL.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	The course gives introduction to the fundamentals of MySQL and relational databases using database programming techniques emphasizing database structures, modelling, and database access.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the fundamental concepts of a database management system	Lecture	Assignment
CO 2	Explain the basic concepts of relational data model, entity-relationship model and relational database design	Flipped Classroom	Case Study Analysis
CO 3	Apply the database design using normalization	Video Lectures	Quiz
CO 4	Understanding of SQL syntax used with MySQL	Flipped Classroom	Assignment
CO 5	Explain the basic functions of MySQL database program	Lecture	Seminar

Offered by	Computer Science

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Introduction:** Introduction to DBMS – Information-Data and Data management-File-based data management – Database System - DBMS - Components of a DBMS- Database User-Database Architecture and Design- Data Abstraction - Physical and Logical Data Independence	1	1, 2
		Instructional Hours	12
Suggested Learning Methods : Video Lectures			
II	**Data Models:** Data Models-Introduction-Conceptual, Physical Models-Hierarchical Model - Network Model-Relational Model – E-R Model **Entity – Relationship (E-R) Modeling :** Introduction – E-R Model - Components of E-R Model-Relationships-E-R conventions-Composite Entities - Entity List-E-R diagrams, E-R Modeling Symbols.	1	3, 4
		Instructional Hours	12
Suggested Learning Methods : Demonstration			
III	**Data Integrity, Constraints and Normalization**: Introduction-Integrity Constrains- Normalization-Keys-Relationships-Normalization - Keys- Relationships-First Normal Form(1NF)-Second Normal form(2NF) –Third Normal Form(3NF)- Boyce-Codd Normal Form (BCNF).	1	7, 9
		Instructional Hours	12

Suggested Learning Methods : Group Discussion			
IV	**MySQL**: Introduction to MySQL-Identifier in MySQL-Creating a Database-Selecting Database-Creating Tables-Data Types in MySQL-Using INSERT-Using DELETE-Using Truncate-Using Update-Overview of SELECT-Simple Queries-Selecting Particular Column-Using WHERE Clause to Select Particular Rows. Using GROUPBY Clause -HAVING - ORDER BY – LIMIT.	2	4, 5
		Instructional Hours	12
Suggested Learning Methods : Seminar			
V	**MySQL Queries and Functions:** Using Joins to Run Queries over Multiple table-Understanding the different Join Types-Operator in MySQL-Control Flow functions-String Functions-Numeric Function-Date and Time Functions. **PL/SQL Concepts :** Cursors, Stored Procedures, Database Triggers	2	7, 8
		Instructional Hours	12
Suggested Learning Methods : Quiz			
		Total Hours	**60 Hrs**

Text Books	1. Alexis Leon and Mathews Leon 'Fundamentals of database Management Systems',Vijay Nicole Imprints Pvt Ltd, Chennai,2006. 2. Luke Welling and Laura Thomson, 'My SQL Tutorial, Pearson Education, First Edition,2006 **Unit I :** Sections: 1.1 to 1.4, 2.1 to 2.4 (Chapter 1 and 2) **Unit II :**Sections: 3.1 to 3.7, 4.1 to 4.10 (Chapter 3 and 4) **Unit III :**Sections: 7.1 to 7.3, 9.1, 9.5 to 9.12 (Chapter 7 and 9) **Unit IV :**Section: 4.1 to 4.9, 5.1 to 5.6 (Chapter 4 and 5) **Unit V :**Sections: 7.1 to 7.3, 8.1 to 5.5 (Chapter 7 and 8)
Reference Books	1. Abraham Silberschatz , Henry F.Korth and S.Sudarshan, 'Database System Concepts', TataMc GrawHill, Sixth Edition,2013. 2. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", EightEdition, Pearson Education, 2006. 3. Hugh E. Williams, Saied M.M. Tahaghoghi, Learning MySQL, O Reilly Media, Inc. SecondEdition, 2006
Web. URLs	https://www.w3schools.com/mysql/mysql_rdbms.asp

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Case Study Analysis	Assignment	Seminar	Total
4	4	5	2	2	3	**20**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITC404	Core Paper XI: Computer Networks		
Semester: IV	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	To inculcate knowledge on Networking concepts and technologies like Wireless, Broadband and Bluetooth.
Course Category	Employment and Skill Development
Development Needs	Global
Course Description	To learn the fundamentals of networking systems, their architecture, function and operation and how those fundamentals are reflected in current network technologies.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand about network hardware, software and uses of computer networks	Flipped Classroom	Class Participation
CO 2	Understand Guided Transmission Media, Wireless Transmission, and Communication Satellites	Video Lectures	Assignment
CO 3	Understand error detection and correction, elementary data link protocol and Routing algorithms	Brainstorming	Quiz
CO 4	Understand and Identify the applications of application layer and network security	Interactive Lecture	Poster Presentation
CO 5	Understand the importance of applications layer and cryptography	Lecture / Class Projects	Quiz

Offered by | **Information Technology**

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

Unit	Description	Text Book	Chapters
I	**Uses of computer networks**: Business Applications- Home Applications - Mobile Users - and Social Issues. **Network Hardware** : Personal Area Networks - Local Area Networks - Metropolitan Area Networks - Wide Area Networks, Internetworks. **Network software** : Protocol Hierarchies - Design Issues for the Layers - Connection-Oriented Versus Connectionless Service - Service Primitives - the Relationship of Services to Protocols - **Reference Models** : The OSI Reference Model - The TCP/IP Reference Model – A Comparison of the OSI and TCP/IP Reference Models.	1	1
		Instructional Hours	**12**

Suggested Learning Methods: Flipped Classroom

II	**Physical Layer - Guided Transmission Media**: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission**: Electromagnetic Spectrum –Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites** : Geostationary - Medium-Earth Orbit - Low Earth- orbit Satellites – Satellites versus Fiber.	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Video Lectures			
III	**Data link Layer:** 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** : A Utopian Simplex Protocol- A Simplex Stop-and-Wait Protocol for an Error-Free Channel- A Simplex Stop-and-Wait Protocol for a Noisy Channel. **Sliding Window Protocols:** One-Bit sliding window protocol – A protocol using Go-Back-N – A Protocol using Selective Repeat.	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Brainstorming			
IV	**Network layer: Routing algorithm**-The Optimality Principle, Shortest Path Algorithm, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks, **Transport layer: Elements of transport protocols** -Addressing, Connection Establishment, Connection Release, Error Control and Flow Control, Multiplexing, Crash Recovery **The Internet Transport Protocols UDP**: Introduction to UDP. TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window, TCPTimerManagement, TCP Congestion Control.	1	5,6
		Instructional Hours	**12**
Suggested Learning Methods : Interactive Lecture			
V	**Application layer:** DNS - The Domain Name System, The DNS Name Space, Domain Resource Records, Name Servers, **Electronic mail**-Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, **Network Security: Cryptography**-Introduction to Cryptography, Substitution Ciphers, TranspositionCiphers,One-Time Pads, Two Fundamental Cryptographic Principles.	1	7,8
		Instructional Hours	**12**
Suggested Learning Methods : Lecture / Class Projects			
		Total Hours	**60 Hrs**
Text Books	1. Andrew S. Tanenbaum; Computer Networks, 4th Edition, PHI		

Reference Books	1. Achyut Godbole, Data Communication and Networks, 2007,TMH. 2. Uyless Black, Computer Networks: Protocols, Standards, and Interfaces, 2nd ed.,PHI
Web. URLs	www.w3schools.com//computer_networks.html

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITP404	Core Paper XII: Practical in RDBMS and MySQL		
Semester: IV	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	To make the students to understand Relational Database Management System concepts using Oracle and able to do the various operations on Tables.
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	The course focuses on the basic concepts of relational database scheme and it analyses the relational data model with optimal and feasible solutions.

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

Offered by	**Information Technology**

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

Programme	Description
1	Create a table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.
2	Create tables for library management system which demonstrate the use of primary key and foreign key. Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User id, Accno, Date of Issue and Date of Return. Create a Report(Select verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.
3	Write a MySQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using MYSQL block.
4	Write a MySQL program to check whether given string is palindrome or not
5	Write a MySQL program to find factorial of numbers using function and procedure.
6	Create a MySQL Program to perform updation using various triggers.
7	Create a database trigger to implement on master and transaction tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.

8	Write a MySQL to split the student table into two tables based on result (One table for ―Pass and another for ―Fail). Use cursor for handling records of student table.
9	Write a MySQL to raise the exceptions in Bank Account Management table
10	Write a MySQL to handle package
11	Write a MySQL Cursor for referencing fields in a record
12	Write a MySQL trigger for entering mark in the student table
	Instructional Hours **60**

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	6	6	3	30

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITA404	Allied Paper IV: Robotics		
Semester: IV	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective	To gain knowledge about Robots and its applications in real time environment.
Course Category	Skill Development
Development Needs	Global
Course Description	This course covers a variety of multidisciplinary topics necessary to understand the fundamentals of designing, building, and programming robots

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of robot's family tree	Video Lectures	Class Participation
CO 2	Describing the robots in real time	Flipped Classroom	Assignment
CO 3	Applications of robots	Group Discussion	Quiz
CO 4	Correlating the robots with the society	Case Studies	Assignment
CO 5	Analyze the biological foundations of the reactive paradigm	Lecture / Class Projects	Quiz

Offered by | **Information Technology**

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

Unit	Description	Text Book	Chapters
I	The Robot Family Tree: The First Robots – Computers – Factory Automation – Machine Tools – Industrial Robots – Fictional Robots – Modern Fictional Robots Anatomy of a Robot: The Human Body – and a Robot's Body – Arms and Hands – Moving Around – Sensors – The Brain – Robot School Teaching Robots to be Robots – From Master-Slave to Androids	1	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Video lectures			
II	Robots at Work Today: Factory Robots – Flexible Manufacturing Systems – Service Industry – Robot Delivery Systems – Working in Hazardous Environments – TOMCAT Live Electric Transmission Line Maintenance – Coal Mining – Security Robots – Underwater Robots – Medicine and Health – Why aren't there more Robots at Works? Artificial Intelligence: What does the human brain do? – expert systems – Uncertainty – Talking to intelligent systems – computer forAI.	1	3,4
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Classroom			

III	Intelligent and Advanced Robots: Are there Intelligent Robots? – How Smart should Robots be? – Artificially Intelligent Robots – Planning – Intelligent Teaching and Learning – Introspection – Better Robot Bodies – Advanced Tele operation – Advanced Sensing – Telepresence – Brainless, but Intelligent Robots – Microro bots Robots in Space: Robots on the U.S.Space Station Robots for Exploring the Mars Surface – Space Robots Beyond the Mars mission.	1	5,6
		Instructional Hours	**12**
Suggested Learning Methods : Group Discussion			
IV	Robots, Society – and you: Working Safely with Robots – The "Three laws of Robotics: Revisited – Will Robots Replace People in the Workplace" – Robotics and U.S. Industry – Living Robots? – Robots up Close – Building a Robot	2	7
		Instructional Hours	**12**
Suggested Learning Methods : Case Studies			
V	Biological Foundations of the Reactive Paradigm: Overview – why Explore the Biological Scientist Agency and Computational Theory – What are Animal Behaviors – Reflective Behaviors – Coordination and Control of Behaviors – Innate Releasing Mechanisms –Concurrent Behaviors Perception in Behaviors – Action – Perception Cycle – Two Functions of Perception – Gibson: Ecological Approach – Neisser: Two Perceptual Systems Schema Theory – Behaviors and Scheme Theory – Principles and Issues in Transferring insights to Robots	2	3
		Instructional Hours	**12**
Suggested Learning Methods : Lecture / Class Projects			
		Total Hours	**60 Hrs**

Text Books	1. Ellen Thro, "Robotics the Marriage of Computers and Machines", Universities Press, 2000. 2. Robin. R. Murphy, "Introduction to AI Robotics", PHI,2007
Reference Books	1. King-sun Fu, C.S George Lee, Ralph Gongzalez, "Robotics: Control, Sensing, Vision and Intelligence", Third Edition, 1987.
Web. URLs	www.builtin.com/robotics

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Class Participation	Assignment	Quiz	Total
5	5	6	3	3	3	25

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U4ITZ402	Skill Based Paper II: Practical in Multimedia		
Semester: IV	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	To enable the students to know the fundamental tool of image editing software and make them to apply in real world business.
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	This course examines the different tools and scripting techniques in GIMP

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of GIMP	Demonstration Method	Laboratory Experiments
CO 2	To transform a photograph to drawing		
CO 3	To work with tools		
CO 4	To work with scripting		
CO 5	To work with animations		

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 3

Programme	Description
1	Create Sun Flower
2	Animate Plane flying in the Clouds
3	Create Plastic Surgery for the Nose
4	Create See-through text.
5	Create a Web Page
6	Convert Black and White Photo to Color Photo
7	Design a visiting card containing at least one Graphic and text information.
8	Create an animation to represent the growing Moon.
9	Create an animation to indicate a ball Bouncing on steps
10	Simulate movement of a cloud
11	Display the background given (filename: Tulip.jpg) through your name
12	Create an animation with the following features. Welcome * letters should appear one by one * the fill color of the text should change to a different color after.
	Instructional Hours 45

Tools for Assessment (30 Marks)						
Application of Logic	**Program Creativity**	**Program Debugging**	**Test 1**	**Test 2**	**Observation Note Book**	**Total**
5	**5**	**5**	**6**	**6**	**3**	**30**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

(Common to all UG Programmes)

Course Objective	mw ,yf;fpaq;fis mwpKfggLjjy
Course Category	Skill Development (khztHfspd nkhopj;jpwid Cf;Ftpj;jy;)
Development Needs	Regional (jkpo nkhopapd mtrpaj;ij czHj;Jjy;)
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	mw ,yf;fpa mwpT ngWjy - rpW rpWfijfs to r%f mwT ngWjy;	tpupTiu / fhnzhs tFg;G	xg;gilT
CO 2	jko vOj;Jf;fs mwpKfk nrajy kw;Wk thrjjy Mfpatw;wpd gadghL	FO tpthjk/ tpupTiu	fUj;juq;F
CO 3	gpwnkho mwTj jpwd Nkkglr;nra;jy	tpupTiu/fhnzhsg;gL tpsf;fk	tpdhb tpdh
CO 4	gpwnkho mwTj jpwd Nkkglr;nra;jy	tpupTiu/ FO tpthjk	FOj;jLLk
CO 5	thHj;ij mikf;Fk jpwd ngwrnrajy	tpupTiu / FOj;jLLk	FOj;jLLk

Offered by: jkoj;Jiw

Course Content — Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	ePjE}y;fs	1. ghujahh Mjjr#b 2. nfhd;iwNtejd	1.1 1 Kjy 12 thpfs 2.1 1 Kjy 7 thpfs
			Instructional Hours 6
Suggested Learning Methods : ePjE}y;fspd; rpwg;gid mwpAk gad; ngw;wik			
II	gjndz fo;f;fzf;F E}y (jUf;Fws)	jUf;Fws	fLTs thoj;J – mfu Kjy vdj njhLq;Fk... Mj – 1 Fws – 1 thd rpwgG – ePhpd;wp mikahJ cyF. Mj – 2 Fws – 10 md;GiLik – mdgd topaJ cah;epiy. Mj – 8 Fws – 10 fyt – fzZiLahh; vdgh Mj – 40 Fws ,daitf$wy – ,da csthf ,d;dhj Mj – 10 Fws – 10
			Instructional Hours 6
Suggested Learning Methods : jUf;Fwspd; rpwg;gid mwpe;jik			
III	fpuhkaf fijfs	fpuhkaf fijfs	gukhhjjfFU fijfs ehLLg;Gwf fijfs mwpKfk
			Instructional Hours 6
Suggested Learning Methods : fpuhkaf;fijfspd fij mikg;gpid mwpAk tha;g;G ngw;wik			

IV	nkho[gga[w;rp;	nkho[gga[w;rp;	4.1. gpwnkho[r nrhw;fSf;F jk[o;r;nrhy vOJjy
			Instructional Hours **6**
Suggested Learning Methods : jk[o;r;nrhy vOJk jpwd ngw;wik			
V	vOj;Jg;gapw;rp	vOj;Jg;gapw;rp	5.1 jd;tptuk vOJjy ngaH> fy;Y}hp tptuk vOjr;nra;jy;
			Instructional Hours **6**
Suggested Learning Methods : gpwnkho[fyg;G ,d;w[jk[o;r;nrhy vOJk jpwd; ngw;wik			
			Total Hours **30**

Text Books	1. ,sq;fiy jk[o khztH fSf;Fhpa ghLE}y“mhprRtb” njhFg;G: jk[oj;Jiw> NeU fiy kwWk mwpt[ay fyY}hp> Nfhak;Gj;J}H.
Reference Books	1. Xsitahh Mjj[r#b kz[thrfh gj[ggfk> Nfhak;Gj;J}h ,uh[tj[01. 2. j[Uf;Fws - ghpNkyofh ciu›kz[thrfh gj[ggfk> nrd;id -600018.
Web. URLs	-

Course designed by	**Verified by**

Course Code	Title	
22U4NM4AT2	Part – IV : Advanced Tamil – II	
Semester : IV	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		

Course Objective	E}y;fspd top mwr;rpepjidfis cUthf;Fjy nrknkhopapidr nrk;ikggLj;Jjy;
Course Category	Skill Development (khztHfspd nkhopj;jpwid Cf;Ftpj;jy;)
Development Needs	Regional (jkpo nkhopapd mtrpaj;ij czHj;Jjy;)
Course Description	khzth;fspd nkhopj;jpwid Cf;Ftpj;jy

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	mwr;rpepjidfs ngWjy kwWk ,yf;fz tof;F Kiwfisg ngWjy.	tpupTiu/fhnzhspg;gL tpsf;fk;	fUj;juq;F
CO 2	fbjk vOJjy kw;Wk nkhopawpitg ngWjy	tpupTiu/ FO tpthjk;	xg;giLT
CO 3	giLgghffjjpwd mwpTngwr nra;jy	tpupTiu	fUj;juq;F
CO 4	jfty njhLHgpaYf;fhd fbjk>mikTjjpwd ngwrnra;jy;	tpupTiu/ FO tpthjk;	FOj;jpLLk;
CO 5	nkhopiag gpioapd;wpg Ngr> vOJk jpwd ngwr;nrajy	tpupTiu/fhnzhspg;gL tpsf;fk;	xg;giLT
Offered by	jkpoj;Jiw		

Course Content			Instructional Hours / Week : 2
Unit	Description	Text Book	Chapters
I	gjpndz fo;f;fzf;F E}y	1. jpUf;Fws; 2. ehybahH	$Lhel;G nra;ed;wpawpjy;-ehybahH1.3 fy;tp (131>132 nraAs;fs;)
		Instructional Hours	6
Suggested Learning Methods : ehybahH jpUfFwspd Rit mwpAk tha;g;G ngw;wik			
II	rpWfij	1. nt. ,iwad;G – Gdhjjp rpWfijfs	2.1 NrtpaH thj;jpahH 2.2. □□ு க □
		Instructional Hours	6
Suggested Learning Methods : rpWfijfspd Rit mwpAk tha;g;G ngw;wik			
III	,yf;fzk;	,yf;fzg; gapwrp VL	3.1. எ ழு □த் □து □□□ ச ஒரு வ □□□□□ 3.2. ச □ட □ச □ழு □த் □து □□□□□□ 3.3. nrhw;fisr rhpahfg gadgLj;Jk Kiw 3.4 tpidr nrhw;fs> ngaHrnrhw;fs; 3.5. வ ளை ர எ ழு □த் □து □□□□□□
		Instructional Hours	6
Suggested Learning Methods : ,yf;fzggpio ,d;wp vOJk; gapw;rp ngw;wik			

IV	tof;fwpjy;	,yf;fzk	kuG tof;F - ,ay;G tofF jFjp tof;F mwpjy;
			Instructional Hours 6
Suggested Learning Methods : tofFfs; gw;wp KOikahf mwpAk gapw;rp ngw;wik			
V	gilgghw;wy; gapw;rp	,yf;fpa tuyhW	ftpij – rpWfij – E}y kjpggPL vOJjy;
			Instructional Hours 6
Suggested Learning Methods : kjpggPL nra;Ak; gapw;rp ngw;wik			
			Total Hours 30

Text Books	1. ,sq;fiyjkpo khztHfSf;Fhpa ghlE}y“jpuLL” njhFg;G: jkpoj;Jiw> NeU fiy kwWk mwptpay fyY}hp>Nfhak;Gj;J}H.
Reference Books	1. jpUf;Fws – ghpNkyofH ciu>kzpthrfH gjpggfk> nrd;id 018 2. nt.,iwad;G – G+dhjjprWfijfs> tplahgjpggfk> Nfhak;Gj;J}H.
Web. URLs	-

Course designed by	Verified by

Course Code	Title		
23U3CKC509	Core Paper XIII: PHP Programming		
Semester: V	Credits: 3	CIA: 20 Marks	ESE:55 Marks
(Common to B. Sc. CS / IT / BCA)			
Course Objective	To acquire fundamental knowledge for web development using PHP.		
Course Category	Employability/Skill Development		
Development Needs	Global/National /Local/Regional		
Course Description	To understand the conceptsof PHP Programming and develop webpage.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognize the basic development concepts of PHP	Lecture	Group Discussion
CO 2	Write a simple program using conditional statements	Demonstration	Quiz
CO 3	Understand the concepts of functions and arrays	Flipped Classroom	Seminar
CO 4	Use of Functions, Classes and files	Demonstration	Seminar
CO 5	Construct a simple database program for adding and modifying records	Lecture	Assignment

Offered by	Computer Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	Introducing PHP – Basic development Concepts-Creating first PHP Scripts. Using Variable and Operators - Storing Data in variable – Understanding Data types –Setting and checking variables Data types.	1	1,2
		Instructional Hours	15 Hrs
Suggested Learning Methods: Code Review			
II	Using Constants-Manipulating variables with operators. **Controlling Program Flow:** Writing Simple Programs. Conditional Statements-Writing more complex Conditional Statements – Repeating Action with Loops	1	2,3
		Instructional Hours	15 Hrs
Suggested Learning Methods: Write Simple Programs with conditional Statements			
III	Working with String and Numeric Functions - **Working with Arrays:** Storing Data in Arrays - Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions-Working with Dates and Times.	1	4
		Instructional Hours	15 Hrs
Suggested Learning Methods :Write Simple Programs using Arrays			
IV	**Using Functions and Classes:** Creating User-Defined Functions-Creating Classes. **Working with Files and Directories:** Reading Files –Writing Files.	1	5, 6
		Instructional Hours	15 Hrs

Suggested Learning Methods : Write Simple Programs using Functions			
V	**Working with Database and SQL:** Introducing Database and SQL - Using MySQL - Adding and modifying Data - Handling Errors. cookies – working with sessions. Working with XML	1	7,28
		Instructional Hours	**15 Hrs**
Suggested Learning Methods : Write Applications using Database and XML			
		Total Hours	**75 Hrs**

Text Books	1. VikramVaswani,**PHP A Beginner's Guide**, Tata McGraw-Hill Publishing Company Limited, 1st Edition, New Delhi, 2010. 2. Julie C.Meloni, **PHP, MYSQL and Apache**, Pearson Education,2009
Reference Books	1. Steven Holzner, **The PHP Complete Reference**, Tata McGraw-Hill Publishing Company Limited, 1st edition New Delhi, 2010. 2. Steven Holzer, **Spring in to PHP5**, Tata McGraw-Hill Publishing Company Limited,1st edition New Delhi, 2010.
Web. URLs	**1. https://www.w3schools.com/php/php_intro.asp** **2. https://www.tutorialspoint.com/php/index.htm**

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC510	Core Paper XIV: Artificial Intelligence		
Semester: V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Common to B. Sc., CS / IT			
Course Objective	To understand how Artificial Intelligence used as a Problem Solving technique in real world.		
Course Category	Employability, Entrepreneurship		
Development Needs	Global		
Course Description	The Artificial Intelligence course syllabus is aimed to impart knowledge about networks, algorithms, and programming skills to create algorithms capable of human-like solutions.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Knowledge about overview of Artificial Intelligence	Flipped Classroom	Class Participation
CO 2	Gain Knowledge about Problem Solving methods	Tutorial	Assignment
CO 3	Apply Knowledge and reasoning to the problem	Video Lectures	Seminar
CO 4	Analyze how to use reasoning methods by constructing plans	Tutorial	Assignment
CO 5	Evaluate methods of Knowledge Generation using Learning	Group Discussion	Seminar

Offered by	Information Technology

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction:** What is AI? - The foundation of AI – AI Problems. Intelligent Agent: Introduction-How Agent should act-Structure of Intelligent Agent	1,2	1,2
		Instructional Hours	**15**
Suggested Learning Methods : Flipped Classroom			
II	**Problem Solving by searching:** Problem Solving Agents-Formulating Problems-Examples: 8 queens problem. Search Strategies- Game Playing: Minim ax-Alpha-Beta Pruning.	1	3,5

		Instructional Hours	**15**
Suggested Learning Methods : Tutorial			
III	**Knowledge and Reasoning:** A Knowledge based agent- Representation, Reasoning and Logic. Propositional Logic- Very simple Logic- Introduction to First Order Logic.	1	6,7
		Instructional Hours	**15**
Suggested Learning Methods : Video Lectures			
IV	**Planning:** A simple planning agent – From Problem solving to Planning – Basic Representation of Planning– A partial Order Planning Algorithm- Example**.**	1	11
		Instructional Hours	**15**
Suggested Learning Methods : Tutorial			
V	**Learning:** A General model of Learning Agent – Inductive Learning – Learning from Decision Trees.	1	18
		Instructional Hours	**15**
Suggested Learning Methods : Group Discussion			
		Total Hours	**75 Hrs**

Text Books	1. Stuart J.Russell, Peter Norvig, Artificial Intelligence – A Modern Approach, Prentice Hall Incorporation. 2.Elaine Rich, Kevin Knight, Shivasankar B. Nair, Artificial Intelligence, 3rd Edition, Tata-McGraw, 2009.
Reference Books	1. Deepak Khemani, A First course in Artificial Intelligence, McGraw Hill Education Pvt Ltd,2013.
Web. URLs	https://www.javatpoint.com/artificial-intelligence-ai

Tools for Assessment (20 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITP505	Core Paper XV: PHP Programming Lab		
Semester: V	Credits: 4	CIA: 40 Marks	ESE: 60 Marks
Course Objective	To acquire fundamental knowledge web development using PHP.		
Course Category	Skill Development /Employability		
Development Needs	Global/Local		
Course Description	To development skill set in Machine Learningand apply the concepts to develop applications in order to meet the Local and Global needs		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop the program for control structure and functions	Program Demonstration	Program Creativity
CO 2	Implement the concepts of string and Arrays	Program Demonstration	Debugging
CO 3	Create a simple database program for student information	Program Demonstration	Application of Logic
CO 4	Develop simple program to import Gen bank and finding of mutations	Program Demonstration	Program Development
CO 5	Create a program for Concatenating DNA Fragments Transcription	Program Demonstration	Program Development

Offered by	Computer Science(Data Science)

Course Content	Instructional Hours / Week : 6

Program List

1. Write a PHP program to illustrate Conditional and Looping Statements.
2. Write a PHP program to demonstrate Array Functions, string, numeric and date functions.
3. Write a PHP program to create user defined functions.
4. Write a PHP program for file creation and file manipulation.
5. Write a PHP program for creating sessions.
6. Write a PHP program for creating cookies
7. Create a Simple application using forms in PHP
8. Write a PHP program for creating tables with constraints and demonstrate table join.
9. Write a PHP program for Database connectivity, Create, Insertion, Updating and Deleting rows in MySQL tables
10. Write a PHP program for sorting and searching a data.
11. Write a PHP Program to illustrate the usage of subqueries, aggregate functions, set operators.
12. Write a PHP program to create a simple web page. Validate the Input and apply appropriates to format the output.

Solving Case studies and Program development

						Total Hours	**90** Hrs
Tools for Assessment (40 Marks)							
Laboratory Performance- Application of Logic	**Laboratory Performance- Program Creativity**	**Laboratory Performance- Program Debugging**	**Test 1**	**Test 2**	**Observation Note Book**	**Total**	
5	**5**	**3**	**10**	**10**	**7**	**40**	

Mapping

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

H-High; M-Medium; L-Low

Course designed by	**Verified by**

Course Code	Title		
23U3ITP506	Core Paper XVI: Practical in Web Technology		
Semester: V	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	Students will acquire the skill to choose the technology to use based on the requirements and functionality of the web site.
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	This course supports exploration in careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To develop an ability to design and implement static and dynamic	Demonstration Method	Laboratory Experiments
CO 2	To develop HTML pages with the help of frames, scripting languages, and evolving technology like DHTML,XML.		
CO 3	Able to work with CSS		
CO 4	Analyze different types of features in XML		
CO 5	Able to design web site		

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 4

Programme	Description
1	Create Web Page and apply background color, text color, horizontal rules andspecial characters.
2	Create Web Page and include images with different alignment and wrapped text
3	Create tables and format tables using basic table tags and different attributes.
4	Create a frameset that divides browser window into horizontal and verticalframesets.
5	Create Web Page and apply style rules using CSS.
6	Create Web Page including control structures using JavaScript.
7	Develop and demonstrate the usage of inline and external style sheet using CSS.
8	Write an HTML page including any required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in a another text field in words. If the number is out of range, it should show “out of range” and if it is not a number, it should show “not a number” message in the result box.
9	Write an HTML page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text entered using an alert message. Words are

	separated with a white space and lines are separated with new line character.
10	Write an HTML page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (colour, bold and font size).
11	Write a java script to validate the following fields in a registration page 1. Name (should contains alphabets and the length should not be less than 6 characters) 2. Password (should not be less than 6 characters) 3. E-mail(should not contain invalid addresses)
12	Design a web page using CSS which includes the following: 1) Use different font styles 2) Set background image for both the page and single elements on page. 3) Control the repetition of image with background-repeat property 4) Define style for links as a: link, a:active, a:hover, a:visited 5) Add customized cursors for links. 6)Work with layers.
Instructional Hours	**60**

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	6	6	3	30

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3 CKE501	**Discipline Specific** **Elective Paper I : Blockchain Technology**		
Semester: V	**Credits: 4**	**CIA: 25 Marks**	**ESE:75 Marks**

(Common to B. Sc. CS / IT / BCA)

Course Objective	To understand the Block chain technology and explain about the Block chain technology Techniques.
Course Category	Employability/Skill Development
Development Needs	Global/National /Local/Regional
Course Description	To understand the concepts of Block chain technology and its Techniques.

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Understand emerging abstract models for Block chain Technology.	Lecture	Group Discussion
CO 2	Identify major research challenges and technical gaps existing between theory and practice in crypto currency domain.	Lecture/ Tutorial	Group Discussion
CO 3	It provides conceptual understanding of the function of Block chain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.	Lecture/ Flipped Classroom	Assignment
CO 4	Apply hyper ledger Fabric and Etheric platform to implement the Block chain Application.	Lecture/ Tutorial	Seminar
CO 5	Understand the role of Block chain technology	Lecture/ Tutorial	Seminar

Offered by	**Computer Science**

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

Unit	Description	Text Book	Chapters
I	**INTRODUCTION TO BLOCKCHAIN** Blockchain- Public Ledgers, Blockchain as Public Ledgers -Bitcoin, Blockchain 2.0, Smart Contracts, Block in a Blockchain, Transactions-Distributed Consensus, The Chain and the Longest Chain -Cryptocurrency to Blockchain 2.0 - Permissioned Model of Block chain, Cryptographic -Hash Function, Properties of a hash function-Hash pointer and Merkle tree	1	1
	Instructional Hours		**18 Hrs**
Suggested Learning Methods: Video Lectures on Introduction to blockchain			
II	**BITCOIN AND CRYPTO CURRENCY** A basic crypto currency, Creation of coins, Payments and double spending, FORTH - the precursor for Bitcoin scripting, Bitcoin Scripts , Bitcoin P2P Network, Transaction in Bitcoin Network, Block Mining, Block propagation and block relay, Consensus introduction, Distributed consensus in open environments-Consensus in a Bitcoin network	1	2
	Instructional Hours		18 Hrs
Suggested Learning Methods: Video Lectures on Introduction to bitcoin scripting			

III	**BITCOIN CONSENSUS** Bitcoin Consensus, Proof of Work (PoW)- Hashcash PoW , Bitcoin PoW, Attacks on PoW ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Mining Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, Execute contracts- Consensus models for permissioned block chain- Distributed consensus in closed environment Paxos	1	3
		Instructional Hours	18 Hrs
Suggested Learning Methods: Group Discussion			
IV	**DISTRIBUTED CONSENSUS** RAFT Consensus-Byzantine general problem, Byzantine fault tolerant system-Agreement Protocol, Lamport- Shostak-Pease BFT Algorithm-BFT over Asynchronous systems, Practical Byzantine Fault Tolerance	1	5
		Instructional Hours	18 Hrs
Suggested Learning Methods: Group Discussion			
V	**BLOCK CHAIN APPLICATIONS** Internet of Things-Medical Record Management System-Blockchain in Government and Blockchain Security-Blockchain Use Cases – Finance	1	7
		Instructional Hours	18 Hrs
Suggested Learning Methods : Apply the techniques with real time data			
		Total Hours	**90 Hrs**

Text Books	**1.** Bashir, Imran **, Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks**,2017.
Reference Books	1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. **Bitcoin and cryptocurrency technologies: A comprehensive introduction**. Princeton University Press, 2016. **2.** Joseph Bonneau et al, **SoK: Research perspectives and challenges for Bitcoin and cryptocurrency**, IEEE Symposium on security and Privacy, 2015.
Web. URLs	**https://www.coursera.org/learn/introduction-blockchain-technologies**

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Class Participation	Assignment	Seminar	Total
5	5	6	3	3	3	**25**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE502	Discipline Specific Elective Paper I: Next Generation Networks		
Semester: V	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / IT / BCA)			
Course Objective	To learn the technical, economic and service advantages of next generation networks. Analyse the evolution of technologies of 4G and beyond, to explore the NGN framework catering services of end user with QoS provisioning.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	Description about Course category and Development Needs		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Describe the issues and challenges of wireless domain in future generation network design	Lecture	Assignment
CO 2	Explain the evolution of technologies of 4G and beyond	Lecture/ Tutorial	Seminar
CO 3	Explore the LTE concepts and technologies	Lecture/ Tutorial	Seminar
CO 4	Outline the process of integrating SDN with LTE	Tutorial	Quiz
CO 5	Explain the NGN architectures, management and standardizations	Lecture / Flipped Classroom	Assignment

Offered by | **Computer Applications**

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

Unit	Description	Text Book	Chapters
I	**INTRODUCTION:** Evolution of public mobile services -motivations for IP based services, Wireless IP network architecture –3GPP packet data network architecture. Introduction to next generation networks - Changes, Opportunities and Challenges, Technologies, Next Generation Society, future Trends.	3 2	1, 2 1
		Instructional Hours	**18 Hrs**
Suggested Learning Methods:Report Presentation			
II	**LTE - Introduction:** Architectural Review of UMTS and GSM, History of Mobile Telecommunication Systems, Need for LTE. **Architecture of LTE Air Interface:** Air Interface Protocol Stack, Logical, Transport and Physical Channels, The Resource Grid, Multiple Antenna Transmission, Resource Element Mapping.	5	1, 6
		Instructional Hours	**18 Hrs**
Suggested Learning Methods:Video Lectures			
III	**SDMN-LTE INTEGRATION:** SDN paradigm and applications, SDN for wireless-challenges, Leveraging SDN for 5G network Ubiquitous connectivity-mobile cloud-cooperative cellular network-restructuring mobile networks to SDN-SDN/LTE integration benefits.	4	3, 4, 5, 6
		Instructional Hours	**18 Hrs**
Suggested Learning Methods:Video Lectures and Report Presentation			

IV	**NGN ARCHITECTURE**:Evolution towards NGN-Technology requirements, NGN functional architecture- Transport stratum, service stratum, service/ content layer and customer terminal equipment function. NGN entities, Network and Service evolution -fixed, mobile, cable and internet evolution towards NGN.	1	1, 3, 4, 6
	Instructional Hours		**18 Hrs**
Suggested Learning Methods:Video Lecture			
V	**NGN MANAGEMENT AND STANDARDIZATION**: NGN requirements on Management-Customer, third party, Configuration, Accounting, performance, device and information management. Service and control management- End-toEndQoS and security. ITU and GSI-NGN releases, ETSI-NGN concept and releases, NGMN alliance and NGMN.	1 2	3,7,8 4
	Instructional Hours		**18 Hrs**
Suggested Learning Methods: Report & Video Presentation			
	Total Hours		**90 Hrs**

Text Books	**1.**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 Books	**1. "Next-Generation Wireless Technologies",** Naveen ChilamkurtiSheraliZeadallyHakimaChaouchi.
Web. URLs	https://www.academia.edu/38394302/_ebook_4G_LTE_LTE_Advanced_for_Mobile_Broadband_pdf

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE503	Discipline Specific Elective Paper - I : Internet of Things		
Semester: V	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / IT / BCA)			

Course Objective	To understand the Data and Knowledge Management and use of Devices in IoT Technology, Understand State of the Art – IoT Architecture and Real World IoT Design.
Course Category	Employability/Skill Development
Development Needs	Global/National /Local/Regional
Course Description	This Course focuses on hands-on IoT concepts such as sensing, actuation and communication. It covers the development of Internet of Things (IoT) prototypes—including devices for sensing, actuation, processing, and communication—to help you develop skills and experiences.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the vision of IoT from a global context.	Social Media	Class Participation
CO 2	Understand the Market perspective of IoT.	Brainstorming	Quiz
CO 3	Understand Use of Devices, Gateways and Data Management in IoT.	Video Lectures	Assignment
CO 4	Build state of the art architecture in IoT.	Demonstration	Assignment
CO 5	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.	Discussion	Seminar

Offered by | **Information Technology**

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

Unit	Description	Text Book	Chapters
I	**M2M to IoT**-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.	1	2
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Group Discussion			
II	**M2M to IoT – A Market Perspective**– Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. **M2M to IoT-An Architectural Overview**– Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.	1	3-4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Quiz			
III	**M2M and IoT Technology Fundamentals-** Devices and gateways, Local and wide area networking, Data management.	1	5
		Instructional Hours	**18 Hrs**

Suggested Learning Methods : Assignment			
IV	Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management.	1	5
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Assignment			
V	**IoT Architecture-State of the Art –** Introduction, State of the art. **Architecture Reference Model-** Introduction, Reference Model and architecture, IoT reference Model.	1	6-7
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Seminar			
		Total Hours	**90 Hrs**

Text Books	1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, **"From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence",** Academic Press, 2014.
Reference Books	1. Vijay Madisetti and ArshdeepBahga, **"Internet of Things (A Hands-on-Approach)",** VPT, 2014. 2. Francis daCosta, **"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything",** Apress Publications, 2013
Web. URLs	**1.** https://www.tutorialspoint.com/internet_of_things/index.html

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Class Participation	Assignment	Seminar	Total
5	5	6	3	3	3	**25**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

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

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Know about the big data analytics	Jigsaw	Group Discussion
CO 2	Tools in big data analytics using Hadoop	Inquiry Based	Quiz
CO 3	Data model in big data analytics using NoSql	Demonstration	Assignment
CO 4	Understanding and Know about Map Reduce Programming	Video Lectures	Assignment
CO 5	Gain more knowledge about Hadoop streaming with R	Flipped Classrooms	Seminar

Offered by	**Information Technology**

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

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

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

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

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Class Participation	Assignment	Seminar	Total
5	5	6	3	3	3	**25**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
23U3ITV509	In-plant Training	
Semester: V	Credits: 2	ESE:50 Marks

Objective:

To give optimum exposure on the practical side of industrial society

Guidelines:

1. Duration of the internship training is 2**0 days** during the summer vacation which falls at the **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 5th semester at end of the September

Course designed by	Verified by

Course Code	Title		
23U4ITS503	Skill Based Paper III: Cyber Law		
Semester: V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	To know about the various types of Cyber Crimes, Cyber Laws and its applicability.
Course Category	Employability, Entrepreneurship
Development Needs	Global
Course Description	Cyber Law is a specialisation in the field of law which looks into and rectifies legal issues related to the World Wide Web. The field of Cyber Law deal with criminal activities such as fraud, theft, forgery, and defamation conducted on the internet.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn the various types of cybercrimes	Lecture / Flipped Classroom	Assignment
CO 2	Demonstrate the various types of cyber laws and their applicability	Construct visit Approach/ Tutorial	Seminar
CO 3	Classification of civil, criminal cases and Essential elements of criminal law	Lectures / Video Lessons	Quiz
CO 4	Determine the sections of Indian Evidence act	Tutorial / Case Studies	Assignment
CO 5	Know about the Indian Evidence Act	Flipped Classroom	Seminar

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Introduction to Cyberspace, Cybercrime and Cyber Law: The World Wide Web, Web Centric Business, e-Business Architecture, Models of e-Business, e-Commerce, Threats to virtual world. IT Act 2000 - Objectives, Applicability, Non-applicability, Definitions, Amendments and Limitations. Cyber Crimes- Cyber Squatting, Cyber Espionage, Cyber Warfare, Cyber Terrorism, Cyber Defamation. Social Media-Online Safety for women and children, Misuse of Private information.	1	1,2
		Instructional Hours	**12**

Suggested Learning Methods : Assignment

II	Regulatory Framework of Information and Technology Act 2000 - Information Technology Act 2000, Digital Signature, E-Signature, Electronic Records, Electronic Evidence and Electronic Governance. Controller, Certifying Authority and Cyber Appellate Tribunal. (Rules announced under the Act), Network and Network Security, Access and Unauthorized Access, Data Security, E Contracts and E Forms.	1	3,4, 5, 9
		Instructional Hours	**12**
Suggested Learning Methods : Seminar			
III	Offences and Penalties Information Technology (Amendment) Act 2008 – Objective, Applicability and Jurisdiction; Various cyber- crimes under Sections 43 (a) to (j), 43A, 65, 66, 66A to 66F, 67, 67A, 67B, 70, 70A, 70B, 80 etc. along with respective penalties, punishment and fines, Penal Provisions for Phishing, Spam, Virus, Worms, Malware, Hacking, Trespass and Stalking; Human rights in cyberspace, International Co-operation in investigating cybercrimes.	1	6,7,8
		Instructional Hours	**12**
Suggested Learning Methods : Quiz			
IV	Classification – civil, criminal cases-Essential elements of criminal law- Constitution and hierarchy of criminal courts. Criminal Procedure Code. Cognizable and non-cognizable offences. Bailable and non-bailable offences. Sentences which the court of Chief Judicial Magistrate may pass.	1	8, 14, 15
		Instructional Hours	**12**
Suggested Learning Methods : Assignment			
V	Indian Evidence Act – Evidence and rules of relevancy in brief. Expert witness. Cross examination and re-examination of witnesses. Sections 32, 45, 46, 47, 57, 58, 60, 73, 135, 136,137, 138, 141. Section 293 in the code of criminal procedure. Secondary Evidence Section 65-B.	1	13, 17
		Instructional Hours	**12**
Suggested Learning Methods : Seminar			
		Total Hours	**60 Hrs**

Text Books	1. Karnika Seth; "Computers, Internet and New Technology Laws", Lexis Nexis Butters worth Wadhwa, 2012. 2. VikasVashishth.; "Law and practice of intellectual property in India"3. Jonathan Rosenoer; "Cyber Law: The Law of Internet", Springer- Verlag, New York, 1997. 3. Sreenivasulu N.S; "Law Relating to Intellectual Property", Patridge Publishing, 2013 4. Pavan Duggal; "Cyber Law – The Indian Perspective", Saakshar Law Publications.

Reference Books	1. Harish Chander; "Cyber Laws and IT Protection", PHI Learning Pvt. Ltd, 2012. 2. Nina Godbole and SunitBelapore; "Cyber Security: Understanding CyberCrimes, Computer Forensics and Legal Perspectives", Wiley Publications,2011. 3. Vakul Sharma; "Information Technology: Law and Practice", Universal Law Publishing Co., India, 2011. 4. The Patent Act, 1970 5. The Indian Evidence Act, 1872.
Web. URLs	https://www.javatpoint.com/what-is-cyber-law

Tools for Assessment (20 Marks)

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

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO 3	PSO 4	PSO 5
CO1	H	M	H	M	H	M	L	L	H	H	H	M	
CO2	H	M	H	M	H	M	M	M	H	M	H	H	
CO3	H	M	M	H	M	M	H	H	H	H	M	H	
CO4	H	M	H	M	H	M	L	L	H	H	M	H	
CO5	H	M	H	M	H	M	H	M	H	H	H	M	

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKC611	Core Paper XVII: Data Mining		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to IT / BCA)			
Course Objective	To enable the students to explore data using data mining techniques to solve the business problems.		
Course Category	Skill Development		
Development Needs	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	Assessment Methods
CO 1	Know the basic concept of Data Mining and Association Rules	Lecture / Demonstration / Video Lecture/	Open book Test
CO 2	Understand the concepts of Classification and decision tree	Demonstration / Video Lecture/ Online Tutorial	Assignment
CO 3	Apply the concept of splitting the data into various clusters	Lectures /Video Lessons / Case Studies	Group Discussion
CO 4	Analyse various type of Mining like Web Mining and Text Mining	Tutorial / Demonstration / Video Lessons	Quiz
CO 5	Assess Information Privacy and Data Mining	Tutorial / Demonstration / Case Studies	Seminar

Offered by	Computer Applications

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Data Mining:** Introduction – What is Data Mining?- Why Data Mining – The Data Mining Process – Data Mining Applications – Data Mining Techniques – Some Data Mining Case Studies. Association Rules Mining: Introduction – Basics – Apriori Algorithm	1	1,2
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Video lectures			
II	Classification – Introduction – Decision Tree – Building a decision tree – The tree induction Algorithm – Split Algorithm based on Information Theory – Split Algorithm based on the Gini Index – Overfitting and Pruning –Decision Tree Rules.	1	3
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Online Tutorial			
III	Cluster Analysis: What is Cluster Analysis? – Desired Features of Cluster Analysis – Types of Data – Computing Distance – Types of Cluster Analysis Methods – Partitional Method – The k-Means Method – Hierarchical Methods – Density-Based Methods.	1	4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Case studies			

IV	Web Data Mining – Introduction – Web Terminology and Characteristics –Locality and Hierarchy in the Web – Web Content Mining – Web Usage Mining – Web Structure Mining – Web Mining Software.	1	5
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Video Lectures			
V	Information Privacy and Data Mining: Introduction – What is information Privacy? – Basic Principles to product Information Privacy – Uses and Misuses of Data Mining – Primary aims of data mining - Pitfalls of Data Mining –Technological solutions.	1	9
		Instructional Hours	**18 Hrs**
Suggested Learning Methods: Case Studies			
		Total Hours	**90 Hrs**

Text Books	1. Introduction to Data Mining and Case Studies by G. K. Gupta, Published by Prentice Hall of India Private Limited, New Delhi.
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.
Web. URLs	https://www.tutorialspoint.com/data_mining/index.htm

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Class Participation	Total
5	5	6	3	3	3	**25**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITV610	Project & Viva-Voce		
Semester: VI	Credits: 4	CIA : 40 Marks	ESE: 60 Marks

Course Objective	To give project based learning which makes the students to apply practically what they learned.
Course Category	Employability / Skill Development
Development Needs	Global
Course Description	Develop Problem Solving Skills to solve the computer based problems at Global needs.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamental concepts of algorithm and designs	Lecture / Flipped Classroom	Review
CO 2	Understand the optimal methods and Software Engineering concepts to be applied	Constructivist Approach/ Tutorial	Review
CO 3	Apply the knowledge and what they learned	Lectures / Video Lessons	Review
CO 4	Analyze the Economical and Technical feasibility	Tutorial / Case Studies	Program Execution
CO 5	Develop software based applications and Deployment of software	Lecture / Class Projects	Program Execution

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**PROJECT WORK** 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 INFORMATION TECHNOLOGY Submitted by Name of the Student (Reg.No) Under the Guidance of Guide Name (Designation) <College emblem> 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

	A. Sample Screens B. Reports **EVALUATION PROCESS** Review – I has to be conducted during the Last week of December Review – II has to be conducted during the Last week of January Review – III has to be conducted during the Last week of February Document, Preparation and Implementation has to be done during the First week of March Viva-Voce examination will be conducted at the end of the semester by both Internal (Respective Guides) and External Examiners, after duly verifying the Project Report available in the College.		
		Instructional Hours	**90**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE605	Discipline Specific Elective Paper II - Software Quality Assurance		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / IT / BCA)			

Course Objective	To describe Quality Assurance, understand quality components and apply the quality models.
Course Category	Employability / Skill Development
Development Needs	Global
Course Description	Develop Problem Solving Skills to solve the computer based problems at Global needs.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Knowledge about the concept, factors, of Quality Assurance	Video Lecture	Assignment
CO 2	Understand various components of Quality Assurance	Case Based	Group Discussion
CO 3	Analyze Testing process in Quality Assurance	Lectures / Video Lessons	Seminar
CO 4	Analyze various Software Quality metrics	Tutorial / Case Studies	Quiz
CO 5	Interpret the various on Standards for Software Quality.	Lecture / Class Projects	Quiz

Offered by	**Computer Science**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**What is Software Quality?:** What is software?-Software error, faults and failures-Classification of the causes of software errors-Software Quality Definition and objectives – software quality assurance and software engineering. **Software Quality factors:** Need for comprehensive software quality requirements – classification of software requirements into software quality factors – product operation software quality factors- product revision software quality factors – product transition software quality factors.	1	2,3
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Assignment			
II	**Components of SQA system :** SQA system and architecture – Pre-project components – software project life cycle components – Infrastructure components for error prevention and improvement – Management SQA components – SQA standards, system certification and assessment components – Organizing for SQA – the human components.	1	4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Group Discussion			
III	**Software testing – strategies:** Definition and objectives-	1	9,10

	software testing strategies – software test classifications – White box testing – Black box testing. **Software testing – implementation:** Testing process – Test-case Design – Automated testing – Alpha – beta site testing programs.		
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Seminar			
IV	**Software Quality metrics:** Objectives of quality measurement – Classification of software quality metrics – Process metrics-Product metrics- Implementation of Software Quality metrics – Cost of Software Quality metrics-Classical model of Software Quality.	1	21,22
		Instructional Hours	**18 Hrs**
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 – Bootsrap methodology.	1 2	23 4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Quiz			
		Total Hours	**90 Hrs**

Text Books	**1.** Daniel Galin, **"Software Quality Assurance From Theory to Implementation"**, Pearson education Ltd.,2004. 2. Claude Y. Laporte and Alain April, **"Software Quality Assurance"**, IEEE Press wiley, 2018.
Reference Books	**1.** Stephen H. Kan, **"Metrics and Models in Software Quality Engineering"**, 2nd Edition, Pearson, 2003. 2. Kshirasagar Naik and Priyadarshi Tripathy (Eds), **"Software Testing and Quality Assurance: Theory and Practice"**, John Wiley, 2008
Web. URLs	Software Quality Assurance (SQA) - TAE (tutorial and example.com)

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE606	**Discipline Specific Elective Paper II: Information Security**		
Semester: VI	**Credits: 4**	**CIA : 25 Marks**	**ESE:75 Marks**
(Common to B. Sc. IT / CS / AIML / BCA)			
Course Objective	To enable the students to understand the various aspects of Information Security in the local and global scenario.		
Course Category	Skill Development /Employability/Entrepreneurship		
Development Needs	Global		
Course Description	Develop knowledge of the fundamental theories, models practices of information security management and understanding of ethical and legal aspect information security management and privacy management.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Information Security	Video Lecture	Assignment
CO 2	Identify the legal, ethical and professional issues in Information Security	Peer Teaching	Seminar
CO 3	Discuss the Risk Management Strategy	Case study	Quiz
CO 4	Assess the technologies essential to provide Information Security	Assignments	Assignment
CO 5	Analyse the Information Security Maintenance model.	Flipped Classroom	Seminar

Offered by	**Artificial Intelligence and Machine Learning**

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

Unit	Description	Text Book	Chapters
I	**Introduction to Information security:** History-What is Information Security?-Critical Characteristics of Information, NSTISSC Security Model-Components of an Information System, Securing the Components-Balancing Security and Access-The SDLC-The Security SDLC.	1	1
	Instructional Hours		**18 Hrs**
	Report Presentation		
II	**Need for Security:** Introduction- Business Needs-Threats-Attacks. **Legal, Ethical and Professional Issues:** Introduction-Laws and ethics-types of law-international laws and legal bodies-Ethics and information security.	1	2, 3
	Instructional Hours		**18 Hrs**
	Case Study Preparation		
III	**Risk Management:** Introduction-overview-Identifying and Assessing Risk- Assessing- Control strategies- selecting strategy.	1	4
	Instructional Hours		**18 Hrs**
	Video Lectures		
IV	**Planning for Security:** Introduction-Information Security Policy-Blueprint for Security-Security education-training and awareness-Continuity strategies, Risk appetite, Management discussion points, documenting results.	1	5
	Instructional Hours		**18 Hrs**
	Group Discussion		

V	**Implementing Information security:** Introduction- Project management for information security-Technical and non-technical aspects of implementation. **Information security maintenance:** Introduction- Security management models-Maintenance model.	1	10, 12
		Instructional Hours	**18 Hrs**
		Video Presentation	
		Total Hours	**90 Hrs**

Text Books	1. Michael E. Whitman and Herbert J. Mattord, "**Principles of Information Security**" Second Edition, Thomson Publishers. **Unit I:** Chapter 1; **Unit II:** Chapter 2, 3; **Unit III:** Chapter 4; **Unit IV:** Chapter 5;**Unit V:** Chapter 10,12.
Reference Books	1. Surya Prakash Tripathi and RitendraGoel "Introduction to Information Security and Cyber Laws",2014, Dreamtech Press 2. V.K. Pachghare, "Cryptography and Information Security", 2nd Revised edition, Prentice-Hall of India Pvt.Ltd 3. Mark S. Merkow, "Information Security: Principles and. Practices", Second Edition, Pearson Education
Web. URLs	http://almuhammadi.com/sultan/sec_books/Whitman.pdf

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE607	Discipline Specific Elective Paper - II : Cloud Computing		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / IT / BCA)			
Course Objective	To develop algorithmic solutions to simple computational problems using Python		
Course Category	Employability / Skill Development		
Development Needs	Global		
Course Description	This course gives students an insight into the basics of cloud computing along with virtualization, cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization along with it how one can migrate over it.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To make the students to understand the Cloud Computing and types,	Interactive Lecture	Poster Presentation
CO 2	To understand the cloud architecture	Constructivist Approach/ Tutorial	Assignment
CO 3	To identify the applications of abstraction & virtualization	Lectures / Video Lessons	Seminar
CO 4	To apply cloud computing in real-time.	Tutorial / Case Studies	Case Study
CO 5	To make the students to understand the Cloud Computing and types,	Lecture / Class Projects	Case Study

Offered by	Computer Science

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Defining Cloud Computing:** Defining Cloud Computing - Cloud Types - Examining the Characteristics of Cloud Computing - Disadvantages of cloud computing - Assessing the Role of Open Standards. **Assessing the Value Proposition:** Measuring the Cloud's Value: The laws of cloudonomics - Cloud computing obstacles - Behavioral factors relating to cloud adoption.	1	1,2
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Video lectures about the basics of Cloud Computing			
II	**Understanding Cloud Architecture:** Exploring the Cloud Computing Stack - Connecting to the Cloud. **Understanding 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).	1	3,4
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Practice using Models			
III	**Understanding Abstraction and Virtualization :** Using	1	5,7

	Virtualization Technologies - Load Balancing and Virtualization - Understanding Hypervisors - Understanding Machine Imaging - Porting Applications. **Exploring Platform as a Service:** Defining Services - Using PaaS Application Frameworks.		
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Develop small programmes using visualization tools			
IV	**Using Google Web Services:** Exploring Google Applications - Surveying the Google Application Portfolio - Exploring the Google Toolkit - 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.	1	8,9
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Apply the concept of web services			
V	**Using Microsoft:** Cloud Services - Exploring Microsoft Cloud Services - Defining the Windows Azure Platform - Using Windows Live. **Understanding Cloud:** Security - Securing the Cloud - Securing Data - Establishing Identity and Presence**.**	1	10,12
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Case study			
		Total Hours	**90 Hrs**

Text Books	1. Barrie Sosinsky, **"Cloud Computing Bible"**, Wiley Publishing, Inc.,2011.
Reference Books	1. Ray J Rafaels, **"Cloud Computing: From Beginning to End"**,2015. 2. Arshdeep, Bahga and Vijai Madisetti, **"Cloud Computing: A Hands- on Approach"**, 2014.
Web URLs	https://www.coursera.org/learn/introduction-to-cloud

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE608	Discipline Specific Elective Paper II – Cyber Security		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / IT / AIML / BCA)			
Course Objective	To make the students to understand Cryptography, Cyber crime and its significance in current scenario of IT and information security.		
Course Category	Employability / Skill Development		
Development Needs	Global		
Course Description	Develop Problem Solving Skills to solve the computer based problems at Global needs.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the information and various representation	Lecture / Flipped Classroom	Just – A – Minute Presentation
CO 2	Understand the concept of computer networks and overview of internet	Constructivist Approach/ Tutorial	Poster Presentation
CO 3	Understand the information storage , data communication and data modulation techniques	Lectures / Video Lessons	Assignment
CO 4	Understand the knowledge about the Cryptography, Cyber Crime and Information Security	Tutorial / Case Studies	Seminar
CO 5	Understand the importance of Information Security Framework	Lecture / Class Projects	Quiz

Offered by	Computer Science

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Information and its Representation:** What is information – Quality - of Information - Value of Information - Information Processing - Information Processing cycle in computers - information - Representation and codes - Number Representation - Binary - Representation of Positive integers - Signed Binary Integers - Positive Binary Fractions - signed Binary Fractions - Representing Fractions in Binary - Representation of Alphanumeric - Data - Current Trends in Information Technology – semiconductor - Technology - Information storage - Networking - Applications of - IT - IT Applications in Business - Modeling and simulation	1	1
		Instructional Hours	18 Hrs
Suggested Learning Methods : Video lectures about the basics of Cyber Security			

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	1	2
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Practice using Flow Charts			
III	**Information storage and communication:** Information storage - purpose of storage - Types of storage Devices - File organization - Internal file structure - External file structure and file extension - Data communication - an overview - what is data communication - signals - Basic - Data Communication Model - Modulation Techniques.	1	3
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Develop small programmes on internal file structure			
IV	**Cryptography Systems**: Introduction-Cryptography Systems Types-Symmetric Cryptography - Asymmetic or Public Key, Cryptography-Hash Functions-Why three Encryption Techniques? – Public key Algorithms – RSA Public Key Algorithm – Digital Signature – Diffie – Hellman - ElGamal-EDCSA-XTR. **Cyber Law and Ethics** : Introduction to cybercrime - Prevention - preventive steps for Individuals - preventive steps for organizations and government - How to protect the computer against threats.	1	5 & 6
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Apply the Cryptographic techniques in models			
V	Information security Framework - Information security and privacy - security Framework - Information systems security Framework – Framework for Network security access. Access control Techniques- Computer Security and Access Control-Access control Techniques-Biometric Authentication-Authentication Tokens-Token types and usage-Digitalsignature-Embodiments and vendors-Related Authentication Technologies.	1	8 & 9
		Instructional Hours	**18 Hrs**
Suggested Learning Methods : Case Study			
		Total Hours	**90 Hrs**

Text Books	1. Pankaj Agarwal, **"Information Security & Cyber Laws"**, Acme Learning Private Limited, First Edition,2010
Reference Books	1. Amy Rose, Deborah Arrand, Kristin E. Ohlim, Malloy, Michael G. Solomon, Mike Chapple, **"Information Security Illuminated"**, Jones & Barlett Publishers, 2005. 2. Lawrence C. Miller, **"Cyber Security for Dummies"**, John Wiley & Sons, Inc
Web. URLs	https://www.google.com/aclk?sa=l&ai=DChcSEwjmtam2zc39AhX6k2YCHRvPBg4YABAAGgJzbQ&sig=AOD64_06rlXtkvR6BG9OOIgRBsEFdm27Tw&q&adurl&ved=2ahUKEwiEvKS2zc39AhUfUGwGHQ_5BdEQ0Qx6BAgKEAE

Tools for Assessment (25 Marks)						
CIA I	**CIA II**	**CIA III**	**Assignment**	**Seminar**	**Quiz**	**Total**
5	5	6	3	3	3	**25**

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITE610	Discipline Specific Elective Paper III: Intellectual Property Rights and Privacy Laws		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective	To introduce the concepts of Intellectual Property rights and privacy laws
Course Category	Employability and Entrepreneurship
Development Needs	Global
Course Description	This course helps to understand the different IPR, Copyright and Privacy laws.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Define that various laws associated with intellectual property rights	Flipped Classroom	Group Discussion
CO 2	Explain the concept of commercialization of IPR be licensing	Video Lecture	Assignment
CO 3	Outline the concepts of copyrights and international protection of copyrights	Problem Solving	Seminar
CO 4	Recall the history and perspective of privacy laws.	Tutorial / Case Studies	Quiz
CO 5	Classify the compare the various types of privacy laws	Virtual Lab	Flip Test

Offered by	**DCFS**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Intellectual Property Overvie w -** Concept of Property vis-à-vis Intellectual Property. Types of Intellectual Property- Origin and Development- An Overview. Intellectual Property Rights as Human Right. Role of International Institutions.	**1**	1,2
		Instructional Hours	**18**
Suggested Learning Methods : Video Lectures			
II	**Intellectual Property Rights -**Commercialization of Intellectual Property Rights by Licensing. Determining Financ ial Value of Intellectual Property Rights. Negotiating Payments Terms in Intellectual Property Transaction. Intellectual Property Rights in the Cyber World	1	3,4
		Instructional Hours	**18**
Suggested Learning Methods :Group Discussion			
III	**Copyright -**Introduction to Copyright- International Protection of Copyright and Related rights- An Overview (International Convention/Treaties on Copyright).		5,7
		Instructional Hours	**18**
Suggested Learning Methods : Worked examples			

IV	**Indian Copyright Law -** Indian Copyright Law- The Copyright Act, 1957 with its amendments, Copyright works, Ownership, transfer and duration of Copyright, Renewal and Termination of Copyright, Infringement of copyrights and remedies.	1	8
		Instructional Hours	**18**
Suggested Learning Methods : Problem Based Learning			
V	**Privacy Laws -** History and Perspective of Privacy Laws- Global Privacy Issue- Legal Tools – The Constitution. Statutes & State Protection.	1	10,12
		Instructional Hours	**18**
Suggested Learning Methods : Laboratory practice			
		Total Hours	**90 Hrs**

Text Books	1. Vikas Vashishth.; "Law and practice of intellectual property in India" 2. Sreenivasulu N.S; "Law Relating to Intellectual Property", Patridge Publishing, 2013 3. Vakul Sharma; "Information Technology: Law and Practice", Universal Law Publishing Co., India, 2011.
Reference Books	1. The Copyright Act, 1957 2. The Patent Act, 1970
Web. URLs	Ipindia.gov.in

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITE611	Discipline Specific Elective Paper III: Information Technology for Management		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective	To introduce the concepts of Management in Information Technology
Course Category	Employability and Entrepreneurship
Development Needs	Global
Course Description	This course helps to understand the different Information Technology Ma

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Interpret and Understand the Information Technology for Organization	Flipped Classroom	Group Discussion
CO 2	Analyse the impact of IT on the Organization	Video Lecture	Assignment
CO 3	Outline the concepts of Building systems with creativity	Problem Solving	Seminar
CO 4	Examine the reengineering concept.	Tutorial / Case Studies	Quiz
CO 5	Classify the compare the various types of privacy laws	Tutorial / Case Studies	Flip Test

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Using Technology to Transform the Organization**: Information Technology in the Workplace – What is Information Technology – Transforming Organizations – Information Technology and the Manager – The Challenge of Change – Six Major Trends – **Interpreting and Understanding Information** : The Nature of Information – How people Interpret Information – From Information to Knowledge – Information Technology in Perspective: Frameworks for Information Technology – A Framework Based on IT – The Basics of Information Systems – The Case of Chrysler	1	1,2
		Instructional Hours	**18**
Suggested Learning Methods : Video Lectures			

II	**The Impact of Information Technology on the Organization**: Modern Organizations – Creating New Types of Organizations – Building a T-Form Organization – Strategic Issues of Information Technology – Information Technology and Corporate Strategy – Creating and Sustaining a Competitive Edge – Integrating Technology with the Business Environment – Managing Information Technology – International Business and Information Technology – The Impact of Globalization on Business – Key Issues in International Environment – Managing Information Technology Internationally – Business Models and IT Management	1	3,4
		Instructional Hours	**18**
Suggested Learning Methods :Group Discussion			
III	**Building Systems: Creativity with Technology**: The Design Task – A Systems Design Life Cycle – The Roles of Managers, Users and Designers – User-Oriented Design – The Spiral Model of Development – Data Collection for Analysis and Design – Structured versus Object-Oriented Design – **Building Systems: Further Developments** : System Analysis – Survey and Feasibility Study – Determining Feasibility – Selecting an Alternative Undertaking System Analysis – Undertaking System Designs – General Design Considerations – Computer-Aided Software Engineering		5,7
		Instructional Hours	**18**
Suggested Learning Methods : Worked examples			
IV	**Reengineering: Changing Businesses and Business Processes**: What is Reengineering? – What is a Process? – Reengineering a Process at Mutual Benefit Life – Reengineering a Process at Merrill Lynch – Reengineering the Entire Firm at Oticon – Implementing Change: Implementation – Research on Implementation – An Implementation Strategy – Implementing IT-Based Transformation of the Organization – Beyond Structural Change	1	8
		Instructional Hours	**18**
Suggested Learning Methods : Problem Based Learning			
V	**Organization Support Systems**: Decision-Support Systems – Examples of DSSs – The Promise of DSSs – Executive Information Systems – Group Decision-Support Systems – Groupware and Organizational Knowledge – Multimedia for Business, Education and Entertainment	1	9, 10
		Instructional Hours	**18**
Suggested Learning Methods : Problem Based Learning			
		Total Hours	**90 Hrs**
Text Books	1. Henry C. Lucas, Jr. Information Technology for Management, 7th Edition, Tata Mc Graw Hill 2001		
Reference Books	Earl, Michael J. Management strategies for information technology. Prentice-Hall, Inc., 1989.		

Web. URLs	www.techtarget.com

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3ITE612	Discipline Specific Elective Paper III: Ethical Hacking		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE:75 Marks

Course Objective	To help students understand how ethical hacking is used as a method to prevent hacking. To make it possible for students to learn the process of identifying vulnerabilities and exploits of the technological ecosystem
Course Category	Entrepreneurship, Skill Development
Development Needs	Global
Course Description	This course helps to facilitate students, appreciate the need for understanding non-technology aspects of ethical hacking such as legal frameworks, documentation and report writing.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To know about the basics of Ethical Hacking, Ethics, and Legality	Flipped Classroom	Group Discussion
CO 2	To understand the concept of Footprinting and Social Engineering	Video Lecture	Assignment
CO 3	To examine the different scanning and enumeration techniques	Problem Solving	Seminar
CO 4	To familiarize with the methodologies that can be used for system Hacking.	Tutorial / Case Studies	Quiz
CO 5	To explore the Hacking Web Servers, Web Application Vulnerabilities, and Web-Based Password Cracking Techniques	Virtual Lab	Flip Test

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to Ethical Hacking, Ethics, and Legality** - Understanding Ethical Hacking Terminology - Identifying Different Types of Hacking Technologies - Understanding the Different Phases Involved in Ethical Hacking and Listing the Five Stages of Ethical Hacking - What Is Hacktivism? - Listing Different Types of Hacker Classes - Defining the Skills Required to Become an Ethical Hacker - What Is Vulnerability Research? - Describing the Ways to Conduct Ethical Hacking	1	1
		Instructional Hours	**18**
Suggested Learning Methods : Video Lectures			

II	**Footprinting and Social Engineering** – Footprinting - Describe the Information Gathering Methodology - Describe Competitive Intelligence - Understand DNS Enumeration - Understand Whois and ARIN Lookups - Identify Different Types of DNS Records - Understand How Traceroute Is Used in Footprinting - Understand How E-Mail Tracking Works- Understand How Web Spiders Work - Social Engineering - What Is Social Engineering? - What Are the Common Types Of Attacks? - Understand Identity Theft - Describe Phishing Attacks - Understand Online Scams - Understand URL Obfuscation - Social-Engineering Countermeasures	1	2
		Instructional Hours	**18**
Suggested Learning Methods : Group Discussion			
III	**Scanning and Enumeration** – Scanning - Define the Terms Port Scanning, Network Scanning, and Vulnerability Scanning - Understand the CEH Scanning Methodology - Understand Ping Sweep Techniques - Understand Nmap Command Switches - Understand SYN, Stealth, XMAS, NULL, IDLE, and FIN Scan - List TCP Communication Flag Types - Understand War- Dialing Techniques - Understand Banner Grabbing and OS Fingerprinting Techniques - Understand How Proxy Servers Are Used in Launching an Attack - How Do Anonymizers Work? - Understand HTTP Tunneling Techniques - Understand IP Spoofing Techniques Enumeration - What Is Enumeration? - What Is Meant by Null Sessions? - What Is SNMP Enumeration? - Windows 2000 DNS Zone Transfer - What Are the Steps Involved in Performing Enumeration?	1	3
		Instructional Hours	**18**
Suggested Learning Methods : Worked examples			
IV	**System Hacking** - Understanding Password-Cracking Techniques - Understanding Different Types of Passwords - Understanding Keyloggers and Other Spyware Technologies - Understand Escalating Privileges - Understanding Rootkits - Understanding How to Hide Files - Understanding Steganography Technologies - Understanding How to Cover Your Tracks and Erase Evidence **Trojans, Backdoors, Viruses, and Worms** - Trojans and Backdoors – What is Trojan - List the Different Types of Trojans - Trojan Construction Kit and Trojan Makers - What Are the Countermeasure Techniques in Preventing Trojans? - Viruses and Worms - Understand the Difference between a Virus and a Worm - Understand the Types of Viruses - Understand Antivirus Evasion Techniques - Understand Virus Detection Methods	1	4, 5
		Instructional Hours	**18**
Suggested Learning Methods : Problem Based Learning			

V	**Wireless Hacking** - Overview of WEP, WPA Authentication Mechanisms, and Cracking Techniques - Overview of Wireless Sniffers and Locating SSIDs, MAC Spoofing - Understand Rogue Access Points - Understand Wireless Hacking Techniques - Describe the Methods Used to Secure Wireless Networks **Evading IDSs, Honeypots, and Firewalls** - List the Types of Intrusion Detection Systems and Evasion Techniques - List the Firewall Types and Honeypot Evasion Techniques **Cryptography** - Overview of Cryptography and Encryption Techniques - Describe How Public and Private Keys Are Generated - Overview of the MD5, SHA, RC4, RC5, and Blowfish Algorithms	1	10, 13, 14
		Instructional Hours	**18**
Suggested Learning Methods : Laboratory practice			
		Total Hours	**90 Hrs**

Text Books	1. Kimberly Graves, CEH™ Official Certified Ethical Hacker Review, Wiley Publishing, Inc., 2007
Reference Books	1.PatrickEngebretson,—TheBasicsof Hacking and Penetration Testing : Ethical Hacking and Penetration Testing Made Easy, Syngress Media, Second Revised Edition, 2013. 2. MichaelT. Simpson, Kent Backman, James E.Corley,— Hands On Ethical Hacking and Network Defense, Cengage Learning, 2012.
Web. URLs	www.simplilearn.com

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U3CKE613	Discipline Specific Elective Paper III: Digital Marketing		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE:75 Marks
Common to B. Sc IT / CS			
Course Objective	To identify core concepts of marketing, role of marketing in business and society, acquire knowledge of social, legal, ethical and technological forces on marketing decision-making.		
Course Category	Employability and Entrepreneurship		
Development Needs	Global		
Course Description	To understand the process of Digital Marketing Strategy, Market Research, Content Marketing Strategy, User Experience Design, Web development and Design		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Ability to develop marketing strategies based on product, price, place and promotion objectives.	Lecture	Quiz
CO 2	Ability to create an integrated marketing communications plan which includes promotional strategies and measures of effectiveness.	Demonstration	Group Discussion
CO 3	Ability to communicate the unique marketing mixes and selling propositions for specific product offerings.	Video Lessons	Seminar
CO 4	Ability to construct written sales plans and a professional interactive oral sales presentation.	Video Lessons	Assignment
CO 5	Ability to formulate marketing strategies that incorporate psychological and sociological factors which influence consumers.	Tutorial	Seminar

Offered by	Computer Science

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	Introduction to think – Digital Marketing Strategy –Introduction – Key terms and Concepts – What is Marketing – What is Digital Marketing - Understanding Marketing Strategy – The Building Blocks of Marketing Strategy – Crafting a Digital Marketing Strategy – Case Study	1	2
		Instructional Hours	18
Suggested Learning Methods : Write simple Digital Marketing Strategy			
II	Market Research – Introduction – Key terms and Concepts – the Importance of Market Research – Key Concepts in Market Research – Online Research Methodologies – Justifying the Cost of Research – tools for the trade – Advantages and Challenges	1	3
		Instructional Hours	18

Suggested Learning Methods : Write sample Key Concepts in Market Research			
III	Content Marketing Strategy – Introduction – Key Terms and Concepts – Defining Content Marketing – Strategic Building Blocks – Content Creation – Content Channel Distribution – Tools for the Trade – Advantages and Challenges	1	5
		Instructional Hours	18
Suggested Learning Methods : Group Discussion			
IV	User Experience Design – Introduction – Key Terms and Concepts – Understanding UX design – Core principles of UX design – Mobile UX – Step –by-step guide to UX design –Tools of the trade – Case Study	1	7
		Instructional Hours	18
Suggested Learning Methods : Seminar			
V	Web development and Design – Introduction – Key terms and concepts – Web design – Web Development – Mobile Development – Step-by-step guide to building a website – Case Study	1	8
		Instructional Hours	18
Suggested Learning Methods : Video Presentation			
		Total Hours	90 Hrs

Text Books	Rob Stokes, E- Marketing the Essential guide to marketing in a digital world, 5th Edition, 2017.
Reference Books	1. Danny Star, Digital Marketing 2020, June 2019 2. Ryan Deiss and Russ Henneberry, Digital Marketing dummies, Dec 2016
Web. URLs	https://ondigitalmarketing.com/learn/odm/

Tools for Assessment (25 Marks)

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

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title		
23U4ITZ604	Skill Based Paper IV: Practical in Kotlin		
Semester: VI	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	To gain knowledge in a new language for JVM. It is astatically-typed open-source programming language for generating code that can run on the Java Virtual Machine. It is a mixture of legacy Java code and Kotlin code which is used to build and run some of the largest and most powerful websites on the Internet
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	The course is based on the Java experience; it shows the similarities between the two languages and focuses on what's going to be different.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Kotlin	Demonstration Method	Laboratory Experiments
CO 2	Gain knowledge on content management		
CO 3	Understand the basic Java, Java Virtual Machine		
CO 4	Apply Android, Javascript		
CO 5	Create a new environment using android platform		

Offered by	**Information Technology**

Course Content	Instructional Hours / Week : 6

Programme	Description
1	Kotlin program to print an Integer
2	Kotlin program to Add two integers
3	To define ASCII value of a character using Kotlin
4	To check whether a number is ODD or EVEN using Kotlin
5	To find the largest among three numbers using Kotlin
6	To display Fibonacci series using Kotlin
7	To check whether number is Prime or not
8	To find Factorial of a number
9	To make a simple Calculator using switch case
10	Kotlin program to get current working directory
11	Kotlin program to get current Date/Time

12	Kotlin program to sort a Map by values

Instructional Hours	90

Tools for Assessment (30 Marks)

Application of Logic	Program Creativity	Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	6	6	3	30

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by

Course Code	Title	
23U4IT3ED1 / SBOEC	Extra Departmental Course: Practical in Libre Office Suite	
Semester: III	Credits: 2	ESE: 50 Marks
Course Objective	Introduces the basic features of LibreOffice, Writer, Calc, Impress.	
Course Category	Skill Development / Employability	
Development Needs	Global	
Course Description	This course helps to understand the basic working of Libreoffice	

Course Outcomes		Teaching Methods	Assessment Methods
CO1	Recognize when to use each of the LibreOffice programs to create professional business documents.	Demonstration Methods	Laboratory Experiments
CO2	To create personal and/or business documents following current professional and/or industry standards.		
CO3	To work with various components and functions in Libreoffice suite.		
CO4	To work with various toolbar components in Libreoffice suite.		
CO5	To work with various presentation tools in Libreoffice suite.		

Offered by: Information Technology

Course Content	Instrucion Hour / Week : 2

S.No	List of Practical
1	Create a Document in Libre Office Writer perform formatting operations using line spacing, font type and size, alignment, insert bullets. Save and close the document.
2	Design a National Level Seminar Invitation with the following specifications using of Libre office writer. ➢ Attractive Page Border. ➢ Design the name of the Seminar using WordArt. ➢ Use ClipArt ➢ With backgroundcolor
3	Design a Visiting Card for a person with a card size of 4” X 3” including necessary details.
4	Create a Document in Libre Office Writer with the following tools ➢ Inserting List and Tables ➢ Inserting Shapes ➢ Inserting Header, Footer and Page Number
5	Create a calc sheet with the following ➢ Insert Auto format Tables ➢ Perform Conditional Formatting to a cell

	➢ Apply Formula to a cell
6	Draw a line, XY, bar and pie chart for a given user data in LibreOffice Calc
7	Create a Libre office calc sheet with student strength of ten having marks in five subjects for three semesters. Perform total and average using standard functions.
8	Perform Autofilter, Standard Filter and Advanced Filter to find the fast learner, medium learner and average learner to the problem given in exercise 7.
9	Create a presentation on tourism using different colours and text formats using Libreoffice Impress.
10	Create a presentation about your department using animations, sound effects, ole objects.
11	Create a flow chart for a given problem in the Libreoffice draw using basic shapes.
12	Perform Editing operations to a object in Libreoffice Draw with selection mode, size, and with necessary transformations.
	Total Hours **30**

Text Book:

1. LibreOffice – Getting Started Guide, 2017

Reference Books

1. http://www.open-of-course.org/courses/course/view.php?id=86.

Mapping

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

H-High; M-Medium; L-Low

Course Designed by	Verified by

Course Code	Title	
23U4IT3ED2 / SBOEC	Extra Departmental Course: GIMP	
Semester: III	Credits: 2	ESE: 50 Marks
Course Objective	The objective of the course is to understand the animation technique through open source animation tool	
Course Category	Skill Development / Employability	
Development Needs	Global	
Course Description	This course helps to understand the basic working of GIMP	

Course Outcomes		Teaching Methods	Assessment Methods
CO1	Understand the basics of GIMP	Demonstration Methods	Laboratory Experiments
CO2	Manipulating a photograph to drawing		
CO3	Apply work with tools		
CO4	Apply work with Images		
CO5	Manipulation using Text and colors		

Offered by: Information Technology

Course Content | **Instrucion Hour / Week : 2**

S.No	List of Practical
1	Create Sun Flower
2	Animate Plane flying in the Clouds
3	Create Plastic Surgery for the Nose
4	Create See-through text.
5	Create a Web Page
6	Convert Black and White Photo to Color Photo
7	Design a visiting card containing at least one Graphic and text information.
8	Create an animation to represent the growing Moon.
9	Create an animation to indicate a ball Bouncing on steps
10	Simulate movement of a cloud
11	Display the background given (filename: Tulip.jpg) through your name
12	Create an animation with the following features. Welcome * letters should appear one by one * the fill color of the text should change to a different color after. The display of the full word using flash
	Total Hours 30

Text Book:

1. Karian Kylandar & Olof S. Kylandar, GIMP: The Official Handbook, The Coriolis Group,2014.
2. Philip Whitt, Beginning Photo Retouching & Restoration Using GIMP, APress, 2014

Reference Books

1. Kay Ritcher, **Das GIMP 2.8-Buch,** O'Reilly, 2013.

Mapping

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

H-High; M-Medium; L-Low

Course Designed by	Verified by

Course Code	Title	
23U3ITSS01	**Self Study Paper: Practical in WordPress**	
Semester: II - IV	**Credits: 2**	**ESE:100 Marks**

Course Objective	To acquire fundamental knowledge web development using PHP.
Course Category	Skill Development /Employability
Development Needs	Global/Local
Course Description	To development skill set in Machine Learningand apply the concepts to develop applications in order to meet the Local and Global needs

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Develop the program for control structure and functions	Program Demonstration	Program Creativity
CO 2	Implement the concepts of string and Arrays	Program Demonstration	Debugging
CO 3	Create a simple database program for student information	Program Demonstration	Application of Logic
CO 4	Develop simple program to import Gen bank and finding of mutations	Program Demonstration	Program Development
CO 5	Create a program for Concatenating DNA Fragments Transcription	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week :**

Program List

1. Write a PHP program to illustrate Conditional and Looping Statements.
2. Write a PHP program to demonstrate Array Functions, string, numeric and date functions.
3. Write a PHP program to create user defined functions.
4. Write a PHP program for file creation and file manipulation.
5. Write a PHP program for creating sessions.
6. Write a PHP program for creating cookies
7. Create a Simple application using forms in PHP
8. Write a PHP program for creating tables with constraints and demonstrate table join.
9. Write a PHP program for Database connectivity, Create, Insertion, Updating and Deleting rows in MySQL tables

10. Write a PHP program for sorting and searching a data.
11. Write a PHP Program to illustrate the usage of subqueries, aggregate functions, set operators.
12. Write a PHP program to create a simple web page. Validate the Input and apply appropriates to format the output.

Solving Case studies and Program development	
Total Hours	

Tools for Assessment

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
-	-	-	-	-	-	-

Mapping

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

H-High; M-Medium; L-Low

Course designed by	**Verified by**

Course Code	Title	
23UITSS02	Self Study Paper: Quantitative Aptitude	
Semester: II - IV	Credits: 2	ESE: 100 Marks

Course Objective	This course presents shortcut methods to solve quantitative problems and increases the problem solving ability of students.
Course Category	Employability, Skill Development
Development Needs	Global
Course Description	This course emphasizes on the different quantitative techniques which assists in real time problem solving

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand and gain knowledge about L.C.M & H.C.F.	NA	NA
CO 2	To analyze Profit and Loss and Ratio.	NA	NA
CO 3	To enhance the skill of understanding problems on Ages and Calendar.	NA	NA
CO 4	To evaluate the Problems on Train and Boats and Streams.	NA	NA
CO 5	To evaluate the Problems on Pipes and Cistern.	NA	NA

Offered by	**Information Technology**

Course Content	Instructional Hours / Week :

Unit	Description	Text Book	Chapters
I	Numbers	1	1
	L.C.M. & H.C.F.	1	2
	Average	1	6
		Instructional Hours	
Suggested Learning Methods : Video Lectures			
II	Percentage	1	10
	Profit and Loss	1	11
	Ratio and Proportion	1	12
		Instructional Hours	
Suggested Learning Methods :Video Lectures			
III	Simple Interest	1	21
	Compound Interest	1	22

	Problems on Ages	1	8
	Problems on Calendar	1	27
	Problems on Clocks	1	28
		Instructional Hours	
Suggested Learning Methods : Worked examples			
IV	Time and distance	1	17
	Problems on Trains	1	18
	Boats and Streams	1	19
		Instructional Hours	
Suggested Learning Methods : Problem Based Learning			
V	Time and Work	1	15
	Pipes and Cisterns	1	16
		Instructional Hours	
Suggested Learning Methods: e-content			
		Total Hours	

Text Books	1 Dr. R. S. Aggarwal, **Quantitative Aptitude**, S. Chand, 7th Edition, 2008
Reference Books	1. Dr. N. K. Singh, Quantitative aptitude test, Upkar's, 1st Edition, 2009
Web. URLs	https://www.toppr.com/guides/quantitative-aptitude/

Tools for Assessment

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
-	-	-	-	-	-	-

Mapping

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

H-High; M-Medium; L-Low

Course designed by	Verified by