#### SCHOOL OF COMPUTING SCIENCE AND **ENGINEERING**



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# DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## B. TECH. **4 YEAR PROGRAMME**

### **REGULATION 2017**

PERIYAR MANIAMMAI UNIVERSITY (Under Section 3 of UGC Act, 1956)

**UM1:** Offering well balanced programmes with scholarly faculty and state-of-art facilities to impart high level of knowledge.

UM2: Providing student - centered education and foster their growth in critical thinking, creativity,

Entrepreneurship, problem solving and collaborative work.

UM3: Involving progressive and meaningful research with concern for sustainable development.

UM4: Enabling the students to acquire the skills for global competencies.

**UM5:** Inculcating Universal values, Self-respect, Gender equality, Dignity and Ethics.

#### **DEPARTMENT VISION**

To Produce Intellectuals who can relate theory and practice, familiar with common themes and apply concepts of Computer Science and Engineering for Research and Societal development.

#### **DEPARTMENT MISSION**

- **DM1** To offer UG, PG, Ph.D. programme with state of art facilities in the field of Computer Science and Engineering
- **DM2** To prepare the students become globally competent by enhancing their skills to work in IT Industries and R & D organizations
- **DM3** To prepare the students with good ethical attitude and an ability to relate engineering issues to broader social context
- **DM4** To promote significant research in cutting edge Information Communication technologies with environmental consciousness

#### Table 1: Mapping of University Mission with Department Mission

	DM1	DM2	DM3	DM4	Total
UM1	3	2			5
UM2	2	3	1	1	7
UM3				3	3
UM4		3	2		5
UM5		1	3	1	5

3- High relation 2- Medium relation 1- Low relation 0- No relation

#### PROGRAMME EDUCATIONAL OBJECTIVES

- **PEO1:** Graduates will attain the expertise of analyzing and specifying the requirements for any computing system as well as capable of modeling, designing, implementing and verifying a computing system to meet specified requirements using contemporary tools
- PEO2: Graduates will possess diversified professional skills for successful career.
- **PEO3:** Graduates of the programme will have the competencies for communicating, planning, coordinating, organizing, decision making and leading a team
- **PEO4:** Graduates of the programme will have knowledge of professional, interpersonal and ethical responsibility and will contribute to society through active research.

	PEO1	PEO2	PEO3	PEO4	Total
DM1	3			2	5
DM2		3	3		6
DM3			2	3	5
DM4	1			3	3
Total	4	3	5	8	

**Table 2: Mapping Department Missions and Programme Educational Objectives** 

#### **GRADUATE ATTRIBUTES**

- 1. **Knowledge base for Engineering:** Demonstrate competence in mathematics, natural sciences, engineering fundamentals and specialized engineering knowledge appropriate to the programme.
- 2. Analytical Skills: Identify, formulate, analyze and solve diverse engineering problems.
- 3. **Design:** Solution for complicated open–ended engineering problems and design the components with appropriate standards to meet specified needs with proper attention to public health, safety, environment and society.
- 4. **Experimental Investigation:** Technical skills to conduct investigation, interpretation of observed data and provide solution for multifaceted problems.
- 5. **Modern Engineering tools usage**: Acquire, select, manipulate relevant techniques, resources and advanced engineering ICT tools to operate simple to complex engineering activities.
- 6. **Impact of engineering on society:** Provide a product / project for use by the public towards their health, welfare, safety and legal issues to serve the society effectively.

- 7. **Environment and Sustainability:** Design eco-friendly and sustainable products in demonstrating the technology development to meet present and future needs.
- 8. **High Ethical Standards:** Practice ethical codes and standards endorsed by professional engineers.
- 9. Leadership and team work: Perform as an individual and as a leader in diverse teams and in multi-disciplinary scenarios.
- 10. **Communication Skills:** Professional communication with the society to comprehend and formulate reports, documentation, effective delivery of presentation and responsible to clear instructions.
- 11. Project management and Finance: Appropriate in incorporating finance and business practices including project, risk and change management in the practice of engineering by understanding their limitations.
- 12. Life-long learners: Update the technical needs in a challenging world in equipping themselves to maintain their competence.

#### **PROGRAMME OUTCOMES**

	Programme Outcome
PO1	an ability to apply knowledge of computing and mathematics appropriate to the discipline.
PO2	an ability to analyze a problem, interpret data, and define the computing system requirements which would be appropriate to the solution.
PO3	an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
PO4	an ability to apply creativity in the design of systems which would help to investigate the complex problem and provide software solution.
PO5	an ability to use the computing techniques, skills, and modern system tools necessary for practice as a CSE professional
PO6	an ability to analyze the local and global impact of computing on individuals, organizations, and society
PO7	an ability to develop and use the software systems within realistic constraints environmental, health and safety, manufacturability, and sustainability considerations
PO8	an ability in an understanding of professional, ethical, legal, security and social issues and responsibilities
PO9	an ability to function effectively on teams and individually to accomplish a common goal

PO10	an ability to communicate effectively with a range of audiences by written and oral
PO11	ability to plan, organize and follow best practices and standards so that the project is completed as successfully by meeting performance, quality at CMM level, budget and time
PO12	an ability to engage in Lifelong learning and continuing professional development

#### **PROGRAMME SPECIFIC OUTCOMES**

- **PSO1** ability to employ latest computer languages, environments and platforms for solving problems in the areas of emerging communication technologies.
- **PSO2** ability to use knowledge in data analytics and mining for industrial problems

Table 3: GA versus PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
GA1	3	2	2	1	1	1	1	2	1	2	1	1	3	3
GA2	2	3	2	2	1	0	0	0	0	1	0	0	3	3
GA3	2	2	3	1	3	1	1	0	0	2	0	0	3	3
GA4	2	2	1	3	2	1	0	0	0	1	0	0	2	3
GA5	1	1	1	1	3	2	0	0	3	0	0	0	3	3
GA6	1	1	1	1	1	3	1	3	0	0	0	0	1	1
GA7	0	0	0	1	2	0	3	1	0	1	0	0	1	1
GA8	0	0	0	0	0	0	1	3	1	1	1	1	2	2
GA9	0	0	0	0	0	0	0	2	3	2	1	1	2	2
GA10	0	0	0	0	0	0	0	2	2	3	1	1	2	2
GA11	0	0	0	0	0	0	0	1	1	2	3	0	1	1
GA12	1	1	1	1	1	1	1	1	1	1	1	3	3	3

r										r	r	r	r	r	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	Total
PEO1	3	3	3	3	3	1	1	1	0	1	1	1	3	3	27
PEO2	3	2	2	2	2	2	2	0	0	0	1	1	2	2	21
PEO3	0	0	0	0	0	0	0	1	3	3	2	1	0	0	10
PEO4	1	1	1	1	0	0	0	2	0	0	2	1	0	0	9
Total	7	6	6	6	5	3	3	4	3	4	6	4	5	5	0

 Table 4: Mapping Department Program Outcomes and Programme Educational Objectives

#### **CURRICULUM REGULATION -2017**

	SEMESTER I					
COURSE CODE	COURSE TITLE	L	Т	Р	С	н
XMA101	Algebra, Differential calculus and their application	3	1	0	4	5
XCP102	Computer Programming (Lab included)	3	0	1	4	5
XBW103	Mechanical and Civil Engineering Systems (workshop practice included)	3	1	1	5	7
XAC104	Applied Chemistry (Lab included)	3	1	1	5	7
XGS105	Study Skills and Language Laboratory	1	0	0	1	3( 1L+2S S)
XUM106	Human Ethics, Values, Rights and Gender Equality (plus 2 hours self-study)	1	0	0	1	3
	Total				20	30
	SEMESTER II					
XMA201	Calculus and Laplace Transforms	3	1	0	4	5
XEM202	Engineering Mechanics	3	1	0	4	5
XBW203	Electrical and Electronics Engineering Systems (BEE Lab included)	3	1	1	5	7
XAP204	Applied Physics(Physics Lab included)	3	1	1	5	7
XEG205	Engineering Graphics	2	0	1	3	4
XGS206	Speech Communication	1	0	0	1	3
	Total				22	31
	SEMESTER III					
XDM301	Discrete Mathematics	3	1	0	4	5
XCS302	Data Communication	3	1	0	4	5
XCS303	Digital systems and Microprocessor(Lab Included)	3	0	1	4	5

XCS304	Data Structures (Lab included)	3	1	1	5	7					
XMS305	Material Science	3	0	0	3	3					
XEP306	Entrepreneurship Development	2	0	0	2	3					
XGS307	Interpersonal Communication	0	0	0	0	2					
XCS308	In-plant Training –I	-	-	-	1						
	Total				23	30					
SEMESTER IV											
XMA401	Probability and Queuing Theory	3	0	0	3	3					
XCS402	Computer Architecture	3	0	0	3	3					
XCS403	Object Oriented Programming with Java	3	0	1	4	5					
XCS404	Operating Systems(Lab Included)	3	1	1	5	7					
XCS405	Design and Analysis of Algorithms	3	1	0	4	5					
XEE406	Economics for Engineers	3	0	0	3	3					
XGS407	Technical communication	1	0	0	1	3					
	Extracurricular Activities-NCC/NSS/YRC/RRC/Sports	-	-	-	-	-					
	Total				23	29					
	SEMESTER V										
XMA501	Numerical Methods	2	1	0	3	4					
XCS502	Theory of Computation	2	1	0	3	4					
XCS503	Database Management Systems(Lab Included)	3	0	1	4	5					
XCS504	Web Technology and Mobile Application Development (Lab Included)	3	1	1	5	7					
XCSE5*	Professional Elective-I (with Tutorial)	2	1	0	3	4					
XTQ506	Total Quality Management	3	0	0	3	3					
XGS507	Business Communication	1	0	0	1	3					
XCS508	In-plant Training –II				1						

	Total				23	30
	SEMESTER VI					
X**OE*	Open Elective –I	3	0	0	3	3
XCS602	Data Warehousing and Data Mining	3	0	0	3	3
XCS603	Cloud Computing (Lab Included)	3	0	1	4	5
XCS604	Principles of Compiler Design(Lab Included)	3	1	1	5	7
XCS605	Digital Signal Processing	3	1	0	4	5
XCSE6*	Professional Elective- II	3	0	0	3	3
XES607	Environmental Studies (Non Credit Course)	0	0	0	0	3
XGS608	Academic Writing (Non credit course)	0	0	0	0	2
	Total				22	31
	SEMESTER VII					
X**OE*	Open Elective II	3	0	0	3	3
XCS702	Software Engineering (Lab Included)	3	0	1	4	5
XCS703	Data Analytics (Lab Included)	3	1	1	5	7
XCSE7*	Professional Elective-III	3	0	0	3	3
XCSE7*	Professional Elective-IV	3	0	0	3	3
XUMC706	Cyber Security	3	0	0	3	3
XCS707	Project phase – I	0	0	2	2	4
XGS708	Career Development Skills(Non Credit Course)	0	0	0	0	1
XCS709	In-Plant Training – III	-	-	-	2	-
	Total				25	29
	SEMESTER VIII					
X**OE*	Open Elective III	3	0	0	3	3
XCSE8*	Professional Elective-V	3	0	0	3	3

XCSE8*	Professional Elective – VI	3	0	0	3	3
XCS804	Project Phase II	0	0	12	12	24
	Total				21	33

#### **OPEN ELECTIVES**

Open Elective Code No.	Course Title	L	Т	Р	С	н
XCSOE1	Free Open Source Software	3	0	0	3	3
XCSOE2	Web Design	3	0	0	3	3
XCSOE3	Object Oriented Programming	3	0	0	3	3
XCSOE4	Multimedia design and Development	3	0	0	3	3
XCSOE5	Digital Marketing	3	0	0	3	3

#### LIST OF PROFESSIONAL ELECTIVES

#### **V SEMESTER**

* Elective Code No.	Course Title	L	Т	Р	С	Н
XCSE51	Cryptography and Network Security	2	1	0	3	4
XCSE52	Distributed Computing	2	1	0	3	4
XCSE53	Graph Theory	2	1	0	3	4
XCSE54	Computer Graphics and Multimedia	2	1	0	3	4

#### **VI SEMESTER**

Elective Code No.	Course Title	L	Т	Р	С	Н
XCSE61	Advanced Databases	3	0	0	3	3
XCSE62	Mobile Computing and Communication	3	0	0	3	3
XCSE63	Internet of Things	3	0	0	3	3
XCSE64	Programming with Python	3	0	0	3	3

#### VII SEMESTER

Elective Code No.	Course Title	L	Т	Р	С	н
XCSE71	Network Measurements and Testing	3	0	0	3	3
XCSE72	Software Testing	3	0	0	3	3
XCSE73	XML and Web Services	3	0	0	3	3
XCSE74	Disaster Management	3	0	0	3	3
XCSE75	Ethical Hacking	3	0	0	3	3
XCSE76	Artificial Intelligence and Expert System	3	0	0	3	3
XCSE77	Design and Analysis of Parallel algorithms	3	0	0	3	3
XCSE78	Game Theory	3	0	0	3	3

#### **VIII SEMESTER**

Elective Code No	Course Title	L	Т	Р	С	Н
XCSE81	Digital Image Processing	3	0	0	3	3
XCSE82	Information Retrieval	3	0	0	3	3
XCSE83	Wireless Sensor Networks	3	0	0	3	3
XCSE84	Embedded Systems and PLC	3	0	0	3	3
XCSE85	Service Oriented Architecture	3	0	0	3	3
XCSE86	Advanced Computer Architecture	3	0	0	3	3
XCSE87	Soft Computing	3	0	0	3	3

#### **TOTAL CREDIT: 179**

#### LIST OF ONE CREDIT COURSES

* Elective Code No.	Course Title	L	Т	Р	С	Н
XCSXXX	Web Design using JOOMLA Content Management System	.5	0	.5	1	2
XCSXXX	R Programming	.5	0	.5	1	2
XCSXXX	Internet of Things	.5	0	.5	1	2

### SYLLABUS SEMESTER I

COUR	SE CODE	XMA101		L	Т	Р	С		
COUR	SE NAME	ALGEBRA, DIFFERENTIAL CALCULUS AN	ND	3	1	0	4		
		THEIR APPLICATIONS		-	-	D			
C.D.A		2.0.0		L 2	1	P	H 5		
	SE OUTCON	5:0:0 TES	Domo	3 in	4	U Lor	5 vol		
	<b>Explain</b> the	IES Proparties of Figure values and eigen vectors of	Doma	111		Lev	ei		
COI	the matrices transformatic form.	s, <i>Make Use of</i> orthogonal and similarity on and <i>Construct</i> the quadratic form to Canonical	Cogniti	ve	Un	derst App	anding bly		
CO2Define and Find the radius and circle of curvature in Cartesian and polar coordinates and to Explain evolutes and envelopes.Remembra CognitiveCO2Define and Find the radius and circle of curvature in CognitiveRemembra Understa									
CO3	<b>O3</b> <i>Explain</i> the convergence of series of positive terms, alternating series, and power series using tests of convergence Cognitive Understa								
<b>CO4</b> <i>Find</i> total and partial derivatives, Taylor series expansions of functions and the extremum of functions and their applications. Cognitive									
CO5	O5 <i>Solve</i> the linear equations of second and higher order with constant and variable coefficients and simultaneous first order differential equations and to <i>Apply</i> Method of variation of parameters to <i>Solve</i> the differential equation.								
UNIT	I MAT	RICES					15		
Eigen v Hamilte Orthog Canoni	values and Eig on theorem (er onal transform cal form by Or	envectors of a real matrix –Properties of Eigen value (Concentration of a symmetric matrix to diagonal form – (thogonal transformation.	ues and H ept only) Reductio	Eigen – O on of	vecto rthogo quad	ors – onal ratic	Cayley- matrix - form to		
UNIT	II GEON CALC	METRICAL APPLICATIONS OF DIFFERENT	TAL				15		
Curvatu Involut	are – Cartesian es and evolute	n and polar co-ordinates – Centre and radius of cu s – Envelopes – Properties of envelopes and evolut	urvature es.	– Ciı	cle o	f cur	vature –		
UNIT	III INFI	NITE SERIES					15		
Sequen converg Statemo Absolu Binomi	ces – Conver gence (Compa ent of theorem te and condition tal Series (Sim	rgence of series – General properties – Series arison test, Integral test, Comparison of ratios s and problems only) – Alternating series – Series onal convergence – Power Series – Convergence ple problems only).	of posi and D'A of positiv of expor	tive Alemt ve an nentia	terms pert's d neg d, log	ratic ative arith	Fests of test – terms – mic and		
UNIT	IV FU	NCTIONS OF SEVERAL VARIABLES					15		

Functions of two variables – Partial derivatives – Total differentiation – Taylor's expansion – Maxima											
and Minima – Constrained maxima and minima – Lagrange's Multiplier method – Jacobian											
Determinants.											
UNIT VORDINARY DIFFERENTIAL EQUATIONS AND APPLICATIONS15											
Linear equations of second and higher order with constant and variable coefficients (Euler's and Legendre's equations) – Simultaneous first order linear equations with constant coefficients – Method of variation of parameters - Applications to electrical circuit problems.											
	LECTURE	TUTORIAL	TOTAL								
45 30 75											
ΤΕΥΤ ΡΛΛΙΖΩ.	*****										

#### **TEXT BOOKS:**

- 1. Grewal, B.S. Higher Engineering Mathematics, 40<sup>th</sup> Edition, Khanna Publication, Delhi, 2007.
- 2. Kreyszig, E, Advanced Engineering Mathematics, Eighth Edition, John Wiley and Son(Asia) Ltd, Singapore, 2001.

#### REFERENCES

- 1. Bali N.P and Narayana Iyengar, Engineering Mathematics, Laxmi Publications (P) Ltd, New Delhi, 2003.
- 2. Veerarajan T, Engineering Mathematics Fourth Edition, Tata McGraw Hill Publishing Company Ltd, New Delhi, 2005.
- 3. Kandasamy P., Thilagavathy K, and Gunavathy K, Engineering Mathematics Volume I, II and III, S. Chand & Co, New Delhi, 2005.
- 4. Venkataraman M. K, Engineering Mathematics, Volume I and II Revised enlarge Fourth Edition, The National Publishing Company, Chennai, 2004.

#### **E REFERENCES**

- 1. www.nptel.ac.in
- 2. Advanced Engineering Mathematics Prof. Pratima Panigrahi, Department of Mathematics Indian Institute of Technology, Kharagpur.

#### **CO Vs GA Mapping:**

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO 1	3	2			2					1		2
CO 2	3	1								1		1
CO 3	3	1								1		1
CO 4	3	2								1		1
CO 5	3	2			1					1		2
	15	8	0	0	3	0	0	0	0	5	0	7

COURS	SE CODE	XCP102		L	Т	P	С		
COURS	SE NAME	COMPUTER PROGRAMMING		3	0	1	4		
C:P:A		3:1:0							
				L	Т	Р	Η		
				3	3 0 2 4				
		Course Outcomes	Domain	Ι	<b>Level</b>	<u>+</u>			
001	D C			т		1			
COI	<i>Define</i> prog	tranming fundamentals and <i>Solve</i> simple	Cognitive	Guided					
	programs usi	Psychomotor			1				
CO2	Dofing synta		L L	Comor	abor				
02	structures an	d arrays	Cognitive	r C	Suideo	1001			
	structures an	u anays	Psychomotor	J L	espoi	i			
CO3	<b>Ernlain</b> and	write simple programs using functions and		I	Inders	tand			
005	pointers	while simple programs using functions and	Cognitive	(	Juideo	1			
	pointers		Psychomotor	J J	lespoi	ise			
CO4	<b>Explain</b> and	write simple programs using structures and		T	Inders	stand			
001	unions	where sumple programs using structures and	Cognitive	(	mideo	1			
	Psychomoto					ise			
CO5	<i>Explain</i> and	<i>xplain</i> and <i>write simple programs</i> using files and <i>Build</i>							
	simple projects Cognitive								
	Response								
UNIT I	L	9	+ 6						
	STA	TEMENTS							
Theory									
Program	n – Flowchart	- Pseudo code - Software - Introduction to	C language	- Cl	naract	er se	t —		
Tokens:	Identifiers, K	eywords, Constants, and Operators – sample	program struc	ture	-Head	ler fi	les		
– Data T	Types - Output	t statements – Input statements.							
Practica	al								
1. I	Program to dis	play a simple picture using dots.							
2. I	Program for ac	ldition of two numbers							
3. 1	Program to sw	ap two numbers							
4. I	Program to sol	ve any mathematical formula.							
	I CONTR	KOL STRUCTURE AND ARRAYS			9	+ 0			
Theory	C.t.man et an an an a	Conditional Control statements Describing I			(:1		1		
Control	Structures – (	Conditional Control statements: Branching, L	cooping - Unco	mai	tional	cont	roi		
Initial	ization A a	ak, continue, goto statements – Arrays. One D		ray	- Dec				
- Illuar	ization Initiali	zetion Matrix Operations Multi Dimor	g – Two Dill		Doolor	otion	8 -		
Initialize	ntion Storage	classes: auto extern static Strings: Basic c	perations on s	tring		ation	. —		
Practice	alion. Storage	classes. auto – extern – static. Strings. Dasie C	operations on s	um	35.				
1 1	a Program to fin	d greatest of 3 numbers using Branching State	ments						
1. I 2 I	Program to die	nlay divisible numbers between n1 and n2 usi	ng Looning St	aten	ient				
2. I 3 I	Program to rer	nove duplicate element in an array	ng <u>100ping</u> St	aten	ient				
5. I 4 I	Program to per	form string operations							
TINIT I		TIONS AND POINTERS			Q.	+ 6			
					,				

#### FUNCTIONS AND POINTERS 9+6

#### Theory

Functions: Built in functions - User Defined Functions - Parameter passing methods - Passing arrays to functions - Recursion - Programs using arrays and functions. Pointers - Pointer declaration - Address operator - Pointer expressions & pointer arithmetic - Pointers and function -Call by value - Call by Reference - Pointer to arrays - Pointers and structures - Pointers on pointer. **Practical** 

- 1. Program to find factorial of a given number using four function types.
- 2. Programs using Recursion
- 3. Programs using Pointers

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UNIT IV STRUCTURES AND UNIONS 9+6	

#### Theory

Structures and Unions - Giving values to members - Initializing structure - Functions and structures - Passing structure to elements to functions - Passing entire function to functions - Arrays of structure - Structure within a structure and Union.

#### **Practical**

- 1. Program to read and display student mark sheet Structures with variables
- 2. Program to read and display student marks of a class using Structures with arrays
- 3. Program to create linked list using Structures with pointers

UNIT V	FILES	9 + 6
Theory		

File management in C - File operation functions in C - Defining and opening a file - Closing a file -The getw and putw functions - The fprintf & fscanf functions - fseek function - Files and Structures.

#### **Practical**

- 1. Program for copying contents of one file to another file.
- 2. Program using files using structure with pointer

LECTURE	PRACTICAL	TOTAL
45	30	75
-		

#### **TEXT BOOKS**

- 1. Byron Gottfried, "Programming with C", III Edition, (Indian Adapted Edition), TMH publications, 2010
- 2. Yeshwant Kanethker, "Let us C", BPB Publications, 2008

#### REFERENCES

- 1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", Pearson Education Inc. (2005).
- 2. Behrouz A. Forouzan and Richard. F. Gilberg, "A Structured Programming Approach Using C", II Edition, Brooks-Cole Thomson Learning Publications, 2001.
- 3. Johnson baugh R. and Kalin M., "Applications Programming in ANSI C", III Edition, Pearson Education India, 2003.
- 4. https://iitbombayx.in/courses/IITBombayX/BMWCS101.1x/2015\_T1/courseware

#### Mapping of COs with GAs:

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	3	2			2							2
CO2	3	2			2							2
CO3	3	2	1	2	2							2
CO4	3	2	1	2	2							2
CO5	3	2	1		2			1			2	2
Scaled to 0,1,2,3 scale	3	2	1	1	2			1			1	2

COUR	L	Т	Р	C				
COUR	3	1	1	5				
~				L	Т	P	H	
C:P:A	SE AUTCAI	3:1:0	Domotin	3 T.c.	2	2	7	
	SE OUICON	VIES	Domain Cognitive and	Lev	vel	hor		
COI	various boile	ers, turbines and engines	Psychomotor	Set	nem	lbei		
CO2	Select and id metrology in	<i>lentify</i> the various machine elements and struments	Cognitive and Psychomotor	Rer Per	nem cept	ber ion		
CO3 <i>Choose and distinguish</i> the various manufacturing processes Cognitive and Psychomotor								
CO4       List and describe the classification of surveying and construction materials       Cognitive and Psychomotor								
CO5	<i>Name and e.</i> civil structur	xplain the components and construction of es	Cognitive and Psychomotor	Rer Set	nem	ber		
UNIT	I BAS	ICS OF THERMAL AND ENERGY SYST	ΓEMS	L		9+6	<b>5+6</b>	
Introdu Conver Workin engines steam a <b>Practic</b>	ction to Me ntional and r ng principles o s – Petrol and and nuclear po cal:	echanical Engineering – Streams – The non conventional sources of energy – Heat of Boilers and Turbines – Classification of diesel engines – Performance and heat bal wer plants.	ermal, Design, and energy – Modes o IC Engines – 4 stra ance – Working pri	l M f hea oke a ncip]	anuf at tr and les c	factu ansfe 2 str of hy	ring er – oke ⁄del,	
1. Load	l test on high s	speed single cylinder diesel engine with eddy	current.					
2.Load	test on 4 strok	te single cylinder petrol engine with electrica	l loading .					
UNIT	II FUNDA	MENTALS OF MACHINE ELEMENTS	AND MEASUREM	IEN'	TS	9+6	<b>5+6</b>	
<ul> <li>Engineering materials – Machine elements – fasteners and support systems – Belt drives – Types – Velocity ratio and Length of belt – Gear drives – Types – Velocity ratio.</li> <li>Principle of measurements – Accuracy – Precision – Errors – Measuring instruments – Scale – Vernier Caliper – Micrometer – Slip gauges – Spirit level.</li> <li>Practical: <ol> <li>Comparison and measurements using vernier caliper and micrometer</li> <li>Calibration of vernier using slip gauge</li> </ol> </li> </ul>								
UNIT			9+6	<b>5+6</b>				
Manufa Princip Machin	acturing proce les of metal jo ning – turning,	sses – Classification – Principles of metal fo ining – welding, soldering and brazing. drilling, milling and grinding – Machining ti	ouldii oval	ng, c rate	castir	1g —		

Practical:				
1.Plain turning				
2.Drilling and tapping				
3. Square butt joint				
4. Tee joint				
UNIT IV SURVEYING AN	<b>ID CONSTRU</b>	CTION MA	TERIALS	9+6+6
Surveying: Definition – Survey Ir	nstruments – (	Classification	of Survey – Line	ar and Angular
Measurements – Measurement of area	a – Illustrative l	Examples.	-	-
Construction Materials: Bricks – Stor	nes – Timber – S	Steel – Ceme	nt – Sand – Aggregat	es – Concrete
Practical:				
1.Determination of area and plotting	of a given site b	y chain surve	eying	
2.Running (or) Transverse using com	pass			
UNIT V COMPONENTS AN	D CONSTRU	CTION OF	CIVIL STRUCTUR	ES 9+6+6
Substructure: Bearing capacity -	Types of Four	ndation – A	pplication – Requir	rement of good
foundations.				
Superstructure: Brick masonry - Typ	bes of bond – F	looring – Bea	ams – Columns – Lin	ntels – Roofing –
Doors and windows fittings - Introdu	ction to bridges	s and dams –	Building drawing	
Practical:				
1 Helf lon joint				
2 Mortise and tenen joint				
2. Wortise and tenon joint.	IFCTURE	TUTORI	PRACTICAL	ΤΟΤΑΙ
	LECIURE		INACIICAL	IOIAL
	15	AL 30	30	105
ΤΕΧΤ ΒΟΟΚς.		30	50	105
1 Dr DK Srividhya P Pan	divarai S Bala	murugan "P	asic Civil and Mecha	nicol
Fngineering" PMU Public	cations Vallam	2013		lineal
2 Dr B C Punmia Ashok K	umar Iain "Ba	sic Civil Eng	ineering" Laxmi Pub	lications New
Delhi 2003	unnar Jann, Da	Sie Civii Liig.		ineations, ivew
3 Dr. B.C. Punmia "Surveying	v – Volume I"	Laxmi Public	ations New Delhi 20	005
REFERENCE BOOKS				
1 Venugonal K Basic Mee	hanical Engine	ering Anurad	ha Publications Kum	ubakonam 2007
2 Shanmugam G and Palan	ichamy M S "	Basic Civil a	nd Mechanical Engin	eering" Tata Mc
Graw Hill Publishing Co.	New Delhi, 3rd	d Edition, 200	)9	coming , ruta tric
E RESOURCES		<i>a</i> <b>Dantion</b> , <b>2</b> 00	····	
1.http://nptel.jitm.ac.in/courses				
2.http://www.intechopen.com/books				
Mapping of CO's with GA's:				
11 0				

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	2	-	-	2	-	-	-	-	-	-	-	-
CO2	2			2		1	I	-	-	-	-	-
CO3		2			2	-	-	-	-	-	-	-
CO4		3		1		-	-	-	-	-	-	-
CO5	1	1			3	-	-	-	-	-	-	-
Total	5	6	-	5	5	1	-	-	-	-	-	-

COUR	SE CODE	L	Т	P	С				
COUR	SE NAME	APPLIED CHEMISTRY		3	1	1	5		
PRER	EQUISITES			L	Т	Р	H		
C:P:A		2.8:0.8:0.4		3	2	2	7		
COUR	SE OUTCOM	TES	Domain		Lev	vel			
<b>CO1</b>	<i>Identify</i> and and methods domestics us	describe the various water quality parameters to purify water in contest with boilers and age.	Cognitive Psychom	e & otor	Uno Per	derstar ceptio	nd, n		
CO2	e & otor	Cre	eate, Se	et					
CO3	<i>Interpret</i> the control by techniques.	e types of corrosion, <i>use and measure</i> its various methods including protective	Cognitive Psychom &Affective	e, otor ve	Ap Me Rec	oply, chanis ceiving	em, g		
CO4	<i>Describe</i> , <i>Ill</i> in batteries, anaerobic dig	<i>ustrate</i> and <i>Discuss</i> the generation of energy nuclear reactors, solar cells, fuel cells and gestion.	Cognitive Affective	e &	Re Ana Res	Remember, Analyze, Respond			
CO5	<i>Apply</i> and techniques f nanomaterial	<i>measure</i> the different types of spectral for quantitative chemical analysis and <i>list</i> <i>'s</i> for various engineering processes.	Cognitive	e	Apj Me	ply, chanis	m		
Theory	y Part								
UNIT - Sources and est water - treatme	- I WATE s and types of timation of ha - requirements ent – deminer ent - Effluent tr	<b>R TECHNOLOGY</b> water – water quality parameters – BIS and ISC rdness (problems) - alkalinity: types and estin – disadvantages of using hard water in boiler alization process – desalination using revers reatment processes in industries	) specifica nation (pro rs – intern e osmosis	utions obler al tr s –	s- hare ns) – eatme dom	7 + 8 dness: boiler ent, ex nestic	+9 types r feed ternal water		
	- II ELECT	TROCHEMISTRY	•			8+5 +	15		
Basic concepts of conductance – Kohlraush's law and conductometric titrations –electrodepotentials– Nernst equation: derivation and problems - reversible and irreversible cells – electrolyticand electrochemical cells – emf and its measurements - types of electrodes-reference electrodes -primary and secondary - glass electrode - determination of pH using quinhydrone and glasselectrodes - electrochemical series and its applications - Galvanic cells and concentration cells -potentiometric titrations - redox titrations.UNIT – IIICORROSION AND PROTECTIVE COATINGS9 + 4 + 3									
Corrosion- causes- types-chemical, electrochemical corrosion (galvanic, differential aeration), corrosion in electronic devices, corrosion control - material selection and design aspects - electrochemical protection – sacrificial anode method and impressed current cathodic method. <b>Protective coatings</b> : paints- constituents and functions - electroplating of copper and gold,									

Electroless plating - Distinction between electroplating and electroless plating, advantages of electroless plating, electroless plating of nickel and copper on PCB.

#### UNIT –IV ENERGY STORAGE DEVICES AND NUCLEAR ENERGY 12 + 7

Energy storage devices - Batteries: Types - primary (dry cell, alkaline cells) and secondary (lead acid, Ni-Cd and Lithium ion batteries) - Super capacitors - Fuel cells-Hydrogen-Oxygen fuel cell-Solar cells .

**Nuclear energy**: nuclear fission and fusion –chain reaction and its characteristics – nuclear energy and calculations (problems) – atom bomb –Nuclear reactor- light water nuclear power plant – breeder reactor- Weapon of mass destruction- nuclear, radiological, chemical and biological weapons. Disarmament - National and International Cooperation- Chemical Weapon Convention (CWC), Peaceful Uses of Chemistry. Bio fuels: biomethanation- anaerobic digestion process, biomass: sources and harness of energy.

UNIT –V	SPECTROSCOPY AND NANOCHEMISTRY	9 +6 +3

Electromagnetic spectrum - Lambert law and Beer-Lambert's law (derivation and problems) – molecular spectroscopy -UV- visible spectroscopy: electronic transitions - chromophores and auxochromes – instrumentation (block diagram) - applications – IR spectroscopy: principle – fundamental modes of vibrations – calculations of vibrational frequency – IR spectrophotometer instrumentation (block diagram) – applications of IR spectroscopy.

**Nano chemistry** - Basics - distinction between molecules, nanoparticles and bulk materials; sizedependent properties. Nanoparticles: Nanocluster, nanorod, nanotube and nanowire. Synthesis ; properties and applications of nano materials-Buckminster fullerenes, CNT"S(Single walled carbon nano tubes and Multi-walled carbon tubes)-Graphene- advantages and applications.

#### **TEXT BOOKS**

- Jain and Jain, "A Text book of Engineering Chemistry", Dhanapatrai Publications, New Delhi, 2011.
- 2. Gadag and Nityananda Shetty, "Engineering Chemistry", I.K International publishing House Pvt. Ltd, 2010.
- 3. P. Atkins, J.D. Paula, "Physical Chemistry", Oxford University Press, 2009.
- 4. S. S. Dara, S. S. Umare, "A Text Book of Engineering Chemistry", S. Chand Publishing, 2011
- 5. C.P. Poole and F.J. Owens, "Introduction to Nanotechnology", Wiley, New Delhi ,2007.

#### REFERENCES

- 1. Puri B R Sharma L R and Madan S Pathania, "Principles of Physical Chemistry", Vishal publishing Co., Edition 2004
- 2. Kuriocose, J C and Rajaram, J, "Engineering Chemistry", Volume I/II, Tata McGraw-Hill Publishing Co. Ltd. New Delhi, 2000

#### **E RESOURCES - MOOCs:**

- 1. http://www.mooc-list.com/course/chemistry-minor-saylororg
- 2. https://www.canvas.net/courses/exploring-chemistry
- 3. http://freevideolectures.com/Course/2263/Engineering-Chemistry-I
- 4. http://freevideolectures.com/Course/3001/Chemistry-I
- 5. http://freevideolectures.com/Course/3167/Chemistry-II
- 6. http://ocw.mit.edu/courses/chemistry/

#### **Laboratory Part**

**30 hrs** 

1. Determination of total hardness, temporary and permanent hardness of water by EDTA method.

- 2. Determination of alkalinity of water sample.
- 3. Determination of chloride content of water sample by Argentometric method.
- 4. Conductometric titration of a strong acid with a strong base.
- 5. Determination of strength of hydrochloric acid by pH metric method.
- 6. Conductometric precipitation titration using barium chloride and sodiumsulphate.
- 7. Determination of strength of iron by potentiometric method using dichromate.
- 8. Potentiometric acid-base titration using quinhydrone electrode.
- 9. Corrosion inhibition efficiency by weight loss method.
- 10. Estimation of iron by colorimetric method.

#### REFERENCES

- 1. Mendham, Denney R.C,. Barnes J.D and Thomas N.J.K., "Vogel's Textbook of Quantitative Chemical Analysis", 6th Edition, Pearson Education, 2004.
- 2. Garland, C. W.; Nibler, J. W.; Shoemaker, D. P. "Experiments in Physical Chemistry", 8th Ed.; McGraw-Hill: New York, 2003.
- **3.** Sirajunnisa.A., Sundaranayagi.S.,Krishna.,Rajangam.R.,Gomathi.S., "Applied Chemistry Lab Manual", Department of Chemistry, PMU Press, Thanjavur, 2016.

#### **E-RESOURCES** - MOOCs:

1.http://freevideolectures.com/Course/2380/Chemistry-Laboratory-Techniques 2. http://freevideolectures.com/Course/2941/Chemistry-1A-General-Chemistry-Fall-2011 3.http://ocw.mit.edu/courses/chemistry/5-301-chemistry-laboratory-techniques

LECTURE	TUTORIAL	PRACTICAL	TOTAL
45	30	30	105

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	3	3	3			1	2	1	1	1		2
CO2	2	1	0			1		1	1			1
CO3	3	3	3	2	2	1	2		1	1		1
<b>CO4</b>	3	3	2	2	2	1	2		1	1		1
CO5	2	2	1	1	1	1	1	1	1			1
Total	13	12	9	5	5	5	7	3	5	3		6
Scaled to 0,1,2,3 scale	3	3	2	1	1	1	2	1	1	1		2

#### Mapping of CO's with GA's:

COUR	SE CODE	L	T	Р	SS	С			
COUR	SE NAME	Study Skills and Language Laboratory		1	0	0	2	1	
PRER	EOUISITES			т	T	n	gg	тт	
	- <b>(</b>			L	L	P	22	Н	
C:P:A		1.8:0.6:0.6		1	0	0	2	3	
COUR	SE OUTCOM	IES	Domain		Lev	el	1	<u>.</u>	
CO1	<i>Identify</i> diffe	erent strategies of reading and writing skills.	Cognitive		Ren	nembe	ering		
CO2	<i>Revise</i> the lil	brary skills in their learning process.	Affective		Inte	rnaliz	e		
CO3	<i>Apply</i> different as a novel, papers.	ent techniques to various types of material such newspaper, poem, drama and other reading	Cognitive		Ap	ply			
CO4	<i>Use</i> visual a discourse.	Cognitive		Un	dersta	nd			
CO5	<b>Prepares</b> to f without any f	Cognitive Psychome	e & Understand, notor Guided Respon						
UNIT	I INTRO	DUCTION TO STUDY SKILLS							
Learnir	ng Skills and S	trategies of Learning; Cognitive Study skills and	physical st	udy	skills	, Libr	ary sł	cills	
(How to	o use Library),	, familiarization of library facilities by the librari	an; familiar	izati	on of	basic			
	uing technique	es, how to ransack the library etc.						5	
UNII I How to	use the libror	KENCE SKILLS	· how to fir	d ou	t rafa	ronoo	book	3	
articles	iournals and	other e- learning materials: how to use a dictiona	rv and thes	aurus	. 1010 5.	Tence	UUUK	.5,	
UNIT	II READ	DING RELATED STUDY SKILLS						5	
Process	s of reading, va	arious types of reading materials and varied readi	ng techniqu	ies; f	amili	arizat	tion to	)	
materia	ls written by v	various authors; features of scientific writing and	familiariza	tion	to sci	entifi	c writ	ing	
by reno	wned authors;	note making skills							
UNIT ]	IV WRIT	ING RELATED STUDY SKILLS						5	
Process	s of writing, ch	aracteristics of writing, discourse analysis, use o	f visual aid	s, an	d not	e mak	ting a	nd	
note tal	king skills							_	
UNII	V EXA	M PREPARATION SKILLS	valuation to	ahni		ata		5	
	UACE LAR (	Practical)		ciiiii	lues	elc.			
SOUN	DS OF ENGI	JSH LANGUAGE:						5	
Vowels, consonants, diphthongs, word stress, sentence stress, intonation patterns, connected speech								U	
etc									
VOCABULARY BUILDING									
Grammar, synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, idioms									
and phrases.									
READ	ING COMPR	EHENSION						10	
Readin	Reading for facts, meanings from context, scanning, skimming, inferring meaning, and critical								
reading	. Active listen	ing, instening for comprehension etc.							

		LECTURE	SELF STUDY	TOTAL
		15	30	45
TEXT	BOOKS		<b>b</b>	
Appro	opriate Chapters/Units from the following textboo	oks		
1.	V.R. Narayanaswamy ,Strengthen Your Writing Or	ient Longman, 2	2000	
2.	Ghosh, R N; Inthira, S R, A Course in written Engli	sh: Oxford Uni	v Press, New Delh	i, 2001
3.	Jaya Sasikumar, Champa Tickoo, Writing With A F	Purpose, Publish	ed by Oxford Univ	versity Press
	2000			
4.	Freeman, Sarah: Study Strategies. New Delhi: Oxfo	rd University P	ress, 1979	
5.	Paul Gunashekar M.L. Tickoo, Reading for Meanin	g, S. Chand & O	Company Ltd., 200	)0
6.	Bernard Hartley, Peter Viney, Streamline English: I	Departures, Oxf	ord English, 1990.	
7.	Bernard Hartley, Peter Viney, Streamline English: I	Destinations, Ox	ford: Oxford Univ	versity Press
	1992.			
8.	Bernard Hartley, Peter Viney, Streamline English D	virections, Oxfo	rd University Press	s 1982.
REFE	RENCE BOOKS			
1.	Jaya Sasikumar, Champa Tickoo, Writing With A F	urpose, <u>Oxford</u>	University Press 2	2001.
	Freeman, Sarah: Study Strategies. New Delhi: Oxfo	rd University P	ress, 1979.	
2	Reading for Meaning, Paul Gunashekar M L. Tic	koo. Published	by S. Chand & C	Company Lt

- 2. Reading for Meaning, Paul Gunashekar M.L. Tickoo, Published by S. Chand & Company Ltd. Sultan Chand & Company, 2000
- 3. <u>Susan Fawcett</u> Evergreen: A Guide to Writing with Readings Paperback January 4, 2013.

Mapping	of	COs	with	GAs:
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	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	0	0	0	0	0	0	0	1	1	2	0	0
CO2	0	0	0	0	0	0	0	0	0	2	0	0
CO3	0	0	0	0	0	0	0	0	0	1	0	0
CO4	0	0	0	0	0	0	0	0	0	0	1	0
CO5	0	0	0	0	0	0	0	1	1	1	1	0
Total	0	0	0	0	0	0	0	2	2	6	2	0
Scale	0	0	0	0	0	0	0	1	1	2	1	0

1-5=1, 6-10 = 2, 11-15=3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

COUR	SE CODE		L	Т	P		С		
COUR	SE NAME	ITS AND	1	0	0		1		
PRER	EQUISITES				L	Т	P	SS	H
C:P:A		2.7:0:0.3			1	0	0	2	3
COUR	SE OUTCON	IES		Domain		Le	vel		<u>l</u>
CO1	<i>Relate</i> and relationships	Interpret the human ethics	and human	Cognitive		Re: Un	men ders	nber, standi	nσ
CO2	<i>Explain</i> and against wome	<i>Apply</i> gender issues, equality en	and violence	Cognitive		Un Ap	ders plyi	standi ng	ng,
CO3	<i>Classify</i> and their violatio	Cognitive & Affective		An Re	alyz ceiv	zing ving			
CO4	Classify and on violations	<i>Dissect</i> necessity of human rig	hts and report	Cognitive		Un An	ders alyz	standi ze	ng,
CO5	<i>List</i> and resp fight agains governance.	<b>bond</b> to family values, universa t corruption by common ma	l brotherhood, an and good	Cognitive & Affective		Re (Re	men espc	nber, ond)	
UNIT	I HUN	IAN ETHICS AND VALUES							7
Soc Soc ope har	cial service, S ciety, Integrity eration, Comn mony at variou	ocial Justice, Dignity and wo and Competence, Caring and hitment, Sympathy and Empa is levels.	rth, Harmony ir Sharing, Honesty thy, Self-Confid	h human rela y and Courag dence and Po	tions e, Va ersor	ship alui nalit	: Fa ng ] y-	Time, Livin	and Co- g in
UNIT	II Gl	ENDER EQUALITY							9
Ger emj GD Em	nder Equality powerment. St DI, GEM. Co ppowerment.	- Gender Vs Sex -, Con atus of Women in India Social, ntributions of Dr.B.R. Ambe	cepts, definition Economical, Edu ethkar, Thanthai	n, Gender e ucation, Healt i Periyar and	quity h, Eı d Pl	y, e mple hule	equa oyn e to	ality, nent, l ) Wc	and HDI, omen
UNIT	III W	VOMEN ISSUES AND CHAL	LENGES						9
Wo Dor Me Me	omen Issues a mestic violend asures – Acts dical Terminat	nd Challenges- Female Infant ce, Sexual Harassment, Traffi related to women: Political tion of Pregnancy Act, and Dow	icide, Female fo cking, Access t Right, Property vry Prohibition A	beticide, Violeto education, Rights, and act.	ence Ma Rigł	ag rria nts	ains ge. to E	t wor Remo Educa	men, edial tion,
UNIT	IV HU	UMAN RIGHTS							9
Hu Du Cul	Human Rights Movement in India – The preamble to the Constitution of India, Human Rights and Duties Universal Declaration of Human Rights (UDHR), Civil, Political, Economical, Social and Cultural Rights, Rights against torture, Discrimination and forced Labour, Rights of Children.								
UNIT V GOOD GOVERNANCE AND ADDRESSING SOCIAL ISS									11
Goo Tra Goo Coo	od Governand insparence go vernment syste mmissions, Cre	ce - Democracy, People's vernance, Combating corrupt em of Redressal, Judiciary, Nati eation of Human Rights Literac	Participation, G ion, Fairness ir onal Human Rig y and Awareness	Guaranteed F n criminal ju hts Commissi	reedo stice on a	oms e ao nd c	, C dmi othe	Open nistra r statı	and tion, itory
			LECTURE	SELF STUDY			'	ΤΟΤ	AL

	15	30	45
REFERENCES			
1. Alam, Aftab ed., Human Rights in India Publications,)	: 1999Issues and	Challenges (1	New Delhi: Raj
2. Bajwa, G.S. and D.K. Bajwa, 1996 Hum (New Delhi: D.K. Publications,)	an Rights in Indi	a: Implementa	tion and Violations
3. Chatrath, K. J. S., (ed.), 1998) Education Institute of Advanced Studies).	for Human Rights	and Democra	cy (Shimala: Indian
4. Jagadeesan.P., 1990. Marriage and Social l	egislations in Tam	il Nadu, Elach	iapen pub, Chennai,
5. Kaushal, Rachna, 2000 Women and Huma	n Rights in India (	New Delhi: Ka	veri Books,)
6. Mani. V. S., 1998)Human Rights in India:	An Overview (Ne	w Delhi: Instit	ute for the World
Congress on Human Rights, )			
7. Singh Sehgal, B. P. 1999 (ed) Human Rig Deep and Deep,)	ghts in India: Prob	lems and Persp	ectives (New Delhi:
8. Veeramani K. (1996), Periyar on Women	Right, Emerald Pu	blishers, Chen	nai , India.

	PO	<b>PO1</b>	<b>PO1</b>	<b>PO1</b>	PSO	PSO								
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1		2						2						
CO2								3	2	1				
CO3								2	2	2				
CO4								3		2		2		
CO5								3	2	2		2		
Total		2						13	6	7		4		
Scale d Value		1						3	2	2		1		

#### COs Versus CPA (Learning Domain) mapping

#### $1-5 \rightarrow 1$ , $6-10 \rightarrow 2$ , $11-15 \rightarrow 3$

0-No relation, 1-Low relation, 2-Medium relation, 3-High relation

#### **II SEMESTER**

COU	RSE CODE		L	Т	P	С		
COU	RSE NAME	CALCULUS AND LAPLACE		3	1	0	4	
		TRANSFORMS						
PRER	EQUISITE:	Basic concepts of Differentiation, Integ	ration,					
		Vectors and Complex numbers.						
C:P:A		3:0:0		L	Τ	P	H	
				3	2	0	5	
COU	RSE OUTCOM	ES	Domain	I	Level		4	
CO1	Make Use of	standard results to <i>Find</i> the Laplace	Cognitive	I	Remen	ıberir	ıg	
	transforms of a		A	Apply				
	differential equ							
CO2 Apply multiple integral concepts to Find the area, Cognitiv						ıberir	ıg	
	volume and to		A	Apply				
CO3	Define the gra	idient, divergent curl of vectors. Find	Cognitive	F	Remen	ıberir	ng	
	directional de	rivative, unit vector normal to the		A	Apply			
	surface. <i>Apply</i>	Corresponding theorems to <i>Find</i> the						
~~.	line, surface ar	d Volume integrals.	~ · ·					
CO4	<i>Construct</i> and	examine the analytic functions, and	Cognitive	ι	Unders	tandi	ng	
	their complex	Conjugate and to <i>Explain</i> the concept		I	Apply			
	of cor	formal mapping and to <b>Construct</b> the						
CO5	bilinear transfo	ormation.	<u></u>	т	T J	4 1:		
COS	<i>Explain</i> the functions and	to solve the problems using contour	Cognitive	l	Understanding			
	integration	to solve the problems using contour		ľ	чрргу			
UNIT		TRANSFORMS					15	
Transf	forms of elemen	tary functions - properties - derivative	es and inter	orals	of tra	nsfor	13 ms_	
Transf	forms of derivation	tives and integrals - Transforms of u	nit sten fu	nctio	n and	imn	ulse	
functio	on - Transform	of periodic functions – Convolution Th	neorem – I	nvers	se tran	sform	ns –	
Solutio	ons of differentia	al and integral equations.						
UNIT	II MULTIPI	LE INTEGRALS					15	
Doubl	e integration – (	Cartesian and polar coordinates – chang	e of order	of in	tegrati	on - a	area	
as a d	ouble integral –	change of variables between Cartesian	and polar	coor	dinate	s - tr	iple	
integra	ation Simple a	pplications (Finding area & volume of a	certain reg	ion).				
UNIT	III VECTO	R CALCULUS					15	
Gradie	ent, divergence a	nd curl - directional derivative – normal	and tanger	nt to	a give	n surf	face	
– angl	e between two s	surfaces - irrotational and solenoidal ve	ctor fields	- Lir	ne, Sui	face	and	
Volume Integral - Green's theorem in a plane, Gauss divergence theorem and							ce's	
theore	theorem (excluding proof).							
UNIT IV ANALYTIC FUNCTIONS							15	
Function of a complex variable – analytic function – necessary and su						condi	tion	
(exclu	ding proof) – Ca	auchy Riemann equations – properties o	f analytic f	uncti	ons - l	narmo	onic	

coshz	$k^2$ - Bilinear transformation			$\sim$
COSIL	$z = \frac{z}{z}$			
UNIT	<b>CV</b> COMPLEX INTEGRATION			15
State	ment and application of Cauchy's integral th	eorem and inte	gral formula - T	aylor's and
Laure	nt's expansion - Residues - Cauchy's Residu	e Theorem - C	ontour integratio	on over uni
circle.	•			
		LECTURE	TUTORIAL	TOTAL
		45	30	75
TEXT	Γ			
1	. Grewal, B.S. Higher Engineering Mathema	tics, 41 <sup>st</sup> Editi	on, Khanna Publ	ication,
	Delhi, 2011.			
2	Delhi, 2011. . Kreyszig, E, Advanced Engineering Mather	matics, Eighth I	Edition, John Wi	ley and
2	Delhi, 2011. Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.	natics, Eighth I	Edition, John Wi	ley and
2 <b>REFE</b>	Delhi, 2011. . Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001. ERENCES	natics, Eighth I	Edition, John Wi	ley and
2 <b>REFI</b> 1.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering</li> </ul>	matics, Eighth I g Mathematics,	Edition, John Wi Laxmi Publicati	ley and ons (P)
2 <b>REFF</b> 1.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> </ul>	natics, Eighth I g Mathematics,	Edition, John Wi Laxmi Publicati	ley and ons (P)
2 <b>REFI</b> 1. 2.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineerin Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta	Edition, John Wi Laxmi Publicati ata – McGraw Hi	ley and ons (P)
2 <b>REFI</b> 1. 2.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005</li> </ul>	natics, Eighth I g Mathematics, urth Edition, Ta	Edition, John Wi Laxmi Publicati ata – McGraw Hi	ley and ons (P)
2 <b>REFH</b> 1. 2. 3.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mathen Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav</li> </ul>	natics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati	ley and ons (P) ill cs Volume
2 <b>REFH</b> 1. 2. 3.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05.	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati	ley and ons (P) ill cs Volume
2 <b>REFH</b> 1. 2. 3. 4.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mathen Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20 Venkataraman M. K, Engineering Mathematics</li> </ul>	natics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05. utics, Volume I	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati and II Revised e	ley and ons (P) ill cs Volume nlarge
2 <b>REFH</b> 1. 2. 3. 4.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mather Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineerin Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20 Venkataraman M. K, Engineering Mathemat Fourth Edition, The National Publishing Composition</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05. atics, Volume I ompany, Chenna	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati and II Revised e ai, 2004.	ley and ons (P) ill cs Volume nlarge
2 <b>REFH</b> 1. 2. 3. 4. <b>E RE</b>	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mathen Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20 Venkataraman M. K, Engineering Mathema Fourth Edition, The National Publishing Co</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05. utics, Volume I ompany, Chenna	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati and II Revised e ai, 2004.	ley and ons (P) ill cs Volume nlarge
2 REFF 1. 2. 3. 4. E RE	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mathen Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20 Venkataraman M. K, Engineering Mathema Fourth Edition, The National Publishing Co</li> <li>FERENCES</li> <li>ww.nptel.ac.in</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05. atics, Volume I ompany, Chenna	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati and II Revised e ai, 2004.	ley and ons (P) ill cs Volume nlarge
2 <b>REFH</b> 1. 2. 3. 4. <b>E RE</b> <u>W</u> 1.	<ul> <li>Delhi, 2011.</li> <li>Kreyszig, E, Advanced Engineering Mathen Son(Asia) Ltd, Singapore, 2001.</li> <li>ERENCES</li> <li>Bali N.P and Narayana lyengar, Engineering Ltd, New Delhi, 2003.</li> <li>Veerarajan T, Engineering Mathematics For Publishing Company Ltd, New Delhi, 2005 Kandasamy P., Thilagavathy K, and Gunav I, II and III, S. Chand &amp; Co, New Delhi, 20 Venkataraman M. K, Engineering Mathema Fourth Edition, The National Publishing Co</li> <li>FERENCES</li> <li>ww.nptel.ac.in Advanced Engineering Mathematics Prof.</li> </ul>	matics, Eighth I g Mathematics, urth Edition, Ta athy K, Engine 05. utics, Volume I ompany, Chenna Jitendra Kumar	Edition, John Wi Laxmi Publicati ata – McGraw Hi ering Mathemati and II Revised e ai, 2004.	ley and ons (P) ill cs Volume nlarge

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO 1	3											1
CO 2	3											1
CO 3	3	2								1	1	2
CO 4	3	2			1					1	1	1
CO 5	3	2			1					1	1	1
	15	6	0	0	2	0	0	0	0	3	3	6

COURSE CODEXEM 202LTPCOURSE NAMEENCOMPENDIC MECHANICS210											
COUI	RSE NAME	<b>ENGINEERING MECHA</b>	NICS		3	1	0	4			
PRER	<b>REQUISITE:</b>										
C:P:A	L	2.6: 0.2: 0.2			L	Т	Р	Η			
					3	2	0	5			
COUI	RSE OUTCOM	ES	]	Domain	I	leve	l				
CO1	<i>Identify</i> and support conc	<i>choose</i> various types of 1 litions that act on str	oading and uctural and	Cognitive	τ	Understand					
CO2	<i>Apply</i> pertinen mechanics pri problem.	t mathematical, physical and inciples to the system to	engineering predict the	Cognitive	F	Application					
CO3       Apply knowledge on the concepts of centroid and moment of inertia of various sections and solids.       Cognitive & Applic Development								on )			
CO4Model the problem using free-body diagrams and accurate equilibrium equations and finding the solution.Cognitive & PsychomotorAnalyze, Model											
CO5	<i>Develop</i> conce and dynamics and analysis involving kine	epts of friction, rigid body with an emphasis on the and solving simple dynami matics and momentum.	kinematics e modeling c problems	Cognitive	C	Creat	e				
UNIT	I BASICS A	ND STATICS OF PARTIC	LES		i			15			
Introd	uction - Units a	nd Dimensions - Laws of Me	echanics –Cop	lanar and	No	Non coplanar					
Forces	s - Resolution a	and Composition of forces	- Equilibrium	of a particl	e -	Equ	ival	ent			
system	ns of forces - Pri	nciple of transmissibility – si	ngle equivalen	t force.							
UNIT	II EQUILIB	RIUM OF RIGID BODIES						15			
Free equilit three c	body diagram prium – Equilibr limensions.	- Types of supports and t ium of Rigid bodies in two d	heir reactions imensions - Ec	- requirem	ents rigi	of d bo	sta dies	ble in			
UNIT	III PROPER	RTIES OF SURFACES ANI	D SOLIDS					15			
Deterr produc mome	nination of Area et moments of pl nt of inertia – M	as and Volumes - First mom lane area - Parallel axis theore lass moment of inertia - relati	ent of area and em and Perpen on to area mon	d the centroi dicular axis nent of inerti	d - theo a.	seco rem	nd a - Po	ind Mar			
UNIT	IV DYNAMI	CS OF PARTICLES						15			
Displa	cement, Velocit	y and Acceleration - their rel	ationships - R	elative motio	on -	Curv	vilin	ear			
motio	n - Newton's La	aw - Work Energy Equation	of particles -	Impulse and	d M	ome	ntur	n -			
Impact of elastic bodies.											
UNIT	V ELEMENI	<b>IS OF RIGID BODY DYNA</b>	MICS AND I	FRICTION				15			
Transl	ation and Rotati	on of Rigid Bodies - Velocit	y and accelerat	tion - Genera	al Pl	ane	mot	ion			
- Mor	nent of Momer	ntum Equations - Rotation	of rigid Body	- Work er	lerg	y eq	uati	on.			
Frictic	onal Force - Law	vs of Coulomb friction - Sim	ple Contact fri	ction - Rolli	ng F	esis	tanc	:e -			
Dell F			IFCTUDE	ΤΙΤΛΟΙΑ	T	т∩	TA	т			
			45	30		75		•			
			т <b>.</b>	50		15					

TEXT	BOOKS
1.	D.S.Kumar "A text book of Engineering Mechanics" Publishers S.K.Kataria and
	Sons , 2012
2.	R.S.Khurmi "A Textbook of Engineering Mechanics", S. Chand Publishers, 2011
3.	Engineering Mechanics: Statics (14th Edition) by Russell C. Hibbeler, Best Sellers,
	2015
4.	Engineering Mechanics: Dynamics (14th Edition) by Russell C. Hibbeler, Best
	Sellers, 2015
5.	Velusami.M.A. "Engineering Mechanics with Vector Approach": S.Chand Publishers,
	2012
6.	J. L. Meriam, L. G. Kraige "Engineering Mechanics: Dynamics", Sixth Edition 2012
REFE	RENCES
1.	Beer F.P and Johnson E.R., "Vector Mechanics for Engineers – Statics and
	Dynamics", Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2001.
2.	K.V.Natarajan, "Engineering Mechanics", Dhanalakshmi Publishers, Chennai, 2006.
3.	Chandramouli, Engineering Mechanics, PHI Learning Pvt Ltd, 2011
	Jayakumar and Kumar, Engineering Mechanics, PHI Learning Pvt Ltd, 2013

### Mapping of CO's with PO's:

	PO	PSO	PSO2								
	1	2	3	4	5	6	7	8	9	1	
CO 1	3	3									
CO 2	3	3									
CO 3	3	3									
CO 4	3	3									
CO 5	3	3									

COURSE CODEXBW 203LTPCCOURSE NAMEELETERICAL AND ELETERONICS2115									
COU	RSE NAME	ELETRICAL AND ELETRONICS	)	3	1	1	5		
		ENGINEERING SYSTEMS							
~		2.1.2		-	-	-			
C:P:A		3:1:0		L	Т	Р	H		
				3	2	2	7		
COU	RSE OUTCOM	IES	Domain	L	level		±		
CO1	Describe AC	and DC circuits and measuring	Cognitive	R	lemen	ıberir	ıg,		
	devices. Cons	truct and test AC, DC circuits and	Psychomoto	or N	Mechanism,				
	measuring dev	ices		S	Set				
CO2	Explain differ	Cognitive	R	lemen	nberir	ıg,			
		Psychomoto	or S	et					
CO3	Describe sem	Cognitive							
	input output	characteristics of basic	Psychomoto	or U	Inders	tand,	Set		
	semiconductor								
CO4	<i>Explain</i> logic	gates and their applications and	Cognitive						
	construct and	<i>verify</i> the logic gates and construct	Psychomoto	or I	Under	stand			
	simple adders a	and sub tractors using logic gates.							
CO5	<b>Describe</b> micro	oprocessors in detail.	Cognitive	R	lemen	nberir	ıg		
UNIT	I FUNDAME	NTAL OF DC AND AC CIRCUITS			10+9+20				
01,111	MEAS	SUREMENTS							
Funda	mentals of DC-	– Ohm's Law – Kirchoff's Laws -	Sources - V	oltag	e and	Cur	rent		
relatio	ns –Star/Delta	Transformation - Fundamentals of AC	2 – Average	Value	e, RM	S Va	lue,		
Form 1	Factor - AC por	wer and Power Factor, Phasor Represe	ntation of sin	nusoi	dal qu	antiti	es -		
Simple	e Series, Paralle	el, Series Parallel Circuit - Operating	Principles of	of Mo	oving	coil	and		
Movin	g Iron Instrume	ents (Ammeter, Voltmeter) and Dynam	nometer type	mete	rs (W	att m	eter		
and Er	ergy meter).				1				
UNIT	II F	ELECTRICAL MACHINES			8+9	9	~~		
Constr	uction, Princip	le of Operation, Basic Equations,	Types and	Appli	cation	of	DC		
Genera	ators, DC motor	rs - Basics of Single Phase Induction M	lotor and Th	ree P	hase I	nduc	tion		
Motor	- Construction,	Principle of Operation of Single P	hase Transfo	ormer	, Thre	ee ph	lase		
	TIT	SEMICONDUCTOD DEVICES			0 1 /	2 . 5			
Classi	fication of Sami	iconductors Construction Operation	and Characta	ristics	9 <b>-</b> .	June	tion		
Diode	– Zener Diode	PNP NPN Transistors Field Effect T	ransistors and	d Sili	con C	ontro	lled		
Rectifi	er – Application		i diisistoi s diiv			onuo	neu		
UNIT	9+0	6 + 5							
Basic of Concepts of Number Systems, Logic Gates, Boolean Algebra. Adders.							ors.		
multiplexer, demultiplexer, encoder, decoder, Flip-flops, Up/Down counters, Shi							rs.		
UNIT V INTEL PROCESSORS 9									
Archit	ecture, 8085, 80	086 - Interfacing Basics: Data transfer	concepts –S	imple	Prog	ramm	ning		
concep	ots.	-	-	-	0		-		
-									

#### **PRACTICALS:**

#### ELECTRICAL LABORATORY

- 1. Study of Electrical Symbols, Tools and Safety Precautions.
- **2.** Calibration of Ammeter, Voltmeter, Wattmeter, Energy meter, Multimeter and Lux meter.
- 3. Study of Transformation ratio of Transformer.
- 4. Verification of AC Voltage, Current and Power in
  - a) Series connection of lamps.
  - b) Parallel connection of lamps.
- 5. Fluorescent lamp connection with choke.
- 6. Staircase Wiring.
- 7. House wiring connection.

#### **ELECTRONICS LABORATORY**

- 1. Study of Active and Passive elements Resistors, Inductors and Capacitors.
- 2. Study of Signal Generators, Power Supplies and Voltage Regulators.
- 3. Study of Bread Board and Printed Circuit Board.
- **4.** Testing of DC Voltage and Current in series and parallel resistors which are connected in breadboard by using Voltmeter, Ammeter and Multimeter.
- 5. Measuring input signal magnitude and frequency by using Cathode Ray Oscilloscope.
- **6.** Forward and Reverse bias characteristics of PN junction diode. Forward and Reverse bias characteristics of Zener diode.
- 7. Verification of Truth Tables by Logic Gates.

		LECTURE	TUTORIAL	PRACTICALS	TOTAL
		45	30	30	105
TEXT	BOOKS			•	
1.	Mittle, V. N., 199	0. Basic Electrica	al Engineering. New	v Delhi: Tata McGraw	-Hill.
2.	Malvino, A. P., 20	006. Electronics I	Principles. 7th ed. No.	ew Delhi: Tata McGra	aw- Hill.
3.	Rajakamal, 2007.	Digital System-H	Principle & Design.	2 <sup>nd</sup> ed. Pearson Educa	ation.
4.	Moris Mano, 1999	9. Digital Design	. Prentice Hall of In	dia.	
5.	Ramesh, S. Gaon	kar, 2000. Micro	oprocessor Archited	cture, Programming a	ind its
	Applications with	the 8085. $4^{th}$ ed.	India: Penram Inter	national Publication	ons.
REFE	RENCES				
1.	Corton, H., 2004.	Electrical Techn	ology. CBS Publish	ers & Distributors.	
2.	Syed, A. Nasar, E	lectrical Circuits	. Schaum Series.		
3.	Jacob Millman a	nd Christos, C.	Halkias, 1967. El	ectronics Devices. N	ew Delhi:
	McGraw-Hill.				
4.	Millman, J. and	Halkias, C. C.,	1972. Integrated E	Electronics: Analog a	nd Digital
	Circuits and Syste	ems. Tokyo: McC	Graw-Hill, Kogakus	ha Ltd.	
5.	Mohammed Rafic	uzzaman, 1999.	Microprocessors -	Theory and Applicati	ons: Intel
	and Motorola. Pre	entice Hall Interna	ational.		

### COs versus GAs mapping

CO/G	GA	GA1	GA1									
Α	1	2	3	4	5	6	7	8	9	10	1	2
CO1	3	2	2	2	1	-	-	-	1	-	-	1
CO2	3	2	-	2	1	-	-	-	-	-	-	1
CO3	3	-	-	-	1	-	-	-	1	-	-	1
CO4	3	2	2	2	1	-	-	-	1	-	-	1
CO5	3	-	-	-	1	-	-	-	-	-	-	1
Total	15	6	4	6	5				3			5
Scalin g	3	1	1	1	1				1			1

COU	RSE.CODE	L	Т	Р	С			
XAP	204	APPLIED PHYSICS		3	1	1	5	
PREF	REQUISITE:							
C:P:A		2.875:0.875:0.25		L	Т	Р	Н	
				3	2	2	7	
COU	RSE OUTCOMES	Domai	n	Leve	l	<u>+</u>		
CO1	Remember, Understand, Mechanism							
CO2	CO2       Describe       the production, propagation, perception       Cognitive       H         & analysis       of acoustical wave and locate       basic acoustical       &       H         problem encountered in constructed buildings       Affective       H							
CO3	<i>Understand</i> the <i>measurement</i> an <i>application</i> of va	fundamental phenomena in optics by and <i>describe</i> the working principle and rious lasers and fibre optics.	Cognit ,Psycho otor Affecti	ive om & ve	Understand Mechanism Receiving		ıd, m,	
CO4	<i>Analyse</i> different physics principle.	nt crystal structures, <i>discuss</i> and <i>use</i> s of latest technology by <i>visualizing</i> .	use Cognitive Analysis, ,Psychom Understar otor & Mechanis Affective Receiving					
CO5Develop Knowledge on engineering materials, itsCognitiveUnderproperties and application.ApplyApply							d,	
UNIT	- I MECHAN	ICS AND PROPERTIES OF MATTER			9	+6+1	2	

**Mechanics:** Force - Newton's laws of motion - work and energy - impulse and momentum - torque - law of conservation of energy and momentum - Friction.

**Elasticity:** Stress - Strain - Hooke's law - Stress strain diagram - Classification of elastic modulus - Moment, couple and torque - Torsion pendulum - Applications of torsion pendulum - Bending of beams - Experimental determination of Young's modulus: Uniform bending and non-uniform bending - I shape girders.

**Viscosity:** Coefficient of viscosity - Laminar flow - streamline flow - turbulent flow - Reynold's number - Poiseuille's method.

UNIT – II ACOUSTICS, ULTRASONICS AND SHOCK WAVES	9+6						
Acoustics: Classification of sound - Characteristics of musical sound - Loudness - Weber							
Fechner law - Decibel - Absorption coefficient - Reverberation - Reverberation tim	ne - Sabin's						
formula (growth and decay) - Factors affecting acoustics of buildings (reverber	ation time,						
loudness, focussing, echo, echelon effect - resonance and noise) and their remedies.							
Ultrasonics: Production: Magnetostriction and Piezoelectric methods - NDT: Ultra	asonic flaw						
detector.							

Shock waves: Definition of Mach number - Description of a shock wave - Char	acteristics -				
Methods of creating shock waves.	•				
UNIT – III OPTICS, LASERS AND FIBRE OPTICS	9+6+12				
Optics: Dispersion - Optical instrument: Spectrometer - Determination of refractive	e index and				
dispersive power of a prism - Interference of light in thin films: air wedge - Diffraction	on: grating.				
LASER: Introduction - Population inversion -Pumping - Laser action - Nd-YAG	laser - CO <sub>2</sub>				
laser - Semiconductor Laser (homojunction) - Applications					
Fibre Optics: Principle and propagation of light in optical fibre - Numerical a	perture and				
acceptance angle - Types of optical fibre - Fibre optic communication system.					
UNIT -IV SOLID STATE PHYSICS	9+6+6				
Crystal Physics: Lattice - Unit cell - Lattice planes - Bravais lattice - Miller indices	- Sketching				
a plane in a cubic lattice - Calculation of number of atoms per unit cell - Atom	nic radius -				
Coordination number - Packing density for SC, BCC, FCC and HCP structures.					
Semiconductors: Semiconductor properties - Types of semiconductor - Intrinsic - H	Extrinsic: P-				
type and N-type semiconductor - PN junction diode - Biasing - Junction diode charac	eteristics.				
UNIT –V NOVEL ENGINEERING MATERIALS AND BIOMETRICS	9+6				
Novel Engineering Materials: Introduction - Metallic glasses: Melt spinning	technique,				
properties, applications - Shape Memory Alloys: Transformation temperature,	working of				
SMA, characteristics - Biomaterials: Properties, interaction of biomaterials w	ith tissues,				
applications - Nano phase materials: Production, properties and applications.					
<b>Biometrics:</b> Introduction - definition - instrumentation - devices –advantages.					
TEXT BOOKS					
1. Avadhanulu M. N. and Kshirsagar P. G., "A Text Book of Engineering Pl	hysics", 7th				
Enlarged Revised Edition., S. Chand & Company Ltd., New Delhi, 2005.					
2. Senthil Kumar G., "Engineering Physics", 2nd Enlarged Revised Ed	ition, VRB				
Publishers, Chennai, 2003.					
3. Mani P., "Engineering Physics", Dhanam Publications, Chennai, 2005.					
4. Prabu P. and Gayathri P., " Applied Physics", PMU Press, Thanjavur, 2013					
REFERENCES	NT 5 11 1				
1. Gaur R.K. and Gupta S. L., "Engineering Physics", DhanpatRai Publishers,	New Delhi,				
2. Pillai S.O., "Solid State Physics", 5th Edition, New Age International Public	cation, New				
Delh1,2003.					
E RESOURCES					
<ol> <li>NPTEL, Engineering Physics, Prof. M. K. Srivastava, Department of Physics Roorkee.</li> </ol>	s, IIT,				
LABORATORY					
1. Torsional Pendulum - determination of moment of inertia and rigidity modulus of given material of the wire.	the				
2. Uniform Bending - Determination of the Young's Modulus of the material of the b	beam.				
3. Non-Uniform Bending - Determination of the Young's Modulus of the material of beam.	the				

- 4. Poiseuille's flow Determination of coefficient of viscosity of the given liquid.
- 5. Spectrometer Determination of dispersive power of the give prism.
- 6. Spectrometer Determination of wavelength of various colours in Hg source using rating.
- 7. Air wedge Determination of thickness of a given thin wire.
- 8. Laser Determination of wavelength of given laser source and size of the given micro particle using Laser grating.
- 9. Post office Box Determination of band gap of a given semiconductor.
- 10. PN Junction Diode Determination of V-I characteristics of the given diode.

#### **REFERENCE BOOKS**

- 1. Srinivasan M. & others, "A text book of Practical Physics", Sultan Chand & Sons, 2001.
- 2. Shukla R.K., "Practical Physics", New Age International Publication, New Delhi, 2011.
- 3. UmayalSundari AR., "Applied Physics Laboratory Manual", PMU Press, Thanjavur, 2012.

LECTURE	TUTORIAL	PRACTICAL	TOTAL		
45	30	30	105		

#### Mapping of CO's with GA's:

	GA 1	GA2	GA 3	GA4	GA 5	GA6	GA7	GA8	GA9	GA1 0	GA1 1	GA1 2
CO1	3	2	2	2	1	-	-	-	1	-	-	1
CO2	3		1		1	-	-	-		-	-	1
CO3	3	2	2	2	1	-	-	-	1	-	-	1
CO4	3	2	2	2	1	-	-	-	1	-	-	1
CO5	3		2			-	-	-		-	-	1
Total	15	6	9	6	4				3			5
Scaled to 0,1,2,3 scale	3	2	2	2	1				1			1

COURSE CODE XEG 205						P	C		
COURSE NAME ENGINEERING GRAPHICS				2	0	1	3		
PRER	PREREQUISITE:								
C:P:A	<u>.</u>	1:1:1			Т	P	Η		
				2	0	2	4		
COU	RSE OUTCOM	Domain	Ι	Level	i				
CO1	Apply the natio	onal and international standards,	Cognitive,	ŀ	Apply,	Guide	ed		
	<i>construct</i> and	<i>practice</i> various curves	Psychomotor	r Response and					
			& Affective	I	Respon	ding			
CO2	Interpret, cons	struct and practice orthographic	Cognitive,	Understanding					
	projections of	Psychomotor	,Mechanism and						
			& Affective	Responding					
CO3	Construct Sk	etch and Practice projection of	Cognitive,	ŀ	Apply ,Comple				
	solids in vari	ious positions and true shape of	Psychomotor	C	overt and				
	sectioned solid	ls.	& Affective	I	Respon	ding			
CO4	Interpret, Ske	tch and Practice the development	Cognitive,	ι	Underst	andir	ıg,		
	of lateral surfa	aces of simple and truncated solids,	Psychomotor	(	Complex overt				
	intersection of	solids.	& Affective	and Respon			ing		
CO5	Construct.sket	tch and practice isometric and	Cognitive,	P	Apply,				
	perspective vie	ews of simple and truncated solids.	Psychomotor	(	Complex overt				
<b>T</b> 13 1 <b>T</b> (1			& Affective	8	and Res	pond	ing		
UNIT	I INTRODU AND CO	ICTION, FREE HAND SKETCHI NSTRUCTION OF PLANE CURV	NG OF ENGO VE	τ ΟΙ	BJECI	8	12		
Import	ance of graphi	cs in engineering applications - u	se of drafting	ins	trumen	ts –	BIS		
specifi	cations and con	ventions as per SP 46-2003.							
Pictori	al representatio	n of engineering objects - represent	ation of three	dim	ensiona	ul obj	ects		
in two	dimensional me	edia – need for multiple views – deve	eloping visualiz	zatio	on skill	s thro	ugh		
free ha	and sketching of	three dimensional objects.							
Polygo	ons & curves us	ed in engineering practice – method	s of construction	on –	- constr	uctio	n of		
ellipse, parabola and hyperbola by eccentricity method – cycloidal and involute curves –									
construction – drawing of tangents to the above curves.									
UNIT	II PROJE	CTION OF POINTS, LINES AND	PLANE SUR	FA(	CES		12		
General principles of orthographic projection – first angle projection – layout of views –									
projections of points, straight lines located in the first quadrant – determination of true									
lengths of lines and their inclinations to the planes of projection – traces – projection of									
porygonal surfaces and circular familia inclined to both the planes of projection.									
UNIT III PROJECTION OF SOLIDS AND SECTIONS OF SOLIDS							12		
Projection of simple solids like prism, pyramid, cylinder and cone when the axis is inclined to									
one pla	ane of projection	n – change of position & auxiliary pr	ojection metho	ds –	section	ning o	of .		
above solids in simple vertical positions by cutting plane inclined to one reference plane and									
perpendicular to the other and above solids in inclined position with cutting planes parallel to									
one reference plane – true shapes of sections.									
UNIT	IV DEVE	LOPMENT OF SURFACES AND	INTERSECT	ION	N OF		12		
	SOLID	08							
Need for development of surfaces – development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones – development of lateral surfaces of the above solids with square and circular cutouts perpendicular to their axes – intersection of solids and curves of intersection –prism with cylinder, cylinder & cylinder, cone & cylinder with normal intersection of axes and with no offset.

UNIT V	ISOMETRIC AND PERSPECTIVE PROJECTIONS	12
Principles o	f isometric projection - isometric scale - isometric projections of simple sol	lids,
truncated pr	risms, pyramids, cylinders and cones - principles of perspective projection	ns —
projection o	f prisms, pyramids and cylinders by visual ray and vanishing point methods.	

LECTURE	PRACTICALS	TOTAL
30	30	60

#### TEXT BOOKS

- 1. Bhatt,N.D, "Engineering Drawing", Charotar Publishing House, 46<sup>th</sup> Edition-2003.
- 2. Natarajan,K.V, " A Textbook of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2006.
- **3.** Dr. P.K. Srividhya, P. Pandiyaraj, "Engineering Graphics", PMU Publications, Vallam, 2013

#### REFERENCES

- 1. Luzadder and Duff, "Fundamentals of Engineering Drawing" Prentice Hall of India Pvt Ltd, XI Edition – 2001
- 2. Venugopal,K. and Prabhu Raja, V., "Engineering Graphics", New Age International(P) Ltd., 2008.
- 3. Gopalakrishnan.K.R,. "Engineering Drawing I & II", Subhas Publications, 1998. Shah,M.B and Rana,B.C.,"Engineering Drawing", Pearson Education,2005.

#### **E-RESOURCES:**

http://periyarnet/Econtent

## Mapping of CO's with GA:

	G	GA	GA1	GA11	GA1							
	A1	2	3	4	5	6	7	8	9	0		2
CO1	3	2	3	1	1							1
CO2	3	2	1	1	1							1
CO3	3	2	1	1	1							1
CO4	3	2	1	1	1							1
CO5	3	2	1	1	1							1
Total	15	10	7	5	5							5
Scale	3	2	2	1	1							1
d	5	2	2	1	1							

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

COU	RSE CODE	XGS 206	L	Т	P	С			
COU	RSE NAME	SPEECH COMMUN	ICATION		1	0	0	3	
C.D.A					т	т	Ъ	тт	
C:P:A					L	1	P	п	
					1	0	0	4	
COUL	PSF OUTCOM	IFS		Domoi	n	Lovol			
	Identify diffe	ront styles to verious	forme of public	Cognit	omain Level				
COI	speaking	skills and presentat	ion skills.	Cogiiit	lve	Reme	mberi	ng	
CO2	<b>Understand</b> a	nd identify the proper	tone of language	Cognit	ive .	Under	rstand	ing	
	required in wr	iting and speaking.				onder	stand	mg	
CO3	Adapting the s	speech structures and dev	eloping the	Psycho	m	Analy	oio		
	speech outline	otor		- mary	515				
CO4	Ability to com	Affecti	VA	Reme	mheri	inα			
0.04	Ability to com		Ancen	vc	Kente	moen	ng		
CO5	Calibrates the	e speaker to face the aud	ience without any	Psycho	m j	Reme	mberi	ng	
	anxiety.	otor	or						
UNIT	I INTRODU	<b>JCTION TO PUBLIC S</b>	SPEAKING					9	
Functi	ons of oral com	munication; skills and co	ompetencies neede	d for suc	cessfi	ıl spec	ech		
makin	g; importance o	f public speaking skills in	n everyday life and	l in the a	rea of	busin	less,		
social,	political and al	l other places of group w	ork						
UNIT	II TYPES	OF SPEECH						9	
Manus	script, impromp	tu, rememorized and exte	emporaneous speed	ches; ana	lyzing	g the a	udier	ıce	
and oc	casion; develop	ing ideas; finding and us	ing supporting ma	terials.					
UNIT	III ORGAN	IZATION OF SPEECH	[					9	
Introdu	uction, develop	ment and conclusion; l	anguage used in	various	types	s of s	peecl	hes;	
Adapti	ing the speech s	tructures to the Audience	; paralinguistic fea	atures					
UNIT	IV BASIC	TIPS						9	
how to	present a pape	r/assignment etc; using v	isual aids to the sp	eeches; ι	ising	body	langu	age	
to com	imunicate.		1		U	·	C	Ŭ	
UNIT	V SP	EECH ANXIETY						9	
Public	speaking and s	peech anxiety, public spe	aking and critical	listening					
Speech	n practice (4-6 s	peeches per student)	-	-					
			LECTURE	SELF ST	rudy	Y Z	ГОТ	AL	
			15	30		4	<b>1</b> 5		
TEXT	BOOKS		<b>.</b>			i			
1.	Gordon H. Mi	<u>lls</u> Technical Writing –	Oxford Press, 1978	3					
2.	Barun K. Mit	ra, Effective Technical	Communication:	A guide	e for	scien	tists	and	
	Engineers. Au	thor, Publication: Oxford	University press.	2007					

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1										2		
CO2										2		
CO3				2						1		
CO4												1
CO5				2						1	2	1

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

#### **III SEMESTER**

		XDM 301	L	Τ	P	С	
COURSE	CODE						
COURSE	NAME	DISCRETE MATHEMATICS	3	1	0	4	
PREREQU	JISITES	XMA 101, XMA 201	L	Т	P	H	
C:P:A		3:0:0	3	2	0	5	
COURSE	OUTCOMI	ES	DOM	IAIN	LEVI	EL	
CO1	<b>Define</b> a	nd <i>Explain</i> fundamental Mathematical	Cogn	itive	Remember,		
	concepts su	ich as sets, relations, functions and			Under	rstand	
CO2	Annly ne	rmutations and combinations to solve	Com	itive	Annly	1	
002	counting n	roblems with and without repetition	Cogn		7 ppry	,	
	and to <i>solv</i>						
CO3	<i>Identify</i> an	d <i>Explain</i> different types of graphs	Cogn	itive	Under	rstand	
	and their p	roperties.	U		Apply	7	
CO4	State and	<i>Explain</i> various algebraic structures and	Cogn	itive	Reme	mber,	
	correspond	ing thereoms.			Under	rstand	
CO5	Understand	I the basic concepts of lattices and to Apply	Cogn	itive	Apply	7	
	them to de	rive Boolean expressions.					
UNIT I - L	OGIC ANI	) PROOFS			9+6		
Proposition	al Logic –	Propositional equivalences-Predicates and qu	uantifi	ers-Nes	ted Qu	antifiers-	
Rules of in	terence- Me	thods of Proofs.			0. (		
UNIT II -		ATORICS	vi 1	•	9+6 6	<u>и</u>	
Mathematic	cal induction	Dermutations and combinations Resurren	ne da	lsics O	r coun	ting-1ne	
recurrence	piniciple relations_get	-remutations and combinations-Recurrent	d annli	cations	SOLVIUE	g Lilleai	
	<b>GRAPHS</b>	letating functions-inclusion and exclusion and	u appn	cations	9+6		
Graphs and	d granh mod	dels-Graph terminology and special types of	f oranl	ns-Renr	esentin	o oranhs	
and graph i	somorphism	- connectivity-Euler Graphs and Hamilton cy	vcle.	is nopi	esentin	5 Srupiis	
UNIT IV -	- ALGEBR	AIC STRUCTURES	·		9+6		
Algebraic s	systems-Sen	igroups and monoids-Groups-Subgroups and	l homo	morph	isms-Co	osets and	
Lagrange's	theorem- R	ings & Fields (Definitions and examples).		-			
UNIT V - I	LATTICES	AND BOOLEAN ALGEBRA			9+6		
Partial orde	ering-Posets	-Lattices as Posets- Properties of lattices-La	ttices a	as Alge	braic s	ystems –	
Sub lattices	s-direct pro	duct and Homomorphism-Some Special lattic	es- Bo	olean A	lgebra.		
	L	ECTURE TUTORIAL PRACTIC	AL		ΤΟΤΑ	L	
HOURS		45 30 0			75		
TEXT BO	OKS			<u> </u>	- 1	a • 1	
I. Ken	ineth H.Ros	en, "Discrete Mathematics and its Application Macrow, Hill Park Co. Ltd. New Dollar	ations'	, 6th I	dition,	Special	
11101 2 Tree	mbly I P or	d Manohar R "Discrete Mathematical Str	1,2007	. with	Applic	ations to	
2. Itcl	nnuter Scier	in Manonal R, Discrete Manematical Su uce" Tata McGraw_Hill Pub Co. Ltd. New D	elhi 3	0th Re-	nrint 20		
REFEREN	ICES		, J		print 20		
1. Ralp	h.P.Grimald	i, "Discrete and Combinatorial Mathematics:	An Ar	plied I	ntroduc	tion",	
Four	th Edition, I	Pearson Education Asia, New Delhi, (2002).	1	1		,	
<b>2.</b> Alan	Doerr and l	Kenneth Levasseur, "Applied Discrete Struct	ures fo	or Comp	outer Sc	cience"	
Seco	nd Edition	St. Martin's Press, New York, (1991).		-			
E REFER	ENCES						
www.nptel	.ac.in						
1. Gra	ph Theory A	NPTEL Course, S.A. Choudum , IIT Madra	s.		<i>~ .</i>	_	

2. Graph Theory by Prof. L. Sunil Chandran, Department of Computer Science and

Automation, Indian Institute of Science, Bangalore.

	PO	<b>PO1</b>	<b>PO1</b>	<b>PO1</b>	PSO	PSO								
	1	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	2								2		1		
CO2	3	2								2		1		
CO3	3	2								2		1		
CO4	3	2								2		1		
CO5	3	2								2		1		
Total	15	10								10		5		
Scale	3	2								2		1		
d														
Value														

COU	JRSE CODE	COURSE NAME			L	Т	P	С		
XCS3	02	DATA COMMUNICATION			3	1	0	4		
C:P:A	<b>x</b> = <b>3:1:0</b>									
					3	2	0	5		
COUI	RSE OUTCOM	IES	DOMAIN		L	EVEI		<b>i</b>		
CO1	<i>Understand</i> communication	Cognitive	K	nowle	dge,					
CO2	<i>Understand</i> correction in the second second	Analysis								
CO3	<i>Understand</i> functions and s	Cognitive	Knowledge ,Analysis							
<b>CO4</b>	<i>Understand</i> th	e concepts of transport layer	Cognitive	K	nowle	dge				
CO5	<b>Recognize</b> the	design issue of application layer	Cognitive	A	nalysi	S				
UNIT	I DATA COM	IMUNICATIONS					9	+3		
Data 7	Transmission – T	Fransmission Media – Signal Encodi	ng Techniques -	- M	ultiple	xing	_			
Spread	d Spectrum. Inte	erfaces and modems - Digital data tr	ansmission - Pa	ırall	el and	l Seria	al DT	Έ/		
DCE interface data terminal equipment, data circuit terminating equipment - Standards RS 232,										
Transi	nission rate of r	nodems, Modem standards.								
DCE i Transı	Spread Spectrum. Interfaces and modems - Digital data transmission - Parallel and Serial DTE / DCE interface data terminal equipment, data circuit terminating equipment - Standards RS 232, Transmission rate of modems, Modem standards.									

UNIT II	DATA LINK LAYER	

Types of errors and detection, redundancy, VRC, LRC, CRC techniques - Error correction -Forward and backward error correction - Single bit and multi bit error correction - Hamming code. Data link control: Need for data link control - Line discipline, ENQ / ACK, Flow control stop and wait sliding window protocol, Error control, ARQ, Stop and wait ARQ, Sliding window ARQ Protocols: Asynchronous and Synchronous communications - Asynchronous and Synchronous Protocol - Character oriented protocol, BSC, bit oriented protocols - HDLC frames - Link access procedures.

UNIT III NETWORK LAYER	9+3
Network layer design issues, Congestion Control algorithm, Internetworks - Packet sw	itching
and Datagram approach - IP addressing methods - Subnetting - Routing - Distance	Vector
Routing – Link State Routing – Routers.	

UNIT IVTRANSPORT LAYER9+3Duties of Transport Layer – Multiplexing – De multiplexing – Sockets – User DatagramProtocol(UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality ofService (QOS) – Integrated Services., Connection management .

UNIT V APPLICATION LAYER 9+3	3								
Domain Name Space (DNS) - SMTP - POP 3 - FTP - HTTP - WWW- Security - Cryptograp	hy								
Case study on TCP/IP Architecture , Directory services - Common Management Informati	on								
Protocol - TCP/IP: TCP/IP and the Internet - TCP/IP and OSI.									
LECTURE TUTORIAL Total									

			шетены						**
			45	15				60	
TEXT	BOOKS:								
1.	Behrouz A Forouzan "Da	ta	Communications	Netwo	rking"	4 <sup>th</sup>	Edition '	Tata	McGraw
	Hill, 2008.								

2. Andrew S. Tanenbaum, David J. Wetherall, "Computer Networks", 5th Edition, 2010,

9+3

	ISBN-10: 0132126958, ISBN-13: 978-0132126953
REFE	RENCES
1.	William Schewber ,"Data Communication", McGraw Hill, 2009.
2.	Tanenbaum, "Computer Networks", PHI, 5th Edition, 2011
EREF	ERENCES
1.	http://people.du.ac.in/~ngupta/teach_networks.html
2.	http://www.cs.hunter.cuny.edu/~saad/courses/networks/notes/note1_ho.pdf
3.	http://www.vub.ac.be/BIBLIO/nieuwenhuysen/courses/chapters/network.pdf
4.	http://lecturenotes.in/notes/engg/paper/dccn/page1.html

COUF	RSE CODE	COURSE NAME		L	Т	P	C
XCS3	03	DIGITAL SYSTEMS AND MICROPRO	DCESSORS	3	0	1	4
C:P:A	. =			L	Т	Р	H
1.8: 1.	8: 0.4			3	Λ	2	5
COUF	RSE OUTCOME	S	DOMAIN	3	LE	VEL	' <b>J</b>
CO1	<i>Describe</i> the bas	sics and functions of logic gates	Cognitive Psychomotor	U A	Unders Applyi	tandi ng	ng
CO2	<i>Design</i> and <b>imp</b> logic circuits usi	<b>lement</b> different types of combinational ng logic gates	Cognitive Psychomotor	/ N	Applyi Manipt	ng 1latio	n
CO3	<i>Design</i> and <i>imp</i> circuits using fli	<i>lement</i> different types of sequential logic p flops.	Cognitive Psychomotor	/ N	Applyi Manipı	ng 1latio	n
CO4	<i>Discuss</i> the function the program on S	lamentals of microprocessors and <i>execute</i> 8085.	Cognitive Psychomotor Affective	U A F	Unders Applyi Respor	tandi ng Iding	ng
CO5	<i>Illustrate</i> progra applications by i	amming concepts of 8085 and <i>develop</i> nterfacing I/O devices.	Cognitive Psychomotor Affective	A N H	Applyi Manipı Respor	ng, ılatio ıding	n
UNIT	I BOOLEAN A	LGEBRA AND LOGIC GATES				8-	+3
- Bool method List of 1.Verit	tean functions – ds – Logic gates. <b>Experiments:</b> fication of Boolea	n theorems using digital logic gates	ng Karnaugh	map	and t	abula	tion
UNIT	II COMBINATI	ONAL LOGIC AND DESIGN WITH M	SI DEVICES			9-	+12
Combi conver	national circuits sion – Decoders a	– Analysis and design procedures - Circuits and encoders - Multiplexers and de-multiplex	s for arithmeti kers.	с ор	eration	ns - C	Code
List of 2. Des	Experiments:	ntation of combinational circuits using basic	gates for arbit	trary	functi	ons, c	code
conver	ters, etc.	tation of 4-bit binary adder / subtractor using	g hasic gates a	nd M	151	devic	es
4. Desi 5. Desi	ign and implementing ign and i	tation of magnitude comparator tation of application using multiplexers/Den	nultiplexers	ina iv.			00
UNIT	III SYNCHRO	DNOUS SEQUENTIAL LOGIC				1(	)+6
Sequen List of 6. Desi 7. Desi	ntial circuits – Flip <b>Experiments:</b> ign and implementign and implementi	o flops – Shift registers – Counters - Memory tation of Shift registers tation of Synchronous and Asynchronous co	y and program punters	mab	le logi	2.	
UNIT	IV 8085 MICRO	PROCESSOR				Q	)+3
8085 N	Aicroprocessor are	chitecture-Addressing modes- Instruction set	-Programming	g wit	h 8085	5.	13
List of	Experiments:						

8. Programming with 8085

IINIT	V I/O INTERFACING			9+6
Memo comm (8237) List of 9. Inte 10. Int	ory interfacing and I/O interfacing with 8085 – unication interface – timer-keyboard/display contr ) – applications – stepper motor – Wave form Gene <b>f Experiments:</b> orfacing with 8085-8255, 8253 terfacing with 8085-8279, 8251	- parallel com roller – interrup rator.	nunication interfa at controller –DMA	ce – serial A controller
		LECTURE	PRACTICAL	TOTAL
		45	30	75
TEXI	T BOOKS:			
2.	Ramesh S. Gaonkar ,"Microprocessor – Archit 8085", Penram International Publisher, 5th Ed.,2	ecture, Program 2006.	nming and Applic	ations with
	Charles U Doth Ir "Fundamentals of Logia D	agion" Ath Edi	tion Isian Dublish	ing Uquag
1.	Latest Edition	esign , 4m Eur	uoli, Jaico Puolisi	illig House,
2	Donald D. Givone, "Digital Principles and Design	". Tata McGraw	z-Hill, 2007.	
3.	Douglas V.Hall, "Microprocessors and Int	erfacing : Pro	ogramming and	Hardware",
	Second Edition, Tata McGraw Hill, 2006.	U	0 0	,
E-RE	FERENCES:			
1.	http://nptel.ac.in/courses/117106086/			
2.	http://nptel.ac.in/syllabus/108107029/			

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	0	0	0	0	0	0	0	0	0	0	0	3	2
CO2	3	3	3	1	0	0	0	0	0	0	0	0	3	2
CO3	3	3	3	3	3	1	0	0	0	0	0	0	3	2
CO4	3	3	3	3	3	1	0	0	0	0	0	0	3	2
CO5	3	3	3	1	1	1	0	0	0	1	0	0	3	2
Total	15	12	12	8	7	3	0	0	0	1	0	0	15	10

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original value	15	12	12	8	7	3	0	0	0	1	0	0	15	10
Scaled to 0,1,2,3 scale	3	3	3	2	2	1	0	0	0	1	0	0	3	2

COURS	SE	COURSE NAME		L	Т	Р	C
XCS304	4	DATA STRUCTURES		3	1	1	5
<b>C:P:A</b> :	= 3:1:0					_	
				L	T	P	H
COUR	SE OUT	COMES	DOMAIN		Z EVE	L L	/
CO1	To ki struct	now, <i>analyze</i> , <i>apply</i> and manipulate linear data ures	Cognitive	Knowledg Comprehe	ge, ensioi	1	
CO2	To kı data s	now, <i>analyze, apply</i> and manipulate nonlinear tructures	Cognitive	Knowledg Analysis	ge,		
CO3	To k techni	now, <i>analyze, apply</i> and manipulate sorting iques	Cognitive	Knowledg and Appli	ge, Ai catio	nalysi n	5
CO4	To kn algori	ow, <i>analyze, apply</i> and manipulate graph thms	Cognitive	Knowledg Analysis	ge,		
CO5	To kn	ow and <i>analyze</i> algorithm design techniques.	Cognitive	Knowledg Analysis	ge,		
UNIT -	1 LINE	AR DATA STRUCTURE				12 + 1	2
AD1 - Practic 1. 2. 3. 4. 5. 6. 7. 8. 9. UNIT-	List AD al Singly L Doubly l Circular Linked L Stack Us Linked L Queue U Program Program <b>II NON</b>	inked List inked List Linked List Linked List List Implementation of Stack ing Array implementation List Implementation of Queue sing Array Implementation for Balancing symbol for Postfix expression evaluation LINEAR DATA STRUCTURE				12 + (	5
Theory	,				i		
Trees – <b>Practic</b> 1. 2. 3.	Binary T <b>al</b> Impleme Binary S AVL Tre	Trees – Binary Search Trees – AVL Trees – Splay Trent nting Expression Tree earch Tree earch Tree	ees – Tree Trave	ersal – B T	rees		
UNIT-	III SOR	TING				12+6	
Theory           Insertio           Practic           1.           2.           3.           4.           5.           6.	n sort – S al Insertion Shell Son Heap Son Merge So Quick So Bucket S	Shell sort – Heap sort – Merge sort – Quick sort – Bu Sort rt rt ort ort ort	cket sort – Exte	rnal Sortin	g		

UNIT – IV GRAPH ALGORITHMS				12+6
Theory				
Topological sort – Shortest path algorith	nms – Networl	k Flow problems	– Minimum S	panning Tree –
Applications of Depth First search – NP co	ompleteness.			
Practical				
1. Dijkstra's Algorithm				
2. Prim's Algorithm				
3. Kruskal's Algorithm.			1	
UNIT – V ALGORITHM DESIGN TECH	INIQUES			12
Theory	D	· D ·		1 4 1 1 4 1
Greedy Algorithms – Divide and Conq	luer – Dynam	ic Programming	- Randomized	a Algorithms –
Backtracking algorithms	IECTUDE	TUTODIAI		ТОТАТ
	LECIURE	IUIORIAL		IOIAL
	Λ5	15	20	
	43	15		90
		•.1 • 1 • •	<u>an a 11</u>	¬ 1'' ¬
1. Mark Allen Weiss, "Data Stru Education, Reprint 2011.	ctures and Alg	gorithm Analysis ii	1 C <sup>2</sup> , Second I	Edition, Pearson
REFERENCES				
1. Thomas H. Cormen, Charles	E. Leiserson, H	Ronald L.Rivest, C	lifford Stein, "	"Introduction to
Algorithms", Second Edition, N	Acgraw Hill, 20	002.	,	
2. Reema Thareja, "Data Structure	es Using C", O	xford University P	ress, 2011.	
E – REFERENCES				
1. http://spoken-tutorial.org/tutori	al-search/?sear	ch_foss=C+and+C	pp&search_lan	guage=English
2. Lecture Series on Data Struc	ctures and Alg	gorithms by Dr.	Naveen Garg,	Department of
Computer Science & Engineeri	ng ,IIT Delhi.			_
3. http://www.learncpp.com/				
4. <u>http://vlab.co.in</u>				

	PO	PS	PS											
	1	2	3	4	5	6	7	8	9	10	11	12	01	02
<b>CO1</b>	3	1	1	1	1	0	0	0	1	0	1	1	3	3
CO2	3	2	1	1	1	0	0	0	1	0	1	1	3	3
CO3	3	1	1	1	1	0	0	0	1	0	1	1	3	3
CO4	3	2	1	2	1	0	0	0	1	0	1	1	3	3
CO5	3	1	1	2	0	0	0	0	0	0	1	2	0	0
Total	15	7	5	7	4	0	0	0	4	0	5	6	12	12

Courses	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
Original	15	7	5	7	4	0	0	0	4	0	5	6	12	12
Scaled to	3	2	1	2	1	0	0	0	1	0	1	2	3	3

0,1,2,3 scale							

COURSE CODE	COURSE NAME		L	Т	Р	С
XMS305	MATERIAL SCIENCE		3	0	0	3
C:P:A = 3:0:0			L	T	P	H 2
COURSE OUT	ΓΟΜΕ	DOMAIN	]	LEV	EL	3
CO1	<i>Recall and distinguish</i> various crystal structures.	Cognitive	Remem	ıber,	Analy	ze
CO2	<i>Know</i> about the impacts of defects at the atomic and microstructure scales.	Cognitive	Rement Unders	iber, tand		
CO3	<i>Describe</i> the various Ceramic, Electrical & Electronic Materials.	Cognitive	Remem	ber,	Analy	ze
CO4	<i>Describe</i> the basics of mechanical properties of material and identify how they can be tested.	Cognitive	Remem	iber, .	Analy	ze
CO5	<i>Recognize and Describe</i> various Magnetic Materials and Nano Materials	Cognitive	Remem	ıber		
UNIT I	CRYSTAL STRUCTURE					9
Atomic structur Crystal system spacings and an	re and inter-atomic bonding; Structure s, Bravais lattices; Indexing of direc gles, co- ordination number, packing fac	of crystalline solic tions and planes, ctors.	ls; Latti notation	ces, 1 s, In	unit c ter-pl	ells; anar
UNIT II	<b>DEFECTS IN CRYSTALS</b>					9
Point defects; I	Dislocations, Types of dislocations, Bu	rgers vector and its	represe	ntatio	on; Pl	anar
defects, stackin	g faults, twins, grain boundaries.					
UNIT III	CERAMIC, ELECTRICAL & ELI	ECTRONIC MATI	RIALS			9
Ceramic Mate Properties, glas ceramic –matr Conductivity, l Semiconductor UNIT IV	rials: Introduction, ceramic structures, ses; Composite Materials- Introduction, ix composites. Electrical & Electron Electronic and Ionic Conductivity, In Devices, Dielectric Properties, Piezo-ele MECHANICAL PROPERTIES O	silicate structures, p , classification, cond <b>nic Properties of</b> trinsic and Extrins ectricity. F MATERIALS	processir crete, mo <b>Materi</b> ic Sem	ng of etal-n <b>als:</b> i con	ceran natrix Elect iducti	nics; and rical vity, <b>9</b>
Concepts of str Elastic deform behavior. Hardu	ress and strain, Stress-Strain diagrams; ation, Plastic deformation. Impact Pr ness of materials.	Properties obtained roperties, Strain rat	from the effect	ne Te ts an	nsile d Im	test; pact
UNIT V	MAGNETIC MATERIALS AND	NANO MATERIA	LS			9
Magnetic Ma classification o Ferro, Para Mag Nano Material of Alumina an	<b>terials:</b> Introduction, Magnetic field of magnetic materials, soft magnetic m gnetic materials. <b>Is:</b> Introduction – Nano material prepara d Zirconia, Silicon carbide, nanoop, m	ls or quantities, naterials, H magne ation, purification, s nano-magnetic, nand	types of tic mate sintering p-electro	of merials nanconic,	agnet Ferro part and c	ism, ites, icles other
important nano	materials.			<b>А Т</b>	<b>T^</b> 7	
	LECTURE	IUTORIAL PR	ACTIC	AL	101	AL

		45	-	-	45
TEXT	BOOKS		-		
1.	Askeland D.R.,& P. P. Fullay	(2007), The S	cience and Er	ngineering of Ma	terials $-7^{th}$
	Cengage Learning Publishers.				
2.	William D. Callister, Jr (2008)	), Callister"s M	aterials Scienc	e and Engineerin	g, (Adopted
	by R. Balasubramaniam) Wiley	y-Eastern			
REFE	RENCES				
1.	A.S. Edelstein and R.C. Camm Applications, Inst. Of Physics I	arata Ed. (1998 Publishing, UK.	), Nano Materi	als: Synthesis, Pr	operties and
2.	Raghavan, V (2007), Materials India	s Science and E	Engineering - A	A First Course, Pr	rentice Hall,
3.	James F. Shackelford (1996), Hall, India	Introduction to	Materials Sci	ence for Enginee	ers, Prentice

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	3	3	0	0	0	0	0	0	0	0	0	0
CO2	3	0	0	0	0	0	0	0	0	3	0	0
CO3	3	0	0	0	0	0	3	0	0	0	0	0
CO4	3	3	0	3	0	0	0	0	0	0	0	0
CO5	3	0	0	0	0	0	0	0	0	0	0	0
Total	15	6	0	3	0	0	3	0	0	3	0	0
	1	1	1	1	1			1	1		1	I

Total	15	6	0	3	0	0	3	0	0	3	0	0
Scaled	3	2	0	1	0	0	1	0	0	1	0	0

COUR	SE CODE	XEP 306				L	Т	F		С
COUR	SE NAME	ENTREPREN	EURSHIP DEVI	ELOPMEN	T	2	0	0		2
PRERI	EQUISITE:	Nil				L	Т	P	SS	H
C:P:A		2.7:0:0.3				2	0	0	1	3
COUR	SE OUTCON	MES			Don	nain	]	Level		
CO1	<b>Recognise</b> a	and <i>describe</i> the p	personal traits of a	n	Affe	ective	]	Recei	ving	
	entrepreneur	r.			Cog	nitive	, 1	Unde	rstan	ding
CO2	<b>Determine</b> t	he new venture i	deas and <i>analyse</i>	the	Cog	nitive	, 1	Unde	rstan	ding
	feasibility re	eport.	-					Analy	vsing	-
CO3	Develop the	business plan an	d <i>analyse</i> the plan	n as an	Affe	ective	]	Recei	ving	
	individual of	r in team.			Cog	nitive	,	Analy	vsing	
CO4	<i>Describe</i> va	rious parameters	to be taken into		Cog	nitive	, 1	Unde	rstan	ding
	consideratio	n for launching a	nd managing sma	11						
	business.									
CO5	Explain the	technological ma	anagement and In	tellectual	Cog	nitive	, 1	Unde	rstan	ding
	Property Rig	ghts								
UNIT I	- ENTREPF	RENEURIAL T	RAITS AND FU	JNCTIONS	)					9
Definiti	on of Entrep	reneurship; comp	petencies and trait	s of an entre	prene	eur; fa	octors	affe	cting	
Entrepr	eneurship Dev	velopment; Role	of Family and So	ciety ; Achie	eveme	ent M	otiva	tion;		
Entrepr	eneurship as a	a career and nation	onal development	•						
UNIT I	I- NEW PR	ODUCT DEVE	LOPMENT ANI	D VENTUR	RE CI	REA	FION	1		9
Ideatior	n to Concept d	levelopment; Sou	arces and Criteria	for Selection	n of P	Produ	ct; m	arket		
assessm	ent ; Feasibil	ity Report ;Proje	ct Profile; process	es involved	in sta	rting	a nev	w ver	ture;	
legal fo	rmalities; Ow	nership; Case St	udy.							r
UNIT I	II- ENTREP	'RENEURIAL I	FINANCE							9
Financi	al forecasting	for a new ventur	e; Finance mobili	zation; Busi	ness	plan p	orepa	ration	1;	•
Sources	of Financing	, Angel Investors	s and Venture Cap	oital; Goverr	nment	supp	ort in	n star	tup	
promoti	ion.									-
UNIT I	V- LAUNCH	IING OF SMAI	LL BUSINESS A	ND ITS M	ANG	EME	ENT			9
Operati	ons Planning	- Market and Cha	annel Selection -	Growth Stra	tegies	s - Pro	oduct	Laur	nchin	g –
Incubat	ion, Monitori	ng and Evaluatio	n of Business - Pr	eventing Sid	cknes	s and	Reha	abilita	tion	of
Busines	ss Units.									-
UNIT V	V- TECHNO	LOGY MANAC	GEMENT, IPR P	ORTFOLI	O FO	R NI	EW			9
PROD	UCT VENTU	JRE								
Techno	logy manager	nent; Impact of t	echnology on soci	iety and bus	iness;	Role	of G	over	nmen	ıt in
support	ing Technolog	gy Development	and IPR protectio	n; Entreprer	neursł	nip D	evelo	pmer	nt	
Trainin	g and Other S	upport Services.								
LECTU	JRE	TUTORIAL	PRA	ACTICAL				Τ	OTA	L
45		0	0						45	
TEXT	BOOKS									
1. Hisri	ch, 2016, Ent	repreneurship, T	ata McGraw Hill,	New Delhi.						
2. S.S.K	Khanka, 2013,	Entrepreneurial	Development, S.	Chand and C	Compa	any L	imite	ed, Ne	ew D	elhi.
REFE	RENCES									
1. Math	ew Manimala	i, 2005, Entrepre	neurship Theory d	at the Cross	roads	, Par	adign	ns &	Prax	is,
Biztr	antra ,2nd Edi	ition.								
2. Prasa	nna Chandra,	2009, Projects -	- Planning, Analy.	sis, Selection	n, Imp	oleme	ntati	on an	d	
Revie	ews, Tata McO	Graw-Hill.								

- 3. P.Saravanavel, 1997, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai.
- 4. Arya Kumar,2012, *Entrepreneurship: Creating and Leading an Entrepreneurial Organisation*, Pearson Education India.
- 5. Donald F Kuratko, T.V Rao, 2012, *Entrepreneurship: A South Asian perspective*, Cengage Learning India.
- 6. Dinesh Awasthi, Raman Jaggi, V.Padmanand, *Suggested Reading / Reference Material for Entrepreneurship Development Programmes* (EDP/WEDP/TEDP), EDI Publication, Entrepreneurship Development Institute of India, Ahmedabad. Available from: http://www.ediindia.org/doc/EDP-TEDP.pdf

#### **E-REFERENCES**

- 1. Jeff Hawkins, "Characteristics of a successful entrepreneur", ALISON Online entrepreneurship courses, "https://alison.com/learn/entrepreneurial-skills
- 2. Jeff Cornwall, "Entrepreneurship -- From Idea to Launch", Udemy online Education, https://www.udemy.com/entrepreneurship-from-idea-to-launch/

	PO	<b>PO1</b>	<b>PO1</b>	<b>PO1</b>	PS	PS								
	1	2	3	4	5	6	7	8	9	0	1	2	01	<b>O</b> 2
CO 1	0	0	0	1	2	0	1	1	1	1	2	1	0	0
CO 2	0	0	0	0	0	2	0	1	0	1	1	1	0	0
CO 3	0	0	2	0	0	3	2	1	3	3	3	3	0	1
<b>CO 4</b>	1	0	1	3	0	0	0	0	0	1	2	0	0	0
CO 5	1	1	1	3	0	0	0	0	0	2	2	1	0	0
Total	2	1	4	7	2	5	3	3	4	8	10	6	0	0
Scale	1	1	1	2	1	1	1	1	1	2	2	2	0	1
d to														
0,1,2,														
3														

COUR	SE CODE			L	Τ	Р	SS	С
COUR	SE NAME	INTERPERSONAL COMMUNICATIO	ON	0	0	0	2	0
XGS3	)7			L	Т	Р	SS	Η
C:P:A		2:0:0		0	0	0	2	2
COUR	SE OUTCOM	ES	DOMA	IN	LE	VE	L	1
CO1	<i>Recognize</i> cul communication	ture and a need for interpersonal n.	Cognitiv	ve	Re	men	nber	
CO2	<i>Demonstrate</i> between two p	the need for effective communication people.	Cognitiv	ve	Un	ders	tand	
CO3	<i>Explain</i> famil socialization.	y and social relationships and need for	Cognitiv	ve	Un	ders	tand	
CO4	<i>Justifies</i> the I conflict in inte	P principles as to how to reduce and repair erpersonal relationships.	Cognitiv	ve	Ev	alua	te	
CO5Make use of effective and appropriate language at various interpersonal situations to avoid conflict.CognitiveApply								
UNIT	I - UNIVERSA	ALS OF INTERPERSONAL COMMUNI	<b>ICATIO</b>	NS			5	
Axiom	s of interperson	al Communication - culture in interpersona	l commu	nicati	on a	nd tł	ne self	in
interpe	rsonal commun	ication.						
UNIT	II - APPREHE	ENSION AND ASSERTIVENESS					5	
Aggres	siveness and as	sertiveness - perception in interpersonal co	mmunicat	tion -	liste	ening	g in	
interpe	rsonal commun						_	
UNII Deletie	III - VERBAL	AND NON VERBAL MESSAGES					3	
		IN INTERDEDSONAL DELATIONSHI	air. D				5	
Confli	t in interpersor	al relationship friends and relatives prim	r vary and f	amily	rol	ation	J	
	$\mathbf{V} = \mathbf{SOCIATT}'$	ZATION	iai y aliu i	anni		ation	<u>10</u>	
Need f	v = SOCIALIZ	and benefits of socialization among studen	ts				10	
110001	or socialization	and benefits of socialization among staden	Self-	Study	v		TOT	AL.
			30	otuu,	,		30	
TEXT	BOOKS		1.5.5					
1.DeVi	to, Joseph, The	Interpersonal Communication Book, 13th	Edition -,	Publ	ishe	d		
by Lon	gman Pub Grou	up, Updated in its 13 <sup>th</sup> edition,2000	,					
2.Kath	leen S. Verderb	er, Inter-Act: Interpersonal Communication	Concept	s, Sk	ills a	nd		
Contex	ts, Rudolph F.	Verderber, 2000						
REFE	RENCES							
1.Cliff	ord Whitcomb,	Effective Interpersonal and Task Communi	cation Sk	ills fo	or Ei	ngine	eers,	
Atlanti	c Publishers. 20	)10						

Table:1 Mapping of CO's with GA's:

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	2	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	0	0	0	0	0	3
CO3	0	0	0	0	0	3	0	0	0	0	0	0
CO4	0	0	0	3	0	0	0	0	0	0	0	0
CO5	0	0	0	0	0	0	0	0	0	2	0	0
Total	2	0	0	3	0	3	0	0	0	2	0	0

Scaled	1	0	0	1	0	1	0	0	0	1	0	0
to												
0,1,2,3												
scale												

## XCS308 INPLANT TRAINING - I

C:P:A = 0.34:0.33:0.33

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	2	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	1	3	0	0	1	0
CO3	0	0	0	0	0	0	0	0	3	1	3	1
CO4	0	1	2	1	3	0	0	0	0	0	0	3
CO5	0	0	0	3		0	0	0	0	3	0	1
Total	2	1	2	4	3	0	1	3	3	4	4	5

Total	2	1	2	4	3	0	1	3	3	4	4	5
Scaled	1	1	2	1	1	0	1	1	1	1	1	1

## **IV SEMESTER**

COUR	COURSE CODECOURSE NAMELTPC								
XPQ 4	01	PROBABILITY AND QUEU	EING THE	ORY	3	0	0	3	
C:P:A	= 3:0:0								
					L	T	P	H	
COLID					3	0		3	
COUR	SE OUTCO	MES	DOMA	<b>AIN</b>					
CO1	<i>Define</i> disvariables a and mom discrete and	screte and continuous random nd to <i>Find</i> the expected values ent generating functions of d continuous distributions.	Cognitive	:	Rem	embe	r		
CO2	<i>Explain</i> the and to <i>Find</i>	e joint and Marginal distribution the Correlation and regression.	Cognitive	;	Rem Und	embe erstar	r, Id		
CO3	State and the cross-correl properties Markov and	find WSS, SSS, autocorrelation, lation, ergodic process and their and to <i>identify</i> and <i>Explain</i> d Poisson processes.	Cognitive	;	Rem Und Anal	embe erstan lysis	er, Id,		
CO4	<i>Explain</i> the charact	e Markovian models and to <i>Find</i> ceristics of the models	Cognitive	;	Remember, Understand, Remember, Understand, <b>9</b> erating functions				
CO5	<i>Explain</i> theory and	ne basic concepts of queuing the Non – Markovian	Cognitive	;	Rem Und	embe erstar	er, Id,		
UNIT I	[ RANDO	M VARIABLES			1			9	
Discrete Binomi	e and contin al, Poisson, C	uous random variables - Mome Geometric, Uniform, Exponential	ents, Mome and Normal	ent Gen distribu	eratin tions.	g fur	ction	s –	
UNIT I	I TWO DI	MENSIONAL RANDOM VAR	RIABLES					9	
Joint di linear re	istributions – egression.	Marginal and conditional distrib	outions – co	ovarianc	e – C	orrela	tion	and	
UNIT	III RANDO	OM PROCESSES						9	
Classifi Markov	cation – Stati chain – Chaj	ionary process –Markov process pman Kolmogorov equations –Lii	- Poisson pr niting distri	rocess – butions.	- Disc	rete p	aram	eter	
UNIT I	V QUEUE	ING THEORY						9	
Markov – Little	vian queues – 's formula - Q	Birth and Death processes – Sing Queues with finite waiting rooms -	le and multi - Finite sour	iple serv ce mod	ver que els.	euein	g mo	dels	
UNIT V	V NON-MA	<b>RKOVIAN QUEUES AND QU</b>	EUEING N	ETWO	)RKS			9	
M/G/1 queues.	queue – Polla	aczek Khintchine formula - M/D	/1 and M/E	k/1 as s	pecial	case	s –Se	ries	
		L	ECTURE	TUTO	)RIA	L J	<b>'OT</b> A	L	
		4	5	0		4	5		
TEXT	BOOKS								
1.	Gupta .S.C ar	nd Kapoor .V.K, "Fundamentals c	of Mathemat	ical Sta	tistics	", 11t	h		

extensively revised edition, Sultan Chand & Sons, 2007.

- 2. Veerarajan .T, Probability, "Statistics and Random Processes", Tata McGraw Hill,3rd edition, 2008.
- 3. Kandasamy.P, Thilagavathy.K, Gunavathy.K, "Probability, Statistics and Queueing Theory", S.Chand & Company Ltd, 2004.

#### REFERENCES

- 1. Allen, A.O., "Probability, Statistics and Queueing Theory with Computer Applications", Elsevier, 2nd edition, (2005).
- 2. Taha, H.A., "Operations Research", Pearson Education", Asia, 8th edition, (2007).
- 3. Trivedi, K.S., "Probability and Statistics with Reliability, Queueing and Computer Science Applications", John Wiley and Sons, 2nd edition, (2002).
- 4. Hwei Hsu, "Schaum's Outline of Theory and Problems of Probability, Random Variables and Random Processes", Tata McGraw Hill edition, New Delhi, (2004).

#### **E REFERENCES**

1.Advanced Engineering Mathematics Prof. Somesh Kumar.Department of Mathematics, Indian Institute of Technology, Kharagpur.

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO 1	3	0	0	0	0	0	0	0	1	1	0	1
CO 2	3	0	0	0	0	0	0	0	1	1	0	1
CO 3	3	2	0	0	0	0	0	0	0	1	1	2
<b>CO 4</b>	3	2	0	0	1	0	0	0	1	1	1	2
CO 5	3	2	0	0	1	0	0	0	1	1	1	2
Total	15	6	0	0	2	0	0	0	4	5	3	8

Total	15	6	0	0	2	0	0	0	4	5	3	8
Scaled	3	2	0	0	1	0	0	0	1	1	1	2

COUR	SE CODE	COURSE NAME		L	Т	P	С			
XCS40	2	COMPUTER ARCHITE	CTURE	3	0	0	3			
C:P:A	= 3:0:0			L T P						
					T	P	H			
COUD	SE OUTCOMES		DOM	3 A INI		U EVET	3			
COUR	SE OUTCOMES		DOM	AIN	L	EVEI				
CO1	<i>Describe</i> fun ctional unit of c Addressing mode	computer and <i>Recognize</i> Va es.	rious	7e	Reme Under	mber, stand				
CO2	Describe and Ar	nalyze of arithmetic unit.	Cognitiv	ve	Reme Analy	mber, sis				
CO3	Describe and Red	cognize the basic processing	unit. Cognitiv	ve	Reme	mber,				
					Under	stand				
<b>CO4</b>	Explain and Illus	strate the memory System.	Cognitiv	ve	Reme	mber,				
COS	Emplain and An	Jura the I/O Orcenization	Comitiv	10	Analy	S1S				
COS <i>Explain and Analyze</i> the I/O Organization. Cognitive Remember,										
UNIT	BASIC STRU	CTURE OF COMPUTERS			1 11141 )	515	10			
Functio	nal units - Basic	operational concepts - Bu	s structures -	Softwa	re perfo	orman	ce –			
Memor	y locations and	addresses – Memory ope	erations – Inst	ruction	and	instru	ction			
sequence	cing – Addressing	modes – Assembly language	ge – Basic I/O	operati	ons – S	Stacks	and			
queues-	Measuring, Rep	orting and Summarizing Pe	rformance – Q	uantita	tive pri	nciple	es of			
comput	er design						0			
	I ARITHMETIC	UNII	ion of foot of	1	N / 14: 1		ð 			
Additio	n and subtraction	d operand multiplication and	ign of fast add	tion $-$	Multip Integer	licatio divisi	n or $-$			
Floatin	p point numbers ar	d operations.	i last multiplied		integer	ui v 151	011 -			
UNIT	III BASIC PRO	CESSING UNIT					9			
Fundan	nental concepts –	Execution of a complete inst	struction – Mu	ltiple b	us orga	nizati	on –			
Hardwi	red control – Micr	o programmed control. Pipel	lining – Basic c	oncepts	s – Data	haza	rds –			
Instruct	ion hazards – Inf	luence on Instruction sets -	Data path and	contro	ol consi	derati	on –			
Superso	calar operation									
UNIT IV MEMORY SYSTEM 9										
Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories -										
Performance consideration – Virtual memory- Memory Management requirements –										
	ary storage. V I/O ORGANIZ	ATION					9			
Accessi	ng I/O devices –	Interrupts – Direct Memory	Access – Bus	es – Ir	iterface	circu	its –			
Standar	d I/O Interfaces (F	PCI, SCSI, USB).	,	1						
		L	ECTURE T	U <b>TORI</b>	AL	TOT	AL			
ļ			45	-		45				
TEXT	BOOKS									

- 1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 6th Edition "Computer Organization", McGraw-Hill, 2012.
- 2. John L. Hennessey and David A. Patterson," Computer Architecture: A Quantitative Approach", 5<sup>th</sup> Edition, Morgan Kaufmann, 2011

### REFERENCES

- 1. William Stallings, "Computer Organization and Architecture Designing for Performance", 9th Edition, Pearson Education, 2010.
- 2. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill,1998

#### **E REFERENCES**

1.http://cse10-iitkgp.virtual-labs.ac.in.

2.Lecture Series on Computer Architecture by Prof. Anshul Kumar, Department of Computer Science & Engineering ,IIT Delhi.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	2	3	2	2	1	1	0	0	0	2	2	3	1
CO 2	3	2	3	1	2	1	2	0	0	0	1	1	3	1
CO 3	3	2	2	2	2	1	1	0	0	0	3	1	3	1
CO 4	3	2	2	1	2	1	1	0	0	0	1	1	3	1
CO 5	3	2	3	2	1	1	1	0	0	0	2	1	3	1
Total	15	10	13	8	9	5	6	0	0	0	9	6	15	5
Scaled Value	3	2	3	2	2	1	2				2	2	3	1

#### Mapping of COs with POs:

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

0-No Relation, 1- Low Relation, 2-Medium Relation, 3-High Relation

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO 2
Original	1.5	10	12	0	0		6	0	0	0	0		1.5	
value	15	10	13	8	9	2	6	0	0	0	9	6	15	2
Scaled to 0,1,2,3 scale	3	3	3	2	2	1	2	0	0	0	2	2	3	1

COURS CODE	E		L	Т	Р	C		
XCS403	6	OBJECT ORIENTED PROGRA JAVA	MMING WITH	3	0	1	4	
C: P: A 2:0.5:0.5	= 5							
				L 2		P 2	H 5	
COURS	E OUTC	DOMAIN	3	LEV	EL	3		
CO1	To <b>und</b> and cla	<i>lerstand</i> the basic concepts of OOP sses and objects in C++.	Cognitive Psychomotor Affective		Unde Pract Set	erstan	d	
CO2	To den demons C++.	velop a solution to problems and strating the usage of file handling in	Cognitive, Psychomotor Affective		Anal Pract Guid Resp	yze, ticing ed onse		
CO3	CO3 To understand the basic concepts of OOP Cognitive in Java. Psychomotor Affective					Understand Practicing Set		
CO4	To <i>ap</i> Multith java.	<i>ply</i> the ability to program with nreading and Exception handling in	Cognitive Psychomotor Affective		Unde Appl Pract Guid Resp	erstan y ticing ed onse	d	
CO5	To <i>den</i> solution operation	<i>nonstrate</i> the ability to <i>develop</i> a n to various I/O manipulation ons and connectivity to database.	Cognitive Psychomotor Affective		Anal Pract Guid Resp	yze ticing ed onse		
		COURSE CONTEN	NTS					
UNIT –	I PROG	RAMMING IN C++			9+3			
<ul> <li>Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals, Classes and objects, Constructors and destructors, operator overloading – inheritance, functions and polymorphism.</li> <li>List of Experiments: <ol> <li>Design C++ classes with static members, methods with default arguments, friend functions.</li> <li>Implement complex number class with necessary operator overloading and type conversions such as integer to complex, double to complex, complex to double etc.</li> </ol> </li> </ul>								
UNIT –	II FILE	HANDLING IN C++	• • •		9+3			
C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling. List of Experiments:								

1. Implement Matrix class with dynamic memory allocation and necessary methods.

	one
operator.	
2. Overload the new and delete operators to provide custom dynamic allocation	of
memory.	
JNIT – III JAVA INTRODUCTION9 + 3	
An overview of Java, data types, variables and arrays, operators, control statements, class	ses,
bjects, methods.	
list of Experiments:	
1. Simple Java applications	
- For understanding reference to an instance of a class (object), methods	
- Handling Strings in Java	
JNIT – IV JAVA PROGRAMMING 9+3	
hheritance Packages and Interfaces, Exception handling Strings, Input /Outp	out,
Aultithreading – interrupting threads – thread states – thread priorities – thread	ead
ynchronization – Executors.	
Ast of Experiments:	
1. Simple Package creation.	
2. Interfaces	
- Developing user-defined interfaces and implementation	
- Use of predefined interfaces	
3. Exception Handling Mechanism in Java	
- Handling pre-defined exceptions	
- Handling user-defined exceptions	
JNIT – V FILE HANDLING IN JAVA <sup>9+3</sup>	
iles - streams - byte streams, character streams, text input/output, binary input/outp	1111
	Jui,
andom access file operations, File management using File class.	Jui,
andom access file operations, File management using File class. Connecting to a database, querying a database and processing the results, updating data w	ith
andom access file operations, File management using File class. Connecting to a database, querying a database and processing the results, updating data w DBC.	'ith
andom access file operations, File management using File class. Connecting to a database, querying a database and processing the results, updating data w DBC. <b>.ist of Experiments:</b>	vith
<ul> <li>andom access file operations, File management using File class.</li> <li>Connecting to a database, querying a database and processing the results, updating data w</li> <li>DBC.</li> <li><i>List of Experiments:</i></li> <li>1. Program to implement streaming models</li> </ul>	ith
<ul> <li>andom access file operations, File management using File class.</li> <li>Connecting to a database, querying a database and processing the results, updating data w DBC.</li> <li><b>.ist of Experiments:</b> <ol> <li>Program to implement streaming models</li> <li>Program to implement JDBC Connectivity</li> </ol> </li> </ul>	rith
<ul> <li>andom access file operations, File management using File class.</li> <li>Connecting to a database, querying a database and processing the results, updating data w</li> <li>DBC.</li> <li><i>ist of Experiments:</i> <ol> <li>Program to implement streaming models</li> <li>Program to implement JDBC Connectivity</li> </ol> </li> </ul> LECTURE TUTORIAL PRACTICAL TOTA	rith
andom access file operations, File management using File class. Connecting to a database, querying a database and processing the results, updating data w DBC. .ist of Experiments: 1. Program to implement streaming models 2. Program to implement JDBC Connectivity $\frac{\text{LECTURE}}{45} - \frac{\text{PRACTICAL}}{30} - 75$	rith
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andom access file operations, File management using File class. Connecting to a database, querying a database and processing the results, updating data w DBC. <b>ist of Experiments:</b> 1. Program to implement streaming models 2. Program to implement JDBC Connectivity <u>LECTURE</u> <u>TUTORIAL</u> <u>PRACTICAL</u> <u>TOTA</u> <u>45</u> - <u>30</u> 75 <u>TEXT BOOKS</u> 1. K.R.Venugopal, Rajkumar Buyya, T.Ravishankar, "Mastering C++", TMH, 2003 2. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, 2000	/ith
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- 5. Programming in Java, Bruce Eckel, Pearson Education
- 6. Programming in Java, S. Malhotra and S. Choudhary, Oxford Univ. Press.
- 7. Deitel & Deitel, "Java How to Program", Prentice Hall, 9th Edition, 2012.

-	. Dener & Dener, Java How to Flogram, Frence Han, 9th Edition, 2012.
<b>E</b> – 1	REFERENCES
1	https://docs.oracle.com/javase/tutorial/java/
4	2. https://www.coursera.org/learn/java-programming
	3. https://www.udemy.com/introduction-to-java-programming/
Z	1. https://www.udemy.com/learn-java-programming-tutorial/

	PO	PS	PS											
	1	2	3	4	5	6	7	8	9	10	11	12	01	O2
CO1	3	3	3	3	3	2	2	2	1	0	0	2	3	3
CO2	3	3	3	3	3	2	2	2	1	0	0	2	3	3
CO3	2	2	2	3	3	3	2	2	1	0	0	1	2	2
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	13	12	13	14	12	7	8	8	5	0	0	5	11	10

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original	13	12	13	14	12	7	8	8	5	0	0	5	11	10
Scaled to														
0,1,2,3	3	3	3	3	3	2	2	2	1	0	0	1	3	2
scale														

COURS CODE	E COURSE NAME	COURSE NAME					
XCS404	OPERATING SYSTEMS		3	1	1	5	
C:P:A= 2.8:1.8:0	.4						
			L	Τ	P	H	
			3	2	2	7	
COURS	E OUTCOMES DOM	AIN		LEV	<b>EL</b>		
CO1	A <i>Describe</i> the evolution of operating systems and the <i>handle</i> the system calls issues related to designing OS.	e notor	Desci	Apply			
CO2	<i>Describe</i> , apply the processes, interprocesses communication, and process synchronization and <i>Solve</i> the problems related to processes.	er- Cognitive Des ss Psychomotor Cre Affective App					
CO3	Identify and Describe and apply the main memory, secondary memory management techniques and Solve the memoryCognitive Psychom Affective	e notor e	Descr Creat Appl	ribe e, y			

	management issues.		
CO4	State and Describe the I/O functions	Cognitive	Knowledge
CO5	Understand and <i>Describe</i> the systems the basics of Linux system and perform administrative tasks on Linux Servers.	Cognitive	Apply
UNIT I	<b>OPERATING SYSTEMS OVERVIEW</b>		12 + 6

#### Theory

Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System. Computer System Organization- Operating System Structure and Operations- System Calls, System Programs, OS Generation and System Boot.

#### **Practical**

- 1. Write programs using the process related system calls of UNIX operating system like fork, exec, exit, wait, getuid, geteuid, close, kill etc...
- 2. Write C programs to simulate UNIX commands like ls, grep, etc...

#### UNIT II PROCESS MANAGEMENT

12 + 12

Processes-Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication; Threads- Overview, Multicore Programming, Multithreading Models; Windows 7 - Thread and SMP Management. Process Synchronization - Critical Section Problem, Mutex Locks, Semophores, Monitors; CPU Scheduling and Deadlocks.

#### **Practical**

- 3. Write programs using the I/O system calls of UNIX operating system (open, read, write. etc)
- 4. Simulate Inter Process Communication
- 5. Implement the various scheduling algorithms like FCFS and SJF scheduling, Priority and Round robin scheduling.
- 6. Implement the semaphores like Producer Consumer problem

UNIT III STORAGE MANAGEMENT								
Main Memory-Contiguous Memory Allocation, Segmentation, Paging, 32	and	64	bit					
architecture Examples; Virtual Memory- Demand Paging, Page Replacement,	Allc	ocati	ion,					
Thrashing; Allocating Kernel Memory, OS Examples.								

#### Practical

- 7. Implement first fit algorithm for memory management scheme
- 8. Implement best fit algorithm for memory management scheme
- 9. Implement worst fit algorithm for memory management scheme

**10.** Implement the contiguous file allocation technique

#### UNIT IV I/O SYSTEMS

12 +3

Mass Storage Structure- Overview, Disk Scheduling and Management; File System Storage-File Concepts, Directory and Disk Structure, Sharing and Protection; File System Implementation - File System Structure, Directory Structure, Allocation Methods, Free Space Management; I/O Systems.

#### **Practical**

**11.** Simulate Storage Features using virtual box component

12 + 3

UNIT V CASE STUDY Linux System- Basic Concepts; System Administration-Requirements for Linux System Administrator, Setting up a LINUX Multifunction Server, Domain Name System, Setting Up Local Network Services; Virtualization- Basic Concepts, Setting Up Xen, VMware on Linux Host and Adding Guest OS.

#### Practical

**12.** System virtualization using Vmware.

	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	15	30	90
TEXT BOOKS	5		I	
1. Abrahar	n Silberschatz, Peter Bae	er Galvin and G	breg Gagne, "Ope	erating System
Concept	ts", 9 <sup>th</sup> Edition, John Wiley	and Sons Inc., 201	12.	
REFERENCE	S			
1. William	Stallings, "Operating S	ystems – Intern	als and Design	Principles",
7thEditi	on, Prentice Hall, 2011.			
2. D M D	hamdhere, "Operating Sy	vstems: A Conce	pt-Based Approac	h", Second
Edition,	Tata McGraw-Hill Education	on, 2007		
3. Andrew	S. Tanenbaum, "Modern	Operating System	ns", Second Editio	on, Addison
Wesley,	2001.			
4. Charles	Crowley, "Operating Syste	ems: A Design-Or	riented Approach"	, Tata McGraw
Hill Edu	acation", 1996.			
<b>E-REFERENC</b>	CES			
1. NPTEL	Course Prof. P.C.P. Bhatt,	Department of Co	omputer Science an	nd Engineering,
IISC, Ba	angalore.			

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	1	3	0	0	0	0	0	1	0	0	1	1	2
CO 2	3	3	3	1	0	0	0	0	0	0	1	2	1	3
CO 3	2	3	3	1	1	0	0	0	1	0	1	2	1	3
CO 4	3	2	0	1	1	1	1	0	1	0	0	2	0	3
CO 5	3	2	0	1	1	1	1	0	1	0	0	2	0	3
	14	11	9	4	3	2	2	0	4	0	2	9	3	14

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original value	14	11	9	4	3	2	2	0	4	0	2	9	3	14
Scaled to 0,1,2,3	3	3	2	1	1	1	0	0	1	0	1	2	1	3

scale							

COUR	SE CODE	COURSE NAME		L	С		
XCS40	5	DESIGN AND ANALYSIS OF ALGORI	THMS	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			4
C:P:A	= 3:0.8:0.2			LTP310LTP320LEVELUnderstandAnalysisApplyingUnderstand			
				L	Т	Р	Η
				3	2	0	5
COUR	SE OUTCON	<b>AES</b>	DOMAIN		LEV	<b>EL</b>	
CO1	<i>Explain</i> an notion types	d <i>classify</i> the basic algorithms and their swith recursive and non-recursive.	Cognitive	U	d		
CO2	Origination searching pr	Analyses and <i>designs</i> of sorting and roblems.	Cognitive				
CO3	Apply Greed in various p	dy and Dynamic Programming Techniques roblems.	Cognitive		Appl	ying	г >
CO4	<i>Explain</i> and find out the and iterative	d <i>apply</i> algorithm techniques and ir complexity through recursive e method.	Cognitive	U	d		
CO5	<i>Explain</i> the methods	limitations of algorithm power and design	Cognitive	Understand			
UNIT I	<b>BASIC</b>	ONCEPTS OF ALGORITHMS				1	2

tunes. Fundamentals of the Analysis Framework	ls of Algorithm	nic Solving - Ir	nportant Problem
types - rundamentals of the Analysis Flamework	c - Asymptotic	Notations and	Basic Efficiency
Classes-Mathematical Analysis of Non-recursive A	Algorithm: Exa	mples- Mathema	atical Analysis of
Recursive Algorithm :			
UNIT II BRUTE FORCE AND DIVIDE-AND-	CONQUER		12
Brute Force - Closest-Pair and Convex-Hull Pre-	oblems-Exhaus	tive Search- Se	election Sort and
Bubble Sort - Sequential Search and Brute-force st - Quick Sort - Binary Search tree- Strassens Matrix	ring matching- Multiplication o	Divide and con f large integers.	quer : Merge sort
UNIT III DYNAMIC PROGRAMMING AND	GREEDY TEC	HNIQUE	12
Computing a Binomial Coefficient - Warshalls and I	Floyd" algorithr	n - Optimal Bina	ary Search Trees -
Knapsack Problem and Memory functions. Greedy 7	Technique- Prim	s algorithm- Kru	uskal's Algorithm-
Dijkstra's Algorithm-Huffman Trees.			
UNIT IV ITERATIVE ALGORITHMS			12
Transform and conquer: Presorting - Balanced Sea	arch trees - AV	L Trees - Heap	s and Heap sort -
The Simplex Method-The Maximum-Flow Problem	n - Maximum N	Iatching in Bipa	rtite Graphs
UNIT V LIMITATIONS OF ALGORITHM PO	D and ND com	ESIGN METE	10DS 12
Lower- bound arguments- Decision Trees- P, Ni Limitations Backtracking n Queen's Problem	P and NP-com	piete problems-	coping with the
-1 $-1$ $-1$ $-1$ $-1$ $-1$ $-1$ $-1$		n Circuit nroble	am subset Sum
problem - Branch and bound - Assignment pr	oblem - Knan	i Circuit problem	em - subset-Sum
problem - Branch and bound - Assignment pr Algorithms for NP - Hard Problems - Traveling sal	oblem - Knap	sack problem	em - subset-Sum - Approximation
problem - Branch and bound - Assignment pr Algorithms for NP - Hard Problems - Traveling sal	oblem - Knap esman problem	sack problem	em - subset-Sum - Approximation TOTAL
problem - Branch and bound - Assignment pr Algorithms for NP - Hard Problems - Traveling sal	oblem - Knap esman problem LECTURE 45	a Circuit proble sack problem TUTORIAL 15	em - subset-Sum - Approximation TOTAL 60
problem - Branch and bound - Assignment pr Algorithms for NP - Hard Problems - Traveling sal	oblem - Knap esman problem LECTURE 45	a Circuit proble sack problem  TUTORIAL 15	em - subset-Sum - Approximation TOTAL 60
problem - Branch and bound - Assignment pr Algorithms for NP - Hard Problems - Traveling sal <b>TEXT BOOKS</b> 1. Anany Levitin, Introduction to the	oblem - Knap esman problem LECTURE 45 Design & A	a Circuit proble sack problem TUTORIAL 15 nalysis of Algo	em - subset-Sum - Approximation TOTAL 60 orithms, Addison
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CO2	2	3	2	2	1	0	0	0	0	0	0	0	1	1
CO3	2	2	2	0	1	0	0	0	0	0	0	0	1	1
CO4	2	2	2	2	0	0	0	0	1	0	0	0	1	1
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CO2	Interpret I	Break-even analysis	Cognitive	Unders	tand					
CO3	Illustrate	value engineering procedure	Cognitive	Understand						
<b>CO4</b>	Understan	ad and analyze replacement problem	Cognitive	Understand						
CO5	<i>Explain</i> de	epreciation	Cognitive	itive Understand						
UNIT	I INTROI	DUCTION TO ECONOMICS	<u> </u>				08			

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Flow in an economy, Law of supply and demand, Concept of Engineering Economics – Engineering efficiency, Economic efficiency, Scope of engineering economics- types of costing, element of costs, preparation of cost sheet and estimation, Marginal cost, Marginal Revenue, Sunk cost, Opportunity cost

UNIT II BREAK-EVEN ANALYSIS & SOCIA	L COST BENEFI	T ANALYSIS	12
Margin of Safety, Profit, Cost & Quantity analy	sis-Product Mix de	ecisions and CV	'P analysis,
Profit/Volume Ratio (P/V Ratio), Application of M	Iarginal costing, Lii	mitations	
Social Cost Benefit Analysis: compare different	project alternative	es, Calculate dire	ect, indirect
and external effects; Monetizing effects; Result of a	a social cost benefit	analysis.	
UNIT III VALUE ENGINEERING & COST A	CCOUNTING:		10
Value engineering – Function, aims, Value enginee	ring procedure - Ma	ake or buy decisi	on
LINIT IV DEDI ACEMENT ANALVSIS		ig costs	07
Deplecement englysis Types of replecement problem	am datarmination	of aconomia lifa	of an accet
Replacement of an asset with a new asset.			of all asset,
UNIT V DEPRECIATION	C 1 · · · 1	1 1 1	
Depreciation- Introduction, Straight line method	of depreciation, de	clining balance	method of
depreciation-Sum of the years digits method of dep	rectation, sinking f	und method of de	epreciation,
$\Delta nn m m / m \rho n n n n \rho n n \rho n r \rho n n n r \rho n n r \rho n n n m r n \rho n n n n n n n n n n n n n n n n n$	thod of depreciation	1.	momer
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Annutry method of depreciation, service output me	LECTURE	TUTORIAL	TOTAL
	LECTURE 45	TUTORIAL 0	TOTAL 45
<b>TEXT BOOKS</b>	LECTURE 45	TUTORIAL 0	TOTAL 45
<ul> <li><b>TEXT BOOKS</b></li> <li>1. Sp Gupta, Ajay Sharma &amp; Satish Ahuja, "Cost A Faridabad, Haryana, 2012</li> </ul>	LECTURE 45 Accounting", V K G	TUTORIAL       0       lobal Publication	<b>TOTAL</b> <b>45</b>
<ul> <li>TEXT BOOKS</li> <li>1. Sp Gupta, Ajay Sharma &amp; Satish Ahuja, "Cost A Faridabad, Haryana, 2012</li> <li>2. S.P.Jain &amp; Narang, "Cost accounting – Principle</li> </ul>	LECTURE 45 Accounting", V K G s and Practice", Kal	TUTORIAL 0 lobal Publication	TOTAL           45           1s,
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<ul> <li>TEXT BOOKS</li> <li>1. Sp Gupta, Ajay Sharma &amp; Satish Ahuja, "Cost A Faridabad, Haryana, 2012</li> <li>2. S.P.Jain &amp; Narang, "Cost accounting – Principle Calcutta, 2012</li> <li>3. Panneer Selvam, R, "Engineering Economics", F</li> </ul>	LECTURE 45 Accounting", V K G s and Practice", Kal Prentice Hall of Indi	TUTORIAL 0 lobal Publication lyani Publishers, a Ltd, New Delh	TOTAL           45           18,           i,
<ul> <li>TEXT BOOKS</li> <li>1. Sp Gupta, Ajay Sharma &amp; Satish Ahuja, "Cost A Faridabad, Haryana, 2012</li> <li>2. S.P.Jain &amp; Narang, "Cost accounting – Principle Calcutta, 2012</li> <li>3. Panneer Selvam, R, "Engineering Economics", F 2001.</li> </ul>	LECTURE 45 Accounting", V K G s and Practice", Kal Prentice Hall of Indi	TUTORIAL 0 lobal Publication lyani Publishers, a Ltd, New Delh	TOTAL           45           ns,           i,
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<ul> <li>TEXT BOOKS</li> <li>1. Sp Gupta, Ajay Sharma &amp; Satish Ahuja, "Cost A Faridabad, Haryana, 2012</li> <li>2. S.P.Jain &amp; Narang, "Cost accounting – Principle Calcutta, 2012</li> <li>3. Panneer Selvam, R, "Engineering Economics", F 2001.</li> <li>4. William G.Sullivan, James A.Bontadelli &amp; Elin I Prentice Hall International, New York, 2001.</li> <li>REFERENCES</li> <li>1. Luke M Froeb / Brian T Mccann, " Manage Thomson learning 2007</li> <li>2. Truett &amp; Truett, "Managerial economics- edition 2004.</li> <li>3. Chan S.Park, "Contemporary Engineering F 4. Donald.G. Newman, Jerome.P.Lavelle, ".</li> </ul>	LECTURE 45 Accounting", V K G s and Practice", Kal Prentice Hall of Indi M.Wicks, "Enginee rial Economics – A Analysis, problems Economics", Prentic Engineering Economic	TUTORIAL         0         lobal Publication         lyani Publishers,         a Ltd, New Delh         ring Economy",         problem solving         & cases " Wile         ce Hall of India, 2         omics and analy	TOTAL         45         is,         i,         g approach"         y India 8th         2002.         ysis" Engg.
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CO 1	2	0	0	0	0	1	1	0	0	0	1	1
CO 2	2	3	0	1	0	2	0	0	0	0	2	1
$\begin{array}{c} CO\\ 3 \end{array}$	2	0	0	2	0	1	1	1	0	2	1	1
CO	3	1	0	1	0	1	0	0	0	0	3	1

4												
CO 5	2	0	0	1	0	2	1	0	0	0	1	2
Total	11	4	0	5	0	7	3	1	0	2	8	6
Total	11	4	0	5	0	7	3	1	0	2	8	6
Scaled to 0,1,2,3 scale	3	1	0	1	0	2	1	1	0	1	2	1

COUR	SE CODE		L	Т	Р	SS	C	
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COUR	SE OUTCON	MES	Dom	nain		Level		
CO 1	I <i>dentify</i> the Knowledge report	Cogniti	ive		Rer	nemb	er	
CO 2	I <i>ntegrate</i> bo write a proje	Cogniti	ive		Create			
CO 3	Confidence	to <i>present</i> a project in 10 to 15 minutes	Affecti	ive Respon		ponse	9	
CO 4	The learner <i>identifies</i> and absorbs the pronunciation of sounds in English Language and learns how to mark the stress in a word and in a sentence properlyCogni						ive Rememb	
CO 5	<i>Enables</i> the speaker speaks clearly and fluently with confidence and it trains the learner to listen actively and critically						ceptio	n

UNIT I BA	ASIC PRINCIPLES	OF GOOD TECHNI	CAL WRITING		9				
Style in technical writing, out lines and abstracts, language used in technical writing: technical words, jargons etc									
UNIT IISF	PECIAL TECHNIQU	JES			9				
used in te Classificati	chnical writing: Def ons, division and inter	inition, description or pretation	of mechanism, Descrip	tion of a proces	ss,				
UNIT III I	REPORT/ PROJECT	[			9				
Layout the Presentation	formats: chapters, cor n of the written projec	nclusion, bibliography et 10 – 15 minutes	, annexure and glossary,	Graphics aids etc	c -				
UNIT IV S	OUNDS OF ENGLI	SH LANGUAGE;			9				
Reading for reading, act	or facts, meanings fittive listening, listening	rom context, scannir g for comprehension e	ng, skimming, inferring tc.	; meaning, critic	cal				
UNIT V R	EADING COMPRE	HENSION			9				
Reading for reading, act	or facts, meanings fittive listening, listening	rom context, scannir g for comprehension e	ng, skimming, inferring tc.	; meaning, critic	cal				
	LECTURE	SELF STUDY	PRACTICAL	TOTAL					
HOURS	15	30	0	45					
TEXT BO	OKS								
1. Gordon	H. Mills, Technical	Writing – April, 197	8, Oxford Univ Press						
<b>2.</b> Barun K Author,	<ol> <li>Barun K. Mitra, Effective Technical Communication: A Guide for scientists and Engineers. Author, Publication: Oxford University press. 2007</li> </ol>								
REFERENCE BOOKS									
1. Clif Eng	<ol> <li>Clifford Whitcomb, Effective Interpersonal and Task Communication Skills for Engineers, Atlantic Publishers. 2010</li> </ol>								
Software f	or lab: English Teacl	hing software (Young	g India Films)						

	GA 1	GA 2	GA 3	GA 4	GA 5	GA 6	GA 7	GA 8	GA 9	GA1 0	GA11	GA1 2
CO 1	0	0	0	0	0	0	0	0	0	2	0	0
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CO 4	0	0	0	0	0	0	0	0	0	0	0	1
CO 5	0	0	0	2	0	0	0	0	0	1	2	1

## **V SEMESTER**

COURSE CODE COURSE NAME							L	Т	Р	C		
XMA 501		NUM	IERICAL ME	THODS			2	1	0	3		
<b>C:P:A</b> = 2.7	5:0.25:0											
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COURSE C	DUTCOMES				D	OMAIN		LEVEL				
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CO1	Solve alge to Compu method.	Cognitive	Apply									
CO2	Interpret a Interpolati	and Ap on me	proximate the thods.	data using		Cognitive	Create ,Apply					
CO3	<i>Compute</i> Integration Simpson's	the n <i>and</i> s rules.	Numerical Di to <b>Apply the</b>	ifferentiatior Trapezoid	n and al and	Cognitive	A	Apply				
CO4Solve the first order and second order differential equations using single step and multistep methods.Cognitive methods						Cognitive	Apply					

Apply         Finite difference methods to Solve two- point linear boundary value problems and to Solve         Cognitive one         Create Apply           CO5         Solve         One         dimensional         heat-flow         Create Apply           UNTT I         Solution of Equations and Eigenvalue Problems         12           Solution of algebraic and transcendental equations - Fixed point iteration method - Gauss- Jordan methods         Iterative methods of Gauss-Jacobi and Gauss-Seidel – Matrix Inversion by Gauss-Jordan method – Eigen values of a matrix by Power method.         12           Interpolation with unequal intervals - Newton's forward and backward difference formulae- Interpolation         12           Interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation         12           UNIT II         Numerical Differentiation And Integration         12           Approximation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules - Romberg's method - two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules.         12           UNIT IV Boundary Value Problems for Ordinary Differential Equations - Multi-step methods - Finite difference methods for solving first and second order equations.         12           Single step-methods for solving two-point linear boundary value problems – Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domai				Comitivo	Croate Apply
COS       point linear boundary value problems and to solve one dimensional heat-flow equation and wave equation.       12         UNIT I Solution of Equations and Eigenvalue Problems — Fixed point iteration method – Newton-Raphson method - Solution of linear system of equations - Gauss Elimination method – Gauss-Jordan method Eigen values of a matrix by Power method.       12         UNIT I Interpolation And Approximation		Apply Finite difference meth	ods to Solve two-	Cognitive	Cleate ,Apply
Solve       One       dimensional       heat-flow         equation and wave equation.       12         Solution of algebraic and transcendental equations - Fixed point iteration method – Ocauss-Jordan method – Eigen values of a matrix by Power method.       12         Maphson method - Eigen values of a matrix by Power method.       12         UNIT II Interpolation And Approximation       12         Interpolation with unequal intervals - Newton's forward and backward difference formulae-Interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation       12         UNIT II Numerical Differentiation And Integration       12         Approximation of derivatives using interpolation polynomials - Numerical integration using trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules – Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules.       12         UNIT IV Initial Value Problems for Ordinary Differential Equations - Multi-step methods - Mile's and Adams-Bashforth predictor-corrector methods for solving first order equations.       12         Finite difference methods for solving this and second order equations - Nulti-step methods - Mile's and Adams-Bashforth predictor-corrector methods for solving first order equations.       12         Finite difference methods for solving two-point linear boundary value problems – Finite difference inchniage for the solution of two dimensional Laplace's and Poisson's cquations on rectangular domain – One dimensional heat-flow equation by explicit and implicit me	CO5	point linear boundary value	problems and to		
Image Sequence       12         Solution of algebraic and transcendental equations - Fixed point iteration method – Newton-Raphson methods - Iterative methods of Gauss-Jacobi and Gauss-Seidel – Matrix Inversion by Gauss-Jordan methods - Iterative methods of Gauss-Jacobi and Gauss-Seidel – Matrix Inversion by Gauss-Jordan method - Eigen values of a matrix by Power method.       12         UNTI II Interpolation And Approximation       12         Interpolation with equal intervals - Newton's forward and backward difference formulae-Interpolation with qual intervals - Lagrange interpolation – Newton's divided difference interpolation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules - Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules.       12         UNIT IV Initial Value Problems for Ordinary Differential Equations       12         Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations.       12         UNIT IV Initial Value Problems in Ordinary and Partial Differential Equations       12         Finite difference methods for solving first and second order equations.       12         Finite difference methods for solving two-point linear boundary value problems – Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional Laplace's not Poisson's equations - One dimensional wave equation by explicit methods.       12		Solve One dimensio	onal heat-flow	,	
UNTT Solution of Equations and Eigenvalue Problems       12         Solution of algebraic and transcendental equations - Fixed point iteration method - Newton-Raphson method - Solution of linear system of equations - Gauss Elimination method - Gauss-Jordan methods - Iterative methods of Gauss-Jacobi and Gauss-Seidel - Matrix Inversion by Gauss-Jordan method - Eigen values of a matrix by Power method.       12         UNIT II Interpolation And Approximation       12         Interpolation with equal intervals - Newton's forward and backward difference formulae-Interpolation       112         Approximation of derivatives using interpolation polynomials - Numerical integration using interpolation for derivatives using interpolation of double integrals by Trapezoidal and Simpson's 1/3 and Simpson's 3/8 rules - Romberg's method - Two point and three point Gaussian quadrature formulae - Evaluation of double integrals by Trapezoidal and Simpson's rules.       12         Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations - Multi-step methods - Milne's and Adams-Bashforth predictor-corrector methods for solving first order equations.       12         UNTT V Boundary Value Problems in Ordinary and Partial Differential Equations       12         Single step-methods for solving first and second order equations - Finite difference etchniques for solving three-point and three point previons.       12         Single step-methods for solving first and second order equations - Multi-s		equation and wave equation.			
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Jordan methods – Iterative methods of Gauss-Jacobi and Gauss-Seidel – Matrix Inversion by Gauss-Jordan method – Eigen values of a matrix by Power method. [12] Interpolation with equal intervals - Newton's forward and backward difference formulae- Interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules – Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules. [12] Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations - Multi-step methods - Milne's and Adams-Bashforth predictor-corrector methods for solving first order equations. [12] Finite difference methods for solving two-point linear boundary value problems – Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit methods - One dimensional wave equation by explicit method. [2004] Sankara Rao, K. "Numerical methods in Engineering and Science", 6 <sup>th</sup> Edition, Khanna Publishers, New Delhi, (2004). Sankara Rao, K. "Numerical methods for Scientists and Engineers", 3rd Edition, Prentice Hall of India Private Ltd., New Delhi, (2007). <b>REFERENCES</b> 1. Chapra, S. C and Canalc, R. P. "Numerical Methods for Engineers", 5th Edition, Tata McGraw-Hili, New Delhi, (2007). 2. Gerald, C. F. and Wheatley, P. O., "Applied Numerical Analysis", 6th Edition, Pearson Education Asia, New Delhi, (2007). 3. Brian Bradi	Raphson meth	nod- Solution of linear system	of equations - Ga	uss Elimination	method –Gauss-
Gauss-Jordan method – Eigen values of a matrix by Power method.       12         UNIT II       Interpolation with qual intervals - Newton's forward and backward difference formulae- Interpolation with unequal intervals - Lagrange interpolation – Newton's divided difference interpolation       12         UNIT III       Numerical Differentiation And Integration       12         Approximation of derivatives using interpolation polynomials - Numerical integration using Trapezoidal, Simpson's 1/3 and Simpson's 3/8 rules – Romberg's method - Two point and three point Gaussian quadrature formulae – Evaluation of double integrals by Trapezoidal and Simpson's rules.       12         UNIT IV       Initial Value Problems for Ordinary Differential Equations       12         Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations - Multi-step methods - Milne's and Adams-Bashforth predictor-corrector methods for solving first order equations.       12         Finite difference methods for solving two-point linear boundary value problems – Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit methods - One dimensional wave equation by explicit method.       12         I Grewal, B.S. and Grewal, J.S., "Numerical methods in Engineers", 3rd Edition, Prentice Hall of India Private Ltd., New Delhi, (2007).       2         2. Sankara Rao, K. "Numerical methods for Seintists and Engineers", 3rd Edition, Prarason Education Asia, New Delhi, (2007).       3. G	Jordan metho	ds – Iterative methods of Gau	ss-Jacobi and Gau	ss-Seidel – Ma	trix Inversion by
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Simpson's rules.       12         UNIT IV Initial Value Problems for Ordinary Differential Equations       12         Single step-methods - Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first and second order equations - Multi-step methods - Milne's and Adams-Bashforth predictor-corrector methods for solving first order equations.       12         UNIT V Boundary Value Problems in Ordinary and Partial Differential Equations       12         Finite difference methods for solving two-point linear boundary value problems – Finite difference techniques for the solution of two dimensional Laplace's and Poisson's equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit methods - One dimensional wave equation by explicit method.       12 <b>LECTURE</b> TUTORIAL       TOTAL         30       60         TEXT BOOKS       1.       Grewal, B.S. and Grewal, J.S., "Numerical methods in Engineering and Science", 6 <sup>th</sup> Edition, Khanna Publishers, New Delhi, (2004).       2.         Sankara Rao, K. "Numerical methods for Scientists and Engineers', 3rd Edition, Prentice Hall of India Private Ltd., New Delhi, (2007).       REFERENCES         1.       Chapra, S. C and Canale, R. P. "Numerical Methods for Engineers", 5th Edition, Tata McGraw-Hill, New Delhi, (2007).         2.       Graud, C. F. and Wheatley, P. O., "Applied Numerical Analysis", 6th Edition, Pearson Education Asia, New Delhi, (2007).         3.       Brian Bradie, "A friendly introduction to Numerical analysis",	point Gaussia	n quadrature formulae – Eva	aluation of double	e integrals by	Trapezoidal and
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<ol> <li>Orewal, B.S. and Orewal, J.S., Numerical methods in Engineering and Science ', o Edition, Khanna Publishers, New Delhi, (2004).</li> <li>Sankara Rao, K. "Numerical methods for Scientists and Engineers', 3rd Edition, Prentice Hall of India Private Ltd., New Delhi, (2007).</li> <li>REFERENCES         <ol> <li>Chapra, S. C and Canale, R. P. "Numerical Methods for Engineers", 5th Edition, Tata McGraw-Hill, New Delhi, (2007).</li> <li>Gerald, C. F. and Wheatley, P. O., "Applied Numerical Analysis", 6th Edition, Pearson Education Asia, New Delhi, (2006).</li> <li>Brian Bradie, "A friendly introduction to Numerical analysis", Pearson Education Asia, New Delhi, (2007)</li> <li>Jain M.K. , Iyengar S.R.K, Jain R.K, "Numerical Methods problems and solutions", Revised Second Edition (2007).</li> </ol> </li> <li>E REFERENCES         <ol> <li>www.nptel.ac.in</li> <li>Elementary Numerical Analysis Prof. Rekha P. Kulkarni. Department of Mathematics, Indian Institute Of Technology, Bombay.</li> </ol> </li> </ol>	Milne's and A UNIT V Bou Finite differen techniques for domain – One wave equation	dams-Bashforth predictor-correct <b>indary Value Problems in Ord</b> ce methods for solving two-poin the solution of two dimensional dimensional heat-flow equation by explicit method.	tor methods for sol <b>inary and Partial I</b> at linear boundary v at Laplace's and Po by explicit and im <b>LECTURE</b> 30	Differential Equation value problems - isson's equation plicit methods - TUTORIAL 30	uations       12         - Finite difference       12         - Son rectangular       12         - One dimensional       12         TOTAL       60
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2. Elementary Numerical Analysis Prof. Rekha P. Kulkarni. Department of Mathematics, Indian Institute Of Technology, Bombay.	Milne's and A UNIT V Bou Finite different techniques for domain – One wave equation TEXT BOOK 1. Grewal Edition 2. Sankar Hall o REFERENCI 1. Chapran Tata M 2. Gerald Pearso 3. Brian M Asia, M 4. Jain M Revise E REFERENCI	dams-Bashforth predictor-correct <b>indary Value Problems in Ord</b> ce methods for solving two-point the solution of two dimensional dimensional heat-flow equation by explicit method. <b>S</b> I, B.S. and Grewal,J.S., "Numer h, Khanna Publishers, New Delhi a Rao, K. "Numerical methods f India Private Ltd., New Delhi, ES S. C and Canale, R. P. "Numeri McGraw-Hill, New Delhi, (2007) C. F. and Wheatley, P. O., "Appon Education Asia, New Delhi, ES Stadie, "A friendly introduction to New Delhi, (2007) I.K. Jyengar S.R.K, Jain R. d Second Edition (2007). <b>CES</b>	tor methods for sol inary and Partial I at linear boundary v l Laplace's and Po by explicit and im LECTURE 30 ical methods in Eng , (2004). for Scientists and (2007). cal Methods for En ). plied Numerical An (2006). to Numerical analys K, "Numerical Methods	Differential Equation ving first order of Differential Equation value problems - isson's equation plicit methods - TUTORIAL 30 gineering and Sc Engineers', 3rd gineers', 5th Edual alysis'', 6th Edual sis'', Pearson Edual ethods problem	uations     12       - Finite difference       ns on rectangular       - One dimensional       TOTAL       60       eience", 6 <sup>th</sup> Edition, Prentice       lition,       ucation       and solutions",
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	Milne's and A UNIT V Bou Finite different techniques for domain – One wave equation TEXT BOOK 1. Grewal Edition 2. Sankar Hall o REFERENCI 1. Chapra, Tata M 2. Gerald Pearso 3. Brian H Asia, D 4. Jain M Revise E REFEREN 1. <u>www.r</u> 2. Element	dams-Bashforth predictor-correct <b>indary Value Problems in Ord</b> ce methods for solving two-point the solution of two dimensional dimensional heat-flow equations by explicit method. <b>S</b> I, B.S. and Grewal,J.S., "Numernal A Rao, K. "Numerical methods f India Private Ltd., New Delhi, (2007) A SC and Canale, R. P. "Numerical McGraw-Hill, New Delhi, (2007) C. F. and Wheatley, P. O., "Appon Education Asia, New Delhi, (2007) McGraw-Hill, (2007) McK. , Iyengar S.R.K, Jain R. d Second Edition (2007). <b>CES</b> Mptel.ac.in ntary Numerical Analysis Prof.	tor methods for sol inary and Partial I at linear boundary v il Laplace's and Po by explicit and im LECTURE 30 ical methods in Eng , (2004). for Scientists and (2007). cal Methods for En ). plied Numerical And (2006). to Numerical analys K, "Numerical Methods K, "Numerical Methods	ving first order of         Differential Equalue problems -         isson's equation         plicit methods -         TUTORIAL         30         gineering and Sc         Engineers', 3rd         gineers", 5th Edualysis", 6th Edualysis", 6th Edualysis", 6th Edualysis         sis", Pearson Edualysis         ethods problem         ni. Department	uations     12       - Finite difference       ns on rectangular       One dimensional       TOTAL       60       eience", 6 <sup>th</sup> Edition, Prentice       lition,       ucation       as and solutions",       of Mathematics,

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO 1	3	0	0	0	0	0	0	0	0	1	0	1
CO 2	3	0	0	0	0	0	0	0	0	1	0	1
CO 3	3	0	0	0	0	0	0	0	0	1	0	1
CO 4	3	2	0	0	1	0	0	0	0	1	1	1
CO 5	3	2	0	0	1	0	0	0	0	1	1	1
Total	15	4	0	0	2	0	0	0	0	5	2	5

Total	15	4	0	0	2	0	0	0	0	5	2	5
Scaled	3	1	0	0	1	0	0	0	0	1	1	1

COUI	RSE CODE	COURSE NAME	L	T P		С		
XCS502		THEORY OF COMPUTATION		2	1	0	3	
C:P:A =	C:P:A = 3:0:0							
				L	Т	P	H	
				2	2	0	4	
COURS	JRSE OUTCOMES DOMAIN LEVE				EL			
CO1	Explain and I finite automa	Cognitive	Knowledge					
CO2	Describe regu	lar and context-free languages	Cognitive	Knowledge				
CO3	Describe tran grammars	nsform regular expressions to	Cognitive and Affective	Knov Creat	vledge te	e,		
CO4	Explain Cons	structions of Turing Machines	Cognitive	Knowledge,				
CO5	Describe the computability	Cognitive and Affective	Knowledge, Create					
UNIT I	FINITE AU					9		
Introduction- Basic Mathematical Notation and techniques- Finite State systems – Basic Definitions – Finite Automaton – DFA & NDFA – Finite Automaton with €-moves – Regular Languages-Regular Expression – Equivalence of NFA and DFA – Equivalence of NDFA's with and without €-moves – Equivalence of finite Automaton and regular expressions –Minimization of DFA- - Pumping Lemma for Regular sets – Problems based on Pumping Lemma.

### UNIT II GRAMMARS

Grammar Introduction– Types of Grammar - Context Free Grammars and Languages– Derivations and Languages – Ambiguity- Relationship between derivation and derivation trees – Simplification of CFG – Elimination of Useless symbols - Unit productions - Null productions – Greiback Normal form – Chomsky normal form – Problems related to CNF and GNF.

### UNIT III PUSHDOWN AUTOMATA

Pushdown Automata- Definitions – Moves – Instantaneous descriptions –Deterministic pushdown automata – Equivalence of Pushdown automata and CFL - pumping lemma for CFL – problems based on pumping Lemma.

### UNIT IV TURING MACHINE

Turing Machines- Introduction – Formal definition of Turing machines –Instantaneous descriptions-Turing Machine as Acceptors – Turing Machine as Transducers Computable Languages and functions – Turing Machine constructions – Modifications of Turing Machines.

### UNIT V COMPUTATIONAL COMPLEXITY

Undecidability- Basic definitions- Decidable and undecidable problems - Properties of Recursive and Recursively enumerable languages – Introduction to Computational Complexity: Definitions-Time and Space complexity of TMs –complexity classes – introduction to NP-Hardness and NP-Completeness.

LECTURE	TUTORIAL	TOTAL
45	0	45

### TEXT BOOKS

1. Hopcroft J.E., Motwani R. and Ullman J.D, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2008.

### REFERENCES

1. John.C.Martin, "Introduction to Languages and the Theory of Computation" McGraw-Hill Education, 01-May-2010.

2. Michael Sipser, "Introduction to the Theory of Computation" Cengage Learning, 2012.

### **E-REFERENCES**

Theory of Computation by Prof. Somenath Biswas, Computer Science and Engineering, IIT Kanpur

### Mapping of COs with POs:

	PO	PO10	PO11	PO12	PS	PSO								
	1	2	3	4	5	6	7	8	9				01	2
CO1	2	2	2	3	0	0	0	1	1	1	0	0	0	0
CO2	2	3	2	3	0	0	0	0	0	1	0	2	2	1
CO3	2	2	3	1	1	2	1	2	2	0	0	0	0	2
CO4	3	2	2	2	0	0	0	0	0	1	0	1	0	2
CO5	1	1	3	3	1	2	1	1	1	0	0	2	2	2
Total	10	10	12	12	2	4	2	4	4	3	0	5	4	11

Courses	PO	PO1	PSO	PSO										
	1	2	3	4	5	6	7	8	9	10	11	2	1	2

9

9

9

Original	10	10	12	12	2	4	2	4	4	3	0	5	4	11
Scaled to	2	2	3	3	1	1	1	1	1	1	0	1	1	3
0,1,2,3														
Scale														

COUR	SE CODE	COURSE NAME			L	T	P	C
XCS 503		DATABASE MANAGEMENT SY	STEMS		3	0	1	4
<b>C:P:A =</b>	2.8:0.8:.0.4							
					L	Т	Р	H
					3	0	2	5
COURSI	E OUTCOM	ES	DOMAIN		L	EVEL	1	
CO1	<i>Construct</i> system with	queries with relational database the basics of SQL	Cognitive	Re	mem	ber, Cr	eate	
CO2	<b>Relate and</b> logical desig	<i>Apply</i> the design principles for gn of databases, including ER model zation approach	Cognitive	Un	nderst	and, A	pply	
CO3	<b>Define and</b> structures ar organization tree, B+ tree	<i>Explain</i> the basic database storage and access techniques: file and page s, indexing methods including B-andhashing.	Cognitive	Re Un	emem nderst	ber, and		
CO4	<b>Define</b> and transaction p	<i>Explain the</i> basic issues of brocessing and concurrency control.	Cognitive	Re Un	mem nderst	ber , and		
CO5	work succe development	essfully in a team by design and t of database application systems.	Cognitive	Ap	ply			
UNIT I	INTRODU	CTION					9	9+3

Introduction to File and Database systems- Database s Data models – ER model – Relational Model – Keys – H	ystem structure Relational Alge	e – Data Models bra and Calculus.	– Types of
List of Experiments:			
1. Database design using E-R model and Normaliza	tion		
UNIT II RELATIONAL MODEL			9+21
SQL – Data definition- Queries in SQL- Updates- Vi	ews – Integrit	y and Security –	Relational
Database design – Functional dependences and N	ormalization f	or Relational D	atabases –
Decomposition - Desirable Properties of Decomposition	- Boyce-Codd	Normal Form.	
List of Exporimonts.			
2 Data Definition I anguage (DDI) commands in F	DBMS		
3. Data Manipulation Language (DDL) commands in T	ontrol Languag	re (DCL)	
4. High level language extensions with cursors	ond of Languag	,0 (12 012)	
5. High level language extension with Triggers			
6. Views			
7. Procedures and Functions			
8. Embedded SQL			
UNIT III DATA STORAGE AND QUERY PROCE	SSING		9
Overview of Physical Storage Media – Magnetic I	Disks – RAID	– Tertiary stor	age – File
Organization –Organization of Records in Files – Indexi	ng and Hashin	g –Ordered Indice	es - B + tree
Index Files – B tree Index Files – Static Hashing – Dyna	mic Hashing–	Query Processing.	
UNIT IV TRANSACTION MANAGEMENT		1 5 1 11	9
Iransaction Processing – Introduction- Need for Con	currency cont	rol- Desirable pr	operties of
Types of Looks, Two Phases looking, Deadlock, Times	ty and Schedu	les – Concurrency	Pacovary
Types of Locks- Two Phases locking- Deaulock- Thile s Techniques – Immediate Undate- Deferred Undate - Sha	dow Paging	icultency control	- Recovery
UNIT V ADVANCED DATABASES	dow I aging.		0+6
Distributed databases - Homogenous and Heterogeneous	s - Distributed	data Storage Ohie	ct Oriented
Databases - Need for Complex Data types - OO data N	Aodel- Nested	relations - Compl	ex Types -
Inheritance Reference Types - XML - Structure of XML	Data - XML D	Ocument Schema	- Ouerving
and Transformation - Data Mining and Data Wareh	ousing -Web	database-Spatial	database -
Temporal database - Multimedia database.	C		
List of Experiments:			
1. Develop the following applications using Mysql and	Java		
a. Design and implementation of payroll proces	sing system		
b. Design and implementation of Banking system	m Antion Science		
c. Design and implementation of Library Inform	nation System		
d. Design and implementation of Student morn	lation System		
	LECTURE	PRACTICAL	TOTAL
	45	30	75
TEXT BOOKS			
1. Abraham Silberschatz, Henry F. Korth and S.	Sudharshan, "I	Database System	Concepts",
Sixth Edition, Tata Mc Graw Hill, 2011.			
2. C.J.Date, A.Kannan and S.Swamynathan, "An	Introduction to	Database System	ns", Eighth
Edition, Pearson Education, 2006.			
REFERENCES			
1. Ramez Elmasri and Shamkant B. Navathe, "F	undamentals of	of Database Syste	ems". Fifth
			, ;

Edition, Pearson Education, 2008.

- 2. Atul Kahate, "Introduction to Database Management Systems", Pearson Education, New Delhi, 2006.
- 3. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas Publishing House Private Limited, New Delhi, 2003.
- 4. Raghu Ramakrishnan, "Database Management Systems", Fourth Edition, Tata Mc Graw Hill, 2010.
- 5. G.K.Gupta, "Database Management Systems", Tata Mc Graw Hill, 2011.
- 6. Rob Cornell, "Database Systems Design and Implementation", Cengage Learning, 2011.

### **E-RESOURCES**

- 1. http://spoken-tutorial.org
- 2. http://vlab.co.in/

	PO	PO1	PO1	PO1	PS	PS								
	1	2	3	4	5	6	7	8	9	0	1	2	O 1	O 2
CO 1	3	0	2	1	0	0	0	0	0	0	0	0	3	1
CO 2	3	2	1	1	0	0	0	0	0	0	0	0	3	1
CO 3	3	0	0	0	0	0	0	0	0	0	0	0	3	1
CO 4	3	0	0	0	0	0	0	0	0	0	0	0	3	1
CO 5	0	3	3	3	2	0	0	0	2	1	0	0	3	3

	РО	РО	РО	РО	РО	PO	PO	PO	РО	PO1	PO1	PO1	PS	PS
	1	2	3	4	5	6	7	8	9	0	1	2	01	O 2
Origina 1	12	5	6	5	2	0	0	0	2	1	0	0	15	7

Scaled														
0,1,2,3	3	1	2	1	1	0	0	0	1	1	0	0	3	2
scale														

COUR CODE	RSE E	COURSE NAME		L	Т	Р	С
XCS5	04	WEB TECHNOLOGY AND MOBILE APPLICATION DEVELOPMENT		3	1	1	5
C:P:A 2.7:1.7	:P:A = 7:1.7:0.6			LT		Р	H
				3	2	2	7
COUR	RSE O	UTCOMES	DO	MA]	IN	LEVEL	4
CO1	The that	history of the internet and related internet concepts are vital in <i>understanding</i> Web development.	Cog	gnitiv	ve	Remem	ber
CO2	<i>Den</i> stati cont	<i>c and dynamic web pages and separate design from tent using Cascading Style sheet.</i>	Cog	gnitiv	ve	Remem Apply	ber
CO3	<b>Disc</b> imp	cuss the insights of server side programming and lement complete application over the web.	Cog Psy Affe	gnitiv chon ectivo	re notor e	Understa Apply Set Respond	and 1
<b>CO4</b>	<b>O4</b> <i>Utilize</i> the concepts of XML and Java.				ve	Underst Apply	and

CO5	<i>Use</i> mobile application development software tools i.e. Android, Windows and phy mobile technologies and etc. and identify the environments currently available on the market to <i>design</i> mobile application development	Cognitive Psychomotor Affective	Understand Guided Respond
UNIT I	INTRODUCTION		9 +3
Internet protocol J2ME, Radio D Digital A List of I 1. Wri	standards – TCP,UDP, SMTP and POP3 protocols – UR handlers – content handlers - Java 2 Micro Edition an I2ME and Wireless Devices. Small Computing Techno bata Networks, Microwave Technology, Mobile Radio No Assistants. Experiments: te programs in Java using sockets to implement the follow HTTP request FTP SMTP POP3	RLs – CGI-Intern nd the World of ology: Wireless etworks, Messag	net Address – f Java, Inside Technology, ging, Personal
UNIT I	I CLIENT SIDE TECHNOLOGY		9+3
HTML introduc Dynami model – multime List of I 2. Cre	<ul> <li>forms – frames – tables – web page design – st tion – control structures – functions – arrays – objects c HTML – introduction – cascading style sheets – object : filters and transition – data binding – data control – A dia data.</li> <li>Experiments: eate web pages with the followings</li> <li>HTML</li> <li>Style sheet languages</li> <li>JavaScript</li> </ul>	atic and dynan s – simple web model and colled activeX control -	nic-JavaScript applications. ctions – event – handling of
TINITT T	Ι ΓΕΡΝΕΡ ΓΙΝΕ ΤΕΛΙΝΟΙ ΟΛΥ		9+6
HTTP C connecti – cookie List of I	GET and POST requests -Web server (Java web server / vity – Servlets -Life cycle – deployment of simple server s –XAMPP - simple web applications – multi-tier applica Experiments:	Tomcat / JBoss) vlets –JSP — ses tions.	) – data base ssion tracking
<ol> <li>Write Javas</li> <li>Write</li> <li>Write</li> <li>S</li> <li>I</li> <li>II</li> <li>III</li> </ol>	e a Java Servlets program for email registration form a Script. programs in Java Servlet to do the following. Set the URL of another server. Download the homepage of the server. Display the contents of home page with date, content ty	nd do form val	idation using on date Last
III. I	nodified and length of the home page.	pe, and Expirat	on date. Last
5. Write	a JSP program for simple user authentication process (use	r name, passwor	rd).
	henefits_Advantages of XMI over HTMI EDI Datab	ases-XMI have	7+3 od standards
Structur XML sy devices. List of I	ing with schemas-DTD-XML Schemas-XML processin stems-ebXML-RosettaNet-Applied XML in vertical indu	g-Components stry-Web servic	of e-business es for mobile
UNIT	MOBILE APPLICATION DEVELOPMENT		9+15

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit - J2ME User Interfaces -High-Level Display - Low-Level Display - Record Management System - Generic Connection Framework

### List of Experiments:

7.Installation of J2ME (Java Wireless Toolkit)

- 8. Developing an Android application for temperature conversion that is Celsius to Fahrenheit.
- 9.Creating an Android Application for Library Management System with Multiple 10.Activities and a Simple Menu using List View
- 11. Creating an Android Application of simple audio player.
- 12. Creating an Android Application to display the current location using Google Maps
- 13. Creating an Android Application to display the current temperature using sensors.

<u> </u>				
	LECTURE	TUTORIAL	PRAC	TO
			TICAL	TA
				L
	45	15	15	75

### **TEXT BOOKS**

- Deitel and Nieto, "Internet and World Wide Web How to program", Pearson Education Publishers, 2000.2. W. Bolton Programmable Logic controllers-Newnes,2009
- 2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002.
- 3. Ron Schmelzer et al."XML and Web Services", Pearson Education, 2002.
- 4. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
- 5. J2EE: The Complete Reference, Jim Keof, Tata McGrawHill.
- 6. Web Technology: A Developer's Perspective, By N. P. Gopalan, J.Akilandeswari, 2011.

### REFERENCES

- 1. R.Krishnamoorthy & S.Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
- 2. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.
- 3. Naughton, "The Complete Reference Java2", Tata McGraw-Hill, 3rd edition, 1999.
- 4. Enterprise J2ME: Developing Mobile Java Applications Michael Juntao Yuan, Pearson Education, 2004.
- 5. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
- 6. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005.
- 7. Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition,J.Knudsen,Pearson.

### **E REFERENCES**

- 1. https://www.w3.org/
- 2. http://www.w3schools.com/
- 3. http://www.e-bros.fi/en/mobile\_development.html

	PO	PO1	PO1	PO1	PS	PS								
	1	2	3	4	5	6	7	8	9	0	1	2	O 1	O 2
CO	1	3	0	0	0	0	0	0	0	0	0	0	1	0
1														

CO	1	3	(	0	0	0	(	)	0	0		0	(	)	C	)	0	)	2	0	
2																					
CO	1	3	(	0	1	1	(	)	0	0		0	(	)	C	)	0	)	3	0	
3																					
CO	1	3	(	0	2	0	(	)	0	0		0	(	)	C	)	0	)	1	0	
4																					
Tota	4	12	(	0	3	1	(	)	0	0		0	(	)	C	)	0	)	6	0	
1																					
	DO		2		DO		05	DOC	DC	77		, I		DO	10	DO	11	DC	10	PSO	PSO
	PO		2	PO3	PO <sup>2</sup>	4   P	05	PO6	PC	)/	PO	5 1	PO9	PO	10	PC	<b>)</b> 11	PC	<i>J</i> 12	1	2
Original	4	12	2	0	3		1	0	(	)	0		0	0	)	(	)	(	0	6	0
Scaled																					
to	1	2		0	1		1	Ο		<b>`</b>	Ο		0	0	<b>`</b>	(	h		h	2	0
0,1,2,3		3		0	1		1	0		,	0		U	U	,	(	J	l (	5	Z	0
scale																					

COURSE CODE	COURSE NAME		L	Т	Р	С		
XTQ506	TOTAL QUALITY MANAG	GEMENT	3	0	0	3		
C:P:A = 3: 0: 0			L	Т	Р	Η		
			3	0	0	3		
COURSE	OUTCOMES	DOMAIN		LEV	ΈL			
CO1	<i>List</i> and <i>Explain</i> the basic concepts of total quality concepts and its limitations.	Cognitive	Reme Under	mbei stan	ring, ding			
CO2	<i>Analyze</i> and <i>Explain</i> the Customer satisfaction, Employee involvement, supplier selection and appraise the performance by TQM principle.	Cognitive	Analyzing, Evaluating					
CO3	<i>Explain</i> and <i>Apply</i> the Statistical Process Control Tools.	Cognitive	Under Appli	rstano ng	ding,			
CO4	<i>Select</i> and <i>Explain</i> the different TQM tools and their significance.	Cognitive	Reme Under	mbei stan	ring, ding			
CO5	<i>Explain</i> the importance aspects of different quality systems.	Cognitive	Under	stan	ding			
UNIT I I	NTRODUCTION					9		

Definition of quality – Dimensions of quality – Quality planning – Quality costs – Analysis techniques for quality costs – Basic concepts of Total Quality Management – Historical review – Principles of TQM – Leadership – Concepts – Role of senior management – Quality Council – Quality statements – Strategic planning – Deming philosophy – Barriers to TQM implementation

#### 9 **UNIT II TQM PRINCIPLES** Customer satisfaction - Customer perception of quality - Customer complaints - Service quality -Customer retention - Employee involvement - Motivation, empowerment, teams, recognition and reward – Performance appraisal – Benefits – Continuous process improvement – Juran trilogy - PDSA cycle - 5S - Kaizen - Supplier partnership - Partnering - Sourcing - Supplier selection - Supplier rating - Relationship development - Performance measures - Basic concepts -Strategy – Performance measure. **UNIT III STATISTICAL PROCESS CONTROL (SPC)** 9 The seven tools of quality - Statistical fundamentals - Measures of central tendency and dispersion – Population and sample – Normal curve – Control charts for variables and attributes – Process capability - Concept of six sigma - New seven management tools. 9 UNIT IV TOM TOOLS Benchmarking - Reasons to benchmark - Benchmarking process - Quality Function Deployment (QFD) – House of quality – QFD process – Benefits – Taguchi quality loss function – Total Productive Maintenance (TPM) - Concept - Improvement needs - FMEA - Stages of FMEA. 9 **UNIT V QUALITY SYSTEMS** Need for ISO 9000 and other quality systems - ISO 9000:2000 quality system - Elements -Implementation of quality system – Documentation – Quality auditing – TS 16949 – ISO 14000 – Concept, requirements and benefits. **LECTURE TUTORIAL** TOTAL 45 0 45 **TEXT BOOKS** 1. Dale H. Besterfield, et. Al. "Total Quality Management", New Delhi, Pearson Education, Inc.. 2007. 2. James R. Evans and William M. Lidsay, "The Management and Control of Quality", 5th Edition, South-Western, 2002. REFERENCES 1. Feigenbaum, A.V., "Total Quality Management", McGraw Hill, 1991. 2. Oakland, J.S., "Total Quality Management", Butterworth Heineman, 1989. 3. Narayana V. and Sreenivasan, N.S., "Quality Management - Concepts and Tasks", New Age International, 1996. 4. Zeiri, "Total Quality Management for Engineers", Wood Head Publishers, 1991.

#### **E-REFERENCES**

1. http://nptel.ac.in/faq/110101010/Prof.IndrajitMukherjee,IIT,Bombay and Prof.Tapan P.Bagchi, IIT, Kharagpur.

#### CO Vs GA Mapping

	CO1	CO2	CO3	CO4	CO5	Total	Scaled
							Down 0 t0 5
GA1	2	1	2	1	1	7	2
GA4	1	1	2	2	1	7	2
GA5	1	1	2	2	1	7	2

GA6	1	1	2	1	2	7	2
GA7	1	1	1	1	1	5	1
GA8	1	1	1	2	2	7	2
GA9	1	1	1	-	1	4	1
GA10	1	1	1	2	2	7	2
GA12	1	1	-	-	2	4	1

COUR	SE CODE	XGS507		L	Т	Р	С
COUR	SE NAME	BUSINESS COMMUINCATION		1	0	1	0
				L	Τ	P	С
(	C:P:A	1:1:0		1	0	2	3
COUR	SE OUTCO	MES:	Domai	n	Le	evel	
CO 1	To choose business cor	and apply different styles to various forms of mmunication.	Cogniti	ve	Re	ememl	ber
CO 2	Identify the speaking in	proper tone of language required in writing and business communication.	Cogniti	ve	Uı	nderst	and
CO 3	Display kno in writing v	wledge on grammar and other linguistic features arious forms of business communication.	Cogniti	ve	Uı	nderst	and
<b>CO 4</b>	To distingut forms of Bu	hish between letters and memos and various siness Communication.	Psycho	moto	. Gi Re	uided espons	se
CO 5	Learn how t	o write business reports, minutes, proposals.	Psycho	motoi	· Al	oply	
UNIT 1	IINTRODU	CTION TO BUSINESS COMMUNICATION					
Moderr	n developmer	ts in the style of writing letters memos and reports	: block ]	letters	, sem	i	5
block le	etters, full blo	ock letters, simplified letters etc.,					3
UNIT ]	IIUSE OF L	ANGUAGE					
Memos of writt	/minutes/tele en and spoke	phone memos/ letters/ assignments art of writing E n communication.	E-mail et	tc. Ad	vanta	ges	5
UNIT 1	IIIGRAMM	AR					

The use of active and passive voice; the use of grammar, propriety, accuracy, exactness, the tone & other elements of language used in these writings.	5
UNIT IVTYPES OF REPORTS	
The format of various types of Reports/ projects etc.,	5
UNIT VBUSINESS WRITING	
Writing Business reports, proposals and minutes.	10
SELF-STUDY TOT	ΓAL
COURSE OUTCOMESDomainLeve	el

		30	30
TEXT BOOKS			
1. John Sealy, Writing and Spea	king Author:, Oxford Universi	ty Press, New Del	lhi Third
Edition 2009.			
2. Williams K S, Communication	ng in Business (8th Edition) Eng	gage Learning Inc	lia Pvt.
Ltd.; 2012			
REFERENCES			
1. John Sealy, Writing and Spe	aking, Oxford University Press	, New Delhi Third	d Edition
2009.			

### Mapping of COs with GAs

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	<b>GA10</b>	GA11	<b>GA12</b>
CO1										2		
CO2										2		
CO3				2						1		
CO4												
CO5										1		
Total				2						6		
Scaled				1						2		
Value				1						2		

## 3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

### XCS508 INPLANT TRAINING – II

**C:P:A** = 2:2:2

CO1	<i>Relate</i> classroom theory with workplace practice	Cognitive	Understand
CO2	<i>Comply with</i> Factory discipline, management and business practices.	Affective	Respond
<b>CO3</b>	Demonstrates teamwork and time management.	Affective	Value
CO4	<i>Describe</i> and <i>Display</i> hands-on experience on practical skills obtained during the programme.	Psychomotor	Perception, Set
CO5	<i>Summarize</i> the tasks and activities done by technical documents and oral presentations	Cognitive	Knowledge, Analysis

## CO Vs GA Mapping

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	2	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	1	3	0	0	1	0
CO3	0	0	0	0	0	0	0	0	3	1	3	1
CO4	0	1	2	1	3	0	0	0	0	0	0	3
CO5	0	0	0	3		0	0	0	0	3	0	1
Total	2	1	2	4	3	0	1	3	3	4	4	5

Total	2	1	2	4	3	0	1	3	3	4	4	5
Scaled	1	1	2	1	1	0	1	1	1	1	1	1

### **VI SEMESTER**

COURSE CODE	COURSE NAME	L	Τ	Р	С
XCS602	DATA WAREHOUSING AND DATA MINING	3	0	0	3
<b>C:P:A = 3:0:0</b>					

			L	T P H
			3	0 0 3
COURS	E OUTCOMES	DOMAI	N LEV	VEL
CO1	<b>Design</b> a data mart or data warehouse for any organization	or Cognitive	Remembe	r
CO2	<i>Develop</i> skills to write queries using DMOL	Cognitive	Remembe Understan	r d
CO3	<b>Apply</b> and extract knowledge using data mining techniques	Cognitive	Remembe	r
CO4	Adapt to new data mining tools	Cognitive	Remembe Understan	r d
CO5	<i>Explain</i> the recent trends in data mining such as web mining, spatial-temporal mining	g Cognitive	Understan	d
UNIT I	INTRODUCTION	i.		9
Definition Data Min	n of Data Mining - Data Mining Vs Query ing Tasks – Steps in Data Mining Process	Tools – Machi – Overview of	ne Learning –T Data Mining te	axonomy of chniques.
UNIT II	DATA WAREHOUSING			9
Definitio	n – Multidimensional Data Model – Da	ta Cube – Dim	ension Modeli	ng – OLAP
Operation	ns – Warehouse Schema – Data Warehous	se Architecture	– Data Mart – I	Meta Data –
Types of	Meta Data – Data Warehouse Backend Pr	ocess – Develop	pment Life Cyc	le.
UNIT II	I DATA PRE-PROCESSING AND CI	HARACTERIZ	ZATION	9
Data Clea	aning – Data Integration and Transformat	ion – Data Red	uction – Discre	tization and
Concept	Hierarchy Generation – Primitives – Data	Mining Query	Language – Ge	eneralization
– Summa	rization – Analytical Characterization and	d Comparison -	Association Ru	ıle – Mining
Multi Dir	nensional data from Transactional Databa	se and Relation	al Database.	
UNIT IV	CLASSIFICATION			9
Classifica	tion – Decision Tree Induction – Bay	vesian Classific	ation – Predic	ction –Back
Propagati Method –	on – Cluster Analysis – Hierarchical Met Outlier Analysis.	hod – Density E	Based Method –	Grid Based
UNIT V	ADVANCED TECHNIQUES AND AF	PPLICATIONS	5	9
Knowled – Case St	ge Mining - Web Mining - Spatial Mining udy (at least two).	g - Temporal Mi	ining- Tools – A	Applications
		LECTURE	TUTORIAL	TOTAL
		45	-	45
TEXT B	OOKS			
1. Paulraj 2. Jiawe Kaufn	Ponnaiah, "Data Warehousing Fundamer Han, Micheline Kamber, "Data Mini han Publishers, 2000.	ntals", Wiley Pung: Concepts	blishers, 2001. and Technique	s", Morgan
REFERI	ENCES			
1. Usama "Advar 2. Ralph 2002.	M.Fayyad, Gregory Piatetsky Shapiro, nees in Knowledge Discovery and Data M Kimball, Margy Ross, "The Data Wareh	Padhrai Smyth, lining", The M. nouse Toolkit",	, Ramasamy U I.T. Press, 1996 John Wiley an	Jthurusamy, d Sons Inc.,
3. Alex B for CR	erson, Stephen Smith, Kurt Thearling, "B M", Tata McGraw Hill, 2000.	uilding Data M	ining Application	ons

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	2	0	3	3	2	0	0	0	0	0	0	0	1	0
1														
CO	2	0	0	2	2	0	3	0	0	0	0	0	1	0
2														
CO	3	0	0	3	0	0	0	0	0	0	0	0	1	0
3														
CO	2	0	2	2	3	0	0	0	0	0	0	0	1	2
4														
CO	2	0	0	0	0	0	0	1	0	0	0	0	1	0
5														
	11	0	5	10	7	0	3	1	0	0	0	0	5	2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
ORIGINAL	11	0	5	10	7	0	3	1	0	0	0	0	5	2
SCALED	3	0	1	2	2	0	1	1	0	0	0	0	1	1
TO 0,1,2,3														
SCALE														

COURSE CODE	COURSE NAME	L	Т	Р	С
XCS603	CLOUD COMPUTING	3	0	1	4
C:P:A=					
3:0.75:0.25					
		L	Τ	P	H

		3	0 2 5
COURS	E OUTCOMES	DOMAIN	LEVEL
CO1	<b>Describe and understand the</b> idea of evolution of aloud computing and its services available today.	Cognitive	Describe,
CO2	Describe Ability to develop elassify and analyze	Cognitivo	Describe
02	Describe, Ability to develop, classify and analyze	Developmentor	Create
	components of cloud computing and its business	Affect	Analyze
	perspective	Allett	Allaryze
CO3	Describe, apply, analyze and evaluate the	Cognitive	Describe
	various cloud development tools.	Psychomotor	Create,
~~ .		Affect	Apply
CO4	Explain, Analyze, Demonstrate knowledge on	Cognitive	Describe
	services, architecture, types of infrastructural	Psychomotor	Create,
	models, disaster recovery and Virtualization	Affect	evaluate
0.05		a :::	Apply
C05	Understand, Explain, develop and analyze the	Cognitive	Describe
	case studies to derive the best practice model to	Psychomotor	Create,
	appry when developing and deploying cloud	Allect	Арргу
TINIT T	CLOUD COMPUTINC EUNDAMENTAL		0 + 2
UNIT-I Understa	nding Cloud Computing: Origins and Influences Ba	Lo usic Concepts and T	9+3
and Ben	efits Picks and Challenges Types of cloud Clou	isic Concepts and I	its challenges and
issues of	cloud computing Evolution of Cloud Computing	u services. Dener	and Applications -
Fundame	ental Concepts and Models. Roles and Boundaries (	"loud Characterist	ics Cloud Delivery
Models	Cloud Deployment Models.		les, cloud Denvery
List of F	Experiments:		
1. S	tudy of Cloud Computing & Architecture.		
UNIT –	I CLOUD COMPUTING MECHANISMS	AND ARCHITEC	<b>CTURE</b> 9 + 3
Cloud-E	nabling Technology: Broadband Networks and	Internet Architec	ture, Data Center
Technolo	ogy, Virtualization Technology, Web Technology	y, Multitenant Te	chnology, Service
Technolo	bgy. Fundamental Cloud Architectures: Architectur	e - Workload Dis	tribution, Resource
Pooling,	Dynamic Scalability, Elastic Resource Capacit	y, Service Load	Balancing, Cloud
Bursting	, Elastic Disk Provisioning, Redundant Storage		
List of <b>E</b>	Experiments:		
2. S	tudy and implementation of Infrastructure as a	Service using Qu	anta Plus /Aptana
/]	Kompozer.		
UNIT-II	I CLOUD SERVICES AND FILE SYSTEM	1	9 + 3
Software	as a Service - Platform as a Service – Infrastructure	as a Service - Dat	abase as a Service -
Monitori	ng as a Service – Communication as services. Ser	vice providers- G	oogle App Engine,
Amazon	EC2, Microsoft Azure, Sales force. Introduction to	o Map Reduce, Gl	FS, HDFS, Hadoop
Framewo	Drk.		
List of E	experiments:		
3. 0	ase study on Amazon EC2.		
4. C	case study on Microsoft azure.		
UNIT -I	V WORKING WITH CLOUDS		9+3
Cloud L	Metaler The Clerch C	Addels: The Clou	a Provider, Cloud
Delivery	Models: The Cloud Consumer, Case Study Examp	Menagement C	na Pricing Models:
Business	Cost Metrics, Cloud Usage Cost Metrics, Cost	ivianagement - Co	onsiderations Email
	incation over the Cloud - CKIVI Management		
5. S	tudy and installation of Storage as Service(SaaS).		

- 6. Implementation of identity management using OpenStack.7. Study and implementation of Single-Sing-On (JOSSO).

UNIT	- V VIRTUALIZATION FOR CLOUD A	AND SECURI	TY IN THE CLC	OUD 9+3
Need f	for Virtualization – Pros and cons of Virtualizati	on – Types of	Virtualization -Sy	ystem Vm,
Proces	s VM, Virtual Machine monitor - Virtual machine	hine properties	- Interpretation a	and binary
transla	tion, HLL VM - Hypervisors - Xen, KVM,	VMWare, Virt	tual Box, Hyper-V	V - Cloud
Securi	ty Challenges and Risks – Software-as-a-Servic	ce Security – S	Security Governan	ice – Risk
Manag	gement - Security Monitoring - Security Archited	cture Design –	Data Security – A	pplication
Securi	ty – Virtual Machine Security			
List of	f Experiments:			
8.	Virtualization in Cloud using Vmware and KVM	1.		
9.	Securing Servers in Cloud.		•	
		LECTURE	PRACTICAL	TOTAL
		45	15	60
TEXI	BOOKS		a	1 0
1.	Thomas Erl and RicardoPuttini "Cloud	Computing-	Concepts, Techr	nology &
	Architecture," Pearson, 1st edition 2013.			. <b>D</b> 1 .
2.	Cloud Computing "A Practical Approach" A	Inthony T. Ve	lte, Toby J. Vel	te, Robert
2	Elsenpeter. McGraw-Hill.	"D' (1 ) 1	101 10	· F
3.	Kai Hwang, Geoffrey C Fox, Jack G Dongarra,	, "Distributed a	ind Cloud Comput	ting, From
1	Parallel Processing to the Internet of Things", M	lorgan Kaufmai	nn Publishers, 201	2.
4.	John W.Rittinghouse and James F.Ransom	le, "Cloud Co	omputing: Imple	mentation,
5	James E Smith Davi Noir "Virtual Machines"	Morgon Voufm	onn Dublighara 20	006
J. DEEE	James E Sinni, Kavi Nair, Virtuai Machines ,	Morgan Kaunn	ann Publishers, 20	
1	REINCES Barria Sosinsky, "Cloud Computing Bible," Wil	av India Dut I t	d 1st adition 201	1
1.	Raikumar Buyya James Broberg and Andrzei (	ey mula i vi Lu Goscinski "Clo	ud computing prir	r. ciples and
2.	naradigms " john Wiley and sons 2011		ud computing prin	icipies and
3	Toby Velte Anthony Velte Robert Elsenpeter	"Cloud Compu	ting A Practical A	nproach"
5.	TMH. 2009. Kumar Saurabh. "Cloud Computir	19 – insights in	to New -Era Infra	structure".
	Wiley India.2011	-88		, , ,
4.	Haley Beard, "Cloud Computing Best Practices	for Managing a	and Measuring Pro	ocesses for
	On-demand Computing", Applications and Data	a Centers in the	e Cloud with SLA	s, Emereo
	Pty Limited, July 2008			
E REI	FERENCES			
1	http://aloud.stondonds.org/wilki/indox.nbn2titla_l	Main Daga		
1.		wiani_Page	1 1 /	1 1
2.	webpages.iust.ac.ir/hsalimi//89/Cloud%20C	ommon%20sta	ndards.pptop enne	bula.org,
3.	www.cloudbus.org/cloudsim/, http://www.eucal	yptus.com/		
4.	hadoop.apache.org			
5.	http://hadoop.apache.org/docs/stable/hdfs_desig	n.html		
6.	http://static.googleusercontent.com/external_con	ntent/untrusted_	dlcp/researc h.go	ogle.com/
	en//archive/mapreduce-osdi04.pdf			

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO1 0	PO11	PO12	PSO1	PSO 2
CO 1	1	2	2	0	0	0	0	0	0	0	0	2	2	1
CO 2	0	3	0	2	2	1	3	0	0	0	0	0	3	1

CO 3	3	0	3	0	0	0	0	0	2	0	3	3	1	3
CO 4	3	0	3	0	1	3	0	1	2	0	3	3	3	3
CO 5	0	3	0	0	2	0	1	0	0	1	0	0	3	0
	7	8	8	2	5	4	4	1	4	1	6	8	12	8
	T				1		T					-		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Original value	7	8	8	2	5	4	4	1	4	1	6	8	12	8
Scaled														
to 0,1,2,3 scale	2	3	3	1	1	1	1	1	1	1	2	3	4	3

COURSECODE	COURSE NAME	L	Т	Р	С
XCS604	PRINCIPLES OF COMPILER DESIGN	3	1	1	5
<b>C:P:A</b> =					
2.8:0.8:0.4					
		L	Т	Р	Η
		3	2	2	7

COURS	SE OUTCOMES	DOMAIN	LEVEL
CO1	<b>Describe</b> the compilers and its construction tools and specification of tokens.	Cognitive	Knowledge,
CO2	<i>Describe</i> and <i>apply</i> various parsing techniques for parsing the string.	Cognitive, Psychomotor	Knowledge, Analysis
CO3	Illustrate and construct intermediate language.	Cognitive, Psychomotor	Knowledge, Response
CO4	<i>Describe</i> the code generation and <i>make use of</i> code generator to generate target code.	Cognitive, Psychomotor	Knowledge, Analysis
CO5	<i>Explain</i> code optimization and <b>apply</b> the optimization technique.	Cognitive, Psychomotor	Knowledge, Analysis
UNIT I	INTRODUCTION TO COMPILING		12+6
Compile grouping input bu List of I	ers – analysis of the source program – phases of a co g of phases – compiler construction tools – lexical a ffering – specification of tokens- Lex- Simple Progr <b>Programs</b>	mpiler – cousins on nalysis – role of location of loca	of the compiler – exical analyzer –
<ol> <li>Con</li> <li>Con</li> <li>Imp</li> <li>Gen</li> <li>Con</li> <li>Con</li> <li>Entropy</li> </ol>	nstruction of NFA nstruction of Minimized DFA plementation of Lexical Analyzer Using LexTool. meration of Tokens for Given Lexeme. nversion of Infix to Postfix Expression plementation of Symbol Table		
UNIT I	I SYNTAX ANALYSIS		12 +6
Role of Recursiv Operato Parser-Y	the parser –Writing Grammars –Context-Free G ve Descent Parsing – Predictive Parsing – Bottom-up r Precedent Parsing – LR Parsers – SLR Parser VACC –Simple Program using YACC.	rammars – Top 1 p parsing – Shift I – Canonical LR	Down parsing – Reduce Parsing – Parser – LALR
<ol> <li>7. Synta</li> <li>8. Imple</li> <li>9. Const</li> <li>10. Const</li> </ol>	x Analysis using YACC. Ementation of Shift Reduce Parsing Algorithm. cruction of LR Parsing Table. struction of Operator Precedence Parse Table.		
UNIT 1	III INTERMEDIATE CODE GENERATION		12 + 6
Intermed Case Sta	diate languages – Declarations – Assignment Stat atements – Back patching – Procedure calls.	ements – Boolea	n Expressions –
List of l	Programs		
11.Imple 12. Impl 13. Impl	ementation of Quadruples lementation of Triples. lementation of Intermediate Code Generation.		

UNIT	IV CODE GENERATION			12+6
Issues	in the design of code generator - The targ	get machine – Ru	ntime Storage mai	nagement –
Basic	Blocks and Flow Graphs - Next-use Infe	ormation – A sir	nple Code genera	tor – DAG
repres	entation of Basic Blocks – Peephole Optin	nization.		
List o	f Programs			
14. Im	plementation of Code Generation			
UNIT	V CODE OPTIMIZATION AND RUN	TIME ENVIR	ONMENTS	12+6
Introd	uction- Principal Sources of Optimiz	ation – Optimi	zation of basic	Blocks –
Introd	uction to Global Data Flow Analysis -	Runtime Enviro	onments – Source	Language
issues	- Storage Organization - Storage Allocat	tion strategies –	Access to non-loc	al names –
Param	eter Passing.			
Listo	f Drograms			
LISU	r rograms			
15.Im	plementation of Code Optimization Techni	iques		
10.111		<b></b>		
	LECTURE	TUTORIAL	PRACTICAL	TOTAL
	45	15	30	90
TEXT	BOOKS	L	L	
1.	Alfred V.Aho, Jeffrey D.Ullman, Ray	vi Sethi, "Compi	lers- Principles, 7	Techniques,
	and Tools(Second Edition)", Pearson Edu	ucation India, 20	08.	
REFF	CRENCES			
1.	Allen I. Holub "Compiler Design in C"	D (* TT 11	CT 1' 0000	
2.	Allen I. Holdo Complier Design in C	, Prentice Hall of	f India, 2003.	
	C. N. Fischer and R. J. LeBlanc,	"Crafting a co	mpiler with C",	Benjamin
	C. N. Fischer and R. J. LeBlanc, Cummings, 2003.	"Crafting a co	mpiler with C",	Benjamin
3.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler	"Crafting a co Techniques", Se	mpiler with C", cond Edition, Tata	Benjamin a McGraw-
3.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler Hill, 2003. Henk Alblas and Albert Nymeyer, "P	, Prentice Hall of "Crafting a co Techniques", Se	cond Edition, Tata	Benjamin a McGraw-
3. 4.	<ul> <li>C. N. Fischer and R. J. LeBlanc, Cummings, 2003.</li> <li>J.P. Bennet, "Introduction to Compiler Hill, 2003.</li> <li>Henk Alblas and Albert Nymeyer, "P with C" PHL 2001</li> </ul>	"Crafting a co "Crafting a co Techniques", Se Practice and Prin	cond Edition, Tata cond Edition, Tata	Benjamin a McGraw- er Building
3. 4. 5	<ul> <li>C. N. Fischer and R. J. LeBlanc, Cummings, 2003.</li> <li>J.P. Bennet, "Introduction to Compiler Hill, 2003.</li> <li>Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001.</li> <li>Kenneth C. Louden, "Compiler Const</li> </ul>	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin	cond Edition, Tata cond Edition, Tata ciples of Compile es and Practice".	Benjamin a McGraw- er Building Thompson
3. 4. 5.	<ul> <li>C. N. Fischer and R. J. LeBlanc, Cummings, 2003.</li> <li>J.P. Bennet, "Introduction to Compiler Hill, 2003.</li> <li>Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001.</li> <li>Kenneth C. Louden, "Compiler Const Learning, 2003.</li> </ul>	"Crafting a co "Crafting a co Techniques", Se Practice and Prin cruction: Principl	cond Edition, Tata cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson
3. 4. 5. <b>E RE</b>	<ul> <li>C. N. Fischer and R. J. LeBlanc, Cummings, 2003.</li> <li>J.P. Bennet, "Introduction to Compiler Hill, 2003.</li> <li>Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001.</li> <li>Kenneth C. Louden, "Compiler Const Learning, 2003.</li> </ul>	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin cruction: Principl	cond Edition, Tata cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson
3. 4. 5. <b>E RE</b> 1.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler Hill, 2003. Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001. Kenneth C. Louden, "Compiler Const Learning, 2003. FERENCES http://nptel.ac.in/downloads/106108113/	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin cruction: Principl	cond Edition, Tata cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson
3. 4. 5. <b>E RE</b> 1. 2.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler Hill, 2003. Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001. Kenneth C. Louden, "Compiler Const Learning, 2003. FERENCES http://nptel.ac.in/downloads/106108113/ http://www.svecw.edu.in/Docs%5CCSE0	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin cruction: Principl	cond Edition, Tata cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson
3. 4. 5. <b>E RE</b> 1. 2. 3.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler Hill, 2003. Henk Alblas and Albert Nymeyer, "P with C", PHI, 2001. Kenneth C. Louden, "Compiler Const Learning, 2003. FERENCES http://nptel.ac.in/downloads/106108113/ http://www.svecw.edu.in/Docs%5CCSE0 https://www.wiziq.com/tests/compiler-de	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin cruction: Principl CDLNotes2013.p	mpiler with C", cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson
3. 4. 5. <b>E RE</b> 1. 2. 3. 4.	C. N. Fischer and R. J. LeBlanc, Cummings, 2003. J.P. Bennet, "Introduction to Compiler Hill, 2003. Henk Alblas and Albert Nymeyer, "F with C", PHI, 2001. Kenneth C. Louden, "Compiler Const Learning, 2003. FERENCES http://nptel.ac.in/downloads/106108113/ http://www.svecw.edu.in/Docs%5CCSE0 https://www.wiziq.com/tests/compiler-de http://spoken-tutorial.org/	, Prentice Hall of "Crafting a co Techniques", Se Practice and Prin cruction: Principl CDLNotes2013.p	ompiler with C", cond Edition, Tata ciples of Compile es and Practice",	Benjamin a McGraw- er Building Thompson

	PO	PO8	PO	PO1	PO1	PO1	PSO	PSO						
	1	2	3	4	5	6	7		9	0	1	2	1	2
CO 1	2	3	2	3	2	1	0	0	2	1	0	2	3	2
CO 2	2	3	2	3	2	1	0	0	2	1	0	1	3	2

CO 3	1	3	3	2	1	1	0	0	1	1	0	2	3	2
CO 4	2	2	2	2	2	1	0	0	1	1	0	1	3	2
CO 5	2	3	3	1	1	1	0	0	1	1	0	1	3	2
Total	4	13	12	11	8	5	0	0	7	5	0	7	15	10
	PO	PO8	PO	PO1	PO1	PO1	PSO	PSO						
	1	2	3	4	5	6	7		9	0	1	2	1	2
Original value	4	13	12	11	8	5	0	0	7	5	0	7	15	10

Scaled to

0,1,2,3 scale 

COURSECODE	COURSE NAME	L	Т	Р	С
XCS605	DIGITAL SIGNAL PROCESSING	3	1	0	4
C:P:A = 3:0:0					
		L	Т	Р	Η
		3	2	0	5
COURSE OUTCOMES	DOMAIN		LE	VEL	

<b>CO1</b>	To <i>classify</i> and <i>describe</i> the basics	Cognitive	Comprehe	ension,								
	of discrete time signals and		Knowledg	ge,								
~~~	Systems and <b>analyze</b> using tools	~	Analysis									
CO2	To <b>apply</b> z-transform, DFT and	Cognitive	Applicatio	on,								
	FFT to <b>analyze</b> and <b>design</b> the DSP		Analysis,									
	systems.		Synthesis									
CO3	To <b>analyze</b> and <b>design</b> the IIR	Cognitive	Analysis,									
	digital filters.		Synthesis									
CO4	To <b>analyze</b> and <b>design</b> the FIR	Cognitive	Analysis,									
	digital filters.		Synthesis									
CO5	To <b>apply</b> signal processing for	Cognitive	Applicatio	on,								
	complex DSP application designs		Synthesis									
τινήτ τ	SIGNALS AND SVSTEMS			12								
Basic elem	pents of digital signal Processing _(	Concept of frequen	cy in continuous t	ime and								
discrete ti	me signals –Sampling theorem –Di	screte time signals	Discrete time sv	stems –								
Analysis of	Linear time invariant systems –Z tran	sform –Convolution	and correlation.	stems								
UNIT II	FAST FOURIER TRA NSF ORMS	S		12								
Introductio	n to DFT – Efficient computation of	f DFT Properties of	f DFT – FFT algo	rithms –								
Radix-2 F	FT algorithms – Decimation in Time -	– Decimation in Fre	quency algorithms -	– Use of								
FFT algorit	thms in Linear Filtering and correlation	1.										
UNIT III	IIR FILTER DESIGN			12								
Structure o	Structure of IIR – System Design of Discrete time IIR filter from continuous time filter – IIR											
filter desig	n by Impulse Invariance. Bilinear t	transformation – A	pproximation deriv	atives –								
Design of I	IR filter in the Frequency domain.											
UNIT IV	FIR FILTER DESIGN			12								
Symmetric	& Antisymmetric FIR filters – ]	Linear phase filter-	– Windowing techr	nique –								
Rectangula	r- Kaiser windows – Frequency sampl	ing techniques – Str	ucture for FIR system	ms.								
UNIT V	FINITE WORD LENGTH EFFEC	CTS		12								
Ouantizatio	on noise – derivation for quantization	noise power – Fixe	ed point and binary	floating								
point numl	per representation – comparison – ov	ver flow error – tru	r = $r$ =	efficient								
quantizatio	n error - limit cycle oscillation – signa	al scaling – analytica	al model of sample a	and hold								
operations	- Application of DSP - Model of Spee	ech Wave Form – Vo	ocoder.									
		LECTURE	TUTORIAL T	OTAL								
		45	15	60								
<b>TEXT BO</b>	OKS											
1. Joh	n G Proakis and Dimtris G Mano	olakis, "Digital Sig	gnal Processing Pr	inciples,								
Algorit	hms and Application", PHI/Pearson Ec	ducation, 2000, 3 <sup>rd</sup> E	dition.									
REFEREN	NCES											
I. Ala	n V Oppenheim, Ronald W Schafer an	Id John R Buck, "Di	screte Time Signal									
Processing", PHI/Pearson Education, 2000, 2nd Edition.												
Pro 2 L-1	use D Johnson "Jutra frother T	visital Signal D	againa" Duration									
Pro 2. Joh	ny R.Johnson, "Introduction To D	bigital Signal Proc	essing", Prentice	Hall Of								
Pro 2. Joh Indi 3. Son	ny R.Johnson, "Introduction To D ia/Pearson Education, 2002.	vigital Signal Proc	essing", Prentice	Hall Of								
Pro 2. Joh Indi 3. San	ny R.Johnson, "Introduction To D ia/Pearson Education, 2002. jit K.Mitra, "Digital Signal Processing Graw-Hill 2001 Second Edition	vigital Signal Process: A Computer – Bas	essing", Prentice	Hall Of								
Pro 2. Joh Indi 3. San Mc E REFER	ny R.Johnson, "Introduction, 2000 ia/Pearson Education, 2002. jit K.Mitra, "Digital Signal Processing Graw-Hill, 2001, Second Edition. ENCES	g: A Computer – Bas	essing", Prentice	Hall Of								
Pro 2. Joh Indi 3. San Mc E REFER	ny R.Johnson, "Introduction To D ia/Pearson Education, 2002. jit K.Mitra, "Digital Signal Processing Graw-Hill, 2001, Second Edition. ENCES	yigital Signal Proc	essing", Prentice	Hall Of								

	DO1					DOS	D	$\sim$	DO7	D	00	D	20	DO1(	P	01	PO	PS		PS
	POI	PO	2 P	03	PO4	PO5	P	J6	PO/	Ρ	08	P	J9	POIC	)	1	12	01	(	D2
CO1	3	3		2	1	2		1	0		0	(	)	0		1	0	3		2
CO2	3	3		3	3	2		1	0		0	(	)	0		1	0	3		2
CO3	1	3		3	2	1		1	0		0	(	)	0		1	0	3		2
CO4	1	3		3	1	1		1	0		0	(	)	0		1	0	3		2
CO5	3	1		3	2	1		1	0		0	(	)	0		1	0	3		2
	11	13	3	14	9	8	4	5	0		0	(	)	0		5	0	15		10
	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO P P																			
			102			/4 1	55	10		07	IC	00	10	9 10	510		<i>J</i> 11	12	S	S
																			1	$\frac{0}{2}$
Origina value	al 1	1	13	14	1 9	)	8	5		0	0	)	0		0		5	0	1 5	1 0
Scaled	1 3	3	3	3	2		2	1		0	0	)	0		0		1	0	3	2
to	,																			
0,1,2,3	5																			
scale																				

COUH	RSE CODE	COURSE NAME		L	Т	P	С
XES6	07	3	0	0	0		
C:P:A	A = 2.5: 0: 0.5						
				L	Т	P	Η
				3	0	0	3
COU	RSE OUTCOM	IES	DOMAIN		L	EVEI	i
CO1	<b>Describe</b> the and <b>explain</b> a	significance of natural resources nthropogenic impacts.	Cognitive	Ur Re	nderst mem	and ber,	

CO2	<i>Illustrate</i> the significance of ecosystem and biodiversity for maintaining ecological balance	Cognitive	Knowledge,
CO3	<i>Identify</i> the facts, consequences, preventive measures of major pollution and <i>Recognize</i> the disaster phenomenon	Cognitive	Remember, Recognize
CO4	<b>Explain</b> the socio- economics, policy dynamics and <i>practice</i> the control and Anal measures of global issues for sustainable development.	Cognitive	Knowledge, Analysis
CO5	Recognizethe impact of population and applythe concept to develop variousandAppwelfare programs.	Cognitive	Knowledge, Analysis
UNIT	- I INTRODUCTION TO ENVIRONMENTA	L STUDIES AND	ENERGY 9

Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

### UNIT - II ECOSYSTEMS AND BIODIVERSITY

Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

### **UNIT – III ENVIRONMENTAL POLLUTION**

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Soil waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: flood, earthquake, cyclone and landslide.

UNIT –IV SOCIAL ISSUES AND THE ENVIRONMENT

Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation – Consumerism and waste products – Environment Production Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Water (Prevention and control of Pollution) Act – Issues involved in enforcement of environmental legislation – Public awareness.

### UNIT -V HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations – Population explosion – Family Welfare Programme – Environment and human health – Human Rights – Value Education - HIV / AIDS

9

12

9

– Women and Child Welfare – Role of Information Technology in Environment and human health – Case studies.

LECTURE	TUTORIAL	TOTAL
45	0	45

### TEXT BOOKS

- 5. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
- 6. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, UK, 2003
- 7. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, India, 2003.
- 8. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
- 9. Introduction to International disaster management, Butterworth Heinemann, 2006.
- 10. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, New Delhi, 2004.

### **REFERENCE BOOKS**

- 1. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
- 2. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
- 3. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
- 4. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
- 5. Sundar, Disaster Management, Sarup & Sons, New Delhi, 2007.
- 6. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

### **E RESOURCES**

- 1. Bharat Raj Singh, 2015, Global Warming: Causes, Impacts and Remedies, InTech.
- Richard C. J. Somerville, The Forgiving Air: Understanding Environmental Change, 1998, University of California Press
- 3. Benny Joseph, Environmental Studies, 2005, Tata McGraw Hill.

VCC	(00			L	Т	Р	S S	C
AG9	008			0	0	0	2	0
			ACADEMIC WRITING SKILLS					
C	D			т	т	D	S	ц
C	Γ	A		L	I	Γ	S	п
1.2	0.4	0.4		0	0	0	2	2
COU	RSE	OUTC	OMES:					
CO1:	C: R	: Kn	owledge on the need for going beyond grammar in writing	g paragi	aphs a	and es	says	
CO2:	C: U	: Int	egrate all the written language elements into the production	on of a	cohesi	ive wł	nole	

CO3:	C: U: <i>Practice</i> the discourse features that connects sentences and paragraphs.	
CO4:	C: GR: <i>Synthesize</i> language and ideas to develop sentences, paragraphs and essays	
CO5:	P: A: <i>Produce</i> correct, proper, and fluent pieces of writing	
SYLL	ABUS	
Unit		Hours
	TYPES OF PARAGRAPHS	
Ι	Definition of a paragraph, writing different types of paragraphs: definition paragraph, descriptive paragraph, process paragraph, comparison and contrast	5
	paragraph etc.	
	DISCOURSE FEATURES:	_
11	Cohesion, coherence (connectives) etc; précis writing, summarizing	5
TTT	VARIOUS TYPES OF ESSAYS	F
111	Discursive, argumentative, cause & effect, chronological etc;	5
IV/	USE OF LANGUAGE	5
1 V	Essays according to the type of essays	5
V	Essay Writing practice	10
	Writing practice (SS): 30 hrs	
	Total : 30 hrs	
TEXT	Г BOOKS	
1.	D. H. Howe and G. MC Arthur, Advance with English, Oxford University Press, 199	3
2.	Wren and Martine, High School English Grammar and Composition, S, Chand and	Company,
	1999.	
3.	Raymond Murphy, <i>Intermediate English Grammar</i> , Ii Ed., , Cambridge University I New Delhi, 1994	Press,
4.	Bikrim K. Das, <i>Functional Grammar and Spoken and written communication in Eng</i> Orient Black swan, Hyderabad.Reprinted 2011,	glish,

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA1 0	GA1 1	GA1 2
CO1	0	0	0	2	0	0	0	0	1	2	0	3

CO2	1	0	0	0	0	0	0	0	0	3	0	0
CO3	0	1	0	2	0	0	0	0	0	2	0	2
CO4	0	0	0	0	0	0	0	0	0	0	0	1
CO5	0	0	0	0	0	0	0	0	0	1	2	0
Total	1	1	0	4	0	0	0	0	1	8	2	6
	•				-		-	-	<u>.</u>			-
Total	1	1	0	4	0	0	0	0	1	8	2	6

Scaled

### **VII SEMESTER**

COURSE CODE	COURSE NAME		L	Т	Р	С
XCS702	SOFTWARE ENGINEERING		3	0	1	4
C:P:A= 3:0.75:0.25						
			L	Т	P	Η
			3	0	2	5
COURSE OU	JTCOMES	DOM	AIN		LEVE	Ľ

CO1	<i>Describe, understand and compare</i> various methods of software development activities and	Cognitive Psychomotor	Describe, Understand,
~~~	software development process models.	~	Apply
CO2	Describe, Ability to develop, classify and analyze	Cognitive	Describe
	the knowledge of human-computer interaction	Psychomotor	Create,
	and design software architecture for various	Allect	Anaryze
	application.		
CO3	Describe, apply, Analyze, evaluate and test the	Cognitive	Describe
	basics of software testing and metrics.	Psychomotor	Create,
		Affect	Apply
CO4	Describe, apply, Analyze, evaluate and test the	Cognitive	Describe
	basics of software maintenance and software	Psychomotor	Create,
	project management concepts	Affect	
CO5	Understand and Fundain develop and utilize	Comitivo	Apply
05	the advanced software engineering concents and	Developmentor	Create
	software engineering development tools	Affect	Apply
` UNI'	<b>F-I</b> SOFTWARE PROCESS AND REQUIRI	EMENTS	<b>9</b> + <b>3</b>
Introduct	ion – Hardware Vs. Software - A Generic view of	Process - SDLC -	Process life cycle
models (	Water Fall. Incremental. Evolutionary. Specialized.	Agile) – Agile dev	elopment - System
Engineer	ing. Requirements Engineering - Requirement g	athering technique	es - Requirements
Engineer	ing tasks – Process - Requirement Analysis - El	iciting Requireme	nts - Building the
analysis	Model - Data Modeling Concepts - Object Oriented .	Analysis.	
List of E	xperiments:		
10. F	easibility study for any two application		
11. P	roject Planning for the above application		
12. S	oftware requirement analysis for any two application	1	
13. W	Vrite SRS for any two application		
14. U	<b>DESIGN CONCEPTS AND PDINCIPIES</b>	2	0 + 6
Design F	Engineering _ Design Process and Design Concern	o ts and Model-Arc	9+0 hitectural design -
software	architecture – data design – architectural design –	- transform and tra	insection mapping-
Modeling	g the Component Level Design –Introduction-Design	gning Class-based	Components- User
interface	analysis and design - Coupling and Cohesion- Des	ign elements of in	terface, component
level and	deployment level.	C	
List of E	xperiments:		
15. D	raw use-case, class for any two applications.		
16. D	raw sequence and collaboration diagram for any two	o applications.	
17. D	braw activity and state chart for any two applications		
18. C	omponent, package and deployment diagram for any	y two applications.	0 (
UNII-II Testing	I IEDIING	Stratagia Iganag	9+6
Conventi	onal software. Object oriented software SOA V	- Strategic Issues	- Test strategy for System testing and
debuggin	g - Testing fundamentals - Black Box testing - Wh	nite Box testing - I	System testing and Rasis Path testing -
control st	tructure testing - Test case - Performance testing - O	biect oriented testir	19.
List of E	xperiments:		-0.
19. G	enerate and Implementation of skeleton code for any	y two application	
20. W	Vriting test cases for any two application		
21. T	esting process for any two application		
22. C	heck verification & Validation for any two application	ons.	
UNIT -I	V SOFTWARE PROJECT MANAGEMEN	Г	9
Project N	Management life cycle – Need of application mai	ntenance – Manag	gement spectrum -
Testing	Rationale Management – Configuration Manageme	ent – Project Man	agement – project
			99

process product measures and metrics – Estimation of software projects – Decomposition techniques and empirical estimation models - Risk analysis and mitigation plans - Procurement management.

UNIT VADVANCED TOPICS IN SOFTWARE ENGINEERING9Formal Methods – Basic Concepts – Mathematical preliminaries-Applying Mathematical notationsfor formal specification – Formal specification languages-Clean room software Engineering-Cleanroom Approach-Functional specification-Component-Based Development-Reengineering-<br/>Software Reengineering-Reverse Engineering- Forward Engineering- Introduction to CASE tools<br/>and testing tools – Software process improvement –Automation testing tools.

		1	
	LECTURE	PRACTICAL	TOTAL
	45	15	60
TEXT BOOKS			
1. Roger S.Pressman, Software engineering- A	practitioner's	Approach, McC	iraw- Hill
International Edition, 8 <sup>th</sup> edition, 2015.			
REFERENCES			
1. Ian Sommerville, Software engineering, Pearson	n education Asia	a, 10 <sup>th</sup> edition, 201	6.
2. Pankaj Jalote- An Integrated Approach to Softw	vare Engineering	g, $3^{rd}$ edition 2011	
3. C.Ravindranath Pandian, "Software metrics	– A guide	to planning, ana	alysis and
application", AUERBACH publication, Newyork 2	2011.		
4. Ali Behforooz, Frederick J Hudson, "Softv	vare Engineerii	ng Fundamentals	", second
edition, Oxford University Press, Noida, 2009.	C	C	
E REFERENCES			
1. NPTEL Course Prof. N. L. Sarda, IIT Bombay			
2. http://vlab.co.in/			
3. http://staruml.io/			
4. http://argouml.tigris.org/			
5. http://www.seleniumhq.org			
6. IBM Rational Rose Enterprise Edition 8.1			

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO1 0	PO11	PO12	PSO1	PSO 2
CO 1	1	2	1	0	0	1	0	0	0	0	0	2	2	1
CO 2	2	3	3	2	2	1	3	0	0	0	0	1	3	2
CO 3	3	3	3	1	1	3	0	1	2	0	3	3	3	3
CO 4	3	3	3	1	1	3	0	1	2	0	3	3	3	3
CO 5	1	3	0	0	3	0	1	0	0	1	0	1	3	1

	10		10		_	~		•				10		10
	10	14	10	4	7	8	4	2	4		6	10	14	10
L	10	11	10		,	0		1	•	-	0	10	<b>1</b>	10

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Original														
value	10	14	10	4	7	8	4	2	4	1	6	10	14	10
Scaled	2	3	2	1	2	2	1	1	1	1	2	2	3	2
to														
0,1,2,3														
scale														

COURS CODE	E COURSE NAME		L	Т	Р	С
XCS703	DATA ANALYTICS		3	1	1	5
C:P:A= 3:0.75:0	.25		T	Т	P	н
		·	3	2	2	7
COURS	E OUTCOMES	DOM	AIN		LEVE	EL
CO1	Understand and acquire the basic idea of big	Cognitiv	e	Desci	ribe,	
	data, the key issues on big data, characteristics	-		Unde	rstand	

	and statistical concepts		
CO2	Ability to solve, classify, analyze different ways	Cognitive	Describe
	of data analysis.	Psychomotor	Create,
		Affect	Analyze
CO3	Describe, apply, analyze and evaluate the data	Cognitive	Describe
	analysis using HADOOP and RHADOOP	Psychomotor	Create,
		Affect	Apply
<b>CO4</b>	<i>Explain, Analyze</i> and <i>Select</i> visualization	Cognitive	Describe
	techniques and tools to analyze big data and	Psychomotor	Create,
	create statistical models and understand how to	Affect	evaluate
	handle large amounts of data.		Apply
CO5	Understand, and analyze the various frameworks	Cognitive	Describe
	and its applications	Psychomotor	Create,
		Affect	Apply
UNIT-I	<b>INTRODUCTION TO BIG DATA</b>		12+3

Introduction to Big Data Platform – Challenges of Conventional Systems - Nature of Data Evolution of Analytic Scalability - Intelligent data analysis- Analytic Processes and Tools -Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

### List of Experiments:

- 1. Calculate Summary Statistics using data analysis tool.
- 2. Study and implement prediction error.
- UNIT –II DATA ANALYSIS 12 + 3

Regression modeling, Multivariate analysis, Bayesian modeling, inference and Bayesian networks, Support vector and kernel methods, Analysis of time series: linear systems analysis, nonlinear dynamics – Rule induction – Neural networks: learning and generalization, competitive learning, principal component analysis and neural networks; Fuzzy logic: extracting fuzzy models from data, fuzzy decision trees, Stochastic search methods.

#### List of Experiments:

3. Study and implementation of any two regression modeling.

UNIT-III DATA ANALYSIS USING R AND HADOOP

Features of R language – HADOOP Features – HDFS and MapReduce architecture – R and Hadoop Integrated Programming Environment (RHIPE) Introduction – Architecture of RHIPE – RHIPE function reference – RHADOO Introduction – Architecture of RHADOOP – RHADOOP function reference, SQL on HADOOP.

#### List of Experiments:

4. Set up a pseudo-distributed, single-node Hadoop cluster backed by the Hadoop Distributed File System, running on Ubuntu Linux.

5. MapReduce application for word counting on Hadoop cluster.

UNIT -IVPREDICTIVE ANALYTICS AND VISUALIZATION12+3Predictive Analytics – Supervised – Unsupervised learning – Neural networks – Kohonen models– Normal – Deviations from normal patterns – Normal behaviours – Expert options – Variableentry - Mining Frequent itemsets - Market based model – Apriori Algorithm – Handling large datasets in Main memory – Limited Pass algorithm – Counting frequent itemsets in a stream –Clustering Techniques – Hierarchical – K- Means – Clustering high dimensional dataVisualizations - Visual data analysis techniques, interaction techniques; Systems and applicationsList of Experiments:

6. K-means clustering using map reduce

UNIT - V FRAMEWORKS AND APPLICATIONS

12+3

12 + 3

IBM for Big Data – Map Reduce Framework - Hadoop – Hive - – Sharding – NoSQL Databases - S3 - Hadoop Distributed file systems – Hbase – Impala – Analyzing big data with twitter – Big data for Ecommerce – Big data for blogs.

### List of Experiments:

		LECTURE	TUTORIAL	PRACTICAL	TOTAI
		45	15	15	75
EXT	T BOOKS				
1.	Prajapati, Big Data Analytics w	with R and Hado	op, 2014		
2.	Stephan Kudyba, Big Data, I	Mining, and Ar	nalytics: Compo	nents of Strategic	e Decisio
M	aking, Auerbach Publications, M	larch 12, 2014.			
<i>3</i> .	Michael Berthold, David J. Ha	ind, Intelligent I	Data Analysis, Sp	oringer, 2007.	- 1- 4 <sup>2</sup>
4. Er	Paul Zikopoulos, Chris Ealon	, Paul Zikopoul	S, —Understand	ling Big Data: Ar	iarytics fo
EI	herprise Class Hadoop and Strea	ining Data, MCC	лам ПШ, 2011.		
EFF	CRENCES				
5.	Frank J Ohlhorst, -Big Data	Analytics: Tur	ning Big Data i	nto Big Money,	Wiley ar
	SAS Business Series, 2012.				
6.	Anand Rajaraman and Jeffrey	/ David Ullmar	n, Mining of Ma	assive Datasets, (	Cambridg
-	University Press, 2012.			T (TT)	0.10
7.	Dr. Mark Gardener, Beginning	R: The Statistic	al Programming	Language (Wrox)	), 2013 Juan Da
ð.	Strooms with Advanced Analyti	ig Data Hoal N	Vave: Finding C	$r_{\rm ion} = 2012$	Huge Da
9	Paul Zikopoulos Dirk deRoo	s Krishnan Pa	asuraman Thor	nas Deutsch – Ia	mes Gile
7.	David Corrigan. —Harness the	e Power of Big	data – The big d	lata platform. Mc	Graw Hi
	2012.	8	6	<b>I</b> ,	
10	. Tom White — Hadoop: The De	efinitive Guide '	Third Edition, O	reilly Media, 201	2.
11	. Pete Warden, Big Data Glossar	y, O'Reilly, 20	1.		
12	. Glenn J. Myatt, Making Sense	of Data, John W	iley & Sons, 20	)7	
<b>RE</b>	FERENCES				
_	www.ibm.com/BigDataAnalyt	•			
7.		1CS			
7. 8.	www.pentaho.com/product/big	ics g-data-analytics			
7. 8. 9.	www.pentaho.com/product/big http://www.sas.com/en_us/insi	ics g-data-analytics ghts/analytics/b	ig-data-analytics	.html	
7. 8. 9. 10	www.pentaho.com/product/big http://www.sas.com/en_us/insi ). https://www.edx.org/course/da	ics g-data-analytics ghts/analytics/b ta-analytics-lear	ig-data-analytics ming-utarlington	.html x-link5-10x	
7. 8. 9. 10 11	www.pentaho.com/product/big http://www.sas.com/en_us/insi ). https://www.edx.org/course/da . www.ibm.com/IBMBigDataSt	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming	ig-data-analytics ming-utarlington	.html x-link5-10x	
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10</li> <li>11</li> <li>12</li> </ol>	www.pentaho.com/product/big http://www.sas.com/en_us/insi https://www.edx.org/course/da www.ibm.com/IBMBigDataSt . http://www-01.ibm.com/softwa	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming are/data/infosph	ig-data-analytics ming-utarlington ere/stream-comp	.html x-link5-10x puting	
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10</li> <li>11</li> <li>12</li> <li>13</li> </ol>	www.pentaho.com/product/big http://www.sas.com/en_us/insi https://www.edx.org/course/da www.ibm.com/IBMBigDataSt http://www-01.ibm.com/software/data/ii	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming are/data/infosph nfosphere/strear	ig-data-analytics ming-utarlington ere/stream-comp n-computing	.html x-link5-10x puting	
<ol> <li>7.</li> <li>8.</li> <li>9.</li> <li>10</li> <li>11</li> <li>12</li> <li>13</li> <li>14</li> </ol>	www.pentaho.com/product/big http://www.sas.com/en_us/insi https://www.edx.org/course/da www.ibm.com/IBMBigDataSt http://www-01.ibm.com/software/data/ii www.ibm.com/software/data/ii bigdatauniversity.com/bdu-wp	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming are/data/infosph nfosphere/strear /bdu-course/strear	ig-data-analytics ming-utarlington ere/stream-comp n-computing am-computing	.html x-link5-10x puting	
7. 8. 9. 10 11 12 13 14 15	www.pentaho.com/product/big http://www.sas.com/en_us/insi https://www.edx.org/course/da www.ibm.com/IBMBigDataSt http://www-01.ibm.com/softwa www.ibm.com/software/data/ii bigdatauniversity.com/bdu-wp www.ibm.com/software/data/ii	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming are/data/infosph nfosphere/strear /bdu-course/strean	ig-data-analytics ming-utarlington ere/stream-comp n-computing am-computing	.html x-link5-10x puting	
7. 8. 9. 10 11 12 13 14 15 16	<ul> <li>www.pentaho.com/product/big http://www.sas.com/en_us/insi</li> <li>https://www.edx.org/course/da</li> <li>www.ibm.com/IBMBigDataSt</li> <li>http://www-01.ibm.com/software/data/ii</li> <li>bigdatauniversity.com/bdu-wp</li> <li>www.ibm.com/software/data/ii</li> <li>http://blog.cloudera.com/blog/</li> </ul>	ics g-data-analytics ghts/analytics/b ta-analytics-lear reaming are/data/infosph nfosphere/strear /bdu-course/strear nfosphere/hadoo 2013/06/whats-i	ig-data-analytics ming-utarlington ere/stream-comp n-computing am-computing p next-for-hbase-bi	.html x-link5-10x puting g-data-application	18-

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO 9	PO1 0	PO11	PO12	PSO1	PSO 2
CO 1	1	2	2	0	0	0	0	1	1	0	1	2	3	2
CO 2	0	3	0	2	2	1	3	1	1	0	0	0	3	1
CO 3	3	0	2	2	0	0	2	0	2	2	3	3	1	3
CO 4	1	0	3	0	1	3	0	1	2	0	3	3	3	3
CO 5	0	2	0	0	2	1	1	0	0	1	0	0	3	0

	6	7	7	4	5	5	6	3	6	3	7	8	13	9

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Original value	6	7	7	4	5	5	6	3	6	3	7	8	13	9
Scaled to 0,1,2,3 scale	2	2	2	1	1	1	2	1	2	1	2	3	5	2

COUR	SE CODE COU	RSE NAME		L	Т	Р	С
XUMO	3	0	0	3			
<b>C: P:</b> <i>A</i>	A = 3:0:0						
				L	Т	Р	Η
				3	0	0	3
COUR	SE OUTCOMES		DOMAIN	LEVEL			
CO1	To <i>identify</i> , <i>learn, pro</i> <i>understand</i> the basic	Cognitive	Remember, Analyse.				

	and cyber-attacks.		Apply.
CO2	To <i>define</i> the concepts of system vulnerability scanning and the scanning tools	Cognitive	Remember
CO3	To <i>demonstrate, describe, and differentiate</i> the network defense mechanisms and <i>identify and apply</i> the tools used to detect and quarantine network attacks.	Cognitive	Understand, Analyze, Apply.
CO4	To <i>describe, differentiate, apply</i> the different tools for scanning.	Cognitive	Understand, Analyze, Apply.
CO5	To <i>identify</i> and <i>list</i> the types of cybercrimes, cyber laws and cyber-crime investigations.	Cognitive	Remember

### **UNIT I – INTRODUCTION**

History of Information Systems and its Importance, Basics, Changing Nature of Information Systems, Need for Distributed Information Systems: Role of Internet and Web Services. Information System Treats and attacks, Classification of Threats and assessing Damages Security in mobile and Wireless Computing-Security Challenges in Mobile Devices, authentication service Security, Security Implication for Organizations, Laptops security Concepts in Internet and World Wide Web: Brief review of Internet Protocols TCP/IP, IPV4, and IPV6. Functions of various networking components-routers, bridges, switches, hub, gateway and Modulation Techniques.

### **UNIT II - SYSTEMS VULNERABILITY SCANNING**

Overview of vulnerability scanning, Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit. Networks Vulnerability Scanning - Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – Nmap, THC-Amap and System tools. Network Sniffers and Injection tools – Tcpdump and Windump, Wireshark, Ettercap, Hping Kismet.

### **UNIT III - NETWORK DEFENCE TOOLS**

Firewalls and Packet Filters: Firewall Basics, Packet Filter Vs Firewall, How a Firewall Protects a Network, Packet Characteristic to Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, Snort: Introduction Detection System, Cryptool.

### **UNIT IV – TOOLS FOR SCANNING**

Scanning for web vulnerabilities tools: Metasploit tool, Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools - Zed Attack Proxy, Sqlmap. DVWA, Webgoat, Password Cracking and Brute-Force Tools – John the Ripper, L0htcrack, Pwdump, THC-Hydra.

### **UNIT V - INTRODUCTION TO CYBER CRIME AND LAW**

Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000.

Introduction to Cyber Crime Investigation: Password Cracking, Key loggers and Spyware, Virus and Worms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks

9

9

9

9

		LECTURE	TUTORIAL	TOTAL						
		45	0	45						
ТЕХТ	BOOKS									
1.	Nina Godbole, "Information Systems Security: Security Management, Metrics, Frameworks and Best Practices, w/cd", Wiley Publications, 2008, ISBN 10: 8126516925, ISBN 13: 9788126516926									
2.	Thomas J. Mowbray, "Cybersecurity: Managing Systems, Conducting Testing and Investigating Intrusions", Wiley Publications, 2013, Kindle Edition, ISBN 10: 812654919X, ISBN 13 · 9788126549191									
3.	. D.S. Yadav, "Foundations of Information Technology", New Age International publishers, 3 <sup>rd</sup> Edition, 2006, ISBN-10: 8122417620, ISBN-13: 978-8122417623.									
REFE	RENCES									
1.	Mike Shema, "Anti-Hacker Tool Kit", McGraw Hi	Il Education, 4	th edition, 2014,							
2.	Nina Godbole, Sunit Belapure, "Cyber Security U Forensics and Legal Perspectives", Wiley pub ISBN 13 : 9788126521791.	Understanding lilcations, 201	Cyber Crimes, 3, ISBN 10 : 8	, Computer 126521791,						
3.	Corey Schou, Daniel Shoemaker, "Information As Information Security (McGraw-Hill Information A Tata McGraw Hill 2013 ISBN-10: 0072255242 I	surance for the ssurance & Se SBN-13: 978-(	e Enterprise: A I curity)", 0072255249	Roadmap to						
4.	Vivek Sood, "Cyber Laws Simplified", McGraw H 2001, ISBN-10: 0070435065, ISBN-13: 978-00704	Hill Education 435063.	(INDIA) Private	e Limited in						
5.	Steven M.Furnell, "Computer Insecurity", Springer	r Publisher, 20	05 Edition.							
<b>E</b> – <b>R</b>	EFERENCES									
1.	https://www.cryptool.org/en/									
2.	https://www.metasploit.com/									
3.	http://sectools.org/tool/hydra/									
4.	http://www.hping.org/									
5.	http://www.winpcap.org/windump/install/									
6. 7	http://www.tcpdump.org/									
/.	https://www.wireshark.org/									
8. 0	https://ettercap.gitnub.io/ettercap/									
9. 10	https://www.concise-courses.com/nacking-tools/to	p-ten/								
10	http://www.chi.het/Iniki02									
11	. mup.//symmap.org/									

	DO1	PO	PO1	PO1	PO1	PSO	PSO							
POI	2	3	4	5	6	7	8	9	0	1	2	1	2	
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0

CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original	11	13	13	13	8	2	7	7	6	0	0	0	9	6
Scaled to 0,1,2,3 scale	3	3	3	3	2	1	2	2	2	0	0	0	2	2

<b>COURSE COD</b>	E COURSE NAME	COURSE NAME							
XCS707	<b>PROJECT PHASE – I</b>	PROJECT PHASE – I							
C:P:A = 1:0.5:0									
			0	0	2	4			
COURSE OUT	COMES	DOMAIN	LEVEL						
<b>CO 1</b>	<i>Identify</i> the Engineering Problem	Cog	An	alyze					

	relevant to the domain interest.		
CO 2	<i>Interpret and Infer</i> Literature survey for its worthiness.	Cog	Analyze, Apply
CO 3	<i>Analyse and identify</i> an appropriate technique for solve the problem.	Cog	Analyze, Apply
CO 4	<i>Perform</i> experimentation /Simulation/Programming/Fabrication, <i>Collect and interpret</i> data.	Psy, Cog	Create, Apply
CO 5	<b>Record and Report the</b> technical findings as a document.	Cog	Remember, Understand
CO 6	<i>Devote</i> oneself as a responsible member and <i>display</i> as a leader in a team to <i>manage</i> projects.	Aff, Cog	Value, Organization, Create
CO 7	<i>Responding</i> of project findings among the technocrats.	Aff	Responding

## **CO Vs GA Mapping**

	CO1	CO2	CO3	CO4	CO5	CO6	<b>CO7</b>	Total	Scaled
GA1	3	2	1	2	1	-	1	10	2
GA2	3	2	1	2	1	-	1	10	2
GA3	-	-	1	3	1	-	-	5	1
GA4	-	1	2	3	1	2	2	11	3
GA5	-	-	2	3	1	-	-	6	2
GA6	1	-	1	1	-	3	3	10	2
GA7	1		1	1	-	1		4	1
GA8	1	-	1	1	-	3	-	6	2
GA9	-	-	-	-	2	3	1	6	2
<b>GA10</b>	_	_	_	_	3	3	3	9	2
GA11	-				2	2	2	6	2
#### XCS709 INPLANT TRAINING – III

C:P:A = 2:2:2/ 1:1:1

CO1: Cog(U) Relate classroom theory with workplace practice

CO2: Affective( Respond ) Comply with Factory discipline, management and business practices.

CO3: Affective (Value) *demonstrates* teamwork and time management.

CO4: Psychomotor( Perception , Set ) *Describe* and *Display* hands-on experience on practical skills obtained during the programme.

CO5: Cog(E) *Summarize* the tasks and activities done by technical documents and oral presentations.

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
CO1	2											
CO2							1	3			1	
CO3									3	1	3	1
CO4		1	2	1	3							3
CO5				3						3		1
Total	2	1	2	4	3	0	1	3	3	4	4	5
Scaled	1	1	2	1	1	0	1	1	1	1	1	1

Table 1: Mapping COs with B.Tech GAs

#### **VIII SEMESTER**

<b>COURSE CODE</b>	COURSE NAME		L	Т	Р	С	
XCS804	PROJECT PHASE – II		0	0	12	12	
C:P:A 6:3:3		SE – II					
			L	Т	P	Η	
			0	0	24	24	
COURSE OUTCO	MES	DOMAIN		LE	VEL		
CO 1	<i>Identify</i> the Engineering Problem relevant to the domain interest.	Cog	Ana	alyze			
CO 2	<i>Interpret and Infer</i> Literature survey for its worthiness.	Cog	Ana App	alyze, oly			
CO 3	<i>Analyse and identify</i> an appropriate technique for solve the problem.	Cog	Ana	ý			
CO 4	<i>Perform</i> experimentation /Simulation/Programming/Fabrication, <i>CollFFect and interpret</i> data.	Psy, Cog	Cre	ate, A	pply		
CO 5	<b>Record and Report the</b> technical findings as a document.	Cog	Remember, Understand				
CO 6	<i>Devote</i> oneself as a responsible member and <i>display</i> as a leader in a team to <i>manage</i> projects.	Aff, Cog Value, Orga Create				ation,	
CO 7	Aff	Responding					

# CO Vs GA Mapping

	CO1	CO2	CO3	CO4	CO5	CO6	<b>CO7</b>	Total	Scaled
GA1	3	2	1	2	1	-	1	10	2
GA2	3	2	1	2	1	-	1	10	2
GA3	-	-	1	3	1	-	-	5	1
GA4	-	1	2	3	1	2	2	11	3
GA5	-	-	2	3	1	-	-	6	2
GA6	1	-	1	1	-	3	3	10	2
GA7	1		1	1	-	1		4	1
GA8	1	-	1	1	-	3	-	6	2
GA9	-	-	-	-	2	3	1	6	2
GA10	-	-	-	-	3	3	3	9	2
GA11	-				2	2	2	6	2
GA12	1				3	3	1	8	2

#### **OPEN ELECTIVES**

COUR	SE CODE		L	Τ	Р	С		
XCSOI	E1	FREE OPEN SOURCE SOFT	WARE		3	0	0	3
C:P:A=	= 2.5:0.3:0.2				L	Т	P	Η
					3	0	0	3
COUR	SE OUTCOM	ES	DOM	IAIN		LE	VEL	
CO1	Understand t	he Linux Basic Commands.	Cognit	ive	Ren	nemb	er	
CO2	<i>Describe</i> the	Shell Programming.	Cognit	ive	Ren Unc	nemb lersta	er nd	
CO3	Understand t	he networks in Linux.	Cognit	ive	Ren	nemb	er	
CO4	<b>Understand</b> Internet	the concept of Services on	Cognit	ive	Ren	nemb	er	
CO5	Understand Linux.	ive	Ren	nemb	er			
UNIT	I - LINUX BA					9		
Introduc Comma Termina	ction to Linux ands - Piping -J al Handling.	Operating System - Basic UNIX oining, awk and backup Command	Comma ls - Proce	ands - Fi esses in I	le F Linux	ilters: k: Use	: File er Proe	Related cess and
Unit II	SHELL PRC	GRAMMING						9
Unit III Installir Testing Networ	NETWORK ng Squid Proxy -Removing - ks.	AS IN LINUX and Firewalls - Users and Account Allocating - System Logging: Lo	t Manage gging - A	ement: Co Accountin	onfig ng -	uratic Grap	on - Ci bhical	<b>9</b> reating - Tools –
Unit IV	<b>SERVICES</b>	ON INTERNET						9
Compil Compil Syntax	ing and Debugg ing C and C++ of makefiles - A	ging - Programs under Linux - GNU D Automake and Autoconf - Python:	)ebugger Invoking	: Debugg Python.	ger u	sing	GDB	- Make:
Unit V	PROGRAM	MING IN LINUX						9
Program Introduce Ruby - <i>Glade:</i>	mming in Linu ction to Perl - X Windows A Visual Designe	<b>IX</b> Ruby: OOPS through Ruby - Prof rchitecture and GUI Programming <i>r Tool for GTK and GNOME</i>	iling - C : GTK F	alling Ul Programm	NIX	Syste	em Ca Progra	lls from amming.
				TUTO	KIAJ		ΌΤΑ	
TFYT	BUUKS		45	-			4	15
1.	rogra	ımmin	g, B S					
REFE	RENCES							
1.	Matt Welsh, M	atthias Kalle Dalheimer, Terry Da	wson, ar	d Lar Ka	ufm	an, R	unnin	g Linux,

111

O'Reilly Publishers, December 2002, ISBN: 0-596-00272-6

- 2. Carla Schroder, *Linux Cookbook*, O'Reilly Cookbooks Series, November 2004, ISBN: 0 596-00650-3.
- 3. B.Mahendran, Understanding FOSS, GNU Developers, 2009

## **E-REFERENCES**

- Open Sources: Voices from the Open Source Revolution, January 1999, ISBN: 1- 56592 582-3.
- 2. URL: http://www.oreilly.com/catalog/opensources/book/toc.html.
- 3. The Linux Cookbook: Tips and Techniques for Everyday Use, Michael Stutz, 2001. URL:http://dsl.org/cookbook/cookbook\_toc.html.\
- 4. The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: http://www.tldp.org/guides.html.
- 5. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html.
- 6. An Introduction to GCC, Brian Gough. URL: http://www.network-theory.co.uk/docs/gccintro

	PO	PO1	PO1	PO1	PS	PS								
	1	2	3	4	5	6	7	8	9	0	1	2	O 1	O 2
CO 1	1	3	3	1	3	0	0	0	2	2	2	2	2	1
CO 2	2	3	3	2	3	0	0	0	3	3	1	1	3	2
CO 3	2	3	3	2	3	0	0	0	3	3	1	1	3	2
CO 4	3	2	2	1	2	0	0	0	3	3	0	1	3	2
CO 5	3	2	2	1	2	0	0	0	3	3	0	1	3	2
Tota 1	11	13	13	7	13	0	0	0	14	14	4	6	14	9

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original value	11	13	13	7	13	0	0	0	14	14	4	6	14	9
Scaled to 0,1,2,3 scale	3	3	3	2	3	0	0	0	3	3	1	2	3	2

COURS	L	Τ	P	С					
XCSOE	2	WEB DESIGN		3	0	0	3		
<b>C: P: A</b>	= 2.2:0.3:0.2								
				L	Т	P	Н		
~~~~~				3	0	0	3		
COURS	SE OUTCOMI	ES	DOMAIN	]	LEVE	EL			
CO1	<b>Describe</b> and	d <b>Explain</b> the learning	Cognitive, Psychomotor,	Crea	te.				
	principles and	d techniques of client-side	Affective	App	ly,	Prac	cticing,		
	programming	with HTML.		Rece	eiving		U,		
CO2	To demonst	trate and develop and	Cognitive, Psychomotor	Rem	embe	r,			
	familiarize wi	ith Scripting languages.		Create,					
~~~			~	App	ly, Pra	<u>icticir</u>	ıg		
CO3	To demonstr	ate and Use the web site	Cognitive	Und	erstan	d			
	dynamic bel	havior and server side							
CO4	To <b>Understa</b>	nd the basic concepts of	Cognitive	Und	oretan	d			
0.04	the CMS.	nu the basic concepts of	Cognitive	Unu	cistan	u			
CO5	To demonstr	Und	erstan	d, Cre	eate,				
	Tool.	App	ly, Pra	octicir	ıg				
UNIT I	– HTML5				9				
Introduc	ing HTML5 –	Hello HTML5 – Loose Syr	ntax Returns – XHTML5 –	Embr	aciing	the F	Reeaitv		
of Web	Markup – Pres	sentational Markup Remove	d and Redefined - Docum	ent Sti	ucture	e Cha	nges –		
Adding	Semantics – C	Dpen Media Effort – Client	Side Graphics with <can< td=""><td>vas&gt; -</td><td>Form</td><td>n Cha</td><td>nges –</td></can<>	vas> -	Form	n Cha	nges –		
Emergir	ng Elements an	d Attributes to support web	Applications - Internation	nalizati	ion In	nprov	ements		
- HTMI	L5 Meta Chang	es – Beyond Markup – Majo	or HTML5 Themes -				ſ		
UNIT I	I – CSS						9		
Frames:	A glance at a	common but deprecated e	lement; advantages and di	sadvai	ntages	; fran	ne and		
framese	t properties. In	nages: Image types (JPG,	GIF, PNG). Image file si	zes. N	laking	g or f	finding		
images.	Photoshop for	image cropping and sizing.	Bringing Styles to Web P	ages:	Inline	, emb	edded,		
values to	o html elements	Thing Style Rules: writing	css selectors and rules to specificity and the cascade	b tie st	.yie at	lribul	es and		
	II – ADVANC	FD CSS	specificity, and the caseade	·•			9		
Styling	text: Font and t	text properties Media: Sena	arate style sheets for screen	and r	rint I	<b>Drint</b>	Media:		
Controll	ing Page Break	(s. The Box Model: Styling	with content, padding, bord	lers. a	nd ma	rgins.	Using		
margins	to separate and	l position.	, <b>1</b>	,		0	0		
Color: C	Color and backg	ground color. Color coding i	n hex, percentages, names.	CSS p	ositio	ning:	Static,		
relative,	and absolute	positioning. Floating: Float	ed elements and their ma	rgins.S	Styling	g Lin	ks and		
Lists: P	seudostates and	d lists within lists. Genera	ting text: "Greeked text"	for te	xt-fill	ing—	Lorem		
Ipsum a	nd Cupcake Ips				I				
UNIT I	V – INTRODU	NAGEMENT SYSTEMS				9			
Explorin	ng CMS termin	-side,	client	t-side	, static				
and dyr	namic HTML	website, CMS web pages	generation, Website strat	tegy a	nd pl	annin	g, site		
mapping	g content planni	ing.					r		
UNIT V	– BUILDING	LA				9			

Install Joomla on a server, Create a site structure, Create menu systems, Layout pages and add content of all types to pages, Link to articles and create special menu items, Use of Joomla Plug-ins, Modules, Components and other extensions, Creation and uses of customized Joomla templates, Modifying templates using CSS and HTML, Adding an exclusive area of a site for visitors.

		LECTURE	TUTORIAL	TOTAL
		45	0	45
TEXT	TBOOKS		-	-
1.	Eric Meyer on CSS: Mastering the Language of	Web Design.	2003. Eric Mey	er. New Riders
	Publishing.			
2.	A. Thomas Powell, "The complete reference –	HTML and CS	S (Covers HTM	1L5)" McGraw
	Hill, Fifth Edition, 2010.			
3.	Kogent Learning Solutions Inc. "HTML5 Bla	ack Book: Co	vers CSS3, Jav	aScript, XML,
	XHTML, Ajax, PHP and Jquery – Black Book",	Dreamtech Pre	ess, 2011.	
4.	Kogent Learning Solutions Inc "Web Technol	logies: HTML	, JavaScript, Pl	HP, Java, JSP,
	ASP.Net, XML and AJAX, Black Book", Dream	tech Press, 200	)9.	
5.	Jennifer Marriott, Elin Waring, "The Official Jo	oomla! Book –	2 <sup>nd</sup> Edition", A	ddison-Wesley
	Professional, 2012.			
REFF	CRENCES			
1.	Build Your Own Web Site the Right Way Using	HTML & CSS	, 2nd Edition by	Ian Lloyd.
2.	The Essential Guide to CSS and HTML Web De	sign (Essential	s) by Craig Gran	nel.
3.	Stephen Burge,"Joomla!® 3 Explained: Your	Step-by-Step	Guide", Joom	la! Press, 2nd
	Edition, July 2014.			
<b>E</b> – <b>R</b>	EFERENCES			
1.	https://docs.oracle.com/cd/E19957-01/816-6408-	-10/contents.ht	m	
2.	http://docs.oracle.com/javase/7/docs/technotes/gu	uides/scripting/	programmer_gu	ide/
3.	http://www.w3schools.com/js/default.asp			
4.	https://www.joomla.org/			

	PO	PO1	DO12	PSO	PSO2									
	1	2	3	4	5	6	7	8	9	10	1	PO12	1	
CO1	3	3	3	3	3	2	2	2	1	0	0	2	3	3
CO2	3	3	3	3	3	2	2	2	1	0	0	2	3	3
CO3	2	2	2	3	3	3	2	2	1	0	0	1	2	2
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	13	12	13	14	12	7	8	8	5	0	0	5	11	10

		1												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	13	12	13	14	12	7	8	8	5	0	0	5	11	10
Scaled														
to	3	3	3	3	3	2	2	2	1	0	0	1	3	2
0,1,2,3	5	5	5	5	5	2	2	2	1	0	0	1	5	2
scale														

|--|

XCSC	DE3 OBJECT ORIENTED PROGRAMMING	3	0	0	3		
<b>C: P:</b>	A =				•		
2.875	:						
0.075	.0.25		L	Т	Р	Н	
			3	0	0	3	
COU	RSE OUTCOMES	DOMAIN		L	EVE	L	
CO1	<i>Describe</i> classes and objects and <i>Explain and Develop</i> different types of classes and objects in detail	Cognitive, Psychomotor, Affective	Cre App Rec	ate, oly, ceivii	Prac 1g	ticin	g,
CO2	To <i>demonstrate</i> adeptness of object oriented programming in <i>developing</i> solution to problems demonstrating <i>usage</i> of data abstraction, encapsulation and inheritance	Cognitive, Psychomotor	Rer Cre Apj	nem ate, ply, I	ber, Pract	icing	
CO3	To <b>use</b> and <i>Describe</i> the syntax and features of exception handling	Understand					
CO4	To <i>demonstrate</i> and <i>Use</i> the ability to implement one or more patterns involving dynamic binding and utilization of polymorphism in the solution of problems	Cognitive	Uno	lerst	and		
CO5	To <i>demonstrate</i> the ability to <i>develop</i> solution to various I/O manipulation operations.	Cognitive, Psychomotor	Remember, Create, Apply, Practicing				
UNII	-1 INTRODUCTION			A 1 4	9		1
ODJ	ject oriented programming concepts – objects – classes –	- methods and message $C_{+}$	es - I	ADSU	raction of the second sec	on ar acce	la ss
spe	cifiers – function and data members – default arguments	- function overloading	g – fri	end	func	tions	_
con	st. and volatile functions - static members - Objects -	pointers and objects	$-\cos$	nstan	t ob	jects	_
nes	ted classes – local classes.						
UNIT	- II PROGRAMMING IN C++			• ,•	9		•
allo allo	ctions – default constructor – Parameterized co ocation – copy constructor – destructor – operator o ctions – overloading the assignment operator – type conv	verloading – Constr verloading – overloa	uctor ding	thro	n ay ugh	frier	1C 1d
UNIT	- III FUNCTION IN C++	ersion explicit const		•	9		
Fun spe	action and class templates - Exception handling - cification – terminate and Unexpected functions – Uncaug	- try-catch-throw par tht exception.	radigi	m –	exc	eptio	m
UNIT	- IV INHERITANCE and POLYMORPHISM				9		
Inhe abs pur dov	eritance – public, private, and protected derivations – r tract class – composite objects - Polymorphism - Run e virtual functions – RTTI – typeid – dynamic casting	nultiple inheritance - time polymorphism – g – RTTI and templa	virtu virt tes –	ual b tual t cros	ase o funct s cas	class ions sting	
UNIT	- V File Handling				9		
Stre	eams and formatted I/O - I/O manipulators - file handlin	objec	t ser	ializ	ation	-	
nan	nespaces - std namespace - ANSI String Objects - standard	l template library. ECTURE PRACT 45 -	ICAI	_	TC	)TA] 45	L
TE	XT BOOKS			i			
	<ol> <li>B. Trivedi, "Programming with ANSI C++", 0198083963, 9780198083962.</li> <li>D. D. M. L. M. D. M. L. M. C. M. L. M. C. M. L. M. C. M. L. M.</li></ol>	Oxford University F	Press,	20	13,	ISBN	<b>√</b> :
	2. Paul Deitel, Harvey Deitel, "C++ How to Program", 13: 978-0132662369, ISBN-10: 0132662361.	Sixth Edition, Prentic	е на	11, 20	,11,	ISRL	N -

	REFERENCES
	<ol> <li>Balagurusamy E., "Object oriented programming with C++", Fifth Edition, Third Reprint, Tata McGraw–Hill Education 2011.</li> </ol>
	2. Ira Pohl, "Object Oriented Programming using C++", Pearson Education, Second Edition, Reprint 2007.
	3. B. Stroustrup, "The C++ Programming language", Third edition, Addison-Wesley Professional, 4 <sup>th</sup> edition 2013, ISBN-10: 0321563840, ISBN-13: 978-0321563842.
	E REFERENCES
	1. http://spoken-tutorial.org/tutorial- search/?search_foss=C+and+Cpp&search_language=
	2. http://www.nptel.ac.in
	3. <u>http://www.learncpp.com/</u>
	4. <u>http://vlab.co.in</u>
<b>b</b>	

	DO1	PO	PO1	PO1	PO1	PSO	PSO							
	POI	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original	11	13	13	13	8	2	7	7	6	0	0	0	9	6
Scaled to 0,1,2,3 scale	3	3	3	3	2	1	2	2	2	0	0	0	2	2

COURSE CODE	COURSE NAME	L	Т	Р	С
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XCSOE	1	MULTIMEDIA DESIGN AND DEVELO	MEDIA DESIGN AND DEVELOPMENT						
C:P:A = 3:0:0			L	Т	Р	H			
				3	0	0	3		
COURS	E OU'	I	LEVEL						
CO1	Desc	cribe the multimedia application.	Cognitive	Remen	nber				
CO2	Desc	cribe, Explain the digital presentation.	Cognitive	Remen	nber ,	Unde	rstand		
CO3	Desc	cribe the text and image.	Cognitive	Remember					
CO4	Desc tech	<i>cribe</i> and <i>Explain</i> audio and video nology	Cognitive	Remen Unders	iber , tand				
CO5	Expl	<i>lain</i> compression and multimedia authoring.	Cognitive	Understand					
UNIT I	<u>.</u>	INTRODUCTION					9		
What is software	multin requir	nedia? Defining the scope of multimedia. A rements, multimedia database.	pplications of r	nultimedi	a, ha	rdwa	re and		
UNIT II	]	DIGITAL REPRESENTATION					9		
Introduc to D conv Fourier re	tion, A version eprese	Analog representation, waves, digital represent n, D to A conversion, relation between sample entation, pulse modulation. Importance and de	ntation, need fo ing rate and bit rawback of digi	r digital r depth, Qu tal represe	epres iantiz entatio	entati ation on.	ion, A error,		
UNIT II	I	TEXT AND IMAGE					9		
Intro due of	:	France of tort East insertion communication	Ella formada	Tumos of			<b>1</b>		

Introduction, Types of text, Font, insertion, compression,File formats. Types of images, colour models, Basic steps for image processing, principle and working of scanner and digital camera, Gamma and gamma correction.

UNIT IV	AUDIO AND VIDEO TECHNOLOGY	9

Fundamental characteristics of sound, psycho- 20 acoustics, Raster scanning principles, sensors for TV cameras, color fundamentals, additive and COURSEtractive color mixing, Liquid crystal display (LCD), Plasma Display Panel (PDP), file formats

## UNIT V COMPRESSION AND MULTIMEDIA AUTHORING

9

What is compression? Need for compression, Types of compression- basic compression techniquesrun length, Huffman's coding, JPEG, zip coding. Overview of Image and Video compression techniques. Overview, multimedia authoring metaphor, multimedia production, presentation and automatic authoring, Design paradigms and user interface, overview of tools like adobe premier, director, flash and dreamweaver.

	LECTURE	TUTORIAL	TOTAL
	45	0	45
TEXT BOOKS			

1. Principles of Multimedia by Ranjan Parekh. Tata McGraw-Hill Reference: 2<sup>nd</sup> Edition 2012.

- 2. Multimedia Systems Design by Prabhat K. Andleigh and Kiran Thakrar-PHI publication ,1996
- 3. Multimedia systems by John F. Koegal Buford-Pearson Education. 2009
- 4. Fundamentals of multimedia by Ze-Nian Li and MS Drew. PHI EEE edition.2008.

# **E-REFERENCES**

1.http://www.humber.ca/program/multimedia-design-and-development

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	1	3	3	1	3				2	2	2	2	2	1
CO 2	2	3	3	2	3				3	3	1	1	3	2
CO 3	2	3	3	2	3				3	3	1	1	3	2
CO 4	3	2	2	1	2				3	3		1	3	2
CO 5	3	2	2	1	2				3	3		1	3	2
	11	13	13	7	13				14	14	4	6	14	9

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	11	13	13	7	13				14	14	4	6	14	9
value														
Scaled to 0,1,2,3	3	3	3	2	3	0	0	0	3	3	1	2	3	2
scale														

COURSE	COURSE NAME	L	Т	Р	С
CODE					

XCSOE5	DIGITAL MARKETING		3	0	0	3	
C.D.A -				т	т	D	U
C:P:A = 3.0.0				L	T	r	п
5.0.0							
				3	0	0	3
COURSI	EOUTCOMES	DOMA	IN	I	LEVE	L	
CO1	Describe the evolution of marketing	Cognitiv	e	Remer	nher		
001	Describe the evolution of marketing.	Coginary	C	Kennen			
CO2	<i>Explain</i> the digital world	Rememb	er	Remen	nber,	Unde	rstand
	-						
CO3	Describe the web intelligence and E-mail	Remen	nber				
	marketing.	- · ·		<b>D</b>			
CO4	<i>Describe</i> the social media and online consumer	Cognitiv	e	Remen	nber,	Unde	rstand
C05	Exercise affiliate marketing	Comitiv	-	Undor	stand		
005	Explain armate marketing	Coginuv	C	Unders	stanu		
UNIT I	INTRODUCTION		I			T	9
The evol	ution of marketing: The changing face of adv	vertising -	The tec	hnolog	y beł	nind	digital
marketing	g -Enough technology – let's talk about people- St	rategic thi	nking-	Why y	ou ne	ed a	digital
marketing	strategy -Your business and digital marketing -I	Defining yo	our digi	tal mai	keting	g stra	itegy -
Understan	nding the digital consumer						
UNIT II	WINDOW TO THE DIGITAL WORLD						9
Vana	asies the hugh of your disited mentating would Du		ffastire		4.0		
Your we	osten of huilding your digital marketing world -Bu	filding an e		domo	te	ma II	low to
choose a	steps of building your website -Before you star	tion Writ	ig your	doma	in nai	ntont	low to
	WEBSITE INTELLIGENCE AND RETURN	N ON IN	VESTN	IENT			9
							/
Measurin	g your way to digital marketing success -Gettin	g started -	How in	forma	tion is	s me	asured
Measurin	g what's important to you -Testing, investing,	tweaking	, reinve	esting	-Acti	on st	tations
Harness t	he power of online data, and watch your ROI-tak	e off <b>E-m</b>	ail mar	keting	- The	new	direct
mail -Wh	at exactly is e-mail marketing? -Before you start -	Planning y	our car	npaign	-Dos	and	don'ts
of an e-	nail marketing campaign -Measuring your succ	cess -Still	a vital	comp	onent	of	digital
marketing							
UNITIV	SOCIAL MEDIA AND ONLINE CONSUN	IER ENG	AGEM	ENT			9
Join the c	onversation - What is social media? - The different	forms of so	cial me	dia -T	he rul	es of	
engageme	ent -Adding social media to your own site Fosterin	g a positive	online	image	-rom	oting	your
business	hrough online channels -Monitoring the conversat	ion – reput	ation m	anager	nent I	Dama	ge
limitation	: turning the tide when things go wrong	1		U			C
UNIT V	AFFILIATE MARKETING AND DIGITAL	MEDIA	CREAT	TIVE			9
Recogniz	ing opportunities for strategic partnership -What is	affiliate m	arketin	g? -Th	e click	that	really
counts -W	That advertisers should do Creative application of c	ligital med	ia -Usin	ig an A	gency	v -Do	ing it
yourself -	Digital creative: what works and what doesn't	-		-			-
		CTURE	TUTO	RIAL	, , , , , , , , , , , , , , , , , , ,	ГОТ	AL
		45	(	)		15	
		43	l	)		43	
TEXT B	DOKS	Ł					
1 1 1		•	.1 **	•, 1	•		
1. Unders	tanding Digital Marketing -Marketing strategies for	or engaging	the dig	ital ge	nerati	on	

## REFERENCES

- 1. Digital Foundations: Intro to Media Design with the Adobe Creative Suite 1st Edition- xtine burrough ,Michael Mandiberg.2009.
- 2. Web Intelligence- Zhong, Ning, Liu, Jiming, Yao, Yiyu-2003

## **E-REFERENCE**

- 1. http://www.slideshare.net/narendrasharma/digital-marketing-ppt
- 2. http://www.slideshare.net/priyanka2512dolly/digital-marketing-basics-and-trends
- 3. https://www.google.co.in/?gfe\_rd=cr&ei=fPIWV9uGFOXQ-AOI-
- YCgBQ&gws\_rd=ssl#q=digital+marketing.ppt
- 4. https://www.youtube.com/watch?v=IaiVtB5X8B8

### Mapping of COs with POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	1	3	3	1	3				2	2	2	2	2	1
CO 2	2	3	3	2	3				3	3	1	1	3	2
CO 3	2	3	3	2	3				3	3	1	1	3	2
CO 4	3	2	2	1	2				3	3		1	3	2
CO 5	3	2	2	1	2				3	3		1	3	2
	11	13	13	7	13				14	14	4	6	14	9

Subject Versus POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original value	11	13	13	7	13				14	14	4	6	14	9
Scaled to 0,1,2,3 scale	3	3	3	2	3	0	0	0	3	3	1	2	3	2

## **PROFESSIONAL ELECTIVES**

## **V SEMESTER**

COURSE CODE	COURSE NAME			L	Т	Р	С
XCSE51	<b>CRYPTOGRAPHY AND NETWORK SH</b>	ECURITY		2	1	0	3
<b>C:P:A</b> =				L	Т	Р	Η
3:0:0				_		~	
COURSE O	UTCOMES	DOMA	IN	2	2 L	0 LEVI	4 EL
CO1	<i>Describe and understand</i> the concept of various security attacks.	Cognitive		Re	men	nber	
CO2	<i>Explain and understand</i> the Concept Various encryption Techniques.	Cognitive		Re Un	men ders	iber tand	
CO3	<i>Explain</i> and solve problems related to key Exchange Techniques.	Cognitive		Re	men	nber	
CO4	Describe Authentication Techniques.	Cognitive		Re Un	men	ber , tand	,
CO5	<i>Describe and understand</i> the concept of various security mechanisms.	Cognitive		Co	mpr	ehen	sion
UNIT I – BA	ASICS OF CRYPTOGRAPHY						9
LFSR seque Modular exp fields – conti UNIT II EN Simple DES RC4 – RSA UNIT III Discrete Log ElGamal Pu	nces – Basic Number theory – Congruences onentiation – Fermat and Euler's theorem – La nued fractions. <b>VCRYPTION STANDARDS</b> – Differential cryptoanalysis – DES – Modes of – Attacks – Primality test – factoring. <b>KEY EXCHANGE ALGORITHMS</b> garithms – Computing discrete logs blic keycryptosystems – Hash functions – Secur	<ul> <li>G – Chinese</li> <li>egendre and</li> <li>f operation -</li> <li>– Diffie-I</li> <li>re Hash – B</li> </ul>	e Remai Jacobi – Triple Hellmar irthday	nder sy DE DE	Theorem $S - A$ sy except of $S - A$ cks -	AES AChar MD	Finite 9 
Digital signa	atures – RSA –ElGamal – DSA.						
Authentication IPsecurity –	on applications – Kerberos, X.509, PKI – Electr Web Security – SSL, TLS, SET.	onic Mail s	ecurity	– PC	SP, S	/MI	у ИЕ –
UNIT V SE	CURITY ISSUES						9
System secu Standards.	rity – Intruders – Malicious software – viru	ıses – Firev	walls –	Sec	curit	у	l
		ECTURE	TUT	ORL	AL	ТО	TAL
		30	-	15			45
TEXT BOO	KS		•			•	
<ol> <li>Wade Tra 2nd ed,Pea</li> <li>William S</li> </ol>	appe, Lawrence C Washington, "Introduction to arson, 2007. tallings, "Crpyptography and Network security	Cryptograp Principles a	hy with nd Prac	n cod	ling s", P	theor earso	y", on/P
HI, 4thed,	2006. TES						
1. W. Mao, "	Modern Cryptography – Theory and Practice",	Pearson Ed	ucation	, Sec	cond		

Edition, 2007.

2. Charles P. Pfleeger, Shari Lawrence Pfleeger – Security in computing Third Edition – Prentice Hall ofIndia, 2006

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PSO1	PSO2
CO 1	2	2	0	0	0	0	0	1	0	0	0	1	1	2
CO 2	0	3	2	0	0	0	0	0	0	0	0	1	1	2
CO 3	3	2	2	0	0	0	0	0	0	0	0	1	1	2
CO 4	1	3	0	0	0	0	0	0	0	0	0	1	1	2
CO 5	0	0	3	2	0	1	0	2	0	0	0	1	1	2
Total	6	10	7	2	0	1	0	3	0	0	0	5	5	10

	PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original	6	10	7	2	0	1	0	3	0	0	0	5	5	10
Scaled to 0,1,2,3 scale	2	2	2	1	0	1	0	1	0	0	0	1	1	2

<b>COURSE CODE</b>	COURSE NAME	L	Т	Р	С
XCSE52	DISTRIBUTED COMPUTING	2	1	0	3
C:P:A = 3:0:0		L	Т	Р	Η
		2	2	0	4
			******	******	

COURSE	E OUTCOMES	DOMAIN	LEVEL
CO1	<i>Use</i> network <i>Define</i> and <i>Explain</i> fundamental of network type, Internet protocol.	Cognitive	Knowledge Apply
CO2	<i>Define</i> and <i>Explain</i> the idea of middleware and related issues.	Cognitive	Knowledge Apply
CO3	<i>Understand</i> in detail the system level and support required for distributed system.	Cognitive	Knowledge, Apply
CO4	<i>State</i> and <i>Explain</i> various algebraic structure and corresponding theorems To understand the issues involved in studying data and design of distributed algorithms.	Cognitive	Knowledge, Create
CO5	To <i>understand</i> the Distributed Transaction Processing.	Cognitive	Knowledge, Create
UNIT I	INTRODUCTION	1	9
Character Challenge Internetwo Studies.	ization of Distributed Systems – Examples es – System Models – Architectural and Fu orking – Types of Networks – Network P	s – Resource S indamental Mod Principles – Inte	haring and the Web – dels – Networking and ernet Protocols – Case
UNIT II	PROCESSES AND DISTRIBUTED OB	JECTS	9
Inter-prod Represent Case Stu Distribute Study.	cess Communication – The API for the cation and Marshalling – Client –Server Com dy – Distributed Objects and Remote In ed Objects – Remote Procedure Call – Event	Internet Proto munication – G vocation – Co s and Notificatio	cols – External Data roup Communication – mmunication Between ons – Java RMI – Case
UNIT II	I OPERATING SYSTEM ISSUES I	~	9
The OS L Architectu Cryptogra	ayer – Protection – Processes and Threads - are – Security – Overview – Cryptograph aphy Pragmatics – Case Studies – Distr	- Communication ic Algorithms - ibuted File Sy	on and Invocation – OS – Digital Signatures – estems – File Service
Architectu	ure – Sun Network File System – The Andrew	w File System.	
UNIT IV	<b>OPERATING SYSTEM ISSUES II</b>		9
Name Ser Service – Physical Debuggin Problems	vices – Domain Name System – Directory a X.500 Directory Service – Clocks – Event Clocks – Logical Time And Logical Cl g – Distributed Mutual Exclusion – Election	and Discovery S ts and Process S locks – Global ns – Multicast C	ervices – Global Name States – Synchronizing States – Distributed Communication Related
UNIT V	DISTRIBUTED TRANSACTION PRO	DCESSING	9
Transaction Ordering Protocols	ons – Nested Transactions – Locks – Optimi – Comparison – Flat and Nested Distrib – Concurrency Control in Distributed Tra	stic Concurrenc uted Transactio ansactions – Di	y Control – Timestamp ons – Atomic Commit istributed Deadlocks –
Transactio	on Recovery – Overview of Replication And	Distributed Mul	timedia Systems.
		ECTURE TU	JTORIAL TOTAL
TEVT D4	DOKS	30	15 45
IEAT BO	JUNS	a "Distributed	Systema Concerta or 1
1. Georg Desig	n" Fifth edition – 2011- Addison Wesley.	g, Distributed	systems Concepts and

#### REFERENCES

- 1. Tanenbaum A.S., Van Steen M., "Distributed Systems: Principles and Paradigms", Pearson Education, 2007.
- 2. Liu M.L., "Distributed Computing, Principles and Applications", Pearson and education, 2004.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	1	1	1	0	0	1	0	0	0	1	0	1	2	3
CO 2	1	2	1	0	0	1	0	0	0	1	0	1	1	2
CO 3	2	2	0	0	0	0	0	0	0	0	0	1	1	2
CO 4	0	2	0	0	0	0	0	0	0	0	0	1	2	2
CO 5	1	2	0	0	0	0	0	0	0	0	0	1	2	2
	5	9	2	0	0	2	0	0	0	2	0	4	6	9

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	5	9	2	0	0	2	0	0	0	2	0	4	6	9
Scaled	1	2	1	0	0	1	0	0	0	1	0	1	2	2
to														
0,1,2,3														
scale														

COURSE CODE	COURSE NAME	L	Т	Р	C
XCSE53	GRAPH THEORY	2	1	0	3
C: P: A = 3:0:0					

				L	Т	Р	H						
COUDS	EOUTCOMES		TNT	2	2 EVE	<b>0</b>	4						
COURS	<b>Define</b> and <b>Explain the</b> circuits and trees	Cogniti	AIIN ive	Remer	J <b>E V E</b> oberir	ιL nα							
COI	Define and Explain the circuits and trees.	Cogina	IVC	Unders	standi	ng							
CO2	Describe the circuits and isomorphism	Cogniti	ive	knowle	edge	<u> </u>							
CO3	<i>Identify</i> and <i>Explain</i> the matrix	Cogniti	ive	Unders	standi	ng							
004			•	Apply	1 •								
CO4	State and Explain the spanning free	Cogniti	ive	Kemer	nberii	ng ng							
CO5	<i>Understand</i> the concepts of algorithm.	Cogniti	ive	Apply	stantai	ng							
UNIT I	INTRODUCTION	<u>i</u> - <u>O</u>					9						
Graphs - Compone Distance	Graphs – Introduction – Isomorphism –graphs – Walks, Paths, Circuits – Connectedness – Components – Euler Graphs – Hamiltonian Paths and Circuits – Trees – Properties of trees – Distance and Centers in Tree – Rooted and Binary Trees.												
UNIT II CIRCUITS AND ISOMORPHISM       9         Spanning trees – Fundamental Circuits –Spanning Trees in a Weighted Graph – Cut Sets –       9         Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and													
Spanning trees – Fundamental Circuits –Spanning Trees in a Weighted Graph – Cut Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and Geometric Graphs – Planer Graphs – Different Representation of a Planer Graph.													
Graphs – Planer Graphs – Different Representation of a Planer Graph.         UNIT III MATRIX													
UNIT III MATRIX       9         Incidence matrix -matrices - Circuit Matrix - Path Matrix - Adjacency Matrix - Chromatic       Number - Chromatic partitioning - Chromatic polynomial - Matching - Covering - Four Color         Problem - Directed Graphs - Types of Directed Graphs - Digraphs and Binary Relations - Directed         Paths and Connectedness - Euler Graphs - Adjacency Matrix of a Digraph													
UNIT IV	SPANNING TREE						9						
Algorithr Graph –S	ns: Connectedness and Components – Spanning et of Fundamental Circuits – Cut Vertices and Se	g tree – Findin parability – Dir	g all rected	Spanni Circui	ng Tı ts.	rees (	of a						
UNIT V	DFS ALGORITHM						9						
Algorithm	ns: Shortest Path Algorithm – DFS – Planarity Tes	sting – Isomorp	hism				i						
LECTURE TUTORIAL TOTAL													
		30		15		45	r						
TEXT B	OOKS												
1.Narsing 2003	gh Deo, "Graph Theory: With Application to En	ngineering and	Com	puter S	Scienc	æ", I	γHI,						
REFERI	ENCES												
1. R.J. V	Vilson, "Introduction to Graph Theory", Fifth Edit	ion, Pearson E	ducati	ion, 201	2.								

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	3	2	3	2	2	1	1	0	0	0	2	2	3	1
CO 2	3	2	3	1	2	1	2	0	0	0	1	1	3	1
CO 3	3	2	2	2	2	1	1	0	0	0	3	1	3	1
CO 4	3	2	2	1	2	1	1	0	0	0	1	1	3	1
CO 5	3	2	3	2	1	1	1	0	0	0	2	1	3	1
Total	15	10	13	8	9	5	6	0	0	0	9	6	15	5

	PO	PSO1	PSO 2											
	1	2	3	4	5	6	7	8	9	10	11	12		
Original value	15	10	13	8	9	5	6	0	0	0	9	6	15	5
Scaled to 0,1,2,3 scale	3	3	3	2	2	1	2	0	0	0	2	2	3	1

COURSE	COURSE NAME	L	Τ	P	C
CODE					
XCSE54	COMPUTER GRAPHICS AND MULTIMEDIA	2	1	0	3

~									
<b>C:P:A</b> =	= 3:0:0		L	Т	Р	Н			
			2	2	0	4			
COURS	SE OUTCOMES	DOMAIN	N –	LE	VEL	.1			
CO1	<b>Describe</b> the output primitives.	Cognitive	Rer	nembe	er				
CO2	<i>Explain</i> the 3D transformation	Cognitive	Rer	nembe	er				
CO3	<i>Understand</i> the Multimedia File Handling.	Cognitive	Rer	nembe	er				
CO4	Explain the multimedia system.	Cognitive	Rer Und	nembe lerstar	er, nd				
CO5	<i>Describe</i> and <i>Apply</i> the knowledge of hypermedia.	Cognitive	Une Rer	lerstai nembe	nd, er,				
UNIT I	OUTPUT PRIMITIVE	<u>i</u>	i.			9			
Introduction - Line - Curve and Ellipse Algorithms – Attributes – Two-Geometric Transformations – Two-Dimensional Viewing.									
UNIT I	I THREE-DIMENSIONAL CONCEPT	۲S				9			
Three-D	imensional Object Representations – Thre	e-Dimensional	Geometric	and	Mode	ling			
Transfor	mations – Three-Dimensional Viewing – C	olor models – A	nimation						
UNIT 1	II MULTIMEDIA SYSTEMS DESIGN					9			
An Intro	oduction – Multimedia applications – Mul	timedia System	Architect	ure –	Evolv	ving			
technolo interface	egies for Multimedia – Defining objects for e standards – Multimedia Databases.	· Multimedia sy	vstems – N	lultim	edia I	Data			
UNIT I	V MULTIMEDIA FILE HANDLING					9			
Compre	ssion & Decompression – Data & File	e Format stand	dards – N	Aultin	nedia	Ī/O			
technolo	gies - Digital voice and audio – video ima	ige and animati	on – Full	motio	n vide	- 0			
Storage	and retrieval Technologies.								
UNIT V	<b>HYPERMEDIA</b>			~ ~		9			
Multime Hyperm message	edia Authoring & User Interface – Hypern edia message component – creating Hypern standards – Integrated Document managem	media messagin rmedia message lent – Distribute <b>LECTURE</b>	ng - Mobil e – Integra ed Multime <b>TUTORL</b>	e Me ted m dia Sy	ssagin ultime ystems <b>FOT</b> A	g – edia 3.			
		30	15		45				
TEXT I	BOOKS								
1. Don Educ (UNI 2. Prab (UN	ald Hearn and M.Pauline Baker, "Concation, fourth edition, 2010. T I : Chapters 1 to 6; UNIT 2: Chapter 9 – at K Andleigh and Kiran Thakrar, "Multi IT 3 to 5)	nputer Graphic 12, 15, 16) media Systems	es C Ver and Desig	sion", gn", P	Pear HI, 20	rson )03.			
REFER	ENCES								
1. Judit 2. Foley Educ	h Jeffcoate, "Multimedia in practice teo 7, Vandam, Feiner, Huges, "Computer Gration, second edition 2003.	chnology and aphics: Princip	Applicatio les & Pra	ns", I ctice"	PHI,19 , Pear	)98. :son			

## **E-REFERENCES**

- http://nptel.iitm.ac.in/video.php?CourseId=106106090 (Computer Graphics)
   <u>http://iiith.vlab.co.in/?COURSE=21&brch=205</u>

	PO	PO2	PO	PO	PO	PO	PO7	PO	PO	PO	PO1	PO1	PSO	PSO2
	1		3	4	5	6		8	9	10	1	2	1	
CO1	3	1	2	1	2	0	0	0	0	1	0	0	1	0
CO2	2	2	2	1	2	0	0	0	0	1	0	0	2	0
CO3	2	2	2	2	2	0	1	0	0	1	0	0	2	2
C04	2	1	2	1	1	0	0	0	0	2	0	0	2	1
Co5	7	5	6	4	6	0	1	0	0	3	0	0	5	2

Courses	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
Original	7	5	6	4	6	0	1	0	0	3	0	0	5	2
Scaled to 0,1,2,3 scale	2	1	2	1	2	0	1	0	0	1	0	0	1	1

## **VI SEMESTER ELECTIVES**

COURSE (	CODE	COURSE NAI	ME					L	Т	P	С
XCSE61		ADVANCED	DATAB	ASES				3	0	0	3
<b>C:P:A = 3:</b>	):0										
								L	Τ	P	Η
						-		3	0	0	3
COURSE (	DUTCO	MES				DO	MAIN		J	LEVI	EL
CO1	<i>Explain</i> distribu	the concepted databases	ots of	paralle	l and	Cogni	tive	J	Unders	stand	
CO2	<i>Explai</i> Object	the concepts ar Oriented databas	nd applica	ations o	f	Cogni	tive	τ	Unders	stand	
CO3	Unders intellig	tand and Desc ent databases.	c <i>ribe</i> the	e princi	ples of	Cogni	tive	I T	Remer Unders	nber, stand	
CO4	<i>Identif</i> advanc	and be able to a add database tech	use recen niques.	t and		Cogni	tive	1	Apply		
UNIT I P	ARALI	EL AND DIST	RIBUTI	ED DAT	<b>FABASI</b>	ES					9
Database SArchitectureInter and InSystems DisCommit ProUNIT II	ystem A es – Para tra Quer stributed tocols – <b>DBJEC</b>	Concurrency Concur	istributed istributed Inter and pts - Dispontrol – D <b>F RELA</b>	and Cli I System I Intra of tributed Distribute TIONA	ent-Serv ns – Par operatior Data Sto ed Query L DAT	allel Da allel Da Parall orage – V Proce ABASE	atabase elism - Distrit ssing SS	res – s: I/( – Des outed	Serve D Para sign o Trans	r Sys Illelis f Par actio	stem m – allel ns – 9
Concepts fo	or Objec	Databases: Of	hiect Ide	ntity _	Object	structu	те — Т	vne	Const	ructo	rs —
Encapsulatio	on of C	perations – M	ethods –	- Persis	tence –	Tvpe	and (		Hiera	archie	es -
Inheritance	– Comp	ex Objects – Ol	bject Dat	abase S	tandards	, Lang	uages a	and I	Design	: OD	MG
Model – O	DL - 0	QL – Object	Relation	al and	Extende	d - R	elation	al S	ystems	s: Ot	oject
Relational fe	eatures in	SQL/Oracle						-			_
UNIT III	INTEL	LIGENT DATA	ABASES	)							9
Active Data Design Pri DatabasesTS Rules-Synta Recursive ( Spatial Data	bases: S nciples SQL2- I x and Se Queries Structur	yntax and Sema for Active F Deductive Datab mantics of Dat n SQL- Spatia es Spatial Acce	antics (S Rules- T pases: Lo calog Lan l Databa ess Metho	tarburst, Cempora gic of ( Iguages- ses- Sp ods- Spa	, Oracle, 1 Datal Query L 1 Implem atial Da tial DB	, DB2) bases: languag nentatio lta Typ Implem	- Taxo Overv ges – I n of R es- Sp entatio	nomy view Data ules vatial vn	y- Apj of log- I and R Relat	plicat Femp Recur ecurs ionsh	ions oral sive ion- nips-
UNIT IV	ADVAN	CED DATA M	ODELS								9
Mobile Dat Managemen Concurrency Retrieval- D	tabases: t - Loo y Contro Pata Ware	Location and ation Depende l - Transaction shousing Data M	Handoff nt Data Commi Iining- T	Manag Distrib t Protoc ext Min	gement oution - cols- Mu ing.	- Effe Mobi iltimed	ct of le Tra ia Data	Moł nsact abase	oility tion N es- Inf	on I Mode Forma	Data ls - ution
UNIT V F	EMERG	ING TECHNO	LOGIES	5							9
XML Datab XML in Da Information Systems on Introduction	ases: XM atabases- System the Clo to Big I	IL-Related Tecl XML and SQL - Biological D ad- Cloud Stora Data-Storage-An	hnologies - Native ata Mana age Arch alysis.	S-XML XML agement itectures	Schema- Databas t- Cloud s-Cloud	XML es- We Based Data M	Query eb Dat Datal Iodels-	Lang abase bases Que	guages es- Ge : Data ery La	- Sto eogra a Sto ingua	ring phic rage .ges-
	Ų	<u></u>	<b></b>		LECT	URE	TUTC	)RIA	L]	<b>OT</b> A	<b>\L</b>
					45		0		4	5	
REFEREN	CES										
1. R. Elması	ri, S.B. N	avathe, "Fundar	mentals o	f Datab	ase Syste	ems", F	ifth Ec	lition	, Pear	son	

Education/Addison Wesley, 2007.

2. Thomas Cannolly and Carolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education, 2007.

3. Henry F Korth, Abraham Silberschatz, S. Sudharshan, "Database SystemConcepts", Fifth Edition, McGraw Hill, 2006.

4. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006. 5. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", McGraw Hill, Third Edition 2004

Mapping	of COs	with	POs:
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	РО	PO	РО	PO	PO	РО	РО	РО	РО	PO1	PO1	PO1	PS	PS
	1	2	3	4	5	6	7	8	9	0	1	2	01	O 2
С	2	1	1	0	0	1	1	0	0	0	0	0	2	0
0														
1														
С	2	1	1	0	0	1	1	0	0	0	0	0	2	0
0														
2														
С	2	1	1	0	0	1	1	0	0	0	0	0	2	0
0														
3														
С	2	1	0	3	3	1	1	0	0	0	0	0	2	2
0														
4														
	8	4	3	3	3	4	4	0	0	0	0	0	8	2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	8	4	3	3	3	4	4	0	0	0	0	0	8	2
Scaled	2	1	1	1	1	1	1	0	0	0	0	0	2	1
to														
0,1,2,3														
scale														

COURSE CODE	COURSE NA	ME			L	Т	P	С	
XCSE62	MOBILE CO	OMPUTING AND CO	OMMUNICATIO	N	3	0	0	3	
C:P:A=									
3.8:1:0.2									
						 	P	H	
COUDSE OI	TCOMES		DOMAIN				U	3	
COURSEO	UICOMES		DOMAIN			VLL			
CO1	<i>Understand</i> to mobile commu	he fundamentals of inication	Cognitive	U R	ndersta ememb	nd er			
CO2	<b>Understand</b> th	d U	ndersta	rstand vledge					
	and <i>Compare</i>	K	nowled	ge					
	telecommunic								
CO3	Describe the	concepts of various	Cognitive	U	ndersta	nd			
	Wireless LAN	I							
CO4	Explain the d	ifferent Routing	Cognitive	U	ndersta	nd			
	techniques in	A	pply						
CO5	<i>Understand</i> d	ifferent user	Cognitive	U	ndersta	nd			
	interface proto	ocols in mobile		R	ememb	er			
	communicatio	ons.							
UNIT I	WIRELES	S TRANSMISSION					9	)	
Introduction Wireless trans Modulation Assignment-	to Wireless N smission – Freq – Spread spe types of hand-o	etworks – Application uencies – Signals – A ctrum – Cellular S ff and their characteri	ons – History – ntennas – Signal p ystems: Frequenc stics.	Simplifi ropagati cy Mar	ied Ret ion – M nageme	ference Iultiplex: nt and	Mode ing – Char	1 – nnel	
UNIT II MA	AC AND TELI	ECOMMUNICATIO	ONS SYSTEMS				9	)	
MAC – Mot Architecture- SMS –Intern management	ivation – SDN Location tracki ational roamir – DECT – TET	IA, FDMA, TDMA, ng and call setup- M ng for GSM- call r RA – UMTS – IMT-2	CDMA –Telecon Iobility manageme ecording function 000.	mmunic ent- Ha 1s-subsc	ation S indover riber a	Systems - Securi and serv	– GS ty- G vice c	SM: SM lata	
UNIT III	WIRELESS	LAN					9	)	
Wireless LA 802.11WLAN protocols.	N – Infrared J Standards –	Vs Radio transmiss Architecture – Serv	ion – Infrastructu vices– HIPERLAN	ure $-A$ N $-$ Blu	Adhoc uetooth	Networl Archite	k –IE ecture	EE &	
UNIT IV			ç	)					
Mobile Netw Layer – Trad recovery – Tr	ork Layer – M itional TCP – ansmission / Ti	lobile IP – Dynamic Indirect TCP – Snoo me-out freezing – Sele	Host Configuration ping TCP – Mobilective retransmissi	on Proto le TCP on – Tra	ocol - 1 – Fast ansactio	Mobile 7 retransn on Orien	Fransp nit / I ted T(	port Fast CP.	
UNIT V	APPLICATIO	N LAYER					9	)	
WAP Model- profile- cach SyncML.	Mobile Locati	on based services -W eless bearers for WA	AP Gateway –WA P - WML - WM	AP proto /IL Scri	ocols – pts - V	WAP u WTA –	ser ag iMod	;ent le -	
		LECTURE	TUTORIAL	PRAC	CTICA	L TOI	AL		
		45	-		-		45		

## **TEXT BOOKS**

- 1. Jochen Schiller, "Mobile Communication", 2nd Edition, Pearson Education, 2008.
- 2. Theodore and S. Rappaport, "Wireless Communications, Principles, Practice", 2nd Ed PHI, 2002

#### REFERENCES

- 1. William Stallings, "Wireless Communications and Networks", 2nd Edition, Pearson Education, 2004
- 2. C.Siva Ram Murthy and B.S.Manoj, "Adhoc Wireless Networks: Architectures and Protocols", 2nd Edition, Pearson Education, 2008
- 3. Vijay. K. Garg, "Wireless Communication and Networking", Morgan Kaufmann Publishers, 2007.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CO1	3	2	0	0	0	0	0	0	0	0	0	0	2	1
CO2	1	3	2	1	0	0	0	0	0	0	0	0	2	1
CO3	1	3	3	1	0	2	0	0	0	0	0	0	2	1
CO4	1	2	1	1	0	0	0	0	0	0	0	0	2	1
CO5	1	2	3	1	0	0	0	0	0	0	0	0	2	1
Total	7	12	9	4	0	0	0	0	0	0	0	0	10	5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
Original	7	12	9	4	0	0	0	0	0	0	0	0	10	5
Scaled to	2	3	2	1	0	0	0	0	0	0	0	0	2	1

COUR	SE	COURSE NAME		L	T	Р	C					
CODE				2	Δ	•	2					
VCSFA	(2	INTERNET OF THINGS		3 T	U T	U D	) И					
AUSEU C.D.A	)5 - 3.0.0	INTERNET OF THINGS		<u>г</u> З	1	Г Л	п 3					
	- 5.0.0 SE OUTC	OMFS	DOMAI	N	U	LEV	J FI					
COCK			DOMIN									
CO1	Get an id Internet o	ea of some of the application areas where f Things can be applied	Cognitive		Under	rstand						
CO2	Understa	<i>nd</i> the Standardization Protocol for IoT	Cognitive		Under	rstand						
CO3	Understa	<i>nd</i> the concepts of Web of Things.	Cognitive		Understand							
CO4	Understa	<i>nd</i> the concepts of Cloud of Things with	Cognitive		Under	rstand						
	emphasis on Mobile cloud Computing.											
CO5	Understa	<i>nd</i> the basic concepts of aspect oriented	Cognitive		Under	rstand						
	software of	development	U									
UNIT I	I IN	TRODUCTION					9					
Definit	tions and H	Functional Requirements –Motivation – Ar	chitecture -	- We	eb 3.0	View	/ of					
IoT– U	biquitous	IoT Applications - Four Pillars of IoT -	- DNA of	IoT	- The	e Too	olkit					
Approa	ch for End	-user Participation in the Internet of Things.	Middlewar	e for	· IoT: (	Overv	iew					
-Comm	unication r	niddleware for IoT –IoT Information Securit	y.									
TINIT												
Drotoco	1 Stondard	ration for IoT Efforts M2M and WSN	Drotocola	SC		nd D						
Protoco	le Issue	with IoT Standardization Unified Data	Protocois – Standarda		ADA a							
802 15	$A = B\Delta CN$	let Protocol – Modbus – KNX – Zigbee A	rchitecture	- 11 - N	Jetwor	s – n k lave	>r_					
APS 1a	r = DACN	ity		- 1		K lay						
	II W	FR OF THINGS					10					
Webo	f Things	versus Internet of Things Two Pillars	of the W	Jeh	Δre	hitec	10 turo					
Standar	dization f	or WoT– Platform Middleware for Wo	T = Unifi	ed	Multit	ier V	VoT					
Archite	cture - W	of Portals and Business Intelligence Clo	ud of Thi	105.	Grid/S	SOA	and					
Cloud (	Computing	- Cloud Middleware - Cloud Standards - C	Cloud Prov	iders	and S	vsten	18 –					
Mobile	Cloud Cor	nputing – The Cloud of Things Architecture.				<i>J</i>	10					
UNIT I	IV Io	T MODELS					9					
Integrat	ted Billing	Solutions in the Internet of Things Busine	ess Models	for	the In	terne	t of					
Things	- Network	Dynamics: Population Models – Information	n Cascades	- Ne	etwork	Effec	cts -					
Networ	k Dynamic	s: Structural Models - Cascading Behavior i	n Networks	- T	he Sma	all-W	orld					
Phenon	nenon.											
UNIT Y	V APP	LICATION					8					
						-						
The Ro	ole of the	Internet of Things for Increased Autonomy	and Agili	ity i	n Coll	abora	tive					
Product	tion Enviro	onments - Resource Management in the I	nternet of	Thir	igs: C	luster	ing,					
Synchro	onisation a	and Software Agents. Applications - Sma	art Grid –	Ele	ectrical	Veh	ıcle					
Chargin	ıg.				т		т					
				JKI	AL I	101A 15	11					
BEEEI	PENCES	43		-		43						
1 The	Internet of	Things in the Cloud: A Middleware Pers	nective - F	[0nh	o Zho	u – C	'RC					
Pres	s = 2012	Things in the cloud. A Middleware Fels		lono		u C						
2. Arc	hitecting t	he Internet of Things - Dieter Uckelm	ann: Mark	Ha	rrison	Flo	rian					
Mic	hahelles- (I	Eds.) – Springer – 2011	,			, _ 10						
3. Net	works, Cro	wds, and Markets: Reasoning About a Hig	hly Conne	cted	World	l - Da	ivid					
Easl	ey and Jon	Kleinberg, Cambridge University Press - 20	10									
4. The	Internet of	f Things: Applications to the Smart Grid a	nd Buildin	ig A	utoma	tion ł	у-					

- Olivier Hersent, Omar Elloumi and David Boswarthick Wiley -2012
- 5. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things Key applications and Protocols", Wiley, 2012.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	1	3	0	0	0	0	0	0	0	0	0	0	1	0
CO 2	1	3	0	0	0	0	0	0	0	0	0	0	2	0
CO 3	1	3	0	1	1	0	0	0	0	0	0	0	3	0
CO 4	1	3	0	2	0	0	0	0	0	0	0	0	1	0
	4	12	0	3	1	0	0	0	0	0	0	0	6	0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	4	12	0	3	1	0	0	0	0	0	0	0	6	0
Scaled	1	3	0	1	1	0	0	0	0	0	0	0	2	0
to														
0,1,2,3														
scale														

COURSI CODE	£	COURSE NAME			L	Τ	Р	С				
XCSE64		PROGRAMMING WITH	I PYTHON		3	0	0	3				
					L	Т	P	H				
C:P:A =	3:0:0				3			3				
COURSI	e ourc	OMES	DOMAIN		I	LEVE	L					
CO1	Describ	<i>e</i> the evolution of python	Cognitive	R	emen	ıber						
	program	n and the handle	C									
	installat	ion process with										
C03	differen	t OS.	Comitivo	מ	~ ~ ~ ~ ~ ~ ~	-1						
02	operator	rs with dictionaries	Cognitive	к I	Inder	stand						
CO3	Undersi	<i>tand</i> the function and apply	Cognitive	R	emen	iber						
	the rec											
	and redu											
CO4	Undersi	tand and apply object	Cognitive	R	emen	nber,						
	oriented	U	Inders	tand								
CO5	graphics Underst	ĸ	nowl	edge								
005	python	programming.	Coginave	Б	10.001	cuge						
UNIT I	UNIT I INSTALLATION											
D 1	1	·	L				·	1				
python or	n Linux –	- feature – History and philo	non – installing pyth sophy of python – i	non on nteracti	windo	ows – ode –	struc	ture				
with iden	tification	•										
UNIT II	DAT	A TYPE AND STATEME	NT					8				
Identifica	tion- Dat	ta Types and Variables - Op	erators -input and ra	w inpu	ıt via	the ke	eyboa	rd				
- Conditi	onal Stat	ements -While Loops -For I	Loops -Formatted or	utput -(	Dutpu	t with	Prin	t -				
Sequentia	l Data T	ypes - Dictionaries -Sets and	Frozen Sets -Shallo	w and	Deep	Сору	<b>'</b> •					
UNIT III	<b>FUN</b>	CTION AND REGULAR	EXPRESSION					10				
Functions	- Recur	sion and Recursive Function	e - Tests DocTests	UnitTa	acte -	Mem	nizati	on				
and Deco	orators -	Passing Arguments- Name	espaces - Global v	s. Loc	al Va	ariable	es- Fi	ile				
Managem	ent -Mo	dular Programming and Mod	dules - Introduction	in Reg	gular 1	Expre	ssions	s -				
Regular	Expressi	ons, Advanced -Lambda	Operator, Filter,	Reduce	e and	Ma	p-L	ist				
Compreh	ension- C	Jenerators						~				
	OBJ	ECT ORIENTED PROGR	AMMING	<b>–</b>	1	01 4		9				
exception	1 Handlin	ng - Object Oriented Program	nming - Inneritance	e Exam	pie -	Slots	- Clai	sses				
polymorn	hism, op	erator overloading – Multith	reading.	ut and	outpu	ι - ΠΠ	icina	nee,				
	, , , , , , , , , , , , , , , , , , ,						T					
UNIT VAPPLICATION OF PYTHONPROGRAMMING12												
Graphica	user in	terfaces; event-driven progr	amming paradigm;	tkinter	r mod	lule, d	creati	ng				
simple G	UI; butto	ons, labels, entry fields, dia	logs; widget attribu	ites - s	sizes,	fonts	, colo	ors				
layouts, n	lested fra	mes-, Networks, and Client/	Server Programmin	g; intro	ducti	on to	HTM	L,				
Interactin	g with r	emote HTML server, runni	ng html-based que	ries, do	ownlo	adıng	page	ès;				
COLDID	ranning	, programming a simple CO		ΤΙΤ	)RIA	ГJ	OTA	J.				
			45	0		4	5					
						i						

## **TEXT BOOKS**

1. Fundamentals of Python: First Programs Author: Kenneth Lambert Publisher: Course Technology, Cengage Learning, 2012 ISBN-13: 978-1-111-82270-5

## **E-REFERENCES**

- 1. https://wiki.python.org/moin/BeginnersGuide/Overview
- 2. https://docs.python.org/2/license.html
- 3. http://www.python-course.eu/blocks.php
- 4. http://www.tutorialspoint.com/python

	PO	PO	PO 3	РО	РО	PO	PO	PO	PO 9	PO	PO	PO	PSO1	PSO2
	1	2		4	5	6	7	8		10	11	12		
CO 1		2						1				1	1	
CO 2		3						2				1	1	
CO 3	3	2	2			1						1	1	
CO 4	3	2	2									1	1	2
CO 5	3	2	2									1	1	2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	9	11	6	-	-	1	-	3	-	-	-	5	5	4
Scaled														
to 0,1,2,3 scale	2	3	2	-	-	1	-	1				1	1	1

## **VII SEMESTER**

COUR CODE	SE	COURSE NAME			L	T	Р	С				
XCSE7	′1	NETWORK MEASUREMENTS TESTING	AND		3	0	0	3				
					L	Т	P	C				
C:P:A	= 3:0:0				3	0	0	3				
COUR	SE OUTC	OMES	DOM	AIN		LE	VEL					
<b>CO1</b>	Describe	the cellular network measurements.	Cognitive	e	Ren	nembe	er					
CO2	Describe,	<i>Explain</i> the testing techniques.	Cognitive	e	Ren Und	nembe lerstar	er nd					
CO3	Describe technolog	the basic telecommunication ies.	Cognitive	e	Ren	nembe	er					
<b>CO4</b>	Understa	nd the network test instruments	Cognitive	e	Und	lerstar	nd					
<b>CO5</b>	Understa	<i>nd</i> the performance monitoring.	Cognitive	e	Und	lerstar	nd	_				
UNIT I		RODUCTION TO NETWORK TE	ST AND M	IEASU	REM		<u>S</u>	9				
Introduction to telecommunication network measurements – Testing in the life cycle of the network - Private network performance testing.												
network - Private network performance testing.UNIT IICELLULAR NETWORK MEASUREMENTS AND TESTING9												
UNIT IICELLULAR NETWORK MEASUREMENTS AND TESTING9Introduction to cellular radio network - Cellular measurement strategies – Cellular												
measure	ement desc	ription - Cellular network life cycle t	esting.	- 81-00								
UNIT I	II BA	ASIC TELECOMMUNICATION	<b>TECHNOI</b>	LOGIES	5			9				
Transm and dela	ission med ay jitter - P	ia characteristics and measurement - rotocol analysis.	Fiber optic	e networ	k el	ement	ts Tin	ning				
UNIT I	V NET	WORK TEST INSTRUMENTS						9				
Analog analysis sonnet a	measurem s - Protoco analyzers -	ent instrumentation - Bit error rate l analyzers - Optical testers - Distri Signaling system 7 testing.	e measurem buted netw	ent and ork mor	erro nitori	ng -	forma SDH	and				
UNIT V	V NE	CTWORK MANAGEMENT						9				
Local a system.	rea networ	k management and performance mon	itoring - SS	7 signal	ling r	nonito	oring					
		L	ECTURE	TUTO	RIA	LJ	ΓΟΤΑ	<b>L</b>				
			45		0		45					
TEXT	BOOKS		1.1.6									
1.Coom	ibs Clyde, I McGrow H	F, "Communication Network: Test ar	id Measurei	ment Ha	ind							
REFERENCE												
Willian India Pu 2. J.F. H Press, N	n Stallings, ublication, Hayes, " <i>Mo</i> New York,	<i>"Wireless Communication and Netw</i> 2006. <i>deling and Analysis of Computer Co</i> 1994.	vorks", Seco mmunicatic	ond Edit	ion,P orks"	rentic ,Plent	e Hal um	1 of				

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	1	3	0	0	0	0	0	0	0	0	0	0	1	0
1														
CO	1	3	0	0	0	0	0	0	0	0	0	0	2	0
2														
CO	1	3	0	1	1	0	0	0	0	0	0	0	3	0
3														
CO	1	3	0	2	0	0	0	0	0	0	0	0	1	0
4														
	4	12	0	3	1	0	0	0	0	0	0	0	6	0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	4	12	0	3	1	0	0	0	0	0	0	0	6	0
Scaled	1	3	0	1	1	0	0	0	0	0	0	0	2	0
to														
0,1,2,3														
scale														

COUR CODE	SE	COURSE NAME		L	Т	Р	С						
XCSE7	72	SOFTWARE TESTING		3	0	0	3						
C:P:A	=			Τ.	Т	Р	н						
3:0:0				2	-	_							
COUR	SE OU	TCOMES	<b>DOM</b>	3 IN	U		्र FI						
COUR	SE UU	ICOMES	DOMA										
CO1	Descri	<i>be</i> the testing principles and relate the tester's schiltzen activer development organization	Cognitiv	'e	Reme	ember							
<u>CO</u> 2	Descri	the Explain and Demonstrate how to design	Cognitiv		Reme	mher							
002	approp	briate test cases which will be suitable for	Cogintiv	C	Unde	rstand	l						
	softwa	re product to be tested											
CO3	Descri	be and Demonstrate the knowledge of testing	Cognitiv	'e	Reme	ember							
CO4	Deser	ues.	Cognitiv	10	Domo	mhar							
04	tested	and the components and skills needed by a test	Coginuv	C	Unde	erstand							
	specia	list			enac	istaile							
<b>CO5</b> <i>Explain</i> the types of reviews, its components and review results and <i>Demonstrate</i> the working of Cognitive Comprehension													
review results and <i>Demonstrate</i> the working of software testing tool using any programming language													
software testing tool using any programming language													
software testing tool using any programming language       9													
Testing	as an	Engineering Activity – Need of testing– Role of	Process	in So	ftware	Qual	ity –						
Testing	as a Pr	ocess – Basic Definitions and terminologies – So	ftware Te	esting	Princi	ples –	The						
Tester's	s Role i	n a Software Development Organization – Origin	s of Defe	cts –	Defect	t Clas	ses –						
Develo	ning a I	pository and rest Design – Defect Examples -	- Develop	per/1	ester S	uppor	t for						
UNIT	I J	TEST CASE DESIGN					9						
Introdu	iction	to Testing Design Strategies – The Smarter	Tester	– Te	st Ca	se De	esign						
Strateg	ies –	Using Black Box Approach to Test Case	Design	Ran	dom	Testin	ıg –						
Require	ements	based testing – Boundary Value Analysis – deci	sion table	es - E	quival	ence (	Class						
Partitio	ning sta	te-based testing – cause effect graphing – error gu	lessing -	comp	atibilit	y testi	ing –						
testing	ve etru	ctural testing – code functional testing - Coverage	rest Adec	juacy	Flow	Gran	static						
Coverin	ig Code	Logic – Paths – Their Role in White–box Based	Test Des	ign –	code o	compl	exity						
testing	– Evalu	ating Test Adequacy Criteria.		U		1	2						
UNIT ]	III I	LEVELS OF TESTING					9						
The No	eed for	Levels of Testing – Unit Test – Unit Test	Planning	-Des	signing	g the	Unit						
Tests.	The Te	est Harness – Running the Unit tests and R	ecording	resul	ts – .	Integr	ation						
defect	- Desig	iming integration rests – integration rest r	testing -	Acce	ntance	testi	ng — nσ _						
perform	nance to	esting - Regression Testing – internationalizati	ion testin	g –	ad-hoc	testi	ng -						
Alpha -	- Beta T	ests – testing OO systems – usability and accessib	ility testi	ng.			U						
UNIT I	[V ]	EST MANAGEMENT					9						
Testing	and De	bugging Goals and Policies – Test Planning – Test	st Plan Co	ompo	nents -	- Test	Plan						
Attachr	nents –	Locating Test Items – Reporting Test Results –	I ne role (	or three	e grou - Intro	ups in ducin	1 est						
test spe	cialist –	- Skills needed by a test specialist – Building a Test	ting Grou	11108 - ID.	- muo	auciii	5 uic						
UNIT	V C	ONTROLLING AND MONITORING		. <b>r</b> .			9						
Measur	ement a	and Milestones for Controlling and Monitoring -	Status M	leetin	gs – R	eports	and						
Control	Issues	- Criteria for Test Completion - SCM - Types of	reviews -	– Dev	elopin	ig a re	view						
							139						

program – Components of Review Plans – Re	eporting review	w results – Testi	ng Tools.
	LECTURE	TUTORIAL	TOTAL
	45	-	45
TEXT BOOKS			
1. Srinivasan Desikan and Gopalaswamy	Ramesh, "	Software Testi	ng – Principles and
Practices", Pearson education, 2010.			
2. Aditya P.Mathur, "Foundations of Softwar	e Testing", Pe	arson Education	, 2013.
REFERENCES			
1. Boris Beizer, "Software Testing Technique	es", Second Ed	lition, Dreamtec	h, 2010
2. Elfriede Dustin, "Effective Software Testin	ng", First Editi	on, Pearson Edu	acation, 2003.
3.Renu Rajani, Pradeep Oak, "Software Test	ting – Effectiv	ve Methods, Too	ols and Techniques",
Tata McGraw Hill, 2011			
E-RESOURCES			
http://vlssit.iitkgp.ernet.in/isad/isad/			
http://www.cs.umd.edu/~atif/Teaching/Fal	12009/CMSC <sup>2</sup>	737.html	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	1	3	3	1	3				2	2	2	2	2	1
CO 2	2	3	3	2	3				3	3	1	1	3	2
CO 3	2	3	3	2	3				3	3	1	1	3	2
CO 4	3	2	2	1	2				3	3		1	3	2
CO 5	3	2	2	1	2				3	3		1	3	2
	11	13	13	7	13				14	14	4	6	14	9

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	11	13	13	7	13				14	14	4	6	14	9
value														
Scaled	3	3	3	2	3	0	0	0	3	3	1	2	3	2
to														
0,1,2,3														
scale														

COURSE CODE		COURSE NAME	L	Т	Р	C					
XCSE73		XML AND WEB SERVI	3	0	0	3					
$\mathbf{C} \cdot \mathbf{P} \cdot \mathbf{A} = 3$							P A	H 3			
COURSE	OUTC	OMES	DOMAI	N		LEVE	L L	3			
COCKDL											
CO1Understand the use of web services in B2C and B2B applications.CognitiveRe											
CO2	ive	Remember									
CO3	<b>Design</b> specifie	ive	Ren	nembo	er						
CO4	Implen service	ive	Ren	nembo	er						
CO5	<i>Use</i> inc Apache build, t web ap	Remember									
UNIT I X	ML TE	CHNOLOGY FAMILY		I				9			
XML – b standards - technologi XLINK –	XML – benefits – Advantages of XML over HTML – EDL –Databases – XML based standards – DTD –XML Schemas – X- Files – XML processing – DOM –SAX presentation technologies – XSL – XFORMS – XHTML – voice XML – Transformation – XSLT – XLINK – XPATH.										
UNIT II	ARCH	ITECTING WEB SERVIO	CES					9			
Business m CORBA a Implement services – the runtim	notivation nd DCC tation vi deployn e.	ons for web services – B2B DM – Service – oriented Archiew – web services technologient view – from application	– B2C- Technica hitecture (SOA) ogy stack – logic n server to peer t	al motivat – Archited al view – to peer– pr	ions – cting v compc rocess	limita veb ser osition view -	tions rvices of w – life	of s – eb in			
UNIT III	WEI	<b>B SERVICES BUILDING</b>	BLOCK					9			
Transport protocols for web services – messaging with web services – protocols – SOAP– describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web service policy – Discovering web services – UDDI – Anatomy of UDDI- Web service inspection – Ad-Hoc Discovery – Securing web services.											
UNIT IV	IMP	LEMENTING XML IN E	-BUSINESS					9			
B2B - B2 XML syste mobile dev	B2B - B2C Applications – Different types of B2B interaction – Components of ebusiness XML systems – ebXML – Rosetta Net Applied XML in vertical industry – Web services for mobile devices.										
UNIT V	UNIT VXML AND CONTENT MANAGEMENT9										
Semantic RDF scher WSFL.	Web – ma – Ai	Role of Meta data in web rchitecture of semantic web	content – Reson – content mana	urce Desc agement w	riptior vorkflo	n Fram ow –X	newor LAN	'k − G −			
			LECTUR	RE TUT	ORIA	LI	OTA	L			

	45	0	45						
TEXT BOOKS	•								
1. Ron schmelzer et al, "XML and Web Services", Pearson Education, 2008.									
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An									
Architect's Guide", Prentice Hall, 2004.									
REFERENCE									
1. Frank P. Coyle, "XML, Web Services and the Da	ta Revolution"	, Pearson Educa	ation,						
2002.									
2. Keith Ballinger, ".NET Web Services Architectu	re and Impleme	entation", Pears	on						
Education, 2003.									
3. Henry Bequet and Meeraj Kunnumpurath, "Begi	nning Java Wel	b Services", Ap	ress,						
2004.									
4. Russ Basiura and Mike Batongbacal, "Profession	al ASP.NET W	Veb Services",							
Apress, 2. ASP .NET Web Services", Apress, 200	3								

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	1	3											1	
1														
CO	1	3											2	
2														
CO	1	3		1	1								3	
3														
CO	1	3		2									1	
4														
CO5	1	3		1									1	
	4	12		3	1								6	

Original	5	15	4	1				8	
Scaled	1	3	1	1				2	
to									
0,1,2,3									
scale									

COURSE CO	DE	COURSE NAME	L	Τ	P	C			
XCSE74		<b>DISASTER MAN</b>	AGEMENT		3	0	0	3	
<b>C:P:A = 2.75</b> :	:0:0.25								
					L	Τ	P	H	
			•		3	0	0	3	
COURSE OU	TCOMES		DOMAIN		LEVEL				
CO1	Understand	and <i>Recognize</i> the	Cognitive	Ur	nders	tand,			
	concepts of c	lisaster		Re	emem	ber			
CO2	Recognize a	nd describe the	Cognitive	Ur	nders	tand,			
	causes and e	ffects of disaster	a	Re	emem	ber			
CO3	Describe the	various	Cognitive	Ur	nders	tand			
	approaches c	of risk reduction	Camitiva						
CO4	Demonstrate	e the inter-	Cognitive	T T-	dama	tond			
004	and develop	between disaster		U	iders	land			
	Discuss haza	rd and	Cognitive						
	vulnerability	profile of India	Cognitive						
CO5	and respond	to drills related to		Ur	nders	tand			
	relief.								
UNIT - I	INTRODUC'	TION TO DISAST	ERS	i				6	
Concepts and	definitions- Di	saster, Hazard, Vuln	erability, Resilience, l	Risks					
L									
UNIT - II	DISASTERS	: CLASSIFICATIO	<b>DN, CAUSES, IMPA</b>	CTS				12	
Differential in	npacts- in terr	ns of caste, class, g	gender, age, location,	disabil	ity C	lobal	trend	ls in	
disasters, urba	n disasters, pai	ndemics, complex er	nergencies, Climate cl	hange					
UNIT - III	APPROACH	ES TO DISASTER	RISK REDUCTIO	N				10	
Disaster cycle	- its analysis	, Phases, Culture of	safety, prevention, r	nitigatio	on an	d pre	parec	lness	
community b	ased DRR, S	Structural- nonstruc	tural measures, role	es and	resp	onsib	ilities	of-	
community, P	anchayati Raj	Institutions/Urban	Local Bodies (PRIs/	ULBs),	state	es, Ce	entre,	and	
other stake-ho	Iders.							-	
UNII - IV	IN I EK-KEL DEVELOPM	A HONSHIP BE IV IENT	WEEN DISASTEKS	AND				0	
Factors affect	ing Vulnerabil	ities, differential in	pacts, impact of De	velopm	ent p	roject	s suc	h as	
dams, emban	kments, chang	ges in Land-use et	tc. Climate Change	Adapta	tion.	Řele	evanc	e of	
indigenous know	owledge, appro	opriate technology and	nd local resources						
UNIT - V	DISASTER I	RISK MANAGEMI	ENT IN INDIA					11	
Hazard and V	ulnerability pro	ofile of India Compo	nents of Disaster Reli	ief: Wat	er, F	ood, S	Sanita	tion,	
Shelter, Healt	th, Waste M	anagement Instituti	onal arrangements (	Mitigat	ion,	Resp	onse	and	
Preparedness,	DM Act and P	olicy, Other related	policies, plans, progra	immes a	nd le	gislat	ion).		
The project / f	ieldwork to un	derstand vulnerabilit	ties, work on reduction	n of disa	aster	risk a	nd bu	ild a	
cultural safety	•			IEOT		Т			
τεντ ροοκ	~C.			43		43			
1 Conno	la P Damon	"Introduction to Int	ternational Disaster N	Manager	ment	Bu	ttorw	orth_	
I. Coppo Heiner	nann $2015$			vianagei	ment	, Du	tici w	orui-	
2 KNS	Shastri. "Disast	ter Management in I	ndia". Pinnacle Techn	ology 7	2012				
3. Gupta	Anil K. Sreeia	S. Nair. "Environm	ental Knowledge for	Disaste	r Ris	k Ma	nager	nent.	
NIDM	, New Delhi, 2	011					142		
4. Lee Allyn Davis, "Natural Disasters", Infobase Publishing, 2010									

5. Andharia J, "Vulnerability in Disaster Discourse", JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008

#### **REFERENCES:**

- 1. Alexander David, Introduction in 'Confronting Catastrophe', Oxford University Press, 2000
- 2. Carter, Nick 1991. Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila Philippines.

## WEB SITES AND WEB RESOURCES:

- 1. NIDM Publications at http://nidm.gov.in- Official Website of National
- 2. Institute of Disaster Management (NIDM), Ministry of Home Affairs,
- 3. http://cwc.gov.in , http://ekdrm.net , http://www.emdat.be ,
- 4. http://www.nws.noaa.gov, http://pubs.usgs.gov, http://nidm.gov.ini
- 5. http://www.imd.gov.ini

	Table 1: Mapping of CO with GA												
Course outcomes	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12	
CO1	1					3	2	1				1	
CO2	1					3	2	1				1	
CO3	1					3	2	1				1	
CO4	1					3	2	1				1	
CO5	1					3	2	1				1	
Total	5					15	10	5				5	
Scaled	1					3	2	1				1	
Course Code	Course Name		L	Т	P	C							
---	--	---	---------------------------------------	----------------------------	-------------------------------	-------------------------							
XCSE75	ETHICAL HACKING		3	0	0	3							
<b>C: P: A</b> =													
3:0:0				T	D	TT							
					P 0	H 2							
			3	U	U	3							
Prerequisite:	Cyber Security												
<b>^</b>													
<b>Course Outco</b>	mes		Dor	nain	Level								
Upon completi	on of this course, the student sh	nould be able to											
CO1	Learn about the importance of security	f information	Cog	nitive	Under Analy	stand se							
CO2	Learn different scanning and methodologies and tools	enumeration	Cog	nitive	Reme	mber							
CO3	Understand various hacking to	echniques and attac	ks Cog	nitive	Under Apply	stand							
CO4	Exposed to programming lang professionals	guages for security	Cog	nitive	Under Analy Apply	stand se							
CO5	Familiarize with the different testing	phases in penetration	on Cog	nitive	Under	stand							
UNIT I - INTI	RODUCTION TO HACKING	Ĵ				9							
Attack – Types to Footprinting Tools – DNS	of Hacker Attacks – Hackting g – Information Gathering M Information Tools – Locatin	vism – Vulnerabili Methodology – Fo g the Network Ran	ity Reserved otprintin age – Me	arch – g Too ta Sear	Introdu ls – W rch Engi	uction HOIS ines.							
UNIT II -	SCANNING AND ENUME	RATION				9							
Introduction to Enumeration -	Scanning – Objectives – Sca - Enumeration Techniques – Er	anning Methodolog numeration Procedu	y – Tool re – Too	ls – Ir ls.	ntroduct	ion to							
UNIT III - SY	STEM HACKING					9							
Introduction Guessing – P Privileges –Exc	<ul> <li>Cracking Passwords –</li> <li>assword Cracking Tools – Pas</li> <li>ecuting Applications – Keylogs</li> </ul>	Password Crackin sword Cracking Co gers and Spyware.	ng Web ounter me	osites easures	– Pas s – Esca	sword lating							
UNIT IV - PR	OGRAMMING FOR SECU	RITY PROFESSIO	ONALS			9							
Programming Vulnerabilities Vulnerabilities	Fundamentals – C langu – Tools for Identifying Vu – Tools for Identifying Vulr	age – HTML Inerabilities – Cou nerabilities – Count	– Perl untermea ermeasur	– W sures res.	/indows – Linu	s OS x OS							
UNIT V - PEN	TETRATION TESTING					9							
Introduction - Penetration To Testing Tools	- Security Assessments – esting – Tools – Choosing D	Types of Penetrifferent Types of P	ation T en-Test	esting- Tools	- Phase – Penet	es of ration							
		LECTURE	TUTOR	IAL	TOTA	AL							
	a	45	0		4	5							
TEXT BOOK	8												
-													

- 1. Ec-Council, "Ethical Hacking and Countermeasures: Attack Phases", Delmar Cengage Learning, 2009.
- 2. Michael T. Simpson, Kent Backman, James E. Corley, "Hands-On Ethical Hacking and Network Defense", Cengage Learning, 2012.

### REFERENCES

- 6. Patrick Engebretson, "The Basics of Hacking and Penetration Testing Ethical Hacking and Penetration Testing Made Easy", Syngress Media, Second Revised Edition, 2013.
- 7. Jon Erickson, "Hacking: The Art of Exploitation", No Starch Press, Second Edition, 2008.

	DO1	РО	PO	PO1	PO1	PO1	PSO	PSO						
	POI	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
Original	11	13	13	13	8	2	7	7	6	0	0	0	9	6
Scaled to 0,1,2,3 scale	3	3	3	3	2	1	2	2	2	0	0	0	2	2

COURSI CODE	E	COURSE NAME		L	Т	Р	С
XCSE76		ARTIFICIAL INTELLIGENCE ANI SYSTEM	D EXPERT	3	0	0	3
C:P:A = 3:0:0				L	Т	Р	Н
				3	0	0	3
COURSI	E OU	TCOMES	DOMAIN		LEVE	ĽL	
CO1	Rej cale	present knowledge using propositional culus and predicate calculus.	Cognitive	Remember			
CO2	Use	e inference rules to produce predicate	Cognitive	Reme	mber ,	Under	rstand

	calculus expression.			
CO3	Solve problems using search techniques:	Cognitive	Remember	
	depth-first, breadth-first, forward chaining,			
	backward chaining, best-first, branch-and-			
	bound, and-or-graph, and heuristic search.			
CO4	Analyze and design a fuzzy logic system	Cognitive	Remember, Unde	erstand
	using fuzzy logic and neural network tool			
	box.			
CO5	Analyze and design a rule-based expert	Cognitive	Comprehension	
	system. Design a machine vision system			
	application			
UNIT I	INTRODUCTION			9
General Is	sues and overview of AI The AI problems: w	hat is an AI tec	hnique; Characteris	tics of AI
application	ns Problem Solving, Search and Control Stra	tegies General	Problem solving; P	Production
systems; C	Control strategies; forward and backward chain	ing Exhaustive	searches: Depth first	st Breadth
first search				
	SEARCHING TECHNIQUE		Dest first serve	9 1 1. A *
Heuristic	AND/OP Graphs: Problem reduction and	$d = AO^*$ algorit	lue; Best first searc	ticfaction
problems	Game Playing Min Max Search procedure: Aln	ha-Beta cutoff.	Additional Refiner	nents
UNIT III	LOGICS IN AI	na Deta euton,		<u>9</u>
Knowledg	e Representation First Order Predicate Calculu	is: Skolemnisat	ion: Resolution Prin	nciple and
Unificatio	n; Inference Mechanisms Horn's Clauses; Ser	nantic Network	s; Frame Systems a	and Value
Inheritanc	e; Scripts; Conceptual Dependency AI Prog	ramming Lang	uages Introduction	to LISP,
Syntax and	d Numeric Function; List manipulation functio	ns; Iteration and	d Recursion; Proper	ty list and
Arrays, In	troduction to PROLOG.			
UNIT IV	NATURAL LANGUAGE PROCESSIN	G		9
Natural La	anguage Processing and Parsing Techniques Co	ontext – Free Gi	cammar; Recursive	<b>Fransition</b>
Nets (RT	N); Augmented Transition Nets (ATN); Semi	antic Analysis,	Case and Logic G	frammars;
Goal Stac	Verview – All Example Domain. The Bloch k Planning (linear planning): Non-linear Plan	ving using cor	ponent of Flamming	obabilistic
Reasoning	and Uncertainty Probability theory Bayes	Theorem and F	Bavesian networks:	Certainty
Factor.	, and encorrangly, 1100 denies areary, 24900		, <u>, , , , , , , , , , , , , , , , , , </u>	containty
UNIT V	EXPERT SYSTEM			9
Expert Sy	stems Introduction to Expert Systems, Arch	itecture of Exp	ert Systems; Expe	rt System
Shells; K	nowledge Acquisition; Case Studies; MYCI	N, Learning, I	Rote Learning; Lea	arning by
Induction;	explanation based learning.			
			TUTORIAL	TOTAL
TEVT D(	Nors	45	-	45
IEAI BU	JOKS			
1. Elaine I	Rich and Kevin Knight: Artificial Intelligence –	- Tata McGraw	Hill.	
2. Dan W	Patterson, Introduction to Artificial Intellige	nce and Exper	t Systems – Prenti	ce Hal of
India.		1 	-	
REFERE	NCES			
1. Nils J. I	Nilsson: Principles of Artificial Intelligence – N	Iarosa Publicati	on house.	
2. Artifici	al Intelligence: A Modern Approach, Stuart R	usell, Peter Noi	ving, Pearson Educ	cation 2nd

Edition.

Artificial Intelligence, Winston, Patrick, Henry, Pearson Education.
 Artificial Intelligence by Gopal Krishna, Janakiraman.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO1	1	3	0	0	0	0	0	0	0	0	0	0	1	0
CO2	1	3	0	0	0	0	0	0	0	0	0	0	2	0
CO3	1	3	0	1	1	0	0	0	0	0	0	0	3	0
CO4	1	3	0	2	0	0	0	0	0	0	0	0	1	0
CO5	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	13	0	3	1	0	0	0	0	0	0	0	6	0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	5	13	0	3	1	0	0	0	0	0	0	0	6	0
Scaled to 0,1,2,3 scale	1	3	0	1	1	0	0	0	0	0	0	0	2	0

COURSE (	CODE COURSE NAME	L	Τ	P	С	
XCSE77	DESIGN AND ANALYSIS OF PARALLE ALGORITHMS	L 3	0	0	3	
<b>C:P:A = 3:</b>	):0					
		L	Т	P	H	
		3	0	0	3	
COURSE (	DUTCOMES DOMAIN		LEVI	EL		
CO1	<i>Illustrate</i> and <i>analyze</i> Cost optimal algorithms and measure Performance of its.	Under	stand	& App	ly	

CO2	<i>Explain</i> various tree algorithms and problem solving techniques.	Cognitiv	e Understar Level	nd
	r			
CO3	<i>Compare</i> various sorting and searchin techniques	ng Cognitiv	e Create, Apply	
<b>CO4</b>	<i>Explain</i> Spanning tree concepts and apply it to <b>construct</b> network with minimum cost.	Cognitiv	e Understar	nd & Apply
CO5	<i>Apply</i> problem solving techniques to various application.	Cognitiv	e Understar	nd & Apply
UNIT	I INTRODUCTION			9
Perform	mance Measures of Parallel Algorithms, speed	d-up and efficie	ency of PA, Cos	t optimality, An
examp	le of illustrate Cost-optimal algorithms- such	as summation,	Min/Max on va	rious models.
UNIT	II SEARCHING AND MATRIX	- -		9
Paralle	el Searching Algorithm, Kth element, Kth eler	ment in X+Y or	n PRAM, Parall	el Matrix
Transp	portation and Multiplication Algorithm on PR.	AM, MCC, Ve	ctor-Matrix Mu	ltiplication, Solution of
Linear	Equation, Root finding. Bridges.			
UNIT	III TREES			9
Techni	iques – Balanced Trees, Pointer Jumping, Div	vide and Conqu	er, Partitioning,	Pipelining, Systolic
Comp	utation, Accelerated Cascading, Prefix Compu	utation, List Ra	nking, Euler To	ur, Tree Contraction.
UNIT	IV SORTING TECHNIQUES			9
Paralle	el Sorting Networks, Parallel Merging Algorit	hms on CREW	/EREW/MCC/,	Parallel Sorting
Netwo	rks on CREW/EREW/MCC/, linear array.			
UNIT	V GRAPHS			9
Graph	Algorithms – Connected Components, Spann	ing Trees, Sho	rtest Paths. Com	plexity – NC Class and
P-Con	pleteness.	IDODIDD	TUTODIAL	TOTAL
		LECTURE	TUTORIAL	TOTAL
		45	0	45
REFE	RENCES	<b>_</b>		
1.	The Design and Analysis of Parallel Algorit	hms – Akl S.G	. Prentice Hall,	
	EnglewoodCliffs,NewJersey 07632 (PHI).19	89.		
2.	Analysis and Design of Parallel Algorithms:	Arithmetic and	d Matrix Problei	ms – Lakshmivarahan
	S., Dhall S.K. (McGraw-Hill).1990.			
3.	S. Baase, S and A. Van Gelder, "Computer A	Algorithms: Int	troduction to De	sign and Analysis", 3rd
	edition. Addison Wesley, 2000			
4.	Aho, Hopcraft, Ullman, "The Design and Ar	nalysis of Com	puter Algorithm	s", Addison Wesley
5.	Horowitz, Sahni, "Fundamentals of Comput	ter Algorithm",	Galgotia 2014	

	PO	PO	PO	PO	РО	РО	PO	PO	PO	PO1	PO1	PO1	PS	PS
	1	2	3	4	5	6	7	8	9	0	1	2	O 1	O 2
CO 1	3	2											2	
CO 2	2	3	2										2	
CO 3	1	3	3			2							2	
CO 4	1	1		3									2	
	7	9	5	3									8	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original value	7	9	5	3									8	-
Scaled to 0,1,2,3 scale	2	2	1	1									2	0

Course Code	Course Name	L	Т	Р	С			
XCSE78	GAME THEORY	3	3					
C: P: A = 3:0:0								
		L	Т	Р	Η			
		3	0	0	3			
Prerequisite:	Maths (Linear Algebra, Economics, Statistics, and Pro	obabil	ity)					
Course Outco	mes	Don	nain	Level				
Upon completi	on of this course, the student should be able to							
CO1	Discuss the notion of a strategic game and	Cog	nitive	Under	stand			
	equilibria, and identify the characteristics			Analys	se			
	of main applications of these concepts.							
CO2	To formalize the notion of strategic thinking	Cog	nitive	Remen	nber			
	and rational choice by using the tools of							
	game theory, and to provide insights into using							
	game theory in modeling applications							
CO3	To draw the connections between game theory,	Cog	nitive	Under	stand			
	computer science, and economics, especially			Apply				
	emphasizing the computational issues							
CO4	To introduce contemporary topics in the	Cog	nitive	Under	stand			
	intersection of game theory, computer science,			Analys	se			
	and economics			Apply				
CO5	Implement a typical Virtual Business scenario	Cog	nitive	Under	stand			
	using Game theory							
UNIT I - INTI	RODUCTION				9			
. Introduction -	- Making rational choices: basics of Games – strateg	y - pi	referen	ces – pa	ayoffs			
– Mathematica	l basics - Game theory – Rational Choice - I	Basic	soluti	on con	cepts-			
non-cooperativ	e versus cooperative games - Basic computation	tional	issue	s - fi	nding			
equilibria and	learning in games- Typical application areas for ga	me th	neory (	e.g. Go	ogle's			
sponsored sear	ch, eBay auctions, electricity trading markets).			U	U			
UNIT II - GA	MES WITH PERFECT INFORMATION				9			
Games with	Perfect Information - Strategic games - prison	er's d	lilemm	na, mat	ching			
pennies- Nash	equilibria- theory and illustrations - Cournot's a	nd Be	ertrand	's mode	els of			
oligopoly- auct	tions- mixed strategy equilibrium- zero-sum games	- Ext	ensive	Games	with			
Perfect Info	prmation-repeated games (prisoner's dilemma)-	subga	ame p	erfect	Nash			
equilibrium; co	omputational issues.	U	1					
UNIT III - GAMES WITH IMPERFECT INFORMATION9								
Games with I	Imperfect Information - Bayesian Games – M	otivat	ional	Examp	les –			
General Defini	tions -Information aspects - Illustrations - Extensive	e Gan	nes wit	h Imper	fect -			
Information -	Strategies- Nash Equilibrium – Beliefs and se	equen	tial e	quilibriu	ım –			
Illustrations -	Repeated Games - The Prisoner's Dilemma - Bargain	ning						
UNIT IV - NO	<b>DN-COOPERATIVE GAME THEORY</b>				9			
Non-cooperativ	ve Game Theory - Self-interested agents- Gam	nes i	n nor	mal fo	rm -			
Analysing gam	es: from optimality to equilibrium - Computing Solu	tion C	Concep	ts of No	ormal-			
Form Games -	- Computing Nash equilibria of two-player, zero-	sum	games	-Comp	outing			
Nash equilibri	a of two-player, general-sum games - Identifying do	<u>mina</u> t	ed stra	tegies				

#### **UNIT V - MECHANISM DESIGN**

Aggregating Preferences-Social Choice – Formal Model- Voting - Existence of social functions - Ranking systems - Protocols for Strategic Agents: Mechanism Design - Mechanism design with unrestricted preferences- Efficient mechanisms - Vickrey and VCG mechanisms (shortest paths) - Combinatorial auctions - profit maximization Computational applications of mechanism design - applications in Computer Science - Google's sponsored search - eBay auctions

LECTURE	TUTORIAL	TOTAL	
45	0	45	

#### **TEXT BOOKS**

- 3. M. J. Osborne, "An Introduction to Game Theory", Oxford University Press, 2003.
- 4. N. Nisan, T. Roughgarden, E. Tardos, and V. V. Vazirani, "Algorithmic Game Theory", Cambridge University Press, 2007.
- 5. M. J. Osborne and A. Rubinstein, "A Course in Game Theory", MIT Press, 1994.

#### REFERENCES

- 8. A.Dixit and S. Skeath, "Games of Strategy", W W Norton & Co Inc, 3rd Edition 2009.
- 9. YoavShoham, Kevin Leyton-Brown, "Multi agent Systems: Algorithmic, Game-Theoretic, and Logical Foundations", Cambridge University Press, 2008.
- 10. Zhu Han, Dusit Niyato, Walid Saad, Tamer Basar and Are Hjorungnes, "Game Theory in Wireless and Communication Networks", Cambridge University Press, 2012.

#### Mapping of COs with POs:

	DO1	PO	PO1	PO1	PO1	PSO	PSO							
	PUI	2	3	4	5	6	7	8	9	0	1	2	1	2
CO1	3	3	3	3	3	0	2	2	2	0	0	0	3	2
CO2	3	3	3	3	2	1	1	1	2	0	0	0	3	2
CO3	0	3	2	2	0	1	2	2	0	0	0	0	0	0
CO4	2	2	2	2	0	0	0	0	0	0	0	0	0	0
CO5	3	2	3	3	3	0	2	2	2	0	0	0	3	2
Total	11	13	13	13	8	2	7	7	6	0	0	0	9	6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	Z
Original	11	13	13	13	8	2	7	7	6	0	0	0	9	6
Scaled to 0,1,2,3 scale	3	3	3	3	2	1	2	2	2	0	0	0	2	2

9

### **VIII SEMESTER ELECTIVES**

COURSE	1	COURSE NAME				L	Т	Р	С					
XCSE81		DIGITAL IMAGE PRO	DCESSING			3	0	0	3					
						L	Т	Р	С					
C:P:A=						3	0	0	3					
2.6:0:0.4														
COURSE	OUTC	DMES		DOM	AIN	LE	EVE	L						
<b>CO1</b>	Descril	<i>e</i> how digital images an pipulated in a computer	re represented	Cogn	ognitive Remembe									
CO2	Explai	, Compare and Contrast	various image	Cogn	itive	Un	ders	stan	d.					
	transforms techniques. Describe and Apply the knowledge of image enhancement and restoration		CognitiveAnalysisCognitiveRemember ,											
CO3	Descril	e and Apply the knowle	edge of image	Cogn	itive	Re	men	nbei	r,					
	enhanc	ement and restoration (	techniques in			Ap	ply							
004	differe	t applications.	•	2	•.•	<b>T</b> T	1		1					
CO4	Explai	and Apply the age segme	ntation	Cogn	itive	Un An	ders	stan	d,					
CO5		<i>re</i> and <i>Analyze</i> var	rious image	Cogn	itive	Un	ders	stand	d					
	compre	ssion techniques.	B•	0.8.		Apply Understan Apply								
	*	•				-								
UNIT I		DIGITAL IMAGE FUN	NDAMENTAL	.S		Understand Apply nage processi								
					<u> </u>	Apply image processi								
Digital in	nage – a	pplications of digital ima	age processing	– elements c	of digital ima	ige	proc	cess	ing					
elements c	vidicon f visual	camera – mie scan CCD	sellsor – area s	luminance k	A/D convent	er –	- UIS Pact	spia m	y – ach					
band effe	ct = ima	perception – structure of a ge fidelity criteria – colo	or models, math	nematical prel	iminaries of	2D	svs	tem	s –					
convolutio	on – Fou	ier transform – ZS transfo	rm.	P			5,55		5					
UNIT II		IMAGE TRANSFORM							9					
Properties	s of uni	ary transform – 2D DF	T- DCT- DST-	Discrete wa	velet transfor	·m	– D	iscr	ete					
Hadamard	– Walsl	– Hotelling transform – S	SVD transform –	- Slant, Haar ti	ansforms.				1					
UNIT III		IMAGE ENHANCEMEN	NT AND REST	ORATION	•			•	9					
Histogram	equali	tation and specification	techniques,	Noise distrib	utions, Spati	al	ave	ragi	ng,					
Homomor	n Sillo nhic filt	ring, Meulail, Geometric	inean, naimo	ine mean, co		1110	ean	1110	318,					
Image Re	estoration	- degradation model.	Unconstrained	restoration -	Lagrange 1	nult	tipli	er a	and					
Constraine	ed restor	ation, Inverse filtering-rer	moval of blur c	aused by unif	form linear m	otic	on, '	Wie	ner					
filtering, C	Geometri	c transformations-spatial tr	ransformations.	-										
UNIT IV	NIT IV IMAGE SEGMENTATION													
Pixel base	d approa	ch - feature threshold - ch	hoice of feature	- optimum the	reshold - three	shol	d se	lect	ion					
methods -	- Edge	letection, Edge linking v	via Hough tran	sform -region	based appro	back	1 –	reg	101					
INIT V	regions	IMACE COMPRESSION	spint and merge. N	•				Ī	9					
Need for a	lata con	pression, Huffman. Run I	Length Encoding	g, Shift codes	Arithmetic	codi	ng.	Vec	tor					
Quantizati	on, Tran	sform coding, JPEG standa	ard, MPEG.	o,	,		-0,		4					
				LECTURE	TUTORIA	L	TC	<b>)TA</b>	L					
L														

	45	0	45
TEXT BOOKS :	<u> </u>		
<ol> <li>Rafel C. Gonzalez and Richard E. Woods, Digital Im</li> <li>Anil K.Jain, "Fundamentals of Digital Image Proces</li> </ol>	age Processing sing", Prentice	g", Pearson Edn Hall of India, 2	. 2012. 2010.
<b>REFERENCES</b> :			
<ol> <li>William K. Pratt, "Digital Image Processing", John V</li> <li>Sid Ahmed M.A., "Image Processing Theory, Al McGraw-Hill, 2010</li> </ol>	Viley, NJ, 2010 gorithm and A	). Architectures",	
E-References:			
1. <u>https://see.stanford.edu/Course/EE261</u>			
2. <u>http://nptel.ac.in/video.php?COURSEjectId=117105079</u>			
3. <u>https://www.youtube.com/watch?v=CVV0TvNK6pk</u>			
4. <u>https://www.coursera.org</u>			
5. <u>https://www.cs.nmt.edu/~ip/lectures.html</u>			
6. <u>http://www.siue.edu/~sumbaug/439_syl.html</u>			

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	2	2			2				1	1		2	2	1
CO 2	2	2	1	1	3				3	3		2	3	3
CO 3	3	2	1	2	3				3	3		2	3	3
CO 4	3	3	2	2	3				3	3		2	3	3
CO 5	2	2	1	1	3				1	3		2	3	2
	12	11	5	6	14				11	13		10	14	12

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	12	11	5	6	14				11	13		10	14	12
value														
Scaled	3	3	1	2	3	0	0	0	3	3	0	2	3	3
to														
0,1,2,3														
scale														

COUR	SE	COURSE	NAME			L	Т	Р	C	
XCSE8	32	INFORM	ATION RETRIEV	AL		3	0	0	3	
C:P:A	= 3:0:0					Č		•		
						L	Т	Р	H	
						3	0	0	3	
COUR	SE OUTC	OMES	DOMAI	N	L	EVEL				
				T						
CO1	<i>Define</i> an	d Explain do	ocument and query	Cognitive		Remen	ıber			
003	structure.			a :.:		TT 1	4 1			
002	Explain, I	Develop and		Understand, Application						
CO3	Frnlain	and Magsura	Comitive		Applica	tond				
005	retrieval r	niu <i>Meusure</i> performances	Coginuve	Understand, Evaluation						
CO4	Ernlain a	and Estimate	performance	Cognitive Understand,						
004	improven	nent measure	s.	Cogintive		Applica	ation			
CO5	Explain v	web search.	rawling and link	Cognitive	tand.					
	analysis.									
UNIT I	<b>D</b> C	OCUMENT	AND QUERY STI	RUCTURE	l				9	
Overvie	ew: Abstra	ction – Info	ormation System –	Measures. I	Document	ts and	Querv	y For	ms:	
docume	ent – data s	structures – c	locument Surrogate	s – vocabula	ry contro	l – stru	cture	, of da	ta –	
data co	mpression	– text docun	nents – images and	sounds. Quer	y Structu	res: Ma	atchin	g crit	eria	
– Boole	ean queries	- vector que	queries	- pro	babili	istic				
queries	– natural la	anguage que	ystems	•						
UNIT I	I QU	JERY MAT	SIS				9			
Matchi	ng Process	: Relevance	and similarity mea	isures – Boo	olean base	ed mate	ching	– ve	ctor	
based 1	natching –	- missing te	rms and term relat	tionship – p	robabilist	ic mat	ching	– fu	ızzy	
matchir	ng – proxin	nity matchin	g – effects of weigh	iting – effect	s of scali	ng – da	ta fus	ion. 7	ſext	
Analysi	is: Indexing	g - Matrix ro	epresentation – term	n extraction a	and analy	$s_{1s} - te$	rm as	socia	tion	
- lexica	il measures	s of term sign	inficance – documer	it analysis – o	document	simila	rity –	stop	lists	
– stemr	ning.		ICE MEASUDES						6	
Dinomy			nce MEASURES	11 usor orig	ntad mag	auroa	0110*	200	U	
Dillary	versus IN-a	ll operation	- precision and reca	an - user one	vpootod s	sures –	- avera	age		
	$\mathbf{V}$ <b>PF</b>	$\mathbf{RFORMAN}$	JCF IMPROVEM	FNT TECH	NIOUFS		engui.	•	12	
Relevat	nce feedba	ock and que	ry expansion - Te	ext classifica	ation and	Naive	- Rav	es. 1	∎∡ Fevt	
classifi	ration prob	olem - Naive	Bayes text classific	vation - The l	Remoulli	model	- Prot	nertie	sof	
Naive I	Baves - Fea	ature selection	on - Vector space cl	assification:	Documer	nt repre	esentat	tions	and	
measur	es of relate	dness in vec	tor spaces - Rocchie	o classificatio	on - k nea	rest nei	ghbor	r - Liı	near	
versus	nonlinear c	classifiers -	Classification with	more than ty	wo classe	s - The	e bias	-varia	ince	
tradeof	f - Flat c	lustering:	Clustering in info	rmation retr	rieval - 1	Probler	n sta	temei	nt -	
Evaluat	aluation of clustering - K-means - Model-based clustering - Hierarchical cluster									
Hierarc	Hierarchical agglomerative clustering - Single-link and complete-link clust									
average	e agglomer	ative cluste	ring - Centroid clu	ustering - O	ptimality	of HA	AC -	Divi	sive	
clusteri	ng - Cluste	r labeling - I	mplementation note	es.						
UNIT	V WI	EB SEARC	H AND LINK ANA	ALYSIS					9	
Web se	earch basic	cs: Backgro	und and history -	Web charac	teristics	- Adve	ertisin	g as	the	
econom	ic model -	The search	ndex size an	d estimat	10n - N	lear-d	uplic	ates		
and shi	ngling - W	veb crawling	g and indexes: Ove	erview - Cra	rawling - Distributing indexes -					
	tivity serv	ers - Link	analysis: The W	eb as a gra	aph - Pa	geRanl	K - H	lubs	and	
Author	utes.				TRA		n ra		T	
					LEC	IUKE	4   L	UIA		

		45	45
TEXT	BOOKS		
1.	Robert R. Korfhage, Information storage and retrieval, Joh York, NY, 1997	nn <i>Wiley</i> & Son	s, Inc., New
2.	C. Manning, P. Raghavan, and H. Schütze, <i>Introduction</i> Cambridge University Press, 2008	ı to Informatio	n Retrieval,
REFE	RENCE BOOKS		
1.	Baeza-Yates and B. Ribeiro-Neto. Modern Information. 1 1999	Retrieval. Addi	son Wesley,
2.	Gerard Salton and M. J. McGill. Introduction to Mode McGraw Hill Book Co., New York, 1983.	ern Information	n Retrieval.
3.	C. J. van RIJSBERGEN, <i>The geometry of informatic</i> University Press, 2004	on retrieval, ,	Cambridge

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	3	2	2	1	1	1	1	0	0	0	1	1	2	2
CO 2	2	2	1	1	1	0	1	0	0	0	1	1	2	2
CO 3	2	2	2	1	1	1	1	0	0	0	1	1	2	2
CO 4	2	3	2	1	1	0	1	0	0	0	1	1	2	3
CO 5	2	2	2	1	1	1	1	1	0	0	1	1	3	2
	11	11	9	5	5	3	5	1	0	0	5	5	11	11

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	11	11	9	5	5	3	5	1	0	0	5	5	11	11
Scaled	3	3	2	1	1	1	1	0	0	0	1	1	3	3
to														
0,1,2,3														
scale														

COURS	SE	COURSE NAME			L	Τ	Р	C			
XCSE8	3	WIRELESS SENSOR NETWORKS			3	0	0	3			
C:P:A=					•	•	Ť				
3:0:0											
					L	T	P	H			
COUD		TOOMES	I	ΠΟΛΙΑΙΝΙ	3	0		3			
COUR	SE UU	ICOMES		DOMAIN		1	LEVEL	1			
CO1	Descr	ibe, understand the basic WSN techn	nology and	Cognitive	K	nowl	edge,				
	suppo	rting protocols, with	emphasis	-	Understand						
	placeo	l on standardization basic sensor sy									
	provid	le a survey of									
CO2	Descr	<i>ibe. understand</i> the medium acce	Cognitive	ze Knowledge							
001	protoc	cols and address physical	layer	e o Britis e	U	nders	stand				
	issues										
000	D		. 1.0	<u>a</u>	TZ		1				
003	Descr	<i>the</i> and <i>explain</i> the key routing pro	otocols for	Cognitive		nowl	edge,				
	issues		ucsign		U	nucis	anu				
CO4	Descr	<i>ibe</i> and <i>explain</i> the sensor network m	niddleware,	Cognitive	K	nowl	edge,				
	operat	ing systems and design			U	nders	stand				
	requir	ements.									
CO5	Descr	ibe, understand the Sensor ma	anagement,	Cognitive	K	nowl	edge,				
	Perfor	mance Modeling and	Case	e	U	nders	stand				
		Study.				~~~					
UNIT	-1	INTRODUCTION AND OVERN	VIEW OF	WIRELES	55	SEI	NSOR	9			
		Introduction – Basic Overview of t	he Technolo	ogy- Applica	tio	ns of	Wirel	ess			
		Sensor Networks- Basic Wireless Sens	or Technolo	gy.			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	• • • •			
UNIT –	-II	WIRELESS SYSTEMS AND MAC	PROTOCO	LS				9			
		Wireless Transmission Technology a	and Systems	- Radio Tec	hno	ology	Prime	r -			
		Available Wireless Technologies	-Medium	Access Co	onti	ol sor N	Protoco	ols-			
		Study-IEEE 802.15.4.		101 1010113 -	JUI	501-10		ase			
UNIT-I	II	<b>ROUTING AND TRANSPORT COM</b>	NTROL PR	OTOCOLS				9			
		Routing Protocols for Wireless Ser	nsor Netwo	rks- Data D	oiss	emina	ation a	und			
		Gathering -Routing Challenges and D	Design Issue	s -Routing St	rat	egies-	-Transp	ort			
LINIT -	IV	MIDDLEWARE AND OPERATING	SVSTEMS					9			
UIUI	<b>_</b> ,	Middleware - Principles -Architectu	re -Existing	Middleware	; _]	Introd	luction	to			
		Operating Systems-Design Issues- Exa	mples of Op	erating Syster	ns.						
UNIT V	V	WIRELESS SENSOR NETWORK	MANAGEN	IENT				9			
		Network Management Requirements -	Traditional	Network Man	age	ement	t Mode	ls -			
		and Traffic Management-Design Issues	ure –Nami S-Performan	ng- Localizat ce Modeling-(	101 ີຂ¢	i- Pei e Stu	riormai dv	ice			
			LECTURE	TUTORIA	\L	]	α.γ. ΓΟΤΑΙ				
			45	-			45				
TEXT	BOOK	S									
1. ]	Kazem	Sohraby, Daniel Minoli, & TaiebZnati, '	Wireless Se	nsor Network	s-T	Techn	ology				

,Protools,and Applications",John Wiley,2007
REFERENCES
1. Holger Karl & Andreas Willig, "Protocols and Architectures for Wireless Sensor
Networks", John Wiley, 2005.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing
Approach", Elsevier, 2007.
3. Anna Hac, "Wireless Sensor Network Designs", John Wiley, 2003.
E- REFERENCES
1. http://nptel.ac.in/courses/114106035/37#.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO 1	3	2	2	1	1	1	1	0	0	0	1	1	2	2
CO 2	2	2	1	1	1	0	1	0	0	0	1	1	2	2
CO 3	2	2	2	1	1	1	1	0	0	0	1	1	2	2
CO 4	2	3	2	1	1	0	1	0	0	0	1	1	2	3
CO 5	2	2	2	1	1	1	1	1	0	0	1	1	3	2
	11	11	9	5	5	3	5	1	0	0	5	5	11	11

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	11	11	9	5	5	3	5	1	0	0	5	5	11	11
Scaled	3	3	2	1	1	1	1	0	0	0	1	1	3	3
to														
0,1,2,3														
scale														

COUR CODE	SE	COURSE NAME		L	Т	Р	C
XCSE	84	EMBEDDED SYSTEMS AND PLC		3	0	0	3
C:P:A	: 3:0:0			_			
						H	
COUR	SE OU	TCOMES	DOMAIN	3	U LF	U EVEL	3
CO1	Descr embed	<i>ibe</i> Processors and Hardware used in Ided system.	Cognitive	Rer ,Un	nemb derst	er and le	evel
CO2	Expla system	<b>un</b> Different protocols used in embedded	Cognitive	Unc	lersta	ind le	vel
CO3	Create system	e different application Using embedded n and PLC Programming languages.	Psychomotor	Unc App			
CO4	Expla	in different sensors and its applications	Cognitive	Kno app	owlec ly	lge,	
CO5	Appl PLC c	y the sensors in embedded system And ircuits to implement different applications	Cognitive	Understand & App			Apply
			L	i.			9

#### UNIT I **EMBEDDED SYSTEM BASICS**

Definition and classification - Overview of processors and hardware units in an embedded system -Software embedded into the system – Exemplary embedded systems – Embedded systems on a chip (Soc) – Use of VLSI designed circuits.

<b>UNIT II</b>	DEVICES	<b>AND BUSES</b>	FOR DEVICES	NETWORK

I/O Devices - Device I/O types and examples - Synchronous - ISO-Synchronous and asynchronous communications from serial devices - Examples of internal serial- Communication devices - UART and HDLC - Parallel port devices - Sophisticated interfacing features in devices/ports - Timer and counting devices - 12C- USB - CAN and advanced I/O serial high speed buses - ISA - PCI - PCIX - CPCI and advanced buses.

UNIT III PROGRAMMING CONCEPTS

9

9

PROGRAMMING IN C and C++ Programming in assembly language (ALP) Vs high level language - C program elements - Macros and functions - Use of function calls - Multiple function calls in a cyclic order in the main function pointers - Function queues and interrupt service routines -Queues – Pointers – Concepts of embedded programming in C++ – Objected Oriented Programming - Embedded programming in C++ - C program compilers - Cross compiler - Optimization of memory codes. 9

#### UNIT IV PLC INTRODUCTION

Advantages of plc, Architecture of plc control panel, Functions of various block in plc, Different type of input/output circuits, Programming methods, Programming devices, Basic instructions NO and NC concepts, Boolean gates symbols truth tables, ladder logic, concepts of latching and unlatching, Timers and counters, Maintenance and trouble shooting of plc, applications of plc. 9

UNIT V PLC IMPLEMENTATION

Study of use of various Sensors (Limit Switches, Potentiometer, Proximity, Color, Photoelectric & Temperature Sensors) & Actuators PLC Wiring, PLC Logical Commands, Arithmetic Commands, High Speed Processing Commands, Sequential Logics, Data Transmission Commands, PLC Interfacing with VFD, Automatic Motor Control Circuit designing using Ladder Logic.

LECTURE	TUTORIAL	TOTAL
45	0	45

#### **TEXT BOOKS**

1 Raj Kamal Embedded Systems -, TMH-2011

2. W. Bolton Programmable Logic controllers-Newnes,2009

#### REFERENCES

1. Shibu K.V ,Introduction to Embedded Systems - Mc Graw Hill.2009

2. Frank Vahid, Tony Givargis, John Wiley, Embedded System Design ,2002

3. Lyla, Embedded Systems -Pearson, 2013

4. David E. Simon, An Embedded Software Primer - Pearson Education

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	1	3	0	0	0	0	0	0	0	0	0	0	1	0
1														
CO	1	3	0	0	0	0	0	0	0	0	0	0	2	0
2														
CO	1	3	0	1	1	0	0	0	0	0	0	0	3	0
3														
CO	1	3	0	2	0	0	0	0	0	0	0	0	1	0
4														
	4	12	0	3	1	0	0	0	0	0	0	0	6	0

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
Original	4	12	0	3	1	0	0	0	0	0	0	0	6	0
C														
Scaled	1	3	0	1	1	0	0	0	0	0	0	0	2	0
to														
0,1,2,3														
scale														

COU COD	RSE E	COURSE NAME		L	Т	P	С
XCSI	E <b>85</b>	SERVICE ORIENTED ARCHITECTU	JRE	3	0	0	3
C:P:A	A: 3:0:0						
				L	Т	P	Η
				3	0	0	3
COU	RSE OUI	TCOMES	DOMAIN		LEV	'EL	
CO1	Describe architect	the basic principles of service orientated ure with user interaction.	Cognitive	Know	ledge	9	
CO2	Explain	the message passing techniques in SOA.	Cognitive	Know	ledge	2	
CO3	Underst	and the applications of SOA.	Cognitive	Know	ledge	<b>)</b>	
<b>CO4</b>	Describe	e different kind of platforms in SOA,	Cognitive	Know	ledge	2	
CO5	Understa Web ser	and the various encoding and security in vices.	Cognitive	Know	ledge	•	
UNI	TI I	NTRODUCTION TO SOA					10

Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- How components in an SOA interrelate - Principles of service orientation.

UNIT –II WEB SERVICES

Service oriented analysis – Business-centric SOA – Deriving business services- service modeling - Service Oriented Design – WSDL basics – SOAP basics – SOA composition guidelines – Entity-centric business service design – Application service design – Task- centric business service design.

UNIT-III SERVICE ORIENTED ANALY	YSIS		10
Service oriented analysis – Business-centric SOA	A – Deriving business	s services- service mode	eling - Service
Oriented Design – WSDL basics – SOAP basics	s – SOA composition	n guidelines – Entity-ce	entric business
service design – Application service design – Tas	sk- centric business se	ervice design.	
UNIT -IV SOA WITH .NET AND JAVA			9
SOA platform basics - SOA support in J2EE -	Java API for XML-I	based web services (JA	X-WS) - Java
architecture for XML binding (JAXB) – Java AI	PI for XML Registrie	s (JAXR) - Java API fo	or XML based
RPC (JAX-RPC)- Web Services Interoperability	Technologies (WSI	() - SOA support in .NE	ET – Common
Language Runtime - ASP.NET web forms -	ASP.NET web serv	ices – Web Services I	Enhancements
(WSE).			
UNIT V WEB SERVICES			8
WS-BPEL basics - WS-Coordination overview -	- WS-Choreography,	WS-Policy, WS- Secur	ity
		• •	
	LECTURE	TUTORIAL	TOTAL
	45	0	45
TEXT BOOKS			

1. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Pearson Education, 2005.

#### REFERENCES

1. Thomas Erl, "SOA Principles of Service Design "(The Prentice Hall Service-Oriented Computing

8

Series from Thomas Erl), 2005.

2. Newcomer, Lomow, "Understanding SOA with Web Services", Pearson Education, 2005.

3. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services, An Architect's Guide", Pearson Education, 2005.

4. Dan Woods and Thomas Mattern, "Enterprise SOA Designing IT for Business Innovation" O'REILLY, First Edition, 2006

COURSE CODE	COURSE NAME	L	Т	P	С
XCSE86	ADVANCED COMPUTER ARCHITECTURE	3	0	0	3
C:P:A = 3:0:0					
		L	Т	P	Η
		3	0	0	3

COU	RSE OUTCOMES	DON	IAIN		LEVEL	
CO1	<i>Describe</i> the instruction parallelism	level	Cogni	tive	Remember	
CO2	<i>Describe</i> the instruction parallelism	level	Cogni	tive	Remember ,Understand	
CO3	<b>Describe</b> , the concept of <i>I/O</i> .	memory and	Cogni	tive	Remember	
CO4	<b>Describe</b> , the concept of	<i>I/O</i> .	Cogni	tive	Remember, Understand	
CO5	<i>Explain</i> multicore archi	tecture.	Cogni	tive	Comprehensi	on
UNIT	<b>I</b> INSTRUCTION LE	VEL PARALLE	ELISM			9
ILP schedu	– Concepts and challe uling – Speculation - Comp	enges – Hardy biler techniques f	ware a or expo	nd software sing ILP – Bra	approaches – nch prediction.	Dynamic
UNII	II MULTIPLE ISSUE	PROCESSORS				9
VLIW – Haro Limits	7 & EPIC – Advanced of dware versus software spec s ILP.	compiler support culation mechanis	t – Hai sms – IA	dware suppor A 64 and Itaniu	t for exposing p m processors –	arallelism
UNIT	III MULTIPROCES	SORS AND TH	READ	LEVEL PAR	ALLELISM	9
Symm	petric and distributed	shared memor	rv arc	hitectures –	Performance	ssues –
Synch	ronization – Models of me	mory consistency	v = Intro	duction to Mu	ltithreading	55465
			y marc		initin cading.	0
Casha	norformance Baducing	acho mico nonoli	wordn	vice rota Dad	ioing hit time Ma	9 .in
mamo	ry and performance Men	pory technology	Types (	iss fate – Reu	$\frac{1}{2} = \frac{1}{2} = \frac{1}$	) )
Reliat	bility, availability and depe	ndability – I/O po	erforma	nce measures –	Designing an I/O	system
UNIT	<b>V MULTI-CORE ARC</b>	HITECTURES				9
Softw	are and hardware multithre	ading – SMT and	d CMP	architectures –	Design issues –	
Case s	studies – Intel Multi-core a ssors – case study: IBM Ce	rchitecture – SUN Il Processor.	N CMP	architecture – l	neterogenous mult	i-core
				LECTURE	PRACTICAL	TOTAL
				45	0	45
TEXT	Γ BOOKS				i	
1. Jo	hn L. Hennessev and D	avid A. Patters	on. " (	Computer arcl	nitecture – A au	antitative
approa	ach". Morgan Kaufmann /	Elsevier Publishe	ers. 5th.	edition. 2011.		
REFF	ERENCES		, o uii	cannon, 2011.		
1. D	David E. Culler. Jasw	inder Pal Sin	9h. "F	Parallel comr	uting architectu	re : A
hardw	vare/software approach". N	Iorgan Kaufmanı	n /Elsev	ier Publishers.	5th Edition 2012	
2. Ka	i Hwang and Zhi.Wei Xu	, "Scalable Para	llel Coi	nputing". Tata	McGraw Hill.Ne	w Delhi
2003.		,		1 6,		
E-RE	FERENCES					
1.	http://cse10-iitkgp.virtu	al-labs.ac.in/				
2	https://www.seas.gwu.ed	u/~bhagiweb/cs?	11/lectu	res/lectures.ht	nl	
·						

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	3	2	3	2	2	1	1	0	0	0	2	2	3	1
1														

CO 2	3	2	3	1	2	1	2	0	0	0	1	1	3	1
CO 3	3	2	2	2	2	1	1	0	0	0	3	1	3	1
CO 4	3	2	2	1	2	1	1	0	0	0	1	1	3	1
CO 5	3	2	3	2	1	1	1	0	0	0	2	1	3	1
	15	10	13	8	9	5	6	0	0	0	9	6	15	5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO 12	PS O 1	PS O 2
Origin al value	15	10	13	8	9	5	6	0	0	0	9	6	15	5
Scaled to 0,1,2,3 scale	3	3	3	2	2	1	2	0	0	0	2	2	3	1

COURSE OU	ГСОМЕS	DOMAIN	L	EVEI		
			3	0	0	3
			L	Т	P	H
C:P:A = 3:0:0						
XCSE87	SOFT COMPUTING		3	0	0	3
COURSE	COURSE NAME		L	1	P	C

CO1	<i>Describe</i> the Neural Networks.	Cognitive	Remember	
CO2	Describe back propagation concepts.	Cognitive	Remember ,Understand	
CO3	<b>Describe</b> the concept of Fuzzy logic.	Cognitive	Remember	
<b>CO4</b>	<b>Describe</b> the concepts of Fuzzy membership rules.	Cognitive	Remember, Understand	
CO5	<i>Explain</i> the Genetic Algorithm (GA).	Cognitive	Comprehens	ion
UNIT	I NEURAL NETWORKS-1 (INTRODUC	CTION & ARC	HITECTURE)	9
Neuro Neura netwo hetro-	n, Nerve structure and synapse, Artificial Ne l network architecture: single layer and mu rks. Various learning techniques; perception a associative memory	euron and its n ltilayer feed fo nd convergence	nodel, activation prward networks, rule, Auto-assoc	functions, recurrent iative and
UNIT	II NEURAL NETWORKS-II (BACK PRO	PAGATION N	NETWORKS&	9
ARCI	HITECTURE)			
Percep back algorit	otron model, solution, single layer artificial ne propagation learning methods, effect of lea thm, factors affecting backpropagation training	ural network, m rning rule co-e , applications	ultilayer perceptio fficient ;back pr	on model; opagation
UNIT	<b>HII FUZZY LOGIC-I (INTRODUCTIO</b>	N)		9
Basic	concepts of fuzzy logic, Fuzzy sets and Cri	sp sets, Fuzzy	set theory and o	perations,
Proper	rties of fuzzy sets, Fuzzy and Crisp relations, F	uzzy to Crisp co	onversion.	-
UNIT	IV FUZZY LOGIC –II			9
(Fuzzy rules, Contro	y Membership, Rules) Membership functions, i Fuzzy implications and Fuzzy algorithms, Fuzz oller, Industrial applications.	nterference in fu cyfications & De	uzzy logic, fuzzy i efuzzificataions, F	f-then uzzy
UNIT	V GENETIC ALGORITHM(GA)			9
Basic repres Gener	concepts, working principle, procedures entations, (encoding) Initialization and s ational Cycle, applications.	of GA, flow election, Gene	chart of GA, etic operators,	Genetic Mutation,
		LECTURE	PRACTICAL	TOTAL
		45	0	45
TEXI	F BOOK			
1. S. Algori 2. N.I	Rajsekaran & G.A. Vijayalakshmi Pai, "Ne ithm:Synthesis and Applications" Prentice Hall P.Padhy,"Artificial Intelligence and Intelligent	eural Networks, of India.2003 Systems" Oxfor	Fuzzy Logic and d University Press	d Genetic s.2005
REFE	CRENCES			
1. Sim 2. Tin	an Haykin,"Neural Netowrks"Prentice Hall of nothy J. Ross, "Fuzzy Logic with Engineering .	India.1999. Applications" W	Viley India. 3 <sup>rd</sup>	
Editio	n,2010	111 2004		
🛛 J. Kur	nar Satish, "Neural Networks" Lata Mc Graw I	1111.2004		

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO
													1	2
CO	3	2	3	2	2	1	1				2	2	3	1
1														
CO	3	2	3	1	2	1	2				1	1	3	1
2														
CO	3	2	2	2	2	1	1				3	1	3	1
3														
CO	3	2	2	1	2	1	1				1	1	3	1
4														
CO	3	2	3	2	1	1	1				2	1	3	1
5														
	15	10	13	8	9	5	6	0	0	0	9	6	15	5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	РО	PS	PS
												12	O 1	0
														2
Origi	15	10	13	8	9	5	6	0	0	0	9	6	15	5
nal														
value														
Scale	3	3	3	2	2	1	2	0	0	0	2	2	3	1
d to														
0,1,2,														
3														
scale														

### **ONE CREDIT COURSES**

							L	Т	P	С
			We	b Design using JOOMLA Conten	igement	.5	-	.5	1	
C	Р	٨		System		0	T	Т	р	н
C	1						1	0	1	2
PREI	REQI	UISITE	: HTM	L and Designing Tools			L =	Ť		
COU	RSE	OUTC	OMES			Domai	n		Lev	vel
After	the co	ompletio	on of th	ne course, students will be able to						
CO1	Una tecl	<i>derstand</i> nniques	d and of clier	<b>perform</b> <i>the l</i> earning principle nt-side programming with HTML5	s and	Cognitive Psychomo	otor	Uno Gui Res	dersta ded pons	anding e
CO2	Un	derstan	id, den	nonstrate and <i>use</i> the Joomla Tool.		Cognitive Psychomo	otor	Uno App Gui Res	dersta ply ded pons	anding e
UNII	<b>Г I -</b> ]	HTML	5							(06
Store Geolo – Wel	– We ocatio b RT(	eb SQL n – mic	Datab rodata	ase – Server Sent Events - Web – Drag and Drop – Web Workers	Sockets – Index	– Canvas DDB – We	– Au eb Me	dio a essagi	ng –	ideo - CORS
UNII	ги ј	OOML	LA BAS	SICS						(06
Introd Comp	luctio ponen	n – Ins ts Menu	tallatio 1 – Exte	n – Architecture – Control Panel ensions Menu – Help Menu.	– Tool	bar – Men	us –	Cont	ent I	Aenu -
UNIT	ГШ	JOOM	LA MI	ENUS						(06
Create	e Mer	nus – Ac	dding N	Menu Items – Modifying Menu Iten	ns – Cre	ating Subn	nenus			
UNII	Г IV J	IOOMI	LA MC	DULES						(06
Create modu modu	e Mo ile ile – E	dules – Se Donatior	Bread earch M Modu	crumb Module – Feed Display M Module – Random Image Module Ile	Iodule - e – Wh	- Footer M o's Online	Iodule Moc	e – I lule -	Lates – Sy	t News ndicate
UNIT	r v J	OOML	A ADV	ANCED					(06)	
Temp Logo Banne Mana	olate 1 – Cat ers – iger –	Manager tegory N Adding Extensi	r – Cu Janage Conta on Ma	stomize Template – Adding Tem ement – Adding Content – Formatti acts – Adding News Feed – Addir nager – Website Backup – Website	plate – ing Con ig Foru SEO.	Creating T tent – Artic m – Addin	empl cle Mo g We	ate – etada b lin	Cus ta – ks –	stomize Adding Plugir
	LEC	TURE		<u> </u>	PRACT	ICAL		TC	<u>)TA</u>	L
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XML and AJAX, Black Book", Dreamtech Press, 2009.

5. Jennifer Marriott, Elin Waring, "The Official Joomla! Book – 2<sup>nd</sup> Edition", Addison-Wesley Professional, 2012.

### REFERENCES

- 1. Build Your Own Web Site the Right Way Using HTML & CSS, 2nd Edition by Ian Lloyd.
- 2. The Essential Guide to CSS and HTML Web Design (Essentials) by Craig Grannel.

### **E REFERENCES**

- 1. https://docs.oracle.com/cd/E19957-01/816-6408-10/contents.htm
- 2. http://docs.oracle.com/javase/7/docs/technotes/guides/scripting/programmer\_guide/
- 3. http://www.w3schools.com/js/default.asp
- 4. https://www.joomla.org/
- 5. https://downloads.joomla.org/
- 6. https://docs.joomla.org/
- 7. https://extensions.joomla.org/
- 8. https://www.tutorialspoint.com/joomla/
- 9. http://www.tutorialspoint.com/html5/

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PR	ERE(	QUISI	<b>ТЕ:</b> В	asic Mathematical and Statistic	cal Concepts					
со	URSI	E OUI	CON	IES:						
			(	Course Outcomes		Domai	n		Lev	vel
Afte	r the c	ompleti	on of tl	ne course, students will be able	to					
CO	List	motivat	ion for	learning a programming langu	lage	Cognitive		Une	derst	anding
Acce	ess onl	ine reso	ources	for R and import new functio	n packages	Psychomo	otor	Gui	ded	-
into	the R v	workspa	nce	ĩ	1 0	5		Res	pons	e
CO	2: Rec	ogni7e	and m	ake appropriate use of differe	nt types of				r	-
data	structi	ires			in types of	Cognitive		An	าโง	
Idon	tify Ar	ncs nd Imnl	omont	appropriate control structures t	o solve a	Psychomo	tor	Gui	ded	
norti	aulor r	na impi	minar	wohlem		1 Sycholino	101	Da	non	
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	UNIT LINTRODUCTION (15									
UNI		IROD		DN	**** 1					(15)
Insta	Illing F	$\mathbf{x}$ on $\mathbf{v}$ a	rious C	Derating Systems-Installing R	on Window	s from $CRA$	AN M	ebs1	te-In	stalling
KSII Imn	ating	n Varioi	us Ope	rating Systems-R Packages-In	stalling an F	к Package-	Impo	orting	; <b>F</b> 116	es in K:
1 mpo	Jung a United Hor	all Exce	Everc	ise on - Installing R & R studie	B Consol	11 <b>K</b> .				
LINI			NC W			0				(15)
Intro	ductio			d History of P Data Typasi	where of Dat	o Structuro	in I	) D	Ohio	(IS)
Attri	butes	Vectors	and	Lists_ Arrays_Matrices_Eact	ors- Data H	a Suluciules	s III r iccina	λ- Κ τ Va	lues	Names
Attri	bute-C	<sup>ontrol</sup>	Struct	ures: Introduction-If-else-For	r loops-Whi	ile loops-R	enea	t N	ext	Break
Fund	ction-B	Basic Plo	otting-S	Simulation.			copea	., .,	•••••	Dieun,
1	. Har	nds-on H	Exercis	e on Data types (Vectors, Matr	ix, Factor, D	Oata Frames	)			
2	2. Har	nds- on	Exercis	se on Basic Graphs(Bar, Pie an	d Histogram	s)	, ,			
	LEC	TURE		TUTORIAL	PRACT	ICAL	TC	)TA	L	
		15		-	15				30	
TE	XT B	OOKS	5							
1	. Gro	olemund	l . Garr	ett . "Hands-On Program	ning with I	R". Paperba	ck –	2014		
	) Not	rman M	<u>, en </u>	"The Art of R Program	mino" A '	Tour of S	tatis	tical	So	ftware
-	De	sign Da	nerbac	k = 0.0011	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1001 01 0	iuiib	near		1000 010
REF	FREN	NCFS	iperbac	K, OCI 2011						
	"A	First Co	ourse ir	Statistical Programming with	R" by Brau	n & Murdoo	h			
	2. "A	Beginn	er's Gu	ide to R" by Zuur	IC Oy Diddi		/11			
	3. "In	troducti	on to S	cientific Programming and Sir	nulation Usi	ng R" by Cl	hapm	an &	Hal	/CRC
2	I. "R	in a Nu	tshell"	by Adler		6 ,	1			
4	5. "Aı	n Introd	uction	to R" by Venables& Smith						
E-R	EFER	ENCES	5							
1	. <u>http</u>	os://www	w.prog	ramiz.com/r-programming						
2	2. http	os://www	w.tutor	ialspoint.com/r/						
3	3. http	os://www	w.rstud	io.com/online-learning/						
	4. <u>http</u>	os://www	w.r-pro	ject.org/about.html						
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PRI	EREC	QUISI	<b>TE:</b> Internet Technologies						
CO	URSI	E OUI	COMES:						
			Course Outcomes	Domain	n		Lev	vel	
Afte	After the completion of the course, students will be able to								
CO1	: Und	erstand	State of the Art – IoT Architecture	Cognitive		Unc	lersta	anding	
Perf	orms d	lata orga	anization in worksheet with variety of samples	Psychomo	tor	Gui	ded		
				•				170	

CO2: Understand the over	erviewIoT Platform		Cognitive	Understanding
Programming of Raspbe	rry Pi3		Psychomotor	Guided
				Response
CO3: Understand build	ding blocks of Internet of	Things and	Comitivo	Annly
characteristics			Developmenter	Apply
Evaluate networking te	echnologies for application	within IoT	Psychomotor	Guided
projects				Response
CO4:Understandand ap	oply the concepts IoT protoc	ols, Security	Cognitive	Apply
aspects.			Psychomotor	Guided
				Response
CO5:Describe and Evalu	uate different applications of	the IoT.	Comiting	I In denoton din a
Able to investigate and	propose various requirement	s of IoT for	Cognitive	Understanding
real world applications.			Psychomotor	Set
UNIT I BASICS KNOW	WLEDGE OF IOT			(06)
The IoT Networking C	Core : Technologies involv	ed in IoT D	Development: ]	Internet/Web and
Networking Basics OSI	Model, Data transfer referred	with OSI Mod	lel, IP Addressi	ng, Point to Point
Data transfer, Point to	Multi Point Data transfer &	e Network To	pologies, Sub-	netting, Network
Topologies referred with	Web, Introduction to Web Se	ervers, Introdu	ction to Cloud	Computing.
UNIT II IOT PLATFO	RM OVERVIEW			(06)
IoT Platform overview O	)verview of IoT supported H:	ardware platfo	rms such as. R	aspherry ni ARM
Cortex Processors Ardui	no and Intel Galileo boards	idware plato		ispoonly pi, mini
	no una miter Gumeo Joards.			
UNIT III COMPONEN	TS OF IOT			(06)
Network Fundamentals:	Overview and working pr	inciple of Wi	red Networkin	g equipment's –
Router, Switches, Overv	iew and working principle c	of Wireless Ne	etworking equip	pment's – Access
Points, Hubs etc. Linux	K Network configuration Co	oncepts: Netw	orking configu	rations in Linux
Accessing Hardware & D	Device Files interactions.			
UNIT IV IOT PROTOC	COLS AND APPLICATION	NS		(06)
History of IoT, M2M -	Machine to Machine, Web c	of Things, IoT	protocols App	lications: Remote
Monitoring & Sensing, I	Remote Controlling, Perform	ance Analysis	The Architect	ure The Layering
concepts ,IoT Communic	ation Pattern, IoT protocol A	rchitecture, Th	ne 6LoWPAN S	Security aspects in
IoT.				•
UNIT V CASE STUDY	IN IOT			(06)
Case Study & advanced	l IoT Applications: IoT app	olications in h	nome, infrastru	ctures, buildings,
security, Industries, Hor	me appliances, other IoT e	lectronic equi	pments. Use	of Big Data and
Visualization in IoT, Ind	dustry 4.0 concepts. Sensors	s and sensor 1	Node and inter	facing using any
Embedded target boards	(Raspberry Pi / Intel Galileo/A	ARM Cortex/	Arduino).	
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Response

## **TEXT BOOKS**

- 1. 6LoWPAN: The Wireless Embedded Internet, Zach Shelby, Carsten Bormann, Wiley
- 2. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, Dr. OvidiuVermesan, Dr. Peter Friess, River Publishers
- 3. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann