

ERODE SENGUNTHAR ENGINEERING COLLEGE



(An Autonomous Institution, Affiliated to Anna University) PERUNDURAI, ERODE - 638 057

UG Curriculum and Syllabus (1 to 8 Semesters)

B.E – INFORMATION TECHNOLOGY

Choice Based Credit System (CBCS)

REGULATION 2019



ERODE SENGUNTHAR ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION TECHNOLOGY

REGULATION – 2019 CHOICE BASED CREDIT SYSTEM I TO VIII SEMESTERS CURRICULUM (2020-2021)

Induction Program (Mandatory)	3 weeks duration
Induction program for students to	 Physicalactivity CreativeArts Universal HumanValues
be offered right at the start of the firstyear	 Literary ProficiencyModules Lectures by EminentPeople Visits to localAreas Familiarization to Dept. /Branch &Innovations

1.0	Minimum	credit	s to be ear	ned: 1	62 (for	Eig	ght Se	emes	ter)		
THEORY			SLIVIL	STER						- 12		
THEORY			Objectives& Outcomes	<u>k</u>					Ma	ximu Narks	n	Category
Code No	Course	PEO	PO	PSO		Т	P	C	CA	ES	Tot.	
19BS101	Calculus and its Applications	1,111	1,2,3,4,12	2	3	1	0	4	40	60	100	BS
19BS102	Engineering Physics	1	1,2,4,5,6, 8,9	-	2	0	2	3	40	60	100	BS
19BS103	Engineering Chemistry	1,111	1,2,3,4, 5,7,12	-	3	0	0	3	40	60	100	BS
19HS101	Communicative English	П	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19ES101	Python Programming	1, 11	1,2,3,4,12	1,2	3	0	Ņ	3	40	60	100	ES
19TPS01	Soft Skills –I	11,111	8,9,10,12	3	1	0	1	1.5*	40	60	100	EEC
PRACTIC	AL		6									
19ES104	Python Programming Laboratory	1,111	1,2,3, 4,5,12	1,2	0	0	2	1	60	40	100	ES
19ES105	Computer Hardware Servicing and Maintenance Laboratory	1, 11	1, 2, 3, 12	2	0	0	2	1	60	40	100	ES
19BS105	Chemistry Laboratory	111	1,2,3,4, 5,12	-	0	0	4	2	60	40	100	BS
	TOTAL				15	1	12	21.5	420	480	900	-

			SEM	ESTEI	RII							
THEORY												
Code No	Course		bjective Dutcome	& s	L	т	Р	с	M	aximı Mark:	um s	Cata
		PEO	PO	PSO					CA	ES	Tot.	Category
19BS201	Vector Calculus and Complex Variables	1,111	1,2,3, 4,12	2	3	1	0	4	40	60	100	BS
19BS204	Physics for Information Science	1	1,3,4, 5,7	-	3	0	0	3	40	60	100	BS
19MC201	Environmental Scienceand Engineering	1, 11	I,2,3,4, 5,6,7,8, 12	-	3	0	0	0	40	60	100	MC
	Language Elective				3	0	0	3	40	60	100	HS
19ES202	Advanced C Programming	1, III	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	ES
19ES203	Fundamentals of Electrical and Electronics Engineering	I, IV	1,2,3,4	-	3	0	0	3	40	60	100	ES
19TPS02	Soft Skills –II	11,111	8,9, 10,12	3	1	0	1	1.5*	40	60	100	EEC
RACTICA	AL .		1						4. 5	-		
19ES214	Advanced C Programming Laboratory	1, 11	1,2,3, 4,12	1,2	0	0	4	2	60	40	100	ES
19ES221	Engineering Drawing Laboratory	I,IV	1,2,3, 5,10,12	2	0	0	4	2	60	40	100	ES
0.00			TOTAL		19	1	10	21.5	400	500	900	-

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			SEM	ESTER					۲			
THEORY			-									
Cada Na	Course	Oł O	ojective utcome	& S		T	В	6	M	axim Mark	um s	Catagory
Code No	Course	PEO	PO	PSO			F		CA	ES	Tot.	Category
19BS305	Discrete Mathematics	1	1,2,3,4, 12	2	3	1	0	4	40	60	100	BS
19IT301	Data Structures and Algorithms	1, 111	1,2,3,4 12	1,2	3	0	0	3	40	60	100	PC
19CS302	Computer Architecture	1, 111	1,2,3,4, 12	2	3	0	0	3	40	60	100	PC
19ES302	Digital Electronics	I, III, IV	1,2,3,4 12	1,2	3	0	0	3	40	60	100	ES
19IT304	Database Management System	1,111	1,2,3,4 12	1,2	3	0	0	3	40	60	.100	PC
19TPS03	Quantitative Aptitude and Logical Reasoning - I	11,111	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
19MC301	Indian Constitution	11,111	6,8,10, 11,12		2	0	0	0	40	60	100	MC
PRACTIC	AL .						- 1	-				
19IT305	DBMS Laboratory	I, III	1,2,3,4 ,5,12	1,2	0	0	4	2	60	40	100	PC
19IT306	Data Structures and Algorithms Laboratory	1, 111	1,2,3,4 5,9, 11, 12	1,2	0	0	4	2	60	40	100	PC
19ES308	Digital Electronics Laboratory	I, III,IV	1,2,3,4 12	1,2	0.	0	4	2	60	40	100	ES
	TOTAL				19	1	12	22	460	540	1000	-

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THEORY				COLUMN COLUMN AND ADD		_						
Code No	Course	Objec	tive & Ou	tcomes	L	т	Р	c	Max	imum	Marks	Category
		PEO	PO	PSO					CA	ES	Tot.	
19BS401	Probability and Statistics	I	1,2,3,4	2	3	1	0	4	40	60	100	BS
19IT401	Object Oriented Programming	-1, 111-	1,2,3,4, 12	1, 2	3	0	0	3	40	60	100	PC
19CS402	Software Engineering	1,111	1,2,3,4,5, 8,9,10, 11,12	1,2	3	0	0	3	40	60	100	PC
19HS402	Universal Human Values 2: Understanding Harmony	11,111	9,12	3	2	1	0	3	40	60	100	HS
19CS404	Operating Systems	1,111	1,2,3,4, 12	1,2	3	0	0	3	40	60	100	PC
19TPS04	Quantitative Aptitude and Logical Reasoning - II	11, 111	1,2,9, 10,12	1,2, 3	2	0	0	0	40	60	100	EEC
PRACTIC	AL											
19IT403	Operating Systems Laboratory	1,1 <mark>11</mark>	1,2,3,4, 12	1,2	0	0	4	2	60	40	100	PC
19IT404	Object Oriented Programming Laboratory	∼i,III	1,2,3,4, 12	1,2	0	0	4	2	60	40	100	PC
19HS401	Language Skills	11	5,9, 10,12	3	0	0	2	0	100	-	100	HS
			TOTAL		17	1	10	20	460	440	900	-

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THEORY												
Code No	Course	0	bjective Outcome	e & es	L	т	Р	с	Max	imum	Marks	Category
		PEO	PO	PSO					CA	ES	Tot.	
19IT501	Computer Communication Networks	1	1,2,3,4, 12	2	3	0	0	3	40	60	100	PC
19IT502	Internet Programming	1,111	1,2,3,4 5,12	1,2	3	0	0	3	40	60	100	PC
	Formal				1							
19IT503	Languages and Automata Theory	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19IT506	Communication Engineering	I,III, IV	1,2,3, 8,10,1 2	2	3	0	0	3	40	60	100	PC
	Professional Elective I				3	0	0	3	40	60	100	PE
	Open Elective I				3	0	0	3	40	60	100	OE
19TPS05	Quantitative Aptitude and Logical Reasoning - III	11, 111	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
PRACTIC	CAL)				1				12	
19IT504	Internet Programming Laboratory	1,11,111	1,2,3,4 5,8,9, 12	1,2	0	0	4	2	60	40	100	PC
19IT505	Computer Networking Laboratory	1,11,111	1,2,3, 4,5,12	1,2	0	0	4	2	60	40	100	PC
19HS504	Professional Skills for Software Engineer	П	2,3,6, 8,9,12	1,2	0	0	2	-	100	2.2	100	EEC
			TOTAL		20	0	10	22	500	500	1000	-

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			SEM	IESTE	R VI	10						
THEORY										1-5-1		b . a
		Objecti	ve & Outo	comes					Maxi	mum	Marks	P.
Code No	Course	PEO	PO	PSO		T	P	C	CA	ES	Tot.	Category
19IT601	MachineLearning	1,111	1,2,3,4,5, 8,12	1,2	3	0	1	4	40	60	100	PC
19IT602	Wireless Sensor Networks	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PC
19CS604	Cloud Computing	1,111	1,2,3,4,5,1 0,12	1,2	3	0	0	3	40	60	100	PC
19IT603	Big Data and Analytics	1,111	1,2,3,4, 5,12	1,2	3	0	1	4	40	60	100	PC
	Open Elective II				3	0	0	3	40	60	100	OE
1	Professional Elective II				3	0	0	3	40	60	100	PE
19TPS06	Quantitative Aptitude and Logical Reasoning - IV	11,111	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
PRACTIC	AL I								1			
19IT604	Cloud Computing Laboratory	1,111	1,2,3,4, 5,8,12	1,2	0	0	4	2	60	40	100	PC
191T605	Comprehensive Review1	I, 11,111,11	1,2,3,4, 5,6,7,8, / 9,10, 11,12	1,2,3	0	0	2	0	100	-	100	EEC
19IT606	Mini Project	I, II, Ⅲ,IV	1,2,3,4, 5,6,7,8, 9,10, 11,12	1,2,3	0	0	2	1	100		100	EEC
			TOTAL		19	0	10	23	540	460	1000	-

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			SEN	IESTE	RVII							
THEORY	1					-						
CodeNo	Course	0	bjective Dutcome	& s	L	т	Р	с	M	axim Mark	um s	Category
	Ser Start	PEO	PO	PSO			5		CA	ES	Tot.	5,
19IT701	CryptographyandN etworkSecurity	1,111	1,2,3,4, 5,7,8,9, 12	1,2	3	0	0	3	40	60	100	PC
19IT702	InternetofThings	1,1111 V	1,2,3,4, 5,6,7, 10,11, 12	1,2	3	0	0	3	40	60	100	PC
19IT703	Research Methodology	I, II	1,2,3,4, 12	2	3	0	0	3	40	60	100	PE
	Professional ElectiveIII	1			3	0	0	3	40	60	100	PE
	Professional ElectiveIV				3	0	0	3	40	60	100	PE
PRACTIC	CAL						1			- 1		
19IT704	IOT Laboratory	1,111	1,2,3,4, 5,7,8,9, 12	2	0	0	4	2	60	40	100	PC
19IT705	Security Laboratory	1, 11	1,2,3,4, 5,7,8,9, 12	2	0	0	4	2	60	40	100	PC
19IT706	Project Phase I	I,II,III,I ∨	5,6,7,8, 9,10, 11,12	1,2, 3	0	0	12	. 1	60	40	100	EEC
	T.		TOTAL		17	0	10	20	380	420	800	

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			SEN	IESTER	RVII	I		-				
THEORY	Y											
Code No	Course	0	bjective Dutcome	& s	L	т	Р	с	M	axim Mark	um s	Category
		PEO	PO	PSO			1		CA	ES	Tot.	
	Elective V				3	0	0	3	40	60	100	PE
	Elective VI		Se . 1		3	0	0	3	40	60	100	PE
PRACTI	CAL											
19IT801	Project Phase II	1,11,111,1 V	1,2,3,4, 5,6,7,8, 9,10, 11,12	1,2,3	0	0	12	6	60	40	100	EEC
с., к.	TOTAL					0	14	12	240	160	400	-

S. No. Category		Credits Per Semester								Credits in %	Rar Total (Al	ige of Credits CTE)	
			11	III	IV	V	VI	VII	VIII			Min	Max
1	BS	12	7	4	4	-	-	-	-	27	16.77	15%	20%
2	ES	5	10	5	-		-	-	-	20	12.42	10%	15%
3	HS	3	3	-	3	-		-	-	9	5.59	5%	10%
4	PC	-	-	13	13	16	16	13	-	71	44.0	40%	45%
5	PE		1 . H	-	-	3	3	6	6	18	11.18	10%	15%
6	OE	-	-	-	-	3	3	-	-	6	3.72	5%	10%
7	EEC	1.5	1.5	-	-		1	1	6	11	6.83	5%	10%
11.00	Total	21.5	21.5	22	20	22	23	20	21	162	100	90%	125%

PE- ProfessionalElective

OE- OpenElective

PC- ProfessionalCore

MC -- Mandatorycourse

CA – Continuous Assessment ES- EndSemesterExamination EEC-Employability Enhancement Course

MANDANTORY COURSE

Code No	Course	0	bjective a	8.		т	в	C	M	laxim Mark	um s	Catagory
	Course	PEOs	POs	PSO s	L		F	C	СА	ES	Tot.	Category
19MC201	Environmental Science and Engineering	1, 11	1,2,3,4, 5,6,7, 8,12	-	3	0	0	0	40	60	100	BS
19MC301	Indian Constitution	11,111	6,8,10, 11,12		2	0	0	0	40	60	100	MC

LANGUAGE ELECTIVE

Code No	Course	Obje	ctives & Outc	omes		T	D	C	M	laxim Mark	um s	Category
Code No	Course	PEOs	POs	PSOs		Ľ.		ľ	CA	ES	Tot.	outegory
19HX201	English for Engineers	П	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX202	Hindi	П	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX203	Japanese	II	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX204	French	11	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS

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Chairman - BoS Dept. of IT - ESEC

Code No	Course	Obj &O	ectives utcomes		L	т	Р	с	Ma	laximum Marks		Category
		PEO	РО	PSO					СА	ES	Tot.	
PROFESS	SIONALELECTIVEI		(2)									
19ITP01	Web Application development using C#and.NET	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP02	Advanced Java Programming	I,III	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP03	Open Source Systems	1,111	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP04	Compiler Design Principles	1,111	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP05	Data warehousing and Data Mining	1,111	1,2,3 4,5,12	2	3	0	0	3	40	60	100	PE
19ITP06	Computer Graphics And Multimedia Systems	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP07	Distributed Systems	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
PROFESS	SIONALELECTIVEII											
19ITP08	GraphTheory	I,IV	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP09	Human ComputerInteracti on	I,I∨	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP10	BioInformatics	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP11	Information StorageManageme nt	1,11	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP12	Object Oriented Analysis and Design	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP13	Service OrientedArchitec ture	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP14	Web ServicesProgramming andXML	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE

CodeNo	Course	Obj utco	ectives& omes	0	L	- т	Р	с	Ma	aximu Mark	Category	
		PEO	PO	PSO					CA	ES	Tot.	
PROFES	SIONALELECTIVEIII							ų s		-		
19ITP15	Software Testing	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP16	High Performance Computing	1,111	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE .
19ITP17	Green Computing	1,111	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP18	Digital Signal Processing	1,111	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP19	Information Retrieval	1,111	1,2,3 4,5,12	2	3	0	0	3	40	60	100	PE
19ITP20	Multi Core And Computing Communication Systems	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP21	Artificial Intelligence	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
PROFESS	SIONALELECTIVEIV		1									
19ITP22	R Programming	I,IV	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP23	Block Chain Technology	I,IV	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP24	Embedded System	I,II _.	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP25	Video Analytics	1,11	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP26	Embedded Security	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP27	Robotics],	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP28	Information Coding Techniques	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE

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Chairman Dept. of IT - ESL-

Code No	Course	urse Objectives & L	т	Р	c	Ma	iximi Mark	ım (s	Category			
		PEO	PO	PSO					СА	ES	Tot.	
PROFES	SIONALELECTIVE V											
19ITP29	Software Project and Quality Management	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP30	Quantum Computing	1,111	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP31	Natural Language Processing	1,111	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP32	Soft Computing	1,111	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP33	Deep Learning	1,111	1,2,3 4,5,12	2	3	0	0	3	40	60	100	PE
19ITP34	Mobile and Pervasive Computing	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
19ITP35	Data Visualization Techniques	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PE
PROFES	SIONALELECTIVEVI											
19ITP36	Ethical Hacking	I,IV	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP37	E-Commerce	I,IV	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19ITP38	Computer Vision	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP39	Cyber Forensics	1,11	1,2,3 4,5,12	1,2	3	0	0	3	40	60	100	PE
19ITP40	Information Security	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP41	Fundamentals of Nano Science	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE
19ITP42	Image Processing	1,11	1,2,3 4,12	1,2	3	0	0	3	40	60	100	PE

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	IN ORMATION TE	CHNC	DLO	GY	4.98	R 20	019	Semester I
Course Code	Course Name		Houi Wee	s/ k	Credit	Total Hours	Ma	aximum Marks
19BS101	CALCULUS AND ITS APPLICATIONS	3	1	0	4	60		100
 Interpret the interpret the interpret the interpret the interpret the interphenomena inv Find eigen valuarising in the fie Summarize and variables. 	roductory concepts of Limit and co troductory concepts of calculus, olving continuous change of varia lies and eigen vectors which is of eld of engineering. d apply the methodologies involve	this wi bles ne of t	he p	able bowe	them to rful tools oblems r	model and to handle elated to	nd a e pra func	nalyze physic actical problen tions of sever
 Apply differentiation to Identify and modes solve the higher Analyze the cha Characterize the 	ation to solve maxima and minim differentiate functions del the real time problems using f order ordinary differential equatio racteristics of a linear system with a functions of several variables and	a prob irst oro ns. Eigen	der li valu	near near ues a	e both th [.] different and Eigen	e limit de ial equati vectors.	finiti ons.	on and rules o Recognize an
Integrate the fun	ictions for evaluating the surface a	area ar	nd vo	lume	9.	Same.		
Repesentation of a	function-Limit of a function-Co	ntinuty	-Der	ivati	ves-Differ	entiation	rule	12 Maxima an
		includes	200			ondation	. are	s-iviaxima an
Minima of one variat		riandaty				Children		12
Minima of one variat Jnit II ORDINAR Linear differential e equations of higher variation of parameter	ole Y DIFFERENTIAL EQUATIONS quations of second and higher order with variable coefficients ers for second order differential eq	order Cauc	with chy's	cor cor	nstant co ear differ	efficients. ential equ Electrical	Linuatio	12 lear differentia n - Method c
Minima of one variat Jnit II ORDINAR Linear differential e equations of higher variation of parameter Jnit III MULTIVA	ole CY DIFFERENTIAL EQUATIONS quations of second and higher order with variable coefficients ers for second order differential eq RIABLE CALCULUS	order : Caud juation	with chy's s-Vil	i cor i line oratir	nstant co ear differen ng string-	efficients. ential equ Electrical	Linuatio	12 lear differentia n - Method o uits
Minima of one variat Jnit II ORDINAR Linear differential e equations of higher variation of paramete Jnit III MULTIVA ⁻ unctions of Two V maxima and minima	A pole A DIFFERENTIAL EQUATIONS quations of second and higher order with variable coefficients ers for second order differential eq RIABLE CALCULUS ariables - Total Differential - Der	order : Cauc juation	with chy's s-Vil	i cor i line oratii mpli	nstant co ear different ng string- cit functio	efficients. ential equ Electrical	Lin uatio circu	12 lear differentia n - Method c uits 12 's- constrained
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Course	Course Name	He	ours /eek	1	Credit	Total Hours	Maximur Marks	n
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19BS102	ENGINEERING PHYSICS	2	0	2	3	60	100	
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IE.	XT BOOK(S):
1.	Bhattacharya, D.K. & Poonam, T. — Engineering Physicsll. Oxford University Press, 2015
2.	Gaur, R.K. & Gupta, S.L. — Engineering Physicsll. Dhanpat Rai Publishers, 2012
3	Pandey, B.K. & Chaturvedi, S. — Engineering Physicsll. Cengage Learning India, 2012
REF	ERENCE(S):
1.	Halliday, D., Resnick, R. & Walker, J. — Principles of Physicsll. Wiley, 2015
0	

Serway, R.A. & Jewett, J.W. — Physics for Scientists and Engineersll. Cengage Learning, 2010
 Tipler, P.A. & Mosca, G. - Physics for Scientists and Engineers with Modern Physics'.W.H.

3. Freeman, 2007

List of Experiments PHYSICS (ANY FIVE)

30 hrs

- 1. Determination of rigidity modulus Torsionpendulum
- 2. Determination of Young's modulus by non-uniform bendingmethod
- 3. Determination of Young's modulus by uniform bendingmethod
- 4. Determination of wavelength and particle size usingLaser
- 5. Determination of acceptance angle and numerical aperture in an opticalfiber
- 6. Determination of thermal conductivity of a bad conductor Lee's Discmethod
- 7. Determination of velocity of sound and compressibility of liquid Ultrasonicinterferometer
- 8. Determination of wavelength of mercury spectrum spectrometergrating
- 9. Determination of band gap of asemiconductor
- 10. Determination of thickness of a thin wire Air wedgemethod

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Course Code 19BS103 Course Object • Underst		Hours /			R 2019	Semester I	03	
19BS103 Course Object • Underst	Course Name	ŀ	lours Wee	s/ ek	Credit	Total	Maximum N	larks
Course Object			1	P		AE	100	
 Underst 	ENGINEERING CHEWISTRY	3	into	U	3	45	100	
 Know th Unders Gain kn Know th Course Outco Make th Know th Impart k storaged Aware th Impart k 	the fundamental concepts of electrochem tand the principles and generation of en- towledge onpolymers. The types of fuels and the manufacture of types: At the end of this course, learners e students conversant with water treatm e reaction involved in corrosion and corr nowledge on renewable energy sources devices the synthesis & industrial application of po- nowledge on different types of fuels (sol	solid solid solid solid entte rosior like olyme id liqu	ando in ba l, liqu be al chnie chnie n pro nucle ers uid, g	uid a ble to ques tecti ear a	nd gased o: onmetho and to im primary,	uclearrea ousfuels. ds part knov	actors. vledge on ene ry and synthe	ergy tic)
and com	bustionprocess.	10						9
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oroblems).Stan corrosion (galv sacrificial anod	dard hydrogen electrode-Calomel Ele anic, differential aeration) - types-facto e and impressed current cathodic protec	ectroo ors in tion i	de. Influe meth	Corre ncing od.	osion: c g corrosi	hemical ion rate	& electroche corrosion cor	emica ntrol
Jnit III ENER	GYSOURCES					1. 1. 19. 19		9
ntroduction- nu preeder reactor on battery. Fue	iclear energy- nuclear fission- nuclear fu . Batteries and fuel cells: Types of batte el cell :H2 -O2 fuel cell.	usion eries-	- nuo alka	clear line	chain re battery-	eactions- lead stor	light water re age battery- li	actor ithiun
Jnit IV POLY	MER CHEMISTRY					1.1		9
Aonomers - p olymers base copolymerizatic	olymers - polymerization - functionalit d on source and applications. Types n. Preparation, properties and applicat tics (poly vinyl chloride, poly tetrafluoroe of plastics (blow moulding, injection, extr	y - of tions ethyle usior	degro polyr of the ene a n).	ee c meriz nerm nd F	of polym zation: a nosetting PMMA). F	erization addition, (epoxy Rubber: S	- classificati condensatior resin and bal SBR.	on o and celite
and thermoplas	SANDCOMBUSTION							
and thermoplas		al-p	roxin	nate	and ulti			9
and thermoplas Compounding of Jnit V FUELS Fuel: Introduction of metallurgical Fischer-Trophs quefied petrole	on- classification of fuels- solid fuels-co coke (Otto Hoffmann method) – Liqu and Bergius processes- knocking- octar um gases(LPG)- water gas- bio diesel.	uid fu ne nu Com	iels: imbe busti	Ref r- ce on- f	ining of etane nur flue gas	mate ana petroleur nber – G analysis	alysis- manufa m- synthetic aseousfuels: (ORSAT Meth	9 acture petro nod).

TEXT	BOOK(S):
1.	Jain P.C. and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing Company (P) Ltd., New Delhi,2019
2.	Ravikrishnan A., "Engineering Chemistry", Sri Krishna Hi-tech Publishing Company Pvt. Ltd. Chennai,2019
REFE	RENCE(S):
1.	Dara S.S, Umare S.S, "Engineering Chemistry", S. Chand & Company Ltd., New Delhi 2016.
2.	Sivasankar B., "Engineering Chemistry", Tata McGraw-Hill Publishing Company, Ltd., New Delhi,2017.
3.	Gowariker V.R, Viswanatha. N.V, Jayadev Sreedhar-"Polymer Science", Publishing company New Age International Publishers, New Delhi, 2015.
4.	Ozin G. A. and Arsenault A. C., "Nano chemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2017.
5.	Ashima Srivastava and Janhavi N N., "Concepts of Engineering Chemistry", ACME Learning Private Limited., New Delhi., 2015.

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Department	INFORMATION 1	ГЕСН	NOL	OG	1		Semester I	HS
Course	Course Name	H	lours Wee	s / k	Credit	Total	Maximum	
Code	and grant and the second second second	L	Т	Ρ	С	Hours	Warks	
19HS101	COMMUNICATIVE ENGLISH	3	0	0	3	45	100	
 To acqui To deve To enha To improve 	lire basic English grammar. lop listening skills to listen lectures and ance the reading skill to comprehend te ove writing skills to express thoughtsfre	d basi chnic eelv.	cvide alwri	eos. tings		8		
To deve	lop speaking skills to speak fluently in	realco	ontex	ts.				
 Improve Develop Acquire t Enhance Commun 	mes: At the end of this course, learners language usage in LSRWskills. listening skills to comprehend general / he ability to understand different writter the writing skills to express the ideas c icate fluently in real timecontext.	techi techi ntexts	nicali earn	talks ers.				45
Unit I LANG	UAGE FOCUS							9
Parts of speech Tense forms - S Unit II	- Word formation - Sentence types (de ubject - Verb agreement NING	clarat	ive,	impe	rative, ex	clamato	ry & interrogat	ive)
Listening for s conversations - completing the h	pecific information: Short conversat Telephone etiquette - Note-taking - Lis vrics - Clear individual sounds - Word s	tions stening stress	/ m g for	ionol gist	ogues - / interviev	Gap f ws - List	illing - Telep ening to song:	hone s and
Unit III READ	ING							9
Completing the s Understanding t	sentences - Prediction - Skimming for g ext and sentence structure - Close read	gist - S ding	Scan	ning	for speci	fic inforn	nation -	
Unit IV WRITI	NG							9
^P aragraph writin Dialogue writing	g (descriptive, narrative, expository & - E-mail -Instructions	persu	asive	e) - L	etter (fori	mal and	informal) -	
Unit V SPEĂ	KING						14	9
Self-introduction experiences and Agreement / disa TEXT BOOK(S)	- Giving personal and factual informati I future plans - Mini-presentation - Expr agreement - Likes and dislikes):	ion - 1 ressin	⊺alkiı g op	ng al inion	bout pres s and jus	ent circu tifying o	mstances, pas pinions -	st
1. Communi university	cative English by KN Shoba ,Lourdes J 2017.	loava	ni Ra	ayen	Publishe	d by Car	nbridge	×.
REFERENCE(S	0:	0.17						_
1 Murphy, F	aymond. English Grammar in Use – A ate learners Of English .lved. United Ki	Self- ngdor	Stud n: Ca	y Re ambi	ference a ridge Univ	and Prac versity P	tice Book For ress. 2012.	
2 Seely, Joh University	n. Oxford Guide to Effective Writing ar Press. 2005.	nd Sp	eakir	ng. Ir	ndian ed.	New De	lhi: Oxford	
3 Anderson United Kir	, Kenneth et al. Study Speaking: A Cou Igdom: Cambridge University Press 19	irse ir 92.	Spo	oken	English f	or Acade	emic Purposes	S.

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Departme	INFORMATION TECHNOL	OGY				R 2019	Semester I	ES
Course	Course Name	H	ours Neek	1	Credit	Total	Maximum	1
Code		L	Т	Ρ	С	Hours	warks	
19ES10	1 PYTHON PROGRAMMING	3	0	0	3	45	100	
 To un To un To un progno To da To un 	se of learning this course is nderstand problem solving concepts. nderstand why Python is a useful scripting language rams. evelop Python programs with conditionals andloops se Python data structures — lists, tuples,dictionaries	e for deve s	elopei	rs an	d to read	and write	e simple Pyth	ion
Course O At the end Apply Recc To de To w To re	utcomes: of this course, learners will be able to / problems solving techniques to real worldproblem gnize and construct common programming idioms: esign, code, and test Python programs using List, T rite code using dictionaries andfunctions and and write data from/to files in PythonPrograms.	s. variable uples an	s, looj dStrin	p, bra igs	anch, and	dinput/out	put.	
Unit I	COMPUTATIONAL THINKING						100	9
problem S Structure Unit II History- - Operator Unit III Creating S List-Acces Operation	olving concepts-: Algorithm, Pseudo-code and Flov Problem Solving with Decisions - Problem Solving INTRODUCTION TO PYTHON Features - Setting up path - Working withPytho - Conditional Statements – Looping – Control State STRING MANIPULATION, LIST AND TUPLES String - AccessingStrings- Basic Operations - sing list-Operationson List -Workingwithlists-Functions s – Functions and Methods.	vchart Pr with Loc on- ements. - String s onandMe	Ba lices	sicS	ving with Study: Ra yntax-Va oction and eatingtup	Sequent aptor and riableand d Methods le-Tuple	s – Creating	s. 9
Unit IV	DICTIONARIES AND FUNCTIONS				11.1	1.1		9
Creating Defining a	ictionaries - Accessing values in dictionaries - Wor function - Calling a function- Types of functions - F local variables.	king with unction A	dictic Argum	onarie nents	es - Prop - Anonyn	erties – F nous func	unctions - tions-	
Unit V	MODULES, FILES AND EXCEPTION HANDLING						and the second second second	9
Modules -	Importing module - Math module - Random modu FileOpeningModes-Readingandwritingfiles–Functio Handling - Except clause - Try , finally clause DK(S)	le -Packa onsExcep e User D	ages- otionH efined	landl dExc	Composi ing- eptions.	tion Files	- Opening an Exception	nd n -
Exception				1	D 11			
Exception TEXT BOO 1,	David Riley and Kenny Hunt, "Computational Think Hall/CRC, 2014.	king for th	ie Mo	aern	Problem	Solver",	Chapman &	
Exception TEXT BOO 1, 2,	David Riley and Kenny Hunt, "Computational Think Hall/CRC, 2014. Michael Dawson ,"Python Programming for the Abs	king for th solute Be	ie Mo ginne	dern r", 3	Problem	Solver", n, 2010.	Chapman &	
Exception TEXT BOO 1, 2, REFEREN	David Riley and Kenny Hunt, "Computational Think Hall/CRC, 2014. Michael Dawson ,"Python Programming for the Abs CE(S) M. Sprankle, "Problem Solving and Programming C	king for the solute Be	ie Mo ginne ", 9th	dern r", 3 Editi	Problem rd Edition on, Pears	Solver", n, 2010. son Educ	Chapman &	
Exception TEXT BOO 1, 2, REFEREN 1.	David Riley and Kenny Hunt, "Computational Think Hall/CRC, 2014. Michael Dawson ,"Python Programming for the Abs CE(S) M. Sprankle, "Problem Solving and Programming C Delhi, 2011.	solute Be Concepts	ie Mo ginne ", 9th	dern r", 3 Editi	Problem rd Edition on, Pears	Solver", n, 2010. son Educ	Chapman &	
Exception TEXT BOU 1, 2, REFEREN 1. 2. 3.	David Riley and Kenny Hunt, "Computational Think Hall/CRC, 2014. Michael Dawson ,"Python Programming for the Abs CE(S) M. Sprankle, "Problem Solving and Programming C Delhi, 2011. Brian Heinold, "Introduction to Programming Using Allen Downey, Green Tea Press Needham, "Think Massachusetts	king for the solute Be Concepts Python", Python, I	e Mo ginne ", 9th Moun How t	aern r" , 3 Editi t St. o Th	Problem rd Edition on, Pears Mary's U ink Like a	Solver", n, 2010. son Educ niversity, a Comput	Chapman & ation, New 2013. er Scientist",	

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Departm	ent	INFORMATION TECHNOLO	GY				R 2019	Semester I	ES
Course)	Course Name	Ho V	ours Veel	/ (Credit	Total	Maximum	1
Code			L	Т	Р	С	Hours	Marks	
19ES10)4	PYTHON PROGRAMMING LABORATORY	0	0	2	1	30	100	
Course C The purpo The purpo To To Use Rea Course O At the end Writ Imp Dev Use Rea List of Ex Sun Ger Imp Crea Exp Imp	Dbjec Dse o write imple functor orese ad an Dutco d of the te, te bleme velop e Pyth ad an of t herati leme ate a lore s leme	etive (s): of learning this course is , test, and debug simple Pythonprograms. ement Python programs with conditionals and ctions for structuring Pythonprograms. ent compound data using Python lists, tuples, on d write data from/to files inPython. omes: his course, learners will be able to est, and debug simple Pythonprograms. ent Python programs with conditionals andloop Python programs step-wise by defining function hon lists, tuples, dictionaries for representing of d write data from/to files inPython. The set among three numbers without using the Digits of aNumber ion of PrimeNumbers ent a sequentialsearch a calculatorprogram stringfunctions ent SelectionSort	oops dictic oss. comp thirc	and o	es.	ngthem. a.			
 Rea Den Den Den Den Crea Platforms 	nd an nonst nonst nonst nonst ate C nee	d write into afile trate usage of basic regularexpression trate use of advanced regular expressions for trate use ofList trate use ofDictionaries Comma Separate Files (CSV), Load CSV files ded : Python 3 interpreter for Windows / Lin	data into i 1ux	valid nterr	atior nal D	n. ÞataStruc	ture		
TEXT BO	OK(S	5)				1995			
1,	Dav & H	vid Riley and Kenny Hunt, "Computational Thir all/CRC, 2014.	king	for t	he N	Nodern P	roblem So	olver", Chapm	an
2	Mich	hael Dawson ,"Python Programming for the A	osolu	ite B	egin	ner", 3rd	Edition, 2	2010.	
REFEREN	ICE(S)	Uctros						
1.	M. S Delł	Sprankle, "Problem Solving and Programming hi, 2011.	Con	cept	s", 91	th Edition	, Pearsor	education, N	lew
2.	Bria	n Heinold, "Introduction to Programming Usin	g Py	thon	',Mo	unt St. M	ary's Univ	versity, 2013.	
3.	Aller Scie	n Downey, Green Tea Press Needham, "Thin entist", Massachusetts.	k Pyt	hon,	Hov	v to Thinł	k Like a C	omputer	
	1/100		-	-			00		

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Department	INFORMATION TECH	INOLOG	GY		V	R 2019	Semester I EE
Course Code	Course Name		lour Wee	rs/ ek	Credit	Total	Maximum
		L	Т	P	С	Hours	Marks
19TPS01	SOFT SKILLS - I	1	0	1	1.5	30	100
Course Object	tive (s): The purpose of learning this	s course	is				
 To deve To enha To implied To deve To deve 	elop basic grammar knowledge inEn ance Speaking Skills inEnglish rove Verbal and Non-verbal Commu elop Confidence and EmotionalIntelli elop Inter PersonalSkills.	glish. nications igence	Skills	3			
Course Outco Have co Speak f Have go Handle Work in	omes: At the end of this course, learn ompetent knowledge ofgrammar fluent English by enriching Vocabula ood Presentation Skills through verb any Situation with confidence by be a team by having team coherence a	ners will ryKnowl al and n ing emo and deal	be a edge on ve tiona ing v	able t e. erba illysta vithp	io: Icommun able. eople.	ication.	
UNIT 1 Effe	ctive English – Written English						6
Basic rules of	Grammar - Parts of Speech - Tense	s – Verb	s.Se	enter	ice Const	ruction.Dia	alogues and
Conversations	- Writing. Exercises to practice and	improve	the	se si	KIIIS.		6
Vocabulary -	Idioms & Phrases - Synonyms-A	ntonym	s Dia	alogi	ies an	d Convers	ations –Writing
Exercises to p	ractice and improve theseskills.	untorrym	0.010	loge	un an	u convore	adono mining.
UNIT 3 Art o	of Communication & The Hidden I	Data Inv	olve	d			6
Verbal Comm Non Verbal Co Importance of	unication - Effective Communication ommunication - Body Language of feelings in communication - dealing	n - Activ self and with feel	e list othe ings	enin ers. in co	g –Parap ommunica	hrasing – I ation.	Feedback.
UNIT 4 Wor	Id of Teams – Part -01						6
Self Enhancen	nent - importance of developing asse	ertive ski	lls- c	level	oping sel	f confiden	ce – developing
emotional intel	ligence.						6
Importance of	Team work - Team vs. Group - Attril	hutes of	2 511	ICCAS	sful team	– Barrier	s involved
Working with G	Groups – Dealing with People- Group	Decisio	n Ma	aking).].	Damon	o mitoritoù
 REFERENCES 1. The Seventian 1. The Seventian 1. The Seventian 2. All the box 3. Man's seventian 3. Man's seventian 3. Goal - El 6. Working 7. Excel in 1 8. Developinan 10. Effective 11. "Strateginan 11. "Strateginan 11. "Strateginan 11. "Strateginan 11. "Strateginan 11. "Effective 12. "Effective 	i: en Habits of Highly Effective People ooks in the "Chicken Soup for the So arch for meaning – ViktorFrankl itest miracle in the world – OgMandir iyahuGoldratt. with Emotional Intelligence - DavidG English – Sundra Samuel, SamuelPr ng Communication Skills by Krishna Is of Effective Communication, Ludio Presentation Skills (A Fifty-Minute S c interviewing" by Richaurd Camp, M India Pvt.Ltd	- Stephe ul"series no Goleman ublicatio Mohan w and F Series Bo lary E. V	en R s. and anth ook) /ielha	Mee non; I by S aber	ey. ra Banerj Prentice I teveMano and Jack	i; MacMilla Hall ofIndia del L. Simon	an India Ltd.,Delh a. etti – Published



Department	INFORMATION TECHNOLOG	Y				R 2019	Semester I E
Course	Course Name	ŀ	loui We	rs / ek	Credit	Total	Maximum
Code		L	Т	Ρ	С	Hours	Marks
19ES105	COMPUTER HARDWARE SERVICING AND INSTALLATION LABORATORY	0	0	2	1	30	100
Course Obje The purpose • To und • To ide • To app • To inte applica • To per Course Outo At the end of • Explain • Classif • Unders • Unders	ective (s): of learning this course is derstand the basic concepts & structure of comp ntify the existing configuration of the computers by their knowledge about computer peripherals grate the PCs into Local Area Network & re-ins ations. form routine maintenance andupgrades. comes: this course, learners will be able to: n how a PC works, and understand the relations y and explain the function of different computer stand purpose and functions of an operatingsyst stand the purpose and functions of the computer stand diagnostic procedures and troubleshooting	hip hip har bar bar bar bar bar bar bar bar bar b	r hai Iperi Ienti oper betv dwa	rdwar pher ify/re rating ween reco erals. ques	re &netwo als. ctify prob systems hardware mponents	e andsoft	oard. ous Shipboard ware. uters, portable
2 Form Fac 3 Processo 4 PC Repairs 5 Hard disk 6 Installing 7 Upgrading 8 Installing 9 Installing 10 Installing 10 Installing 11 Install and sharing files 12 Install and 13 Securing EXT BOOK 1. Scott Mu 2. Mike Me	 Individual e & Operating Oystems Individual e & Maintaining States Individual e & Maintaining Windows OS Individual e & Maintaining Windows Individual e & Ma	S, Li Scal nall	nux pee QU rouk	Drive r-to-j IE, P	ers beer netw earson E ooting PC	ork for ducation,	New Delhi, 2015. Edition, Tata
McGraw	Hill, 2019 E(S)					2 Send	
1. Ron Gils	ter, "PC Hardware – a beginner's guide" – Tata	Mc	Grav	w Hill	, 2001	1.1	
2. Govinda McGraw	raju B. "IBM PC and Clones: Hardware, Trouble Hill Pub. Co., New Delhi,2002	Sh	ootii	ng ar	nd Mainte	nance", 2	^{2nd} Edition, Tata

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Department	INFORMATION TECH		R 2019	Semester I	BS			
Course Code	Course Name	Ho	ours /eek	1	Credit	t Total	Maximum	1
4000405		L	Т	P	С	Hours	Marks	
1985105	CHEMISTRY LABORATORY	0	0	4	2	60	50	

Course Objective (s): The purpose of learning this course is to

• Determination of total, temporary & permanent hardness of water by EDTAmethod.

- Determination of chloride content of water sample by Argentometricmethod.
- Estimation of iron content of the given solution usingpotentiometer.
- Determination of strength of given hydrochloric acid using pHmeter
- Conductometric titration of strong acid vs strongbase.

Course Outcomes: At the end of this course, learners will be able to

- Make the student to acquire practical skills in the determination of water quality throughvolumetric analysis.
- Acquire the knowledge about chloride content in watersample.
- Make the student to acquire practical skills about strength of iron using potentiometric titrations.
- Understand the how to estimate hydrochloric acid in water sample using pHmeter.
- Gain the knowledge about conductance ofions.

Exp No.	Name of Experiments (Any Ten)
1	Determination of Total, Temporary & Permanent hardness of water by EDTA method.
2	Determination of chloride content of water sample by Argentometric method.
3	Determination of Dissolved oxygen content in water sample using Winklers Method
4	Determination of Alkalinity in WaterSample
5	Determination of strength of given hydrochloric acid using pH meter.
6	Determination of strength of acids in a mixture of acids using conductivity meter.
7	Conductometric titration of Weak acid vs Weak base.
8	Estimation of iron content of the given solution using potentiometer.
9	Conductometric titration of strong acid vs strong base.
10	Determination of Molecular weight of polyvinyl alcohol using Ostwald viscometer
11	Estimation of iron content of the water sample using spectrophotometer
12	Estimation of Copper in Brass

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Department	INFORMATION TECHNO	LOC	θY			R 2019	Semester II	BS
Course Code	Course Name	1	lour Wee	s/ k	Credit	Total Hours	Maximu Marks	m
19BS201	VECTOR CALCULUS AND COMPLEX VARIABLES	3	1	0	4	60	100	-
Course Obj Summ princip Implem electro	ective (s): The purpose of learning this countries and apply the methodologies involved bles of Calculus viz: Vector, Vector Different ment the Complex Analysis, an elegant met batatics.	rse d in s tiatic hod	is to solvi on ar in th	ng p nd Ve ie sti	roblems ectorInteg udy of he	related to gration. at flow, flu	fundamental uid dynamics	and
Develor approp Definition Course Out	op enough confidence to identify and model priate solutions, using the skills learned in the ng a complex function and solving through a comes: At the end of this course, learners	l ma neir com will b	then inter plexi pe al	natic activ nteg ole to	al patterr e and su ration o:	ns in real v pportinge	world and offe nvironment.	ər
 Chara Apply Recog Identif Use the 	cterize the calculus ofvectors. the theoretical aspects of vector integral ca nize the differentiation properties of comple y the complex functions and their mapping e concepts of integration to complex function	Iculu exfur in ce ons i	is in nctio ertair in ce	thei ns. n cor	⁻ coreare nplexplar regions.	as. nes.		
Unit I DIF	FERENTIATION OF VECTORS							12
Vector point f	unction- Directional derivative - Gradient -D	Diver	gen	ce -C	Curl - Sole	enoidal –	Irrotational ve	ector
fields –Scala	potential							140
	Line Integral Surface integral Creen's th	oor	in in		lana Sta	ko'o Thor	rom Course	12
divergence th	eorem- Applications involving cubes and p	arall	elen	ined	lane- Slu	kes med	Jeni- Gauss	
	ALYTIC FUNCTIONS	aran	cicp	ipeu				12
Analytic Function - Def	tions- Necessary and Sufficient conditions remination of Analytic Function using Milne Potential Flow	of A Tho	naly	tic Fi son r	unction- I nethod -/	Properties Applicatio	s of Analytic ns to the	
	PPING OF COMPLEX FUNCTIONS	1	T					12
Conformal ma multi valued f	apping- Application of transformation: transl unctions - Linear fractional Transformation	latio (Bili	n, ro near	tatio tran	n, magni sformatio	fication ai	nd inversion o	of
Jnit V CO	MPLEX INTEGRATION							12
Cauchy's Fur Classification	idamental Theorem - Cauchy's Integral For of Singularities - Cauchy's Residue Theore	mula em	a - T	aylor	's and La	aurent's s	eries-	
REFERENCI	E(S):							
1. Erwin K Limited	reyszig , Advanced Engineering Mathemati New Delhi 2015	CS,	lent	h Ed	ition, Wil	ey India F	Private	
2. C. Ray HillPubl	vvylle and C. Louis Barrett, Advanced Engil ishing Company Ltd, 2003	neer	ing	Math	ematics,	Tata McC	sraw-	
3. J. A. Br Hill,Nev	own and R. V. Churchill, Complex Variables / Delhi, 1996	san	d Ap	plica	itions , Si	ixth Editio	on, McGraw	
4. PeterV. Private	O.Neil,AdvancedEngineeringMathematics,E Limited,2018	Eigh	th		Editior	n ,Cengag	ge Learning Ir	ndia
5. Glyn Ja	mes, Advanced Engineering Mathematics,	Thir	d Ed	lition	Wiley In	dia,2007		

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			LUG	1		Total	Semester II	BS
Course Code	Course Name		łour Wee т	s/ k	Credit	Total Hours	Maximun Marks	ı
19BS204	PHYSICS FOR INFORMATION	3.	0	0	3	45	100	
 To understand properties. Become profiles. Become profiles. Become profile Understand Know the ap Course Outcom Acquire knowled Gain knowled Have the neise Understand Understand Init I SEMIC Introduction- typendirect band gesemiconductors 	ficient inmagnetic ficient in super conducting the optical properties ofmaterials plications of Nanomaterials incompute nes: At the end of this course, learners weldge on basics of semiconductor pl dge on magnetic properties of materials adge on super conducting materials are ecessary understanding on the function the basics of nanomaterials and carb CONDUCTOR PHYSICS bes of semiconductors - Intrinsic Sei gap semiconductors - Carrier com - Carrier concentration in N-type & P-	er s will b hysics and qua ning o onnan micono centra -type s	be ab and thei antur f opt ducto tion emic	ole to its ap rappli ncom ical m es.	pplication cations puting naterials f Energy ntrinsic s ictors – H	s in vario oroptoele band dia semicond	usdevices, ectronics, gram – direc uctors – ex theory (n-typ	9 st au trins e au
Agnetism in n usceptibility–typ erromagnetism naterials-Ferrite	naterials – magnetic field and induc bes of magnetic materials – mic	ction - crosco	- ma pic	agnet class	ization -	magnetion of mag	c permeabilit	/ ar
line and meaning	s-applications-magnetic recording an	nd rea	dout	eory, -stora	Hysteres age of m	sis, soft a agnetic c	and hard ma lata-Tapes, F	als gnet lopp
disc and magnet	s-applications-magnetic recording an ic disk drives and GMR	nd rea	dout	eory, -stora	Hysteres age of ma	agnetic o	and hard ma lata-Tapes, F	als gnet lopp 9
disc and magnet Jnit III SUPE Introduction-supe Fype I & Type evitation and SC Jnit IV OPTIC Classification of	s-applications-magnetic recording an tic disk drives and GMR R CONDUCTING MATERIALS er conducting phenomena-Properties II super conductor, High TC super co QUIDS- super conducting computing-q AL MATERIALS optical materials – carrier generation a	of su conduc juantu	per o	eory, -stora condu Applicomput	age of ma actors-Me cations of ing (quality on proces	sis, soft a agnetic c sissner ef f super c itative co sses - Ab	ffect-isotope of conductor-Ma ncepts)	als gnet lopp 9 effec gnet 9 sior
disc and magnet Unit III SUPE ntroduction-sup Type I & Type evitation and SC Jnit IV OPTIC Classification of andscatteringofli uminescence - Blu ray-DVDRAM Init V NANC	s-applications-magnetic recording an tic disk drives and GMR R CONDUCTING MATERIALS er conducting phenomena-Properties II super conductor, High TC super of QUIDS- super conducting computing-q AL MATERIALS optical materials – carrier generation a ghtinmetals,insulatorsandSemiconductor Flourescence and phosphorescence - A ELECTRONIC DEVICES	of su conduc juantu and re ctors(c - LCD,	per o ctor-/ m cc once Opt	condu Applicomput binati ptsori	age of ma actors-Me cations o ing (quali on procea nly)-Excit torage de	sis, soft a agnetic c sissner ef f super c itative co sses - Ab tons-Tra evice-CD	ffect-isotope e conductor-Man ncepts) psorption emis ps– ROM-DVD R	als gnei lopp 9 effec gnet 9 sior OM- 9
disc and magnet Unit III SUPE ntroduction-sup Type I & Type evitation and SC Unit IV OPTIC Classification of andscatteringofli uminescence - Blu ray-DVDRAM Unit V NANO ntroduction – Na Applications of lectron transisto achnique- Prope	s-applications-magnetic recording an tic disk drives and GMR R CONDUCTING MATERIALS er conducting phenomena-Properties II super conductor, High TC super of 20IDS- super conducting computing-q AL MATERIALS optical materials – carrier generation a ghtinmetals,insulatorsandSemiconduc Flourescence and phosphorescence - <i>A</i> ELECTRONIC DEVICES anomaterials-Synthesis-physical vapo nanomaterials- 3D printers-magnetic r-DNA computing- Carbon nanotubes rties and applications	of su conduc juantu and re ctors(c - LCD, our dep c sen : prepa	per o ctor-/ m cc once Opt	eory, -stora condu Applicomput binati eptsor ical s ical s	Aysteres age of ma uctors-Me cations or ing (quali on proces nly)–Excit torage de uantum c ors– spir nemical V	sis, soft a agnetic c sissner ef f super c itative co sses - Ab tons–Tra evice-CD onfinement onfinement apour De	ffect-isotope e conductor-Ma ncepts) sorption emis ps- ROM-DVD R ent - quantur - Nanobots-S eposition	als gnet lopp 9 effec gnet 9 sior OM- 9 n dc Sing

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TEX	(T BOOK(S):
1.	Jasprit Singh, —Semiconductor Devices: Basic PrinciplesII, Wiley 2012.
2.	Kasap, S.O. — Principles of Electronic Materials and DevicesII, McGraw-Hill Education, 2007.
3	Kittel, C. —Introduction to Solid State PhysicsII. Wiley, 2005.
REF	ERENCE(S):
1.	Garcia, N. & Damask, A. — Physics for Computer Science Students. Springer-Verlag, 2012.
2.	Hanson, G.W. —Fundamentals of Nanoelectronics. Pearson Education, 2009
3.	Rogers, B., Adams, J. & Pennathur, S. — Nanotechnology: Understanding Small Systems. CRC Press, 2014

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Department	INFORMATION TECHN	OLO	GY			R 2019	Semester II MC
Course Code	Course Name	H	ours Veek	/	Credit	Total Hours	Maximum Marks
19MC201	ENVIRONMENTAL SCIENCE AND ENGINEERING	3	0	0	0	45	100
19MC201 Course Obje • Study ti • Finding problem • Apply ti • Study ti manage Course Outc • Extend preserv • Outline the futu • Explain of natur • Find the harvesti • Develop extend types of ecosy value of biodiv biodiversity -T Conservation of Unit II ENV Pollution: Cau Noise pollution wastes - Role landslides. Unit III NA	ENVIRONMENTAL SCIENCE AND ENGINEERING ctive (s): The purpose of learning this con- the nature and facts aboutenvironment. and implementing scientific, technologions. The types of natural resources and the indi- the knowledge to various social issues by the integrated themes and biodiversity, mement. omes: At the end of this course, learner their knowledge in maintaining ecological ation ofbiodiversity. the role of human being in maintaining a regenerations. the constituents of environment, precioural alresources. a role of government and Non-Government ingtechniques. b their awareness about population grow their knowledge in role of information techniques. b their awareness about population grow their knowledge in role of information techniques. b their structure and functions of fores versity - consumptive use-productive use intreats to biodiversity - Habitat loss - of biodiversity - In-situ and Ex-situ conse VIRONMENTAL POLLUTION ses - effects and control measures of A a - Solid waste management - Causes - of an individual in prevention of pollut TURAL RESOURCES the - Use-over exploitation -deforestation	3 ourse cal ar dividu / undo atura s will al bala a clea us res ent or th, Fa chnolo e - so poa ervatio - so poa ervatio - otien - - Wa	0 is to al rol ersta l resc be al ance be al ance ganiz ganiz ganiz ganiz ganiz ching ogy ir ness ad de syste ching on. Disa	0 onon e in ding ource and viron es in cation plan cation plan com a com a - co com a - co com a - co com a - co com com a - co com com a - co com com com com com com com com com c	0 nic solution conserving the envises, pollution or make us ment and the envion the envi	45 ons to env ironmenta on control e of their d useful en ronment a blain the v gramme a t & humar f an ecos Food cha ecosyster sthetic val and man ollution - ures of urb ements -	100 vironmental ources. al legislationlaws. and waste knowledge in the hvironment for and conservation various rain water and HIV/AIDS and hhealth. 10 ystem - Structure ains- food webs - m - Biodiversity - ues - Hotspots of wildlife conflicts. 8 Soil pollution and ban and industrial Floods - cyclone- 9 ization of surface
and ground wa extracting and agriculture - Ef energy sources an individual in Unit IV SOC	ater - conflicts over water - Mineral results using mineral resource - Food resound fects of modern agriculture - fertilizer- p s - solar energy - wind energy. Land resources. CIAL ISSUES AND THE ENVIRONMEN	sourc irces bestic sourc	e - u - wo ide p :es -	ise-e rid f roble land	exploitatio ood prol ems - En degrada	on-environ olems cha ergy reso tion - soil	imental effects of anges caused by urce - Renewable erosion - Role of 9
Sustainable & climate change (Prevention ar Chemistry – 12 Unit V HUM	Unsustainable development-Water cons e-global warming - acid rain - ozone la nd control of pollution) Act - Water (p Principles of Green chemistry – Applica IAN POPULATION AND THE ENVIRO	ervat ayer prevention NME	ion - deple ntion of Gr NT	rain etion and een	water ha - Enviro l control chemistr	arvesting (onment pr of pollut y.	roof top method)- otection act - Air ion) Act - Green
							8. gm.

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Population growth - variation among nations - Population explosion & its consequences - Family, child, women welfare programmes - Human rights - HIV/AIDS - Human health and environment - Role of information technology in environment and human health.

TEXT BOOK(S): Anubha Kaushik and C.P. Kaushik, Environmental Science and Engineering, New Age 1. International Publishers, New Delhi(2015) 2. Dr. A.Ravikrishan, Environmental Science and Engineering., Sri Krishna Hitech Publishing co. Pvt. Ltd., Chennai, 12th Edition (2016) **REFERENCE(S):** Masters, Gilbert M, -Introduction to Environmental Engineering and Sciencell, Second Edition, 1. Pearson Education, New Delhi (2012). Santosh Kumar Garg, Rajeshwari garg, smf Ranjni Garg — Ecological and EnvironmentalStudiesl 2. Khanna Publishers, NaiSarak, Delhi (2014). R.K. Trivedi, "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standard", 3. Vol. I and II, Enviro Media. Dharmendra S. Sengar, "Environmental law", Prentice Hall of India PVT LTD, New Delhi, 2007. 4. 4. Rajagopalan, R, "Environmental Studies-From Crisis to Cure", Oxford University Press 2005 Cunningham, W.P. Cooper, T.H. Gorhani, "Environmental Encyclopedia", Jaico Publ., House, 5. Mumbai, 2015.

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Departmen	INFORMATION TECH	NOLO	GY			R 2019	Semester II H
Course	Course Name	H V	ours Veek	/ (Credit	Total	Maximum
Code		L	Т	Р	С	Hours	Marks
19HX201	ENGLISH FOR ENGINEERS	3	0	0	3	45	100
 To a offex To de offex To el offex To el offex To el offex To de offex T	quire the usage of grammar in Englishla velop listening skills which will enable to s. hance the reading skill to comprehend prove writing skills to express thoughtst velop speaking skills to speak fluently i comes: At the end of this course, learned ove their language usage in LSRWskills lop listening skills to understand senter ire the ability to understand different wr nce the writing skills to express the idea municate fluently in pair /team. IGUAGE FOCUS & Passive) - Reported speech - Condition TENING	angua o liste techni freely. n reak ers will s. nce str ittente as of t	ge. n lec calw conte l be a ess a xxts. helea - Col	tures riting exts. able andir arne	s and col is. to: ntonatior rs. ions - Di	mprehen ns. iscourse	nd different types
istening for	pecific information – Identifying senten	ce stre	ess -	Rhy	thm - Int	onation	ding the second
Jnit III RE	ADING						9
Reading grap	ns and charts - Skimming and scanning	texts	- Ide	entify	ing topic	c senten	ces -
Jnit IV WF	ITING		2				9
lob Application	n, Letter and Resume - Recommendati (book and movie) - Transcoding (inter	ions - rpretin	Repo g cha	ort w arts a	riting (ac & diagra	ccident a ms)	nd survey) -
Jnit V SP	AKING						9
Collaborative anguage Fu and opinions EXT BOOK	task - Turn taking (initiating and respon actions: suggesting - comparing and co S):	ding a ntrasti	ng -E	priat Expre	ely) - Ne essing - 1	egotiating finding o	g - Exchanging - ut facts, attitudes
1. Community Communis Community Community Community Community Community Community Comm	cative English by KN Shoba ,Lourdes . Revised Edition2018 (S):	Joavar	nRay	/en F	Jublishe	d by Car	nbridge
1 Jeremy Develo 2002.	Comfort, Pamela Rogerson, Trish Stot bing Speaking Skills for Business Englis	t, and sh, Ca	Dere mbri	ek Ut dge:	ley, Spe Cambrid	aking Ef dge Univ	fectively and ersity Press,
2 Eric H. Purpos	Glendinning and Beverly Holmstrom, Ses. United Kingdom: Cambridge Univer	tudy R sity Pr	eadi ess,	ng: /	A Course 4.	e In Read	ding for Academi
3 Murphy Interme	, Raymond. English Grammar in Use – diate learners Of English .lved. United	A Self Kingdo	f-Stu om: (dy R Cam	eference bridge U	e and Prant Pra Prant Prant Pra Prant Prant Prand Prant Pran	actice Book For Press. 2012.
4 Seely, Univers	ohn. Oxford Guide to Effective Writing ity Press. 2005.	and S	peak	ing.	Indian e	d. New [Delhi: Oxford

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Chairman - BoS Dept. of English - ESEC

& SM.

Chairman - BoS Dept. of IT - ESEC

Department	INFORMATION TEC	CHNOLOG	GΥ			R 2019	Semester II H
Course	Course Name	Н	our: Wee	s / ek	Credit	Total	Maximum
Code		L	Ť	. P	С	Hours	Marks
19HX202	HINDI	3	0	0	3	45	100
Course Objective (• Help studen • Understand • Understand	s): The purpose of learning th ts to acquire the basics ofHind theNouns Pronouns andtenses the differentyocabulary	is course li	is to		~		
 Speak inHin 	d						
Use Nouns i Communicat Clarity on the Use Properv Unit HINDLALE	n speaking and wrting e effectively with Improved flu e basic sounds of the Hindilan ocabulary	ency inHir guage	ndi				9
Genders (Masculin	& Feminine Nouns ending	in a ei	0 11)- A	lasculine	& Femi	nine - Reading
Exercises. Introduct	ion - Vowels - Consonants - F	Plosives -	Fric	ative	s - Nasa	sounds -	- Vowel Signs -
Chandra Bindu& Vis	arg -Table of Alphabet-Vocab	ulary.					
							10
				> .		0	9 Na Daadian
Genders (Masculine	3 & Feminine Nouns ending	in a ,e,i,	o, u	,)- N	lascuine	& remin	nine - Reading
	JNS AND TENSES	1.1.5	_	_			9
Categories of Prono	uns - Personal Pronouns - Se	econd pers	son (you	& honori	fic) - Defin	nite & Indefinite
pronouns - Relative	pronouns - Present tense - Pa	ast tense -	Futi	ure te	ense - As	sertive &	Negative
Sentences - Interrog					1.0	1000	9
IV	IED VOOADULAI(I						Ŭ
Parts of body - Rel	atives - Spices- Eatables- Fr	ruit & Veg	etak	oles	- Clothes	s - Direct	ions-Seasons -
Professions.			-0				9
Model Sentences - S	Speaking practice for various of	occasions					0
TEXT BOOK(S)	produce for famous of		-		- Aline along		and the second second
Elementary Hin	di: Learn to Communicate in F	-vervday 9	Situa	tions	by Rich	ard Delac	v Tuttle
1. Publication 201	3	_veryddy c	Jitua	tione	by Rione	ard Delde	y Tuttio
2 Colloquial Hind	: The Complete Course for Be	eginners by	у Те	j K. I	3hatia	1.5.2	All and a second
REFERENCE(S):					1.1.1	inter la sa	
1 B. R. Kishore, (P) Ltd., New [Self Hindi Teacher for Non-Hi Delhi, 2009	indi Speak	king	Peop	ole, Vee I	Kumar Pu	blications
2 Syed, Prayoja	n Mulak Hindi, Rahamathullah	Vani Prak	asa	n, Ne	ew Delhi,	2002.	Land I.
3 Ramdev, Vyak	aran Pradeep, Saraswathi Pra	akasan, Va	arana	asi, 2	2004.		

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	INFORMATION TECHNO	LOC	GY			R 2019	Semester II	HS
Course	Course Name	H	ours Wee	s / k	Credit	Total	Maximun	n
Code		L	Т	Ρ	С	Hours	Warks	
19HX203	JAPANESE	3	0	0	3	45	100	
Course Obje To help To teac To teac	ctive (s): The purpose of learning this cou students acquire the basics of Japanesel th them how to converse in Japanese in va th the students the Japanese cultural face	ang ariou ariou	is to uage usoce nd so	e casio	ons etiquette			
Course Outc Improve Clarity Propen	omes: At the end of this course, learners ed fluency inJapanese on the basic sounds of the Japaneselangu vocabulary	will lage	be al	ole to	o commu	nicate effe	ectively with:	
Jnit I Int	roduction				in second			9
/ocabulary (2 Jnit II Vo ntroduction - N1 no N1 - so no N2 - Kanji- N1(Time) ne Numbers) - Di Jnit III No	5 Numbers) - Phonetic and semantic reser cabulary & Grammar 語彙と文法 Kore - Sore - are - Kono N1 - Sono N1 - des ka ' koko - soko - asoko - kochira - s 10 - imaji-fun des - Introduction of verb - V - N1 kara N2 des - N1 tho N2 / S n ctionary Usage.	ano och V m e K	N1 ira - as - anji-	- so achi V ma 10 -	des - so ra - N1 w asen - V Technic	jaarimase a N2 (Pla mashitha- al Japane	en - S1 ka - S2 ce) des - dhok V masendeshi se Vocabulary	9 ka o-N tha- (2
kimasu - kima voshimus - Na ool - means)	kimas - ki mas - kayerimasu - Dhoko ye asu - kayerimasu - N1(Personal or Anima aniwoshimasuka - Nan & Nani - N1(Place) de V - Word / Sentence wa go nan des	moi al) th de ka	kima no V V - V - N1	isen iths √ ma	- ikimase u - S yo. asenka - ` erson) ne	endheshiti - N1 wo V masho - e agemus	ha - N1(vehicle V (Transitive) · Oo. Kanji-10 - N1(Person	9 - N , N1) ne
kimasu - kima voshimus - Na ool - means) noraimus - mo apanese Voc	kimas - ki mas - kayerimasu - Dhoko ye asu - kayerimasu - N1(Personal or Anima aniwoshimasuka - Nan & Nani - N1(Place) de V - Word / Sentence wa go nan des o V shimashitha - , Kanji-10 - Japanese Ty abulary (25 Numbers)	moi al) th de ka pev	kima no V V - V - N1 vriting	iths / ma / ma (Pe g usi	- ikimase u - S yo. asenka - ` arson) ne ing JWPC	endheshitl - N1 wo V masho - e agemus CE Softwa	ha - N1(vehicle V (Transitive) - Oo. Kanji-10 - N1(Person re, Technical	9 - N , N1) ne
kimasu - kima voshimus - Na ool - means) noraimus - mo lapanese Voc Jnit IV Voc	kimas - ki mas - kayerimasu - Dhoko ye asu - kayerimasu - N1(Personal or Anima aniwoshimasuka - Nan & Nani - N1(Place) de V - Word / Sentence wa go nan des o V shimashitha - , Kanji-10 - Japanese Ty abulary (25 Numbers) cabulary & Grammar 語彙と文法	moi al) th de ka pev	kima no V V - N - N1 vriting	iths / ma / ma (Pe g usi	- ikimaso u - S yo. asenka - ` arson) no ing JWPC	endheshit - N1 wo V masho - e agemus CE Softwa	ha - N1(vehicle V (Transitive) - Oo. Kanji-10 - N1(Person re, Technical	9 - N , N1) ne 9
kimasu - kima woshimus - Na ool - means) noraimus - mo lapanese Voc Jnit IV Voo ntroductionto/ N1 wadho d jasukimasu - ukoshi - ama masu-N1waN (anji-10 - Jaj lumbers)	kimas - ki mas - kayerimasu - Dhoko ye asu - kayerimasu - N1(Personal or Anima aniwoshimasuka - Nan & Nani - N1(Place) de V - Word / Sentence wa go nan des o V shimashitha - , Kanji-10 - Japanese Ty abulary (25 Numbers) abulary & Grammar 語彙と文法 Adjectives-N1wanaadjdes.N1waiiadjdes-na es ka - N1 wadhonna N2 des ka - S1 k N1 gakiraimasu - jozu des - hetha des - d ri - zenzen - S1 kara S2 - dhoshithe, N1 2(Place)nearimasu-iimasu-N1(Person,Pla banese Dictionary usage using JWPCE	moi al) th de ka pew aadj a S hon ga ce,c Sc	kima No V - N1 vriting naN 2 - c na N arima orThi oftwa	iths / ma / ma (Pe g usi 1-iiae Ihore 1 - l asu ng)n re,	- ikimase u - S yo. asenka - ' arson) ne ing JWPC djiiN1-The - N1 ga Jsages o - imasuN oN2(Pos Technica	endheshitl - N1 wo V masho - e agemus CE Softwa othemo-ar aarimasu f yoku - dl 1(Place) ition)-N1y I Japanes	ha - N1(vehicle V (Transitive) - Oo. Kanji-10 - N1(Person re, Technical mari - wakarimasu haithai - thakus ne N2 gaarima aN2, se Vocabulary	9 - N , N1) ne 9 - N ⁴ san asu (25
kimasu - kima voshimus - Na ool - means) noraimus - mo Japanese Voc Jnit IV Voo ntroductionto/ N1 wadho d gasukimasu - sukoshi - ama imasu-N1waN (anji-10 - Jaj Numbers) Jnit V Ro	kimas - ki mas - kayerimasu - Dhoko ye asu - kayerimasu - N1(Personal or Anima aniwoshimasuka - Nan & Nani - N1(Place) de V - Word / Sentence wa go nan des o V shimashitha - , Kanji-10 - Japanese Ty abulary (25 Numbers) abulary & Grammar 語彙と文法 Adjectives-N1wanaadjdes.N1waiiadjdes-na es ka - N1 wadhonna N2 des ka - S1 k N1 gakiraimasu - jozu des - hetha des - d ri - zenzen - S1 kara S2 - dhoshithe, N1 2(Place)nearimasu-iimasu-N1(Person,Pla banese Dictionary usage using JWPCE	moi al) th de ka ppew aadj a S hon ga ce,c	kima no V - N1 vriting naN 2 - c na N arima prThi	asen iths / ma (Pe g usi 1-iia lhore 1 - L asu ng)n re,	- ikimase u - S yo. asenka - ' erson) ne ing JWPC djiiN1-The e - N1 ga Jsages o - imasuN oN2(Pos Technica	endheshit - N1 wo V masho - e agemus CE Softwa othemo-ar aarimasu f yoku - d l1(Place) ition)-N1y I Japanes	ha - N1(vehicle V (Transitive) - Oo. Kanji-10 - N1(Person re, Technical mari - wakarimasu haithai - thakus ne N2 gaarima aN2, se Vocabulary	9 ⇒) da - N' , N1) na 9 - N' san asu (25 9

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Depa	artment	INFORMATION TECH	NOLO	GY			R 2019	Semester II	HS
Co	urse	Course Name	H	lours Wee	s / k	Credit	Total	Maximum	1
	ode		L	Т	P	С	Hours	Warks	
19H	HX204	FRENCH	3	0	0	3	45	100	
Cour •	rse Objec To help To teach	tive (s): The purpose of learning this students acquire the basics of French them how to converse in French in v	course nlangua /ariousc	is to ge occas	sions				
Cour	se Outco	mes: At the end of this course, learn	ers will	be a	ble to	o:			
•	The stud French.	ents will become familiar with the bas	sics of F	Frend	ch la	nguage	and start	conversing in	
Unit I	Alph	abet Français	5				and the second		6
Alpha	bet Fran	cais (alphabets) - Les Accents Fra	ançais ((the	acce	ents in	French)	- aigu - gra	ve -
de iou	iflexe - tre	macedille - ecrire son nom dans le fi	rançais	(spe	elling	one -sna	ime in Fre	encn) - Les n	oms
Unit		abara month 8 year (Nombra mai	o ot opp	(co)					6
Los n		ois de l'année (Months) - Numéro 1 é	5 et ann	lumb	ore	1 to 100	GRAMM		0
LC3 II	ullis de lli			(UIII)	013	1 10 100			
:Coniu	ugaison								
:Conju Unit I	ugaison II Lan	guage Skills & Grammar (Compéte	nces lin	guist	tique	s et grai	nmaire)		10
:Conju Unit I Moyer	ugaison II Lan ns de tra	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot	nces lin fessions	guist s (Pr	tique rofes	s et grai sions) -	nmaire) Nomsd'e	endroitscomm	10 nuns
:Conju Unit I Moyer (Place	ugaison II Lan ns de tra es) - Nat	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER	nces lin fessions : (Liste	guist s (Pr ning	tique rofes) Éc	s et grai sions) - couter 1	nmaire) Nomsd'e - alphab	endroitscomm et associéà	10 nuns des
:Conju Unit I Moyer (Place préno	ugaison II Lan ns de tra es) - Nat msfrançai	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (nces lin fessions : (Liste (Speakii	guist s (Pr ning ng)P	tique rofes) Éc résn	s et grai sions) - couter I tation -	nmaire) Nomsd'e - alphab même /F	endroitscomm et associéà Présentez - V	10 nuns des /ous
:Conju Unit I Moyer (Place préno (Introd	ugaison II Lan ns de tra es) - Nati msfrançai ducingone	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples	nces lin fessions : (Liste (Speakii	guist s (Pr ening ng)P	tique rofes) Éc résn	s et gran sions) - couter I tation -	nmaire) Nomsd'e - alphab même /F	endroitscomm et associéà Présentez - V	10 nuns des /ous
:Conju Unit I Moyer (Place préno (Introc Unit I	ugaison II Lan ns de tra es) - Nat msfrançai ducingone V Gran	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire)	nces lin fessions : (Liste (Speakii	guist s (Pr ening ng)P	tique rofes) Éc résn	s et grai sions) - couter 1 tation -	nmaire) Nomsd'e - alphab même /F	endroitscomm et associéà Présentez - V	10 nuns des /ous 12
:Conju Unit I Moyer (Place préno (Introd Unit I Prono Femin	ugaison II Lan ns de tra es) - Nati msfrançai ducingone V Gran oms (Pro	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbe	nces lin fessions : (Liste (Speakii ns et s)COUT	guist s (Pr ning ng)P de FR	tique rofes) Éc résn ferr	s et gran sions) - couter I tation - mme (C	nmaire) Nomsd'e - alphab même /F ommon er les pr	endroitscomm et associéà Présentez - V masculine noms - Obse	10 nuns des /ous 12 and
:Conju Unit I Moyer (Place préno (Introc Unit I Prono Femin les de	ugaison II Lan ns de tra es) - Nat msfrançai ducingone V Gran oms (Pro ninenouns essins et c	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro	nces lin fessions : (Liste (Speakii ns et s)COUT ofilsd'uti	guist s (Pr ning ng)P de ER lisate	tique rofes) Éc résn ferr :cou	s et gran sions) - couter I tation - nme (C ter et cr d'interlin	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLEF	10 nuns des /ous 12 and rver
:Conju Unit I Moyer (Place préno (Introc Unit I Prono Femin les de :Parle	ugaison II Lan ns de tra es) - Nat msfrançai ducingone V Gran oms (Pro ninenouns essins et c r de savill	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro e - Parler de sa profession	nces lin fessions : (Liste (Speakii ns et s)COUT ofilsd'uti	guist ning ng)P de ER lisate	tique rofes) Éc résn ferr :cou eurse	s et grai sions) - couter I tation - nme (C ter et cr d'interlin	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLEF	10 uns des /ous 12 and rver
:Conju Unit I Moyer (Place préno (Introc Unit I Prono Femin les de :Parle Unit V	ugaison II Lan ns de tra es) - Nati msfrançai ducingone V Gran oms (Pro ninenouns essins et c r de savill / Spea	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro e - Parler de sa profession iking & Writing (Parler et écrire)	nces lin fessions : (Liste (Speakin s) cout ofilsd'uti	guist ning ng)P de ER llisate	tique rofes) Éc résn fem :cou	s et gran sions) - couter I tation - nme (C ter et cr d'interlin	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLEF	10 nuns des /ous 12 and rver
:Conju Unit I Moyer (Place préno (Introd Unit I Prono Femin les de :Parle Unit V Narrat	ugaison II Lan ns de tra es) - Nat msfrançai ducingone V Gran oms (Pro ninenouns essins et c r de savill V Spea tion de so	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro e - Parler de sa profession iking & Writing (Parler et écrire) n nom et l'endroitoù on vit - Son âge	nces lin fessions : (Liste (Speakin s)COUT ofilsd'uti et date	guist ening ng)P de ER llisate	tique rofes) Éc résn fem :cou eurso aissa	s et gran sions) - couter I tation - ime (C ter et cr d'interlin	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLER	10 nuns des /ous 12 and rver
:Conju Unit I Moyer (Place préno (Introd Unit I Prono Femin les de :Parle Unit V Narrat téléph	ugaison II Lan ns de tra es) - Nati msfrançai ducingone V Gran oms (Proninenouns) essins et c r de saville V Spea tion de so oneet'dre oneet'dre	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro e - Parler de sa profession king & Writing (Parler et écrire) n nom et l'endroitoù on vit - Son âge sse-Narration du temps - La France et ÉCOUTER :Ecouter les conversatio	nces lin fessions : (Liste (Speakin s)COUT ofilsd'uti et date en Euro	guist s (Pr ning ng)P de ER llisate de n pe P	tique rofes) Éc résn fer :cour eurse aissa ARL	s et gran sions) - couter I tation - tation - ter et cr d'interlin ance - N ER :Cor	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter uméro de versation	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLER	10 nuns des /ous 12 and rver 11 11
:Conju Unit I Moyer (Place préno (Introc Unit I Prono Femin les de :Parle Unit V Narrat téléph - Joue	ugaison II Lan ns de tra es) - Nati msfrançai ducingone V Gran oms (Pro- ninenouns essins et c r de savill V Spea tion de so ioneet'dre er la scène BOOK(S	guage Skills & Grammar (Compéte nsport (Transport) - Noms de Prot ionalités (Nationalities) ECOUTER s - Écouter et répondre PARLER (self)LIRE :Lireles phrases simples nmar (et grammaire) nouns) - Nomscommunsmasculir) - Verbescommuns (Common verbs outer les dialogues LIRE : Lire les pro e - Parler de sa profession tking & Writing (Parler et écrire) n nom et l'endroitoù on vit - Son âge sse-Narration du temps - La France e e ÉCOUTER :Ecouter les conversatio	nces lin fessions : (Liste (Speakin s)COUT ofilsd'uti et date en Euro ons (CD	guist s (Pr ning ng)P de ER ilisate de n pe P alter	tique rofes) Éc résn fer :cou eurso aissa ARL r ego	s et gran sions) - couter I tation - mme (C ter et cr d'interlin ance - N ER :Cor)ÉCRIR	nmaire) Nomsd'e - alphab même /F ommon er les pri gua(alter uméro de versation E :Écrireu	endroitscomm et associéà Présentez - V masculine noms - Obse ego)PARLER	10 nuns des /ous 12 and rver
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	INFORMATION TECHNOL	DGY				R 2019	Semester II	E
Course	Course Name	H	ours Wee	/ k	Credit	Total Hours	Maximum Marks	
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19ES20	2 ADVANCED C PROGRAMMING	3	0	0	3	45	100	
Course C)bjective (s):							
The purpo	ose of learning this course is							
• To	develop C Programs using basic programmingc	onstru	cts					
• To	develop C programs using arrays andstrings							
• To	develop applications in C using functions , point	ers and	dstru	cture	es			
• To	do input/output and file handling inC							
• To	use Interrupts in CProgramming							
Course C	utcomes:							
At the end	of this course, learners will be able to							
• Deve	elop C applications using Arrays andStrings.							
• Deve	elop C applications using Function andPointers.							
• Deve	elop application using structure andunion.							
• Desi	gn a C application using Sequential and Randor	n-acce	essfil	е				
• Deve	elop program using Interrupts& bit leveloperation	IS						
Unit	CONSTRUCTS OF C							9
Lexical el	ements – Operators - data types – I/O statemen	ts – fo	rmat	spe	cifications	- control	statements -	
decision r	naking and looping.							_
Unit II	ARRAYS & FUNCTIONS							0
AND								9
Array har	ndling in C – declaration – single dimensional	arrays	s, tw	0 -	dimensio	nal arrays,	multidimensio	nal
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2.	Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw- Hill Education, 2017.
3.	Ivor Hortan, Instant C Programming, Wrox Press, 1995

Chairman - Bos Dept. of IT - ESEC

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 Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice Hall of India, 2006

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• To co	ach the students on InterviewSkills	o s and		1.5.				
To de	velop PresentationSkills							
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Department	INFORMATION TECHN	OLOG	Y			R 2019	Semester II	ES
Course	Course Name	Н	lours Wee	s / k	Credit	Total	Maxim	um
Code		L	Т	Ρ	С	Hours	Marks	
19ES221	ENGINEERING DRAWING LABORATORY	0	0	4	2	60	100	
 To provide equipmer To gain th To develo connection To provide To develo 	ctive (s): The purpose of learning the e hands on training for fabrication of nt /tools. e skills for making fitting joints and h p the skills for preparing the green s on e hands on training for dismantling a p the skills for making wood/sheet n	is cour comp nouseh and m and ass netal m	oner oner oold j oould semt	s to nts us pipe and oling Is us	sing carp line conr to make of petrol ing suita	entry, sh nections u simple h engines, bletools	eet metal and using suitable ousehold elec gear box and	welding tools. ctrical lpumps.
 Fabricate Fabricate Make fitti Prepare g Dismantle 	omes: At the end of this course, lear e simple components using carpentr ng joints and household pipe line co green sand mould and make simple e and assemble petrol engines, gea	ners w y, shee onnecti house r box a	vill be et me ons hold andp	e able etal a using elec umps	e to: and weldi g suitable strical cor s.	ngequipr tools. nnections	ment/tools s using suitabl	etools
Course Outco Fabricate Make fitti Prepare g Dismantle Make sim ist of Experi 1. Forming 2. Fabricat 3. Making	omes: At the end of this course, lear e simple components using carpentr ng joints and household pipe line co green sand mould and make simple e and assemble petrol engines, gea nple models using wood and sheetm ments of simple object in sheet metal usin ion of a simple component using this a simple component using carpent	ners w y, shee nnecti house r box a netal. g suita n and t ry pow	vill be et me ons hold andp able t thick ver te	e able etal a using elec umps tools plate ools.	e to: and weldi g suitable strical con s. (Examples. (Examples. (Example)	ngequipr etools. nnections le: Dust F nple: Boo le: Pen s	ment/tools s using suitabl Pan / SoapBo okrack) stand/Tool bo	etools x x/ Lette
Course Outco Fabricate Make fitti Prepare g Dismantle Make sim I. Forming 2. Fabricat 3. Making box. 4. Prepare 5. Construct bend,Ga using pin	pmes: At the end of this course, lear e simple components using carpentr ng joints and household pipe line co green sand mould and make simple e and assemble petrol engines, gea nple models using wood and sheetrr ments of simple object in sheet metal usin ion of a simple component using this a simple component using carpent a "V" (or) Half round (or) Square joi ct a household pipe line connection the way and Taps (or) Construct a p pes, bend, gate valve, flanges and for	ners w y, shee onnecti house r box a netal. g suita n and t ry pow nt from s usin ipe co otvalve	will be et me ons hold andp thick ver to the g pip nnece	e able etal a using elec umps tools plate ools. give pes, c	e to: and weldi g suitable strical con s. (Examp es. (Exar (Examp n mild St Tee joint s of hous	ngequipr etools. nnections le: Dust F nple: Boo le: Pen s teelflat. , Four wa	ment/tools s using suitabl Pan / SoapBo okrack) stand/Tool bo ay joint, elbov ation centrifug	etools x x/ Lette v, union jal pumj

8-8M. Chairman - BoS Dept. of IT - ESEC

Departr	nent	INFORMATION TECHNOL	.OGY			1 ii	R 2019	Semester II
Cours	e	Course Name	H	our: Nee	s / ek	Credit	Total Hours	Maximum Marks
			L	T	Р	С		
19ES2	14	ADVANCED C PROGRAMMING LABORATORY	0	0	4	2	60	100
Course O	bjective (s):						
The purpo	se of leari	ning this course is						
• To c	levelop C	Programs using basic programmingcom	nstructs	5				
• To c	levelop C	programs using arrays andstrings	23	sz - 6	2			
• To c	levelop ap	oplications in C using functions , pointer	rs ands	truc	ture	es		
• To c	lo input/οι	utput and file handling inC						
• lot	andle sig	nals and Process and accessperiphera	IS			_		and the second second
Course O	utcomes:							
At the end	of this co	urse, learners will be able to						
 Write 	a C Prog	ram using basic programmingconstruct	S.					
• Deve	lop C app	lications using Function andPointers.						
• Deve	lop applic	ation using structure andunion.						
 Designation 	n a C ap	plication using Sequential and Random	access	sfile				
Deve	lop a C pr	ogram to interact withdevice						
ist of Ex	periment	s						
1. Program	ns using c	only I/OFunctions						
2. Program	ns to stud	y operators and datatypes						
3. Program	ns based	on controlStructures						
 Program 	ns using F	or and Whileloops						
5. Program	ns using s	ingle dimensionalarrays						
6. Program	ns using n	nulti Dimensionalarrays						
Program	ns on Son	ing and searching usingarrays						
D. Program	ns based	on stringinanipulations						
0 Program	me using	Euloritors with parameters						
1 Progra	m using	toraneclasses						
2. Progra	ms to intr	oducepointers						
3. Progra	ms usinas	structures						
4. Progra	ms using	array of structures						
5. Progra	m to send	l and receivesignals						
6.Program	n to hand	leprocess						
7. Progra	m to displ	ay device details	_					Mr. Stranger
EXT BOO	DK(S)			100		le dese		
1, B	rian W Ke	rnighan, The C programming language	e, secol	nd e	diti	on pears	son Educa	ation Asia, 200
2, E	.Balaguru	samy, C Programming, Second Edition	, Tata	Mcg	rav	v Hill, 20	09	
3. Y	aswantKa	nitkar, Let Us C, 16 th Edition, BPB Pub	lication	, 20	15			
EFEREN	CE(S)						-	e1
1. P	aul Deitel	and Harvey Deitel, -C How to Progra	m, Sev	enth	n ec	lition, Pe	earson Pu	ublication.
2. P C	radip Dey xford Univ	, Manas Ghosh, —Fundamentals of Co versity Press, 2009.	omputin	ig a	nd I	Program	ming in C	C, First Edition,
3. B H	yron S. G ill Educati	ottfried, "Schaum's Outline of Theory a on, 1996.	nd Prol	olen	ns c	of Progra	imming w	ith C",McGraw
4. Iv	or Hortan	, Instant C Programming, Wrox Press,	1995					



Depa	artment	INFORMATION TECH	NO	OG	Y		R 2019	Semester III	BS
Cou	urse /	Course Name	ŀ	lour Wee	s/ k	Credit	 Total Hours 	Maximum Marks	
108	\$305	DISCRETE MATHEMATICS	2	1	P 0		60	100	
Cours	e Obiecti	ve (s): The purpose of learning this cou	irse	is to	U		00	100	-
• Ui • Ui • Di • Di • Di • Cours • F • C • C	nderstand problem s nderstand determine evelop en appropria e Outcon ormulate ontradicti lse logica elations, f	I the notion of mathematical thinking, ma solving. I and use the terms Cardinality, finite, co which of these characteristics is assoc ough confidence to identify and model r te solutions, using the skills learned in the nes: At the end of this course, learners short proofs using the following method on. I notation to define and reason about fu unctions andintegers. ate the ability to solve problems using co	athe ount iate math heir will ls: d nda	ably d with nema inter be al irect ment	cal p infir h a g action action ble t pro- cal m echr	proofs an lite and u givenset l pattern ve and s o: of, indire nathema niques an	nd be able uncountal s in real w upporting ect proof a tical conc nd combir	e to apply them oly infinite, and vorld andoffer environment nd proof by epts such as so natorics in the	ets,
• R	ontext of ecognize	discreteprobability. properties of graphs and itsapplications	5						
• S	olve Bool	ean functions and minimize circuits usir	ngga	ates.					
Unit I	LOGI	C AND PROOFS							12
Proposi Quantif	itional Log iers – Nes	gic – Applications of Propositional logic- sted Quantifiers – Rules of inference – I	Pro ntro	posit ducti	iona ion t	l equiva o proofs	lences – I	Predicates and	
Unit II	COUN	ITING				i	1 K	and shares	12
The ba functior	sics of co s –Princi	ounting – The pigeonhole principle – Per ple of Inclusion and Exclusion	mut	atior	ns ai	nd comb	inations -	- Generating	
Unit III	RELA	TIONS							12
Relation of relati	ns and the ons-Equiv	eir properties – n-ary Relations and their valence relations- partial orderings.	r Ap	plica	tion	s- Repre	esenting re	elations – Clos	ures
Unit IV	GRAP	PHS		-					12
Graphs graphs planar g	and grap and grap graphs – g	h models – Graph terminology and spec n isomorphism – Connectivity – Euler ar graph coloring.	cial nd ⊢	type: lamil	s of ton	graphs - paths –s	- Matrix re shortest pa	epresentation o ath problems –	f
Unit V	BOOL	EAN ALGEBRA							12
Boolear	function	s- representing Boolean functions – log	ic ga	ates-	mini	mization	n of circuit	S.	
REFER	ENCE(S)	in the statistic statistic second							
1. Ke 20	ennath H 012.	Rosan, "Discrete Mathematics and Its A	ppli	catic	ons"	Seventh	1 Edition,	Tata McGraw H	Hill,
2. Ra Pe	alph. P. G earson Ec	rimaldi,"Discrete and Combinatorial Ma lucation Asia, New Delhi, 2007.	ther	natic	s: A	n Applie	ed Introdu	ction", Fifth Edi	ition,
3. Be	ernard Ko lition , Pe	Iman, Robert C. Busby, Sharan Cutler F arson Education Pvt Ltd., New Delhi, 20	Ross 010.	s, "Di	scre	ete Math	ematical \$	Structures", six	th
4. Ko	oshy, "Dis	crete Mathematics with Applications", E	lsev	/ier F	Publi	cations,	2008.		

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88M

Department	INFORMATION TECHNOLO	GY			R2019	Semes	ster III	PC
Course	Course Name	H V	ours Veel	s/ <	Credit	Total	Maxir	num
Code		L	Т	Ρ	С	nours	war	KS
19IT301	DATA STRUCTURES AND ALGORITHMS	3	0	0	3	45	10	0
Course Objec	tive (s):							
 The purpose To learn abo To familiarize To study abo 	of learning this course is to ut the basic operations of ADT and analyz with linked lists and itsoperations ut stack and queueoperations	e the a	sym	ptot	icnotations		*	
To learn abo	ut tree datastructures							
 To study abo 	out graph and its algorithms					in the second		
Course Outco	omes:							
At the end of	this course, learners will be able to:							
 Apply the fur 	idamental knowledge of various Data stru	ctures	for d	esig	ining ,imple	ementing a	ind	
evaluating tir	ne complexity for real timeproblems.							
Write prograu	ms to implement linked List to problemsol	utions				1.1		
 Implement st 	ack and queue operations for variousappl	lication	S					
Relate the kr	lowledge of tree data structuresimplement	tations						
Apply the co	ncept of graphs in real worldproblems.							
Jnit I INT	RODUCTION							9
ntroduction to	Data Structures – Abstract Data Typ	es (AD) T)	- A	rray as Al	DT Repre	sentatio	ns
Algorithm Ana	alysis - Asymptotic notations - Math	nematic	al	Ana	lysis for	Recurrenc	e Rela	tions
Recurrences for	or Fibonacci Series and Factorial – Search	ning: Se	eaue	ntia	(linear) se	earch and	Binary	
Search		Ŭ						
Jnit II LIN	IKED LIST	1.00	5.15				al na ser a	9
inked List: Circular Linke	Representation – Singly Linke d List – All Operations(insertion,deletion,	ed L display	ist ,upd	- atio	Doub n)	oly Linke	ed Lis	t
Jnit III ST.	ACK & QUEUE		5111					9
Stack ADT rep	resentations - Operations - Polish notatio	ns – A	oplic	atio	n of Stack	Checking	of Bala	nced
Paranthesis, C - Priority Queu	onversion of infix to postfix, Evaluation of ie-Application of Queues: Addition of two	Postfix polynor	Exp	res	sions–Circu	ular Queue	e – Dequ	eue
Jnit IV TR	EES		N. P.		12.30			9
3inary Trees: r	epresentation - Tree Traversal algorithm-	Expre	ssio	n Tr	ees - Binar	y Search	Free –	
search - insert	ion - deletion -Find Min & Max- AVL Tree	es - sea	arch	— in	sertion - d	eletion - S	SplayTre	es
Jnit V GR	APHS	1.1.1	1.1					9
ntroduction – search- Depth	Ferminology – Graph Representation-Ope first search – Topological sort - Shortest- ping tree – Prim's and Kruskal'salgorithms	erations path a	on (Igori	Gra thm	phs - Trave s (Dijsktra	ersing : Bre Algorithm	eadth firs	it
				-				-
. Reema Thar Mark Allen V	י) eja, "Data Structures Using C", Second E Veiss, "Data Structures and Algorithm Ana	dition , alysis ir	Oxfo n C",	ord 2nd	UniversityF Edition, P	Press,2011 earsonEd	ucation,	1997
			- 1			distant.		Y
REFERENCE(1. Stephen G. I 2. Aho, Hopcro 3. Ellis Horowit	S) Kochan, "Programming in C", 3rd edition, ft and Ullman, "Data Structures and Algor z. Sattai Sabai, Susan Anderson Freed."	Pearso ithms",	nEd Pea	uca	tion. nEducation	,1983	C" Sec	and
Edition. Universit	sity Press.2008	runuar	nem	ais	U Data Str	uctures in	0, 300	JIIU

Departm	ent	INFORMATION TECHNOI	LOGY				R 2019	Semester III	ES
Course		Course Name	H	ours Week	/	Credit	Total	Maximum M	arks
Code			L	T	Ρ	С	Hours		
19ES30)2	DIGITAL ELECTRONICS	3	0	0	3	45	100	
Course	Objective	(s):							
The purp	ose of lear	ning this course is							
•- IC	design dig	ital circuits using simplified Booleanf	unctions						
•= 10 T-	analyze a	nd design combinationalcircuits							
•= IC	analyze al	d design synchronous and asynchro	onous se	quen	laici	rcuits			
•= 10	understan	d Programmable LogicDevices		SK.					
• 10			alcircuits	5		-			
At the en	d of this co	Nurse learners will be able to							
- Gi	mplify Book	ean functions using KMan							
- De	sign and A	nalyze Combinational and Sequentia							
- Im	nlement de	signs using Programmable LogicDev							
• W	rite HDL co	de for combinational and Sequential	Circuits						
• De	sian Reais	ter. Counter and Memory	onouno						
nit	BOOLEAN	ALGEBRA AND LOGIC GATES			-				9
orms-Di amilies nit II	GATE LEV	gates –Digital Integrated Circuits-Intr	oduction	, Spe		Characte	eristics, D		9
are Con	on, The Ma ditions, NA	ip Method, Four Variable Map, Five NND and NOR implementation. Exclusion	√ariable I sive –OF	Map, Func	Proc	luct of S	ums Sim	olification, Don'i	
nit III	COMBINA	TIONAL LOGIC							9
ombinat	ional circui	ts- Analysis and Design Procedure- I	Binary Ad	der-	Sub	tractor- I	Decimal A	dder – Binary	1
lultiplier	 Magnitud 	le Comparator – Decoders- Encoders	s- Multipl	exers	5-				
nit IV	SYNCHRO	NOUS AND ASYNCHRONOUS SEC	QUENTI	AL LO	DGIC				9
equentia ssignme f State F	nt- Design low Tables	Atches – Flip flops – Analysis of Clo Procedure. Asynchronous Circuits- / – Race Free State Assignment –Ha	cked Sec Analysis zards- Do	luenti Proce esign	al C edure Exar	e- Circui nple.	State Rec ts with La	tches – Reduct	ion
edisters	Shift Regi	sters Ripple Counters Synchronous	Counter	2		Randor	n access	memory Memo	rv
ecoding ogic	Error Dete	ection and correction, Read only Men	nory, Pro	gram	mab	le Logic	Array, Pr	ogrammable A	rray
EXT BO	DOK(S)								
1:	Malvino, P Edition, 20	aul Albert , Leach, Donald P,Gautam 14.	n Saha: E	Digital	Prin	iciples A	nd Applic	ations, TMH 8t	h
2.	Morris Mar	no and Michael D. Ciletti,"Digital Des	ign", 6 th I	Editio	n, Pe	earson E	Education	, 2018	
REFERE	NCE(S)		28	-					
1.	Bartee, Th	omas C: Digital Computer Fundame	ntals, 4th	Editi	on, T	FMH.20	16.		
2.	Floyd, Tho	mas L: Digital Computer Fundament	als, 11th	Editi	on, F	earson	Internatio	onal. 2017.	
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Departm	INFORMATION TEC	CHNOLO	GY			R 2019	Semester III	PC
Cours	e Course Name	ŀ	lour Wee	s/ ek	Credit	Total Hours	Maximum Marks	ſ
		L	Т	Ρ	С	nouro		
19CS3	02 COMPUTER ARCHITECTUR	RE 3	0	0	3	45	100	
 Course C The purpose To une To know To know To know To know To know To know Course C At the endom Designed Analyse Designed archited 	Descrive (s): base of learning this course is derstand the basic structure and opera derstand the operation of the arithmetic base of the operation of the arithmetic base of the different types of contro base of the different ways of communicating outcomes: I of this course, learners will be able to on of a pipelined CPU and cachehierarch and evaluate CPU and memory hier on the trade-offs in modern CPU includir ectures	tion of a o cunit. I and the luding ca with I/O hy archyper ng issues	digita con che devi	alcom cept of ces a ces a ance cting	puter. ofpipelinin ory and vi and standa superscal	g. rtualmemor ard I/Ointer ar and dyna	y. faces. amically schedule	d
 Design 	hardware of multiprocessors including	g cache o	ohe	ence	andsynch	nronization		
 Design 	n a complex simulation tool to study va	rious mic	ro ar	chite	cturalfeatu	ires.		
Unit I	BASIC STRUCTURE OF COMPUTER	S						9
instructiona RISC - Cl	I units - Basic operational concepts - B sequencing - Hardware - Software Int SC	us structi erface - I	ures nstru	- Per iction	set archit	ecture - Ad	s - Instructions an dressing modes -	a -
Unit II	ARITHMETIC OPERATIONS			104			11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	9
Arithmetic positive nu fixed point	Operations - Addition and subtraction umbers - Signed operand multiplication operations	of signed and fast	l nun mul	nbers tiplica	- Design ition - Inte	of fast add ger divisior	ers -Multiplication - Floating point a	of nd
Unit III	BASIC PROCESSING UNIT AND PIP	ELINING	;	0 fr				9
Fundamer Micro prog control con approache	ntal concepts - Execution of a complet grammed control - Pipelining :Basic considerations - Performance considerations.	e instruc oncepts - ons - Exc	tion Dat ceptio	- Mul a ha: on ha	tiple bus o zards - In ndling - IL	organization struction ha .P –Hardwa	n - Hardwired cor azards -Data path are and Software	ntrol n and
Unit IV	MEMORY SYSTEM		17	1.5				9
Basic con performan storage de	cepts - Semiconductor RAM - ROM - S ce - Virtual memory - Memory manage evices	Speed - S ment req	ize a uirer	and concernents	ost - Cach s - Associa	e memorie ative memo	s -Improving cach ries -Secondary	ie
Unit V	I/O ORGANIZATION							9
Accessing circuits - S	g I/O devices - Programmed Input/outp tandard I/O Interfaces (PCI, SCSI, and	ut Interru USB), IC	pts - DP -	Direo CPU	ct Memory Commun	Access- B ication.	uses - Interface	2.5
1.	William Stallings, —Computer Organiza Edition, Pearson Education.2016.	ation and	Arch	nitectu	ure – Desi	igning for P	erformance, 10th	
2.	John P. Hayes, —Computer Architectu	re and O	gan	zatio	n, 3rd Edi	tion, Tata N	IcGraw Hill, 2017	
REFEREN	CE(S)					1		
1. 8	Carl Hamacher, ZvonkoVranesic and S Systems, 6th Edition, Tata McGraw Hill	afwatZak , 2017	ку, —	-Com	puter Org	anization a	nd Embedded	
2. [David A. Patterson and John L. Hennes Hardware/Software interfacell, 3rd Editi	ssy, —Co on, Elsev	mpu vier, 3	ter O 2005.	rganizatio	n and Desi	gn: The	
3.	/.P. Heuring, H.F. Jordan, —Computer	Systems	s De	sign a	and Archit	ecture, 2nd	Edition, Pearson	



Department	INFORMATION TECHN	OLO	GY			R 2019	Semester III	PC
Course	Course Name	F	lours Week	/ :	Credit	Total	Maximum	1
Code		L	Т	Ρ	C	Hours	Marks	
19IT304	DATABASE MANAGEMENT SYSTEM	3	0	0	3	45	100	
The purpos Unde Learr Unde Apply Unde conse	e of learning this course isto rstand the fundamentals of DBMSArc a data modeling using the entity-relation rstand the use of Structured Query La rormalization techniques to normaliz rstand the needs of database process equences of concurrent dataaccess.	hitectionship angua e theo sing a	ure. and ge (S datab nd lea	deve QL) a ase arn te	loping da and learn echniques	atabasede SQLsynt s for conti	esigns. tax. rolling the	
 the end of Desc Expla desig Desig Comp recov Famil 	or this course, learners will be able to ribe the fundamental elements of relat in the basic concepts of relational dat n, relational algebra and SQL. In ER-models to represent simple data pare and contrast various transaction p eryprocedures iar with basic database storage struct	ional a moc abase proces ures a	datab del, er appli ssing and ac	ase ntity- catio and ccess	manager relationsl onscenari concurre stechniqu	nentsyste hip model os ncy contr ues	ems l, relational data ol techniques a	abase nd
Unit I	NTRODUCTION					17		9
History and	motivation for database systems; con	npone	ents o	f dat	abase sy	stems; D	BMS functions;	
database a	rchitecture and data independence.		_		+-			0
	DATAMODELING				1. 1 1	d	Lala Databasa	9
Data mode languages: embedding	Overview of database languages; S nonprocedural queries in a procedura	ented QL; q al lang	uery uage	optin intro	nizational nization; oduction	4th-gene to Object	ration environn Query Langua	query nents ge.
Unit III F	RELATIONAL DATABASES							9
Entity-Relat Mapping co and relation forms; multi	ionship model – E-R Diagrams – onceptual schema to a relational sche al calculus; Relational database desig valued dependency; join dependency	Enha ema; gn: Da /; repr	anced entity atabas resent	-ER and se de tatior	Model referent sign; fun theory.	 ER-to- ial integri ctional de 	Relational Map ty; relational al ependency; nor	oping gebra mal
Unit IV T	RANSACTION PROCESSING	14						9
Transaction	s; failure and recovery; concurrency o	ontro	1		e e gallé	SON TO U	P. 299.06	
Unit V 🛛 P	HYSICAL DATABASE DESIGN	1						9
torage and ength record	file structure; indexed files; hashed file s; database efficiency and tuning. No	es; b - SQL-N	trees Mongo	files DB-	with der Introduct	nse index tion to Da	; files with varia ta Mining and D	ible Data
/arehousing								
/arehousing TEXT BOO	K(S)							
/arehousing TEXT BOO 1. A E	K(S) A. Silberschatz, H. F. Korth& S. Suders dition 2010.	shan,	Datal	base	systemc	oncepts,	McGraw Hill, 6t	th
/arehousing TEXT BOO 1. A E 2. C	K(S) A. Silberschatz, H. F. Korth& S. Suders Edition 2010. C. J. Date, An introduction to database	shan, syste	Datal ems, /	base ∖ddis	systemc	oncepts, ey,8th Ed	McGraw Hill, 6t lition, 2003.	th
/arehousing TEXT BOO 1. A 2. C REFERENC	K(S) Silberschatz, H. F. Korth& S. Suders dition 2010. J. Date, An introduction to database E(S)	shan, syste	Datal ems, /	base \ddis	systemc	oncepts, ey,8th Ed	McGraw Hill, 6t	th
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Department	INFORMATION TECHNO	OLO	GY		1.1	R 2019	SemesterIII	EE
Course	Course Name	Hours/ Week Credit		Credit	Credit	Total	Maximum	n
Coue		L	T	Ρ	C	Hours	Ivial KS	
19TPS03	QUANTITATIVE APTITUDE AND LOGICAL REASONING - I	2	0	0	0	30	100	
Course Objec	tive (s):	_	-5					
To crack ap	otitude assessment by using speed mat	hcon	cepts	s.				
To solve pr	oblems using fast track method by learr	ning s	simp	lificat	tion andn	umbers.		
To learn the	e basic of ratio and proportion and mixtu	ireco	ncep	ots.				
To calculate	e different ways of solving problems on	avera	age a	anda	ges.			
To learn the	e logical skills by analyzing theobjects.	o will	hor	blo t	· • ·			-
Solve the	mes. At the end of this course, learners	S WIII	be a	ible i	.0.			
Crack the	question with speed and accuracy.	eimr	lifics	ation	and num	nareevetar	n	
Solve mos	t of the aptitude topics by knowing ratio	and	nron	ortio	n tonics w	vithallegati	on'	
Solve the r	problems on average and ages by using	logi	cal w	av o	fapproacl	nanogua 1.		
Develop th	eir logicalthinking.		-					
JNIT 1 SPE	ED MATHS AND NUMBER SYSTEMS		1		1 - H			6
SPEED MATH	S: Square and square roots - Square for	or nu	mbe	rs fro	om 31 to :	50. Finding	g squares of	
numbers betwe	een 81 to 100. Cubes and cubes roots.			5		and the		
NUMBER SYS	STEMS: Numbers and types of Numbers	s – P	rope	rties	of Numb	ers –Face	value and	
place value - D	Divisibility rules – Concept on unit digit a	nd re	mai	nder	theorem.	S H.10).	Ravi	_
	MPLIFICATIONS & PROBLEMS ON NO	JMR	ERS					6
SIMPLIFICATI	ONS: BODMAS rule – Application of alg d fraction – Continued fraction and its s	gebra impli	aic fo ficati	ormu ion –	lae –Simp Recurrin	decimals	of decimal s.	
	IN NOMBERS. Set of numbers - Assum			E	annunbe	is and ion	in equations	6
	ROPORTION; Ratio between two or m		IUR	E	Miscolla		bloms	0
LLIGATIONS	S ANS MIXTURES: Definition – Allegation	on ru on ru	le – amo	Mea ong t	n value (c he quanti	or cost pric	e) of the mixt than two.	ure
JNIT 4 AVE	RAGES & PROBLEM ON AGES							6
AVERAGES:	Average from total –Total from the avera	age -	– Mis	scella	aneous pr	oblems.		
PROBLEMS	NAGES: Ages - Persons in Past - Pres	sent	- Fut	ure.	Miscellan	eous prob	lem.	
JNIT 5 ANA	LOGY & MIRROR & WATER IMAGES							6
ANALOGY: St	udy and topic relationship – Worker and	tool	rela	tions	hip – loc	and actio	on relationship)
- vvork and wo	- Quantity and unit - Animals and young		and	raw Malo	materials	– instrum	ent and	
AIRROR IMAG	SES AND WATER IMAGES: Letter inve	erted	– Oł	biect	inverted.	ale.		
EFEDENCES		nicu	0.	Jeer	inventeu.		5271.	2
. Abhijit Guh	a, Quantitative Aptitude for Competitive	Exai	mina	tions	, Fourth I	Edition, Ta	ta McGraw-H	ill
2. Arun Sharn	na, How to prepare for Data Interpretation	on fo	r the	CAT	, First Ec	lition, Tata	McGraw-Hill	
. R.V.Pravee	en,"Quantitative Aptitude and Reasoning	"Thir	dEc	lition	. PHI Lea	rning.201	6.	
Dr.R S Agg	arwal, Quantitative Aptitude, Revised at td.2017.	nd Ei	nlarg	ed E	dition, S.	Chand Pu	blishing	
6. Arun Sharn	na "How to Prepare for Quantitative Apti and Aptitude" for GATE and ESE Preli	tude	"Eigh Made	nt Ed	ition, Mc	Graw HillE	ducation,2018	3.

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Course Code Course Name Hours Week Ci L T P 19MC301 INDIAN CONSTITUTION 2 0 0 Course Objective (s): The purpose of learning this course is Course Objective (s): The purpose of learning this course is To understand the premises informing the twin themes of liberty ar perspective. To address the growth of Indian opinion regarding modern Indian in and entitlement to civil and economic rights as well as the emergen years of Indiannationalism. To address the role of socialism in India after the commencement or 1917 and its impact on the initial drafting of the IndianConstitution. Discuss the growth of the demand for civil rights in India for the bulk of Gandhi in Indianpolitics. Discuss the intellectual origins of the framework of argument that in of social reforms leading to revolution inIndia. Discuss the passage of the Hindu Code Bill of1956. Unit II HISTORY OF MAKING OF INDIAN CONSTITUTION Preamble - Salient Features Unit II PHILOSOPHY OF THE INDIAN CONSTITUTION Preamble - Salient Features <tr< th=""><th>10</th><th>DLOGY</th><th></th><th></th><th></th><th></th><th>R 2019</th><th>Seme</th><th>ester III</th><th>MC</th></tr<>	10	DLOGY					R 2019	Seme	ester III	MC
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Unit III CONTOURS OF CONSTITUTIONAL RIGHTS & DUTIES Fundamental Rights - Right to Equality - Right to Freedom - Right against E f Religion - Cultural and Educational Rights - Right to Constitutional Reme Etate Policy - Fundamental Duties. Unit IV ORGANS OF GOVERNANCE Parliament - Composition - Qualifications and Disqualifications - Powers an President - Governor - Council of Ministers - Judiciary, Appointment and Ti Qualifications - Powers and Functions. Unit V LOCAL ADMINISTRATION District's Administration head: Role and Importance, - Municipalities: Introce Elected Representative, CEO of Municipal Corporation - Pachayati raj: Intro- Elected officials and their roles, CEO ZilaPachayat: Position and role- Hierarchy (Different departments) -Village level: Role of Elected and Appoint grass root democracy. Jnit VI ELECTION COMMISSION Iection Commission: Role and Functioning, Chief Election Commissioner tate Election Commission: Role and Functioning, Institute and Bodies for nd women EXT BOOK(S): I. The Constitution of India", 1950 (Bare Act), Government Publication 2. Dr. S.N.Busi, "Dr. B. R. Ambedkar Framing of Indian Constitution", Publishers 3. M. P. Jain, "Indian Constitution Law", 7th Edn., Lexis Nexis,2014. </td <td>-</td> <th></th> <th>0</th> <th>DU</th> <td>1711</td> <td></td> <td></td> <td></td> <td></td> <td>5</td>	-		0	DU	1711					5
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3. M. P. Jain, "Indian Constitution Law", 7th Edn., Lexis Nexis,2014.	ng) of India	in	Cor	nsti	tuti	on", 1st E	dition, 2	016. Ava	a
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EFERENCE (5)			5	щ			7,000		A, and	2112
1. D.D. Basu , Introduction to the Constitution of India, Lexis Nexis, 2015.	no	dia, Lex	is	Nex	cis,	20	15.			

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	INFORMATION TECHNOLO	GY				R 2019	Semester III	ES
Course	Course Name	H N	ours Nee	k k	Credit	Total	Maximum	
Code		L	Т	Ρ	С	Hours	Marks	
19ES308	DIGITAL ELECTRONICS LABORATORY	0	0	4	2	60	100	
 The purpose of Familiar Familiar Underst Set up A Provide Provide 	of learning this course is to rize students with digitallCs, and the building blocks of digitalcircuits Adder an Subtractorcircuits students the opportunity to set up Combination students the opportunity to set up sequential	onal(Circu	Circu	its				
At the end of t Study an Implement Design a Design a	omes: his course, learners will be able to nd Test LogicGates ent LogicCircuits and Implement Adder and Subtractor and Implement Combinational Circuits and Implement Sequential LogicCircuit							
List of Experi Study of Logi a. Logic gates b. Verification c. Realization Implementation d. Verification e. Verification Adder and Su f. Implementat g. Implementat Combination h. Design of D i. Design of Co j. Design of mi	inents ic Gates. using discreteComponents. of truth table for AND, OR, NOT, NAND, NOF of NAND and NORgates on of Logic Circuits. of Booleanlaws. of DeMorgan'slaw ubtractor ion of Half-Adder and Full-Adder tion of Half-Subtractor andFullSubtractor al Circuit Design ecoder andEncoder odeConverter. ultiplexers anddemultiplexers. rcuit Design tion of Shift registers. SerialTransfer	R and	d XC	DRga	tes.			
Sequential Ci k. Implementa I. Ring Counte	r, 4-bit Binary Counter, BCDCounter.			-		No.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
Sequential Ci k. Implementa I. Ring Counte TEXT BOOK(S	r , 4-bit Binary Counter , BCDCounter. S) Paul Albert , Leach, Donald P Gautam Saha I	Diaits	al Pri	ncip	es And A	oplication	s. TMH 8th	
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Course	Course Name	Н	lours Wee	s / k	Credit	Total	Maximum	
Code		L T F		Ρ	С	Hours	Warks	
19IT305	DBMS LABORATORY	0	0	4	2	60	100	
Course Objec	tive (s):	-			100			
 To learn ERdiagr To under design c To know and reco To under will help Course Outco At the end of the Use the Eamiliar 	the fundamentals of data models am. erstand the relational database im- concepts whe fundamental concepts of trans- overyprocedure. estandtheinternalstoragestructures in physical DB design along with omes: his course, learners will be able to Relational model, ERdiagrams. ize to use SQL commands to mar	s to con plantationsaction susingo Query o: nage th	ion u n pro liffero optir	ualiz sing ocess entfil mizat	e and de SQL wit sing- con eandinde tion tech	epict a dat h effective ncurrency o exingtechr niques.	abase system us relational databa control technique niqueswhich	ing ase s
Apply prApply coDesign e	oceduralextensions oncurrency control and recovery n effective Databases for enterprise	nechan applica	isms itions	for	practical	problems.		
List of Experi	ments		×			-		
List of Experi 1 Conceptual	ments Database design usingE-RDIAGF	RAM.						
List of Experi 1 Conceptual 2 Implementat	ments Database design usingE-RDIAGF ion of SQL commands DDL, DML	RAM. ., DCL	and	TCL				
List of Experi 1 Conceptual 2 Implementat 3 Queries to d	ments Database design usingE-RDIAGF ion of SQL commands DDL, DML emonstrate implementation of Inte	RAM. ., DCL egrityC	and onst	TCL	S			
List of Experi 1 Conceptual 2 Implementat 3 Queries to d 4 Practice of In	ments Database design usingE-RDIAGF ion of SQL commands DDL, DML emonstrate implementation of Inte n builtfunctions	RAM. ., DCL egrityC	and onst	TCL	S			
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List of Experi 1 Conceptual 2 Implementat 3 Queries to d 4 Practice of li 5 Implementat 6 Implementat 7 Practice of F 8 Application I	ments Database design usingE-RDIAGF ion of SQL commands DDL, DML emonstrate implementation of Inte n builtfunctions ion of Join operation and Nested ion of virtual tables using Views Procedural extensions(Procedure, Development using front end tools	RAM. ., DCL egrityC Querie Functi	and onst s, Pr on, C	TCL raint: actic	s cing set c ors, Trigg	operators i gers)	n SQL queries	
List of Experi 1 Conceptual 2 Implementat 3 Queries to d 4 Practice of li 5 Implementat 6 Implementat 7 Practice of F 8 Application I a. Inventory C	ments Database design usingE-RDIAGF ion of SQL commands DDL, DML emonstrate implementation of Inten ion of Join operation and Nested ion of virtual tables using Views Procedural extensions(Procedure, Development using front end tools ontrolSystem	RAM. ., DCL egrityC Querie Functi	and onst s, Pr on, C	TCL raints actic	s cing set o ors, Trigg	operators i gers)	n SQL queries	
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TEXT	BOOK(S)
٦.	A. Silberschatz, H. F. Korth& S. Sudershan, Database systemconcepts, McGraw Hill, 6th Edition 2010.
2.	C. J. Date, An introduction to database systems, Addison Wesley,8th Edition, 2003.
REFE	RENCE(S)
1.	R. Elmasri& S. B. Navathe, Fundamentals of database systems, Addison Wesley, 6th Edition, 2011.
2.	H. Garcia et al., Database system implementation, Prentice Hall,2000

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Department	ent INFORMATION TECHNOLOGY				Sei	nester II	I PC
Course Code	Course Name		Hour Wee	s/ k	Credits	Total Hours 60	Maximur Marks
19IT306	DATA STRUCTURES & ALGORITHMS LABORATORY	0	0	4	2		100
Course Objecti The purpose of I • To implemen • To demonstr • To understan • To implemen • To get familia Course Outcon At the end of this	ve (s): learning this course is to nt linear and non-linear datastructures rate the various sortingtechniques nd the different operations of searchtree nt graph traversalalgorithms arized to sorting and searchingalgorithm nes: s course, learners will be able to:	es ns					
 Write routine Suggest app Appropriately Suggest function Demonstrate ist of Experimed 	es to demonstrate linear and non-linear propriate linear / non-linear data structur y use the Tree ADT operations for a give ctions to implement graphical concepts e searching and sortingalgorithms.	data s re oper renprol for rea	tructuration tolem	ureop is for scena	perations solving a g arios.	jivenprob	lem
1 Implementatio	on of Socrahing Algorithms						
1. Implementatio	on of secting algorithms		•				
5. Implementatio	n of Arrayad I	dlint					
	on of Stack ADT using Arrays and Linke						
. Implementatio	on of Queue ADT using Arrays and Link	edlist					
	n of Doubly EndedQueue						
Applications o	f Stack andQueue		×				
3. Implementatio	n of Singly and Doubly Linked Lists						
. Implementatio	n of TreeTraversals						
0. Implementati	on of Binary Search Free						
1. Implementati	on of AVLI rees						
2. Implementati	on of Graph I raversals						
3. Implementati	on of Minimum Spanning I ree			1	Sec.	her and	1
EXT BOOK(S) Reema Tharej Aho, Hopcroft	a, "Data Structures Using C", Second I and Ullman, "Data Structures and Algo	Edition prithms	, Ox ", Pe	ford l arsor	Jniversity F DEducatior	Press, 20 1,1983.	11
REFERENCE(S)	C Kochan "Programming in C" and ad	ition F	Poaro	on E	ducation		-
2. Mark Aller Pearson E	n Weiss, "Data Structures and Algorithi Education, 1997.	m Anal	ysis i	in C",	2nd Editio	n,	
3. Ellis Horo	witz, Sartaj Sahni, Susan Anderson-Fre	eed, "F	unda	amen	tals of Data	a	No. and

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Department	INFORMATION TECH	HNOL	OG	(R 2019	Semester IV	BS
Course	Course Name	H	Hours/ Week		Credit	Total	Maximum N	larks
Coue		L	Т	Р	С	Tiours		-
19BS401	PROBABILITY AND STATISTICS	3	1	0	4	60	100	
 Unde Unde Unde Unde Sumi Deve Suppression 	stand the basic concepts of probability a stand the basic concepts of randomvaria stand the basic concepts of hypothetical narize and apply the methodologies for th op enough confidence to identify and mo	nd the ables testir ne dat del m	e dis ng of a an athe	tribu sam alysi mati	tions wit ples from is using s ical patte	hcharact m apopul statistical erns in re-	eristics lation Inotions. al world ando	ffer
	omes: At the end of this course, learner	n thei	he al	ale t		supportin	igenvironmen	ι.
Demo	strate and apply the basic probability axi	oms	and c	conc	o. epts in tl	neir corea	areas.	
 Apply 	he concepts of probability distributions in	an a	ppro	priat	e place o	of science	e and	
Engine	ering	21 // 435		1.0.15				
 Apply 	asic statistical inference techniques, incl	uding	con	fider	nce inter	vals; hyp	othesis testing	g to
scienc	e/engineeringproblems.	on uci	na A		/Atochni	ique		
 Design Correl 	te and predict the valid outcome of a rea	l time	prob	lem	Alechin	ique.		
Unit I PF	OBABILITY AND RANDOM VARIABLE							12
Probability - /	xioms of probability - Conditional probab	ility -	Tota	pro	bability -	Baye's t	heorem- Ran	dom
variable - Pro	pability mass function - Probability densit	y func	ction	- Pro	operties	– Momer	nt generating	
functions.		-	_					1.40
	OBABILITY DISTRIBUTIONS							12
Moment gene probability dis	rating functions of probability distribution tributions: Binomial- Poisson- Uniform -E	s- Co xpone	ncep entia	t and I –N	d applica ormal- V	tions of s Veibull dis	standard stributions.	
Unit III TE	STING OF HYPOTHESIS		-		a.L.B		NET CINTER WAS	12
Sampling dist Normal distri distributions f of fit.	ibutions – Estimation of parameters – St oution for single mean and difference or mean, variance and proportion – Conti	atistic of me ngeno	eans cy ta	ypot -Te ble (hesis – L sts base test for i	Large sar ed on t, ndepende	nple test base Chisquare a ent) – Goodne	ed on nd F ess
	SIGN OF EXPERIMENTS	v ron	dom	izod	docian	Dond	omizod	12
block design	Latin squaredesign	y lan	uom	izeu	uesign	- Nanu	omzeu	
Unit V CC	RRELATION AND REGRESSION		17					12
Correlation -	Iultiple correlation-Regression-Multiple re	gres	sion-	Line	ar fit-Qu	adratic fi	t The photo live	
REFERENCE	S):			P ⁻¹	-22	1.1	e na su di s	2.
1. Devore. New De	J.L., "Probability and Statistics for Engine hi, 9th Edition, 2015.	eering	g and	l the	Science	es", Ceng	age Learning	,
2. Walpole Scientis	R.E., Myers. R.H., Myers. S.L. and Ye. s", Pearson Education, Asia , 9th Edition	K., "P , 201	roba 1.	bility	and Sta	atistics fo	r Engineers a	nd
3. Ross, S Elsevier	M., "Introduction to Probability and Statis 2009.	stics fo	or Er	ngine	ers and	Scientist	ts", 4 th Edition	
4. Spiegel Probabi	M.R., Schiller. J. and Srinivasan. R.A., " ty and Statistics", Tata McGraw Hill Editi	Schau on, 20	ım"s 009.	Out	line of TI	heory and	d Problems of	•

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Doparatione	INFORMATION TECHNOL	R 2019	Semester IV	PC				
Course	Course Name	Н	our Wee	s/ ek	Credit	Total	al Maximum 's Marks	
Code		L	Т	Ρ	C	Hours		
19IT401	OBJECT ORIENTED PROGRAMMING	3	0	0	3	45	100	
 Fhe purpose Gain kinconcep Understory Understory<!--</td--><td>of learning this course isto nowledge about basic Java language synt ots such as variables, conditional and itera stand the fundamentals of object-oriented s, invoking methods etc and exception han stand the principles of inheritance, packag stand the basics of Exception Handling &M now to handleevents comes: this course, learners will be able to: ava application programs using OOP principles ava programs to implement error handling p application using multithreading</td><td>ax a tive prog dlin es a fulti</td><td>and exce gran ggme andii thre es a nce chnic</td><td>sema necution necha nterfa adino nd p</td><td>antics to v on method g in Java, nisms. aces. g roper prog using exc</td><td>vrite Java p Isetc. including gramstruct</td><td>orograms and use defining classes, uring dling</td><td></td>	of learning this course isto nowledge about basic Java language synt ots such as variables, conditional and itera stand the fundamentals of object-oriented s, invoking methods etc and exception han stand the principles of inheritance, packag stand the basics of Exception Handling &M now to handleevents comes: this course, learners will be able to: ava application programs using OOP principles ava programs to implement error handling p application using multithreading	ax a tive prog dlin es a fulti	and exce gran ggme andii thre es a nce chnic	sema necution necha nterfa adino nd p	antics to v on method g in Java, nisms. aces. g roper prog using exc	vrite Java p Isetc. including gramstruct	orograms and use defining classes, uring dling	
•- Write a	event based javaprogram						åna alla	
	TRODUCTION TO JAVA							9
Basics of Ja	va programming, Byte Code, Data types, '	Vari	iable	es. O	perators.	Control str	uctures including	5
Basics of Ja election, Lo	va programming, Byte Code, Data types, ` oping, Java methods, Overloading, Math c	Vari clas	iable s, A	es, O rrays	perators, – One ai	Control str nd Multidim	uctures including nensional	<u> </u>
Basics of Ja selection, Lo Jnit II O Basics of ob	va programming, Byte Code, Data types, ` oping, Java methods, Overloading, Math o BJECT AND CLASSES iects and classes in java, Constructors, Fi	Vari clas nali	iable s, A zer.	es, O rrays Visit	perators, – One ar pility modi	Control str nd Multidim fiers. Meth	ods and objects.	9
Basics of Ja selection, Lo Jnit II 0 Basics of ob nbuilt classe	va programming, Byte Code, Data types, ¹ oping, Java methods, Overloading, Math o BJECT AND CLASSES jects and classes in java, Constructors, Fi s like String, Character, StringBuffer, File,	Vari clas nali this	iable s, A zer, s ref	es, O rrays Visit	perators, s – One ar pility modi ce, static	Control str nd Multidim fiers, Meth injava	uctures including nensional ods and objects,	9
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Basics of Ja selection, Lo Jnit II O Basics of ob nbuilt classe Jnit III INI Inheritance Dynamic bind ava, Inheritin Jnit IV TH Thread - Thre Exception ha Jnit V GL	va programming, Byte Code, Data types, V oping, Java methods, Overloading, Math or BJECT AND CLASSES jects and classes in java, Constructors, Fi s like String, Character, StringBuffer, File, HERITANCE AND PACKAGES in java, Super and sub class, Type of ding, Generic programming, Casting object og interface, Package in java, Util package READS AND EXCEPTION HANDLING ead life cycle and methods, Thread Creation ndling with try-catch-finally – Nested try-ca JI PROGRAMMING	Vari class nali this inhe ects	iable s, A zer, A s ref erita , Ins Meth	visit eren nce, stanc	perators, – One an pility modi ce, static Overridin ce of open Multi thre defined E	Control str nd Multidim fiers, Meth injava ng, Object rator, Abst eading - Th xception	uctures including nensional ods and objects, class, Polymorpl ract class, Interfa nread synchroniza	9 9 hism ce ii 9 tion,
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8 gm. Chairman - BoS Dept. of IT - ESEC

Department	INFORMATION TECHNO	DLOG	Ϋ́		Ne Dari	R 2019	Semester IV	PC	
Course	Course Name	Н	lour Wee	s / ek	Credit	Total	Maximum		
Code		L	Т	Р	С	Hours	IVIARKS		
19CS402	SOFTWARE ENGINEERING	3	0	0	3	45	100		
 The purpose of To know To desig To gathe To devel To verify 	f learning this course is the fundamentals of project manager n software usingmodels. In knowledge on various software test op an efficient software system through the quality of softwareproducts	menta ing, n gh go	activ naint ood g	ities. tenar roup	ncemetho	ds ness.			
Design, i to meet o Apply de Apply tes improve Unit I FUNI Software Engir	mplement and evaluate a system / co desiredneeds sign and development principles in th sting methods for the softwareproduct the product by checking the quality of DAMENTALS OF SE AND REQUIRE neering Fundamentals; Software proc odels; Overview of Project Managem	the correspondence of the second seco	ter b nstru softw T EI s: Sc ctivit	ased ction varep NGIN oftwa ties;	l system p oroducts IEERING Software	rocess, con resystems. le and proc	ess models; Proc	9 cess ons:	
Requirements requirements; specification do	elicitation; Requirements analysis User requirements, System requirem ocument. Prototyping - Basic concept	mod nents, s of fo	leling , req orma	g te juirer al spe	chniques; ment valid ecification	Functional ation and s techniques	and nonfunctions of tware requirent	onal nent	
Unit II SOF	TWARE DESIGN			1	1.1.1.1.1.			9	
Fundamental of Data and, Obj Object-oriented	design concepts and principles; Designect models, Architectural design- S d analysis and design; User interface	gn cha ysten desig	arac n sti n; D	terist ructu esigi	tics; Syste ring, Con n for reuse	m Models - trol models e; Design pa	Context, Behavio ; Structured des atterns;	oral, sign;	
Unit III SOFT	WARE VALIDATION AND MAINTE	NAN	CE				- 10 Jac - 10	9	
Software valida generation; Bla Object-oriented maintainable so	ation: Validation planning; Testing fun ick-box and white-box testing technique I testing; Inspections. Software evolut oftware; Reengineering; Legacy syste	ndame ues; l tion: S ems; S	enta Jnit, Softv Softv	ls, in integ vare vare	cluding te gration, va maintenai reuse.	st plan crea Ilidation, and nce; Charac	tion and test cas d system testing; teristics of	e	
Team manag	iement – Team processes, Team in a software team. Role identifica	n or tion a	gani and	zatio	on and o anment F	decision -n Project track	naking, Roles king, Team prob	and	
resolution; Proj analysis and m	ect planning and scheduling; Software anagement; Software quality assuran	e mea	asur	eme are d	nt and est	imation tech on manage	miques;Risk ment;.		
Unit V SOF	TWARE QUALITY PROCESS IMPR	OVE	MEN	IT			and de sample ut	9	
Overview of Q PCMM, TQM a environments; I Configuration m	uality management and Process Imp and Six Sigma; overview of CASE t Project management tools; Requirem nanagement tools;	prove tools. nents	men Sof ana	it; Oʻ ftwar Iysis	verview o e tools ai and desi	f SEI -CMM nd environn gn modeling	1, ISO 9000, CM nents: Programn g tools; testing to	1MI, ning ols;	

ESM. Chairman - BoS Dept. of IT - ESEC

TEX	T BOOK(S)
1.	R. S. Pressman, Software Engineering, a practitioner's approach,McGraw Hill,7th Edition, 2010.
2.	Ian Sommerville, "Software Engineering", 9th Edition, Addison- Wesley, 2011
REF	ERENCE(S)
1.	PankajJalote, "Software Engineering, A Precise Approach", Wiley India, 2010.
2.	Kelkar S.A., "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.
3.	Stephen R.Schach, "Software Engineering", Tata McGraw-Hill Publishing Company Limited, 2007.

Department	NAME OF THE DEPA	R 2019	Semester IV	HS				
Course Code	Course Name	ŀ	lour Wee	s/ k	Credit	Total	Maxim	num
		L	Т	Р	С	Hours	IVIAI	KS
19HS402	UNIVERSAL HUMAN VALUES 2 : UNDERSTANDING HARMONY	2	1	0	3	60	100	
 To help th ensure su To facilitat well as tow the rest o movement To highlio 	the students appreciate the essential constained happiness and prosperity which e the development of a Holistic perspective vards happiness and prosperity based of f existence. Such a holistic perspective towards value-based living in a natura ht plausible implications of such a living in a such a suc	omplei are th ctive a on a co e form I way. Holistic	ment ne co mon orrec ns th c un	tarily ore a og sti ot un e ba oders	between spirations udents to derstandi sis of Ur standing	VALUES of all hum wards life a ng of the H niversal Hu	" and 'SKILL nan beings. and professio luman reality iman Values of ethical hu	S' to on as ∕ and ⊢ and uman
conduct, ti Salient Feature	ustful and mutually fulfilling human beh s of the Course: The salient features the salient fe	avior a his cou	and urse	mutu is to	ally enric	hing intera	iction with Na	ature
 (i.e. a worl The whole aspects of by verifyin living. The prime 	dview of the reality "as it is") through the course is presented in the form of a the reality are presented and the stud g them on the basis of their natural acc focus throughout the course is toward	e proc dialog dents a eptano	ess ue w are e ce w	of se /here enco ithin	elf-explora by a set uraged to oneself a	of propos self-explo nd validat	als about va pre the propo e experientia	rious osals Illy in fe of
 While intro notions is 	t rather than just a transfer of informatic oducing the holistic worldview and its also made to enable the students disce	implio rn the	catio diffe	ns, a	a critical	appraisal	of the preva	ailing
Course Method • To explora human bei • The course	blogy: The methodology of this course tional and thus universally adaptable. ng vis-à-vis the rest of existence.	is : It inv	olve	s a s	systemati	c and rations.	onal study o	f the
 It is free from It is a processing as truth or based on the based on t	om any dogma or value prescriptions. ess of self-investigation and self-explor reality is stated as a proposal and the heir Natural Acceptance and subseque l every activity is a source of reflection. ss of self-exploration takes the form of	ation, studer ent Exp a dialo	and nts a perie	not o re fa ential betv	of giving s acilitated t Validatio veen the	sermons. V o verify it on – the wl teacher ar	Vhatever is fo in their own r hole existen nd the studen	ound right, ce is ts to
 begin with evolution. This self-e beliefs 	, and then to continue within the stu xploration also enables them to critic	ident	in e ^r evalu	very ate	activity, their pre-	leading to	o continuous	self
Module 1 – Intro	duction to Value Education			-			6+	-3
ectures - Unders continuous Happi nd Physical Facil spirations utorials [Practice	standing Value Education - Self-explora ness and Prosperity – the Basic Humar ity - Happiness and Prosperity – Curre e Session] - Sharing about Oneself - E	tion as n Aspir nt Sce x <i>plorin</i>	s the ation anarion og Hu	Pro ns - o - N umai	cess for \ Right Und Method to n Conscio	/alue Educ derstandin Fulfill the ousness -	cation - g, Relationsh Basic Humai <i>Exploring</i>	nip n

Module 2 – Harmony in the Human Being 6+3
Lectures - Understanding Human being as the Co-existence of the Self and the Body - Distinguishing
between the Needs of the Self and the Body - The Body as an Instrument of the Self - Understanding
Harmony in the Self - Harmony of the Self with the Body - Programme to ensure self-regulation and
Health
Tutorials [Practice Session] - Exploring the difference of Needs of Self and Body - Exploring Sources of
Imagination in the Self - Exploring Harmony of Self with the Body
Module 3 – Harmony in the Family and Society 6+3
lectures - Harmony in the Family – the Basic Unit of Human Interaction - Values in Human-to-Human
Relationship - 'Trust' - the Foundational Value in Relationship - 'Respect' - as the Right Evaluation -
Understanding Harmony in the Society - Vision for the Universal Human Order
Tutorials (Practice Session) - Exploring the Feeling of Trust - Exploring the Feeling of Respect -
Exploring Systems to fulfil Human Goal
Module 4 – Harmony in the Nature/Existence 4+2
Lectures - Understanding Harmony in the Nature - Interconnectedness, self-regulation and Mutual
Fulfilment among the Four Orders of Nature – Realizing Existence as Co-existence at All Levels - The
Holistic Perception of Harmony in Existence
Tutorials [Practice Session] - Exploring the Four Orders of Nature - Exploring Co-existence in Existence
Module 5 Implications of the Holistic Understanding 6+2
Lectures Notural Accortance of Human Values Definitiveness of (Ethical) Human Conduct
People for Humanistic Education, Humanistic Constitution and Universal Human Order Competence in
Basis for Humanistic Education, Humanistic Constitution and Oniversal Human Order - Competence in
Professional Ethics - Holistic Technologies, Production Systems and Management Models-Typical Case
Studies - Strategies for Transition towards value-based Life and Profession
Tutorials [Practice Session] - Exploring Ethical Human Conduct - Exploring Humanistic Wodels in
Education - Exploring Steps of Transition towards Universal Human Order
Course Outcomes: At the end of this course, learners will be able to:
 Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
 Students would become more responsible in life and in handling problems with sustainable
solutions
 Students become sensitive to their commitment towards what they have understood (human values)
buman relationship and human society)
 Students would be able to apply what they have learnt to their own self in different day-to-day.
settings in real life at least a beginning would be made in this direction
 Students would have better critical ability.
A Foundation Course in Human Values and Professional Ethics. B. B. Cours. B. Asthona. C. B.
1. A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P
Dagana, 200 Kevised Edition, Excel books, New Deini, 2019. ISBN 976-93-67034-47-1
Aethone C. D. Departie, and Deviced Edition, Event Device, New Delki, 2010, ICDN 072, 02, 07024
2. Astnana, G P Bagana, 2nd Revised Edition, Excel Books, New Deini, 2019. ISBN 976-93-67034-
53-2
REFERENCE BOOK(S):
1. Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004
3. The Story of Stuff (Book)
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj – PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi

88M

SUGGESTED ASSESSMENT:

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, self-assessment, peer assessment etc. will be used in evaluation. *Example*:

Assessment by faculty mentor: 10 marks

Self-assessment: 10 marks & Assessment by peers: 10 marks

Socially relevant project/Group Activities/Assignments: 20 marks

Semester End Examination: 50 marks

The overall pass percentage is 40%. In case the student fails, he/she must repeat the course

	INFORMATION TEC	CHNOLOG	Y			R 2019	Semester IV	PC
Course	Course Name	Hours	/We	ek	Credit	Total	Maximum	1
Code	oourse name	L	L T P	С	Hours	Marks		
1965404	OPERATING SYSTEMS	3	0	0	3	45	100	
 The purpos Unde Fam Expension Lear Lear 	se of learning this course is to erstand the basic concepts of operating iliarise the OS services that assist syst ose several aspects of OS design inclu n CPU scheduling and Processsynchro n the memory management, Secondar	gsystem. emusers ding: proce onization, y Manage	ess, d	eadlo and F	cks and F	ilesystem	s.	
 ourse Ou the end Unde Imple Imple Simu Identi 	atcomes: of this course, learners will be able to: erstand the basic functionalities of OS ement CPU Scheduling and ProcessSy ement IPC &Deadlock alate disk scheduling and Memory man tify File and Disk Storage Management	andProces /nchroniza agementte t with respe	s tion chniq ect to	ues. differ	ent Storaç	geManage	ement	
Unit								
ontr	INTRODUCTION TO US AND PROCE	SS						9
Overview states, I/O process sta	of operating systems-Functionalities, channels- Memory hierarchy micropro ates -Concurrent processes – process	characteris ogramming control blo	stics –Pro	and t	ypes of C concepts s context)S Hardw - operati Threads (vare concepts ons on process	9 -CPU ses -
Overview states, I/O process sta	of operating systems-Functionalities, channels- Memory hierarchy micropro ates -Concurrent processes – process CPU SCHEDULING AND SYNCHRO	characteris ogramming control blo NIZATION	stics –Pro ck -P	and t ocess roces	ypes of C concepts s context)S Hardw - operati Threads (vare concepts - ons on process Concepts	9 -CPU ses - 9
Overview states, I/O process sta Unit II Job and p processes consumer semaphore	of operating systems-Functionalities, channels- Memory hierarchy micropro ates -Concurrent processes – process CPU SCHEDULING AND SYNCHRO processor scheduling – scheduling – critical sections – mutual exclusio processes – Critical section proble es to implement mutex, process synchr	characteris ogramming control blo NIZATION algorithms n – synch m Semap onization –	etics a –Pro –Pro –Pro roniza hores - Critic	and to pocess pocess ation b - in cal re	ypes of C concepts s context hierarch – Proces nit, wait, g.)S Hardw - operati Threads (ies Prob s cooper signal o	vare concepts ons on process Concepts lems of concu ation, producer perations - Us	9 -CPL ses - 9 urren ancise o
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Chairman - B Dept. of IT - ESL

TEXT B	OOK(S)
1.	Abraham Silberschatz, Peter B.Galvin, Greg Gagne, Operating System Concepts. Ninth edition. Addison-Wesley(2015)
2.	William Stallings, "Operating Systems-Internals and Design Principles", Sixth Edition, Pearson Prentice Hall(2009).
REFER	ENCE(S)
1.	Harvey M.Deitel, Paul J. Deitel, David R. Choffnes, "Operating systems", Third edition, Pearson Prentice Hall(2007).
2.	Andrew S. Tanenbaum, Albert S. Woodhull "Operating systems: design And implementation", Third Edition, Pearson Prentice Hall (2006)

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Department	INFORMATION TECHNO	PLOG	iΥ			R 2019	Semester IVE	ΞĒ	
Course Code	Course Name		Hour Wee	k k	Credit	Total Hours	Maximum Marks	um s	
19TPS04	QUANTITATIVE APTITUDE AND	2	0	0	0	30	100		
 To learn To solve To teach To know To know To know Course Outco Solve pro Know the Understa Evaluate issues an Enhance JNIT 1 PAR PARTNERSHII Seeping partne CHAIN RULE: JNIT 2 PRO 	the basic of partnership and chain rule in problems using fast track method by lea the angle of elevation anddepression. the relationship, direction concepts in ea about coding and decoding through logic mes: At the end of this course, learners oblems by using shortcut in partnership a tips and tricks of profit and loss with per nd the concepts ofangles. critically the real life situations by resort indfactors. the logical way of thinking by solving pro TNERSHIP & CHAIN RULE P: Ratio of division of gains: Simple Partners. Definition – Direct proportion and Indirect FIT & LOSS.PERCENTAGE	n sim arning asywa calwa will b nd ch ccenta ng an oblem nersh	plifie prof y. y. e abl aainru age ti d an s coo ip – i	dway it an e to: ule. hrou alyzi des a Com	/. d loss wit gh fast tra ng analyt and rankin pound Pa	hpercenta ackmethod ical reason ngsconcep artnership	ge. Is. ning ofkey ots. - Working and	6	
PROFIT AND L Price – Concep PERCENTAGE JNIT 3 HEIG	_OSS: Basic definition and types of profit t of true v/s false value – Applicationin da Percentage – Percentage using shortc GHT AND DISTANCE	t and ata in suts.	loss terpr	– Co etati	oncept of on proble	discount a ms.	and marked	6	
IEIGHT AND I	DISTANCES: Line of sight – Angle of ele	vatio	n – A	ngle	of depre	ssion.	14-11-11-11-11-11-11-11-11-11-11-11-11-1		
JNIT 4 BLO	OD RELATIONSHIP & DIRECTION SEN	ISE 1	EST					6	
3LOOD RELA DIRECTION SE correctly.	TIONSHIP: Analysis the gender relations ENSE TEST: Distance between the start	ship – ing ar	Reland en	tions Iding	ship diagr points -	am - Fami Sense the	ly tree. direction		
JNIT 5 LOGI	ICAL SEQUENCE OF WORD, CODING SEQUENCE TEST	AND	DEC	COD	ING, NUI	MBER RAI	NKING &	6	
OGICAL SEQ or group – Sequ CODING AND coding & decod	UENCE OF WORDS: Sequence of occu uence of increasing/decreasing size, valuence of increasing/decreasing size, valuence of increasing and the sequence of the s	urrenc ue, int of cod ding n nber t	e of ing r netho test -	ever ty, et neth od. - Ra	nts – Seq tc. od, Codir nking test	uence of o ng patterns t – Time se	bjects in a class – Concepts of equence test.	3	
Abhijit Guha Publishing (: a, Quantitative Aptitude for Competitive E Company Ltd,2012	Exami	natio	ons, I	Fourth Ed	lition, Tata	McGraw-Hill		
 Arun Sharm Publishing (R.V.Pravee 	a, How to prepare for Data Interpretatior Company Ltd,2012. n."Quantitative Aptitude and Reasoning"	n for ti Third	he C Editi	AT, on F	First Editi PHI Learn	on, Tata M ning.2016	1cGraw-Hill		
Dr.R S Agga Ltd, 2017.	arwal, Quantitative Aptitude, Revised and	d Enla	argeo	Edi	tion, S.Cl	hand Publi	shing Company		
Arun Sharm Reasoning	a "How to Prepare for Quantitative Aptitu and Aptitude" for GATE and ESE Prelim	ude"E s, Ma	ight Ide E	Editi asyl	on, McGr Publicatio	aw HillEdu n,2020.	ication,2018		

& SM. Chairman - BoS Dept. of IT - ESEC

Department	INFORMATION TECHNOLOGY					R 2019	Semester IV	PC
Course	Course Name	Hours / Week			Credit	Total	Maximum	
Code		L	Т	Ρ	С	Hours	Warks	
19IT403	OPERATING SYSTEM LABORATORY	0	0	4	2	60	100	
Course Ob The purpos • Unde • To wi	jective (s): e of learning this course is erstand the basics of OperatingSystem rite shell scriptprogram							
 To ur To ur To ur To ur 	nderstand the Scheduling, Page replacemenderstand the various memory managemen nderstand filemanagement nderstand the basic configuration ofLinux	ental ntSc	gorith	nms es	5			
Course Ou	tcomes:		•					
At the end o	of this course, learners will be able to:							
Instal	and configureOS							
 vvrite Implo 	shellscripts	onte	74					
 Imple Confi 	auring Korpols & Virtualization	ents						
Dovo	lon Mini project to demonstrate basic OSfu	ncti	analit	ios				
ist of Exp	eriments	nou	Jilain					-
1. Instal	I and Configure Operating System (Linux a	andV	Vindo	ws)			
2. Unix d	commands and shellprogramming							
3. Inter-	process Communication usingpipes							
4. Simul	lation of CPU Schedulingalgorithms							
5. Imple	mentation of page replacementAlgorithms							
6. Simul	ation of memory managementSchemes							
7. Imple	mentation of filemethods							
8. Virtua	lization							
9. Kerne	Configuration							
10. Mini F	Project : Develop Linux like OS with 10 Linu	ux co	omma	and	sdemon	stration	nundi 1.65x	
TEXT BOO	K(S)							
1. At Ec	oraham Silberschatz, Peter Baer Galvin an dition, John Wiley & Sons (ASIA) Pvt. Ltd, :	d G 2012	reg G 2.	Gagi	ne, Oper	ating Syst	em Concepts, 9 th	
2. Ar	ndrew S. Tanenbaum, Modern Operating S	Syste	em, P	ren	tice Hall	of India P	vt. Ltd, 2015.	n d
REFERENC	CE(S)		1					
1. Ri	chard Petersen, The Linux Complete Refe	renc	e, Si	xth	Edition,	Mcgraw H	lill 2017	
2. Ri Ec	chard Blum and Christine Bresnahan , Lin dition Wiley, 2015	ux C	omm	and	d Line ar	nd Shell So	cripting Bible, 3rd	

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Department	INFORMATION TECHNOL	INFORMATION TECHNOLOGY										
Course	Course Name	Hours / Week			Credit	Total	Maximum					
Code		L	Т	P	С	Hours	Marks					
19IT404	OBJECT ORIENTED PROGRAMMING LABORATORY	0	0	4	2	60	100					
Course Object	ive (s):											
The purpose of	learning this course is to											
 Understa 	nd the fundamentals of object-oriented progr	amn	ning	in Ja	va, inclu	ding defi	ining classes,					
objects, i	nvoking methods etc and exception handling	mec	hani	sms.								
 Understa 	nd the principles of inheritance, packages an	dint	erfac	es.								
 Understa 	nd the basics of Exception Handling &Multith	read	ding									
• Know how	v to handleevents			_								
Course Outcor	nes:											
At the end of thi	s course, learners will be able											
 To write p 	program using objectclasses											
Apply inh	eritance and Interface to writeprogram											
Able to ha	andle I/O with exceptionhandling											
Develop r	nulti threadedprogram											
Io develo	p GUI with eventhandling			_		_		_				
1 Programs	nents using class andmethods											
2. Program	using Inner class and static											
3. Program t	o demonstrate filehandling											
4. Program	using single and multi levelinheritance											
5. Inheritanc	e via Interface and Abstractclass											
6. Programs	on Packageimplementations											
7. Applicatio	ns using Genericcollections											
8. Program (using IOStreaming											
9. Create us	er definedexception											
10. Develop a	ipplication to demonstrate multithreading						14					
12 Program t	a demonstrate event handing using AVAT/Su	ina										
13 Program t	o demonstrate LavoutManagers	ing					Personal State					
ro. r rogram t	e demonstrate Layoutmanagers											
EXT BOOK(S)					in the set							
1. Herbe	rt Schildt, Java: The Complete Reference, 1	lth E	Editic	on, M	cGraw H	ill Educa	ation, 2014					
2. Cay S 2013.	Horstmann, Gary Cornell, Core Java Volum	ə - I	Fund	dame	entals,9th	Edition	, Prentice Hall,	6				
REFERENCE(S)		1		3							
1. Bert E	Bates, Kathy Sierra, Head First Java, 2nd Ed	tion	, OR	eilly l	Media, 2	005.						
2 Kathy	Sierra, Bert Bates, OCA/OCP Java SE 7 Pro	ogra	mme	erla	nd II Stud	dy Guide	e, First edition,					
- McGr	aw Hill Education, 2014.											

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	INFORMATION	INFORMATION TECHNOLOGY R 20									
Course Code	Course Name	He He	ours / Veek	D	Credit	Total Hours	Maximum Marks				
10110.404		L	1	P		20	100	-			
19HS401	LANGUAGE SKILLS	U	0	2	U	30	100				
Course Objecti To involve To involve To focus t To enhand To enhand To integra Course Outcon Understa Commun Compreh Write the Integrate Unit I LISTEI Listening and its of a simple expla	ve (s): The purpose of learning to the students in effective listenin we the oral communication skills in the effective reading of general a ce and comprehend the writtente te LSRWskills. Thes: At the end of this course, learning the technicaltalks. icate to his peer groupproperly. end the general and technicaltex reports and job application in clear LSRWskills. NING importance –Listening strategies nation - Being an active listener:	his cours gactivitie n properr nd techn ext. arners wi arners wi tt. earmanne giving ve	e is manne icaltex ill be a er. to a p erbal a	er. .t. .ble to roces and no	s informat	ion - give i feedback -	information, as taking lecture r	6 part notes			
Unit II SPEA Give personal inf basics - pronunc summarizing aca	KING formation - ask for personal inform ation practice - conversation stat demic readings and lectures	mation - rters: Pe _l	expres p talk ·	ss abil - stres	ity - ask fo sing sylla	or clarificat bles and s	tion - pronuncia peaking clearly	6 tion			
Unit II SPEA Give personal inf basics - pronunc summarizing aca Unit III READ	KING formation - ask for personal information practice - conversation stand demic readings and lectures ING	mation - rters: Pe	expres p talk ·	ss abil - stres	ity - ask fo sing sylla	or clarificat bles and s	tion - pronuncia peaking clearly	6 tion - 6			
Unit II SPEA Give personal int basics - pronunc summarizing aca Unit III READ Strategies for effer photos and title -	KING formation - ask for personal information practice - conversation stat demic readings and lectures ING ective reading - Read and recogn Read for details - Use of graphic	mation - rters: Pe nize diffe	expres p talk · rent ty ers to	ss abil - stres pes o reviev	ity - ask fo sing sylla f texts - P v and aid	or clarificat bles and s redicting c comprehe	tion - pronuncia peaking clearly ontent using nsion -	6 tion - 6			
Unit II SPEA Give personal inf basics - pronunc summarizing aca Unit III READ Strategies for effe photos and title - Understanding pr	KING ormation - ask for personal information practice - conversation state demic readings and lectures ING ective reading - Read and recogn Read for details - Use of graphic ronoun reference and use of con	mation - rters: Pe nize diffe c organiz nectors i	expres p talk · rent ty ers to n a pa	ss abil - stres pes o reviev	ity - ask fo sing sylla f texts - P v and aid e- speed r	or clarificat bles and s redicting c comprehe eading tec	tion - pronuncia peaking clearly content using nsion - hniques	6 tion 6			
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Unit II SPEA Give personal inf basics - pronunc summarizing aca Unit III READ Strategies for effe photos and title - Understanding pr Unit IV WRITI Plan before writin a descriptive para mail writing - Typ	KING ormation - ask for personal information practice - conversation stat demic readings and lectures ING ective reading - Read and recogr Read for details - Use of graphic ronoun reference and use of con NG ng - Develop a paragraph: topic s agraph – Write a paragraph with es of essays- descriptive-narrative	mation - rters: Pe nize diffe organiz nectors i sentence reasons ve- issue	expres p talk rent ty ers to n a pa , supp and e -base	ss abil - stres pes o reviev ssage orting xamp d-argu	ity - ask fe sing sylla f texts - P v and aid e- speed r sentence les - Write umentative	or clarificat bles and s redicting c comprehe eading tec s, conclud an opinio e-analytica	tion - pronuncia peaking clearly content using nsion - hniques ing sentence – n paragraph – I	6 tion - 6 6 Write ∃-			
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Unit IISPEAGive personal inf basics - pronunc summarizing acaUnit IIIREADStrategies for eff photos and title - Understanding piUnit IVWRITIPlan before writir a descriptive para mail writing - TypUnit VINTEGTask based Instri Reading a newspTEXT BOOK(S): 11Gramer F. N 20112Brooks,Marg 20113Richards,C.	KING ormation - ask for personal information practice - conversation stat demic readings and lectures ING ective reading - Read and recogn Read for details - Use of graphic ronoun reference and use of con NG og - Develop a paragraph: topic stat agraph – Write a paragraph with es of essays- descriptive-narrative RATION OF LSRW uction : watching a video –Listing paper and creating topic based vi- largot and Colin S. Ward Readin pret. Skills for Success. Listening Jack. & David Bholke. Speak No	mation - rters: Pe nize diffe organiz nectors i sentence reasons ve- issue g, Sorting deos g and W and Spe w Level	expres p talk rent ty ers to n a pa , supp and e -base , orde riting (eaking. 3. Oxf	ss abil - stres rpes o review ssage orting d-argu ring, c Level . Level ord U	ity - ask fe sing sylla f texts - P v and aid e- speed r sentence les - Write umentative comparing 3) Oxford	or clarificat bles and s redicting c comprehe eading tec s, conclud e an opinio e-analytica g and analy University University Press, Oxfo	tion - pronuncia peaking clearly content using nsion - hniques ing sentence n paragraph I l yzing the ideas y Press: Oxford y Press, Oxford	6 tion 6 6 /Vrite =- 6			
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Unit II SPEA Give personal inf basics - pronunc summarizing aca Unit III READ Strategies for effe photos and title - Understanding p Unit IV WRITI Plan before writir a descriptive paramail writing - Typ Unit V INTEG Task based Instru Reading a newsp TEXT BOOK(S): 1 Gramer F. N 2011 2 Brooks,Marg 2011 Richards,C. REFERENCE(S) 1. Davis, Jase 2006.	KING ormation - ask for personal information practice - conversation stat demic readings and lectures ING ective reading - Read and recogn Read for details - Use of graphic ronoun reference and use of con NG g - Develop a paragraph: topic stat agraph – Write a paragraph with es of essays- descriptive-narrative RATION OF LSRW uction : watching a video –Listing paper and creating topic based vi- largot and Colin S. Ward Readin pret. Skills for Success. Listening Jack. & David Bholke. Speak No con and Rhonda Llss. Effective Action	mation - rters: Pe nize diffe c organiz nectors i sentence, reasons ve- issue g, Sorting deos g and W and Spe w Level i cademic	expres p talk rent ty ers to n a pa , supp and e -base , orde riting (eaking. 3. Oxf	ss abil - stres pes o review ssage orting xampl d-argu ring, c Level . Level ord Ui	ity - ask fe sing sylla f texts - P v and aid e- speed r sentence les - Write imentative comparing 3) Oxford 1 4 Oxford niversity F	or clarificat bles and s redicting c comprehe eading tec s, conclud e an opinio e-analytica g and analy University University Press, Oxfo	tion - pronuncia peaking clearly content using nsion - hniques ing sentence n paragraph I l yzing the ideas y Press: Oxford ord: 2010 sity Press: Oxford	6 tion - - 6 //rite - - - - - -			
Unit IISPEAGive personal inf basics - pronunc summarizing acaUnit IIIREADStrategies for effe photos and title - Understanding piUnit IVWRITIPlan before writir a descriptive para mail writing - TypUnit VINTEGTask based Instruct Reading a newspTEXT BOOK(S): 1Gramer F. N 20112Brooks,Marg 20113Richards,C.REFERENCE(S)1.Davis, Jaso 2006.2.E. Suresh	KING ormation - ask for personal information practice - conversation stat demic readings and lectures ING ective reading - Read and recogn Read for details - Use of graphic ronoun reference and use of con NG ng - Develop a paragraph: topic s agraph – Write a paragraph with es of essays- descriptive-narrative RATION OF LSRW uction : watching a video –Listing paper and creating topic based vi- largot and Colin S. Ward Readin pret. Skills for Success. Listening Jack. & David Bholke. Speak No- con and Rhonda Llss. Effective Ac- Kumar and et al. Enriching Spear	mation - rters: Pe nize diffe organiz nectors i sentence reasons ve- issue g, Sorting deos g and W and Spe w Level cademic	expres p talk rent ty ers to n a pa , supp and e -base , orde riting (eaking 3. Oxf	ss abil - stres pes o review ssage orting xampl d-argu ring, c Level . Level ord Uf g (Lev	ity - ask fe sing sylla f texts - P v and aid e- speed r sentence les - Write umentative comparing 3) Oxford I 4 Oxford hiversity F rel 3) Oxford	or clarificat bles and s redicting c comprehe eading tec s, conclud e an opinio e-analytica g and analy University University Press, Oxfo ord University	tion - pronuncia peaking clearly content using nsion - hniques ing sentence - n paragraph - I l yzing the ideas y Press: Oxford y Press, Oxford ord: 2010 sity Press: Oxfo Orient Black sy	6 tion - - 6 Vrite - - - - - - - - - - - - - - - - - - -			

6 Chairman - BoS Dept. of English - ESEC

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Department	INFORMATION TEC	R 2019	Semester V	PC					
Course			urs eek	1	Credit	Total	Maximum Mar		
Code	Course Name	L	т	Ρ	С	Hours	Maximum	i wiai Ka	
19IT501	COMPUTER COMMUNICATION	3	0	0	3	45	100		
Course Objec	tive (s):	LL							
The purpose of	f learning this course is								
 To study 	the concepts of data communications a	nd fu	Inct	ions	s of differe	ent layers o	f ISO/OSI		
reference	architecture			*					
 To under 	stand the error detection and correction	met	hod	s ar	nd types o	ofLAN			
 To study 	the concepts of sub netting and routing	mecl	nani	ism	S.				
 To under 	stand the different types of protocols an	d ne	two	rkco	omponent	S.			
 To study 	the application protocols and networkse	ecurit	y						
Course Outco	mes:				-				
At the end of th	is course, learners will be able to:								
 Identify the 	ne protocols and services of Data linklay	/er.				*			
 Identify th 	ne protocols and functions associated w	ith th	ne tr	ans	port layer	services.			
Describe	the layering architecture of computer ne	etwo	rks	and	distinguis	sh between	theOSI		
reference	model and TCP/IP protocolsuite.								
 Distinguis 	sh the basic network configurations and	stan	dar	ds a	associated	with each	network.		
Construct	t a network model and determine the ro	utina	of	nac	kets usinc	different r	outingalgorithms	8	
e conotrao		alling	0.1	p a o					
	WORK MODELS	1						9	
Data Commun	ications: Components, Representations	. Dat	a F	low	Network	s: Physical	Structures, Net	work	
Types: LAN, V	VAN. Switching. Internet. Protocol La	verin	q: \$	Sce	narios, P	rinciples, L	ogical Connecti	ons	
TCP/IP Protoco	ol Suite: Lavered Architecture, Lavers ir	TCI	P/IP	sui	te, Descri	ption of lay	ers, Encapsulat	ion	
and Decapsula	tion, Addressing, Multiplexing and Dem	ultip	lexi	ng, '	The OSI N	Nodel: OSI	Versus TCP/IP		
Unit II DAT	A LINK LAYER & MAC			0.				9	
Introduction: N addresses, ARI Protocols: Simp CSMA, CSMA/C Unit III WIR	odes and Links, Services, Categories' P. Data Link Control (DLC) services: ole Protocol, Stop and Wait protocol, CD, CSMA/CA. Controlled Access: Rese ED AND WIRELESS LAN	of li Fran Pig ervat	nk, ning gyb ion,	Sub J, F ack Po	blayers, L low and ing. L1, lling, Toke	ink Layer a Error Cont L2. Rando enPassing.	addressing: Type rol, Data Link L m Access: ALC	es o Laye DHA 9	
Ethernet Protoc Method, Efficier Sublayer, Phys Characteristics, Bluetooth: Arch Switches and R	col: IEEE802, Ethernet Evolution, Stan ncy, Implementation, Fast Ethernet: Acc sical Layer, 10 Gigabit Ethernet. IEEE 802.11: Architecture, MAC Subla itecture, Layers. Hubs, Switches, Me outers, Advantages.	idard cess L1, yer, embe	Me L2 Add ersh	herr thoo . I res: ip,	net: Char d, Physica ntroductio sing Mech Configura	acteristics, al Layer, Gi n: Archite nanism, Ph ation, Com	Addressing, Ac igabit Ethernet: ectural Compar ysical Layer, munication betw	MAC ison weer 9	
		Der	41		d Comu	rding Oth	or convioce	oler	
Addressing, Cla on destination Options, Secur	agram Approach, Virtual Circuit App assless Addressing, DHCP, Network A Address and Label. L1, L2. Interne ity of IPv4 Datagrams, ICMPv4: Messag Phases, Inefficiency in Mobile IP.	roac ddre t Pro ges,	ting h, I ss F otoc Deb	PV4 Reso col	4 Addres olution, Fo (IP): Data ging Tools	ses: Addre orwarding o agram For , Mobile IP	er services, Pa ess Space, Cla of IP Packets: B mat, Fragmenta : Addressing,	acke ssfu asec ation	
	n ann an Anna a						01	1	

Unit V ROUTING AND TRANSPORT LAYER

Introduction, Routing Algorithms: Distance Vector Routing, Link State Routing, Path vector routing, Unicast Routing Protocol: Internet Structure, Routing Information Protocol, Open Shortest Path First, Border Gateway Protocol Version 4. L1, L2, L3. Introduction: Transport Layer Services, Connectionless and Connection oriented Protocols, Transport Layer Protocols: Simple protocol, Stop and wait protocol, Go-Back-N Protocol, Selective repeat protocol, User Datagram Protocol: User Datagram, UDP Services, UDP Applications, Transmission Control Protocol: TCP Services, TCP Features, Segment, Connection, State Transition diagram, Windows in TCP, Flow control, Error control, TCP congestion control. L1, L2

TEXT BOOK(S)

1.	Data Communications and Networking , Forouzan, 5th Edition, McGraw Hill, 2016 ISBN: 1-25- 906475-3
REFER	ENCE(S)
1.	Computer Networks, James J Kurose, Keith W Ross, Pearson Education, 2013, ISBN: 0-273- 76896-4
2.	Introduction to Data Communication and Networking, Wayarles Tomasi, Pearson Education, 2007, ISBN:0130138282

Chairman - BoS Dept. of IT - ESEC

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Department	INFORMATION TECHNOLOG	Υ				R 2019	Semester V	PC
Course	Course Name		Hours / Week		Credit	Total	Maximum Ma	
Code		L	Т	Ρ	С	Hours		
19IT502	INTERNET PROGRAMMING	3	0	0	3	45	100	
Course Object	tive (s):			1			+	
The purpose of Understar Learn HT	learning this course is to nd the basics of WWW and Webdesig ML and CSSa	In				• •		
 Learn java Understart 	ascripts nd PHP&MySQL send and receive data usingXML&A I4	X						
Course Outcor		1/1		- 11 -			and the second	-
At the end of th Understar Create we Use the Ja Develop d Develop th Unit I Introd WWW, Internet Web browser	is course, learners will be able to: nd the concepts of WWW including br ebpages using the HTML andCSS avaScript for client sidevalidation. dynamic pages using PHP &MySQL he modern Web applications using the Iuction to WWW & WEB DESIGN t and IETF, W3C, HTTP Protocol: R and Web servers, Responsive we	e XMI	an an st a	d HT dAJ nd F	AX Response Web des	col. e, Web ap sign issue	oplication architectes including Brow	6 ture: vser,
Bandwidth and centric design,	Cache, Display resolution, Look and Sitemap, Planning and publishing we	Feel o bsite,	of th Des	e W signi	ebsite, P ng effect	age Layou ive naviga	it andlinking, Use tion	r 9
HTML History, images, forms, Browser archite to CSS, basic s texts, using font Unit III CLIEN	Structure of HTML Document – for Inclusion of Audio and Video, Me ecture and Website structure. Overvie syntax and structure, using CSS, back ts, borders and boxes, margins, padd IT SIDE PROGRAMMING	mattir ta tag w and grour ing lis	g ta js, l fea d in ts, j	ags Cha ature nage bosit	and font racter en es of HTN es, colors tioning us	s, color, h ntities, fra ML5. Need and prop sing CSS	nyperlink, lists, ta mes and frame I for CSS, introdu erties, manipulatir	bles, sets, ction ng 9
Client side scrip repetition, Pop and web brows in java script.	oting advantages- Introduction to Java up boxes, Advance JavaScript: Java er environments, Manipulation using I	aScrip script DOM,	t, va and forr	ariab obj ns a	oles, func ects, Jav and valida	tions, cond aScript ow ations, DH	ditions, loops and /n objects, the DC TML- Event hand)M ling
Unit IV PHP F	PROGRAMMING							12
PHP : Introduct Functions, Brov Sessions, Obje database, listing deleting databa	ion and basic syntax of PHP, decision vser control and detection, string, For ct Oriented Programming with PHP, g database, listing table names, creat se, deleting data and tables, Session	n and rm pro Conn ing a Tracł	loo oces ecti table	oing ssing on t e, in and	with exa g, Files, A o server, serting d Cookies	mples, PF Advance F creating ata, alterir	eatures: Cookies database, selectiing tables, queries,	ays, and ng a

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Unit \	/ XML AND AJAX	9
Introd applica AJAX.	uction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML tion. Transforming XML using XSL and XSLT. AJAX Architecture- Dynamic web page Creation us	with sing
TEXT	BOOK(S)	
1.	Steven Holzner, PHP Complete Reference, Mcgraw Hill, 2014	
2.	Internet and World Wide Web How to program, P.J. Deitel&H.M. Deitel, Pearson, 2017	
REFE	RENCE(S)	
1.	Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill, 2017	
2.	Web Technology: Theory and Practice by M. Srinivasan Publisher: Pearson India,2017.	8
3	Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India, 2014	

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Department	INFORMATION TECHNOL	.0G`	Y			R 2019	Semester V	PC
Course Code	Course Name	H	Hours / Week		Credit	Total	Maximum Ma	
		L	Т	Ρ	С	Hours		ann
19IT503	FORMAL LANGUAGES AND AUTOMATA THEORY	3	0	0	3	45	100	
Course Objec The purpose o • To have • To have • To know • recognize	tive (s): f learning this course is an understanding of Computationalla a knowledge of regular languages ar the relation between regular languagers.	angua nd co ge, co	age onte onte	s. xt fre ext fr	ee languag ee languag	es and itsp ge andcorre	roperties. esponding	
To study	the concept of Turingmachines.						Second and	
Understa Design th Apply the Design th Understa Unit I AU Strings, Alpha acceptance of	nd the concepts of Finite Automata, he Context free grammar and Push d pumping lemma properties to Regu he Turing machine for aLanguage. nd the various classes ofproblems TOMATA abet, Language, Operations, Finite strings and languages, on determin	Regi lown lar a Stat	ular aut nd (te N fini	and oma Conte Mach te au	Context fr ta for a co ext FreeLa ine, defini utomation,	eeLanguag ntext freeLa anguages itions, finite determinis	les anguage e automation m stic finite automa	ode
equivalence b between two F	etween NFA and DFA, Conversion SM's, Moore and Malay machines	of N	IFA	into	DFA, mir	nimization o	of FSM ,equival	enc
Unit II REG	ULAR EXPRESSIONS						24	ę
Regular sets, between RE a required),regul grammar and f	regular expressions, identity rules and FA, inter conversion, Pumping ar grammars, right linear and left FA, inter conversion between RE and	s, m lemr linea d RG	anij na, ir g	oulat Clos ramr	tion of reg sure prope mars equiv	gular expre erties of req valence be	essions, equival gular sets(proofs tween regular li	ence s no nea
Unit III CON	TIEXT FREE GRAMMARS	oot 1	Der	votio	no Diakt	Most Dari	ations Ambigui	tv i
Context-Free (Context-Free (Form (CNF), Equivalence of	Grammars, Derivation trees, Left M Grammars, Specifications of Conte Greibach Normal Form (GNF), Po PDA's and CFG's.	xt Fr ushd	own	Grar aut	nmars, No tomata (P	ormal Form DA) – Lan	is, Chomsky No guages of a Pl	orma DA
Unit IV TUR	ING MACHINE							9
Definitions and	Examples Computing Partial Fi	Inctio	ons	with	n Turing	Machines	- Combining T	

8-8/m.

Unit	V CLASSES OF PROBLEMS	9
Cho	msky hierarchy of languages, linear bounded automats and context sensitive language, Introdu	iction
to D	CFL and DPDA,LR(O) Grammar, decidability of problems, Universal Turing Machine, undecida	ability
of po NP h	st's correspondence problem. Turing reducibility, definition of P and NP problems, NP complete ard.	and
TEX	T BOOK(S)	
1.	J.E.Hopcroft, R.Motwani and J.D Ullman, —Introduction to Automata Theory, Languages and Computations, 3rd Edition, Pearson Education, 2011	
2.	J.Martin, —Introduction to Languages and the Theory of Computation, 3rd Edition, TMH, 2007	7. ,
REF	ERENCE(S)	
3.	H.R.Lewis and C.H.Papadimitriou, —Elements of the theory of Computation, 2 nd Edition, Pear Education/PHI, 2003	son
4.	Micheal Sipser, —Theory and Computation, 7th Edition, Thomson Course Technology, 2008	

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Department	INFORMATION TECHN	INFORMATION TECHNOLOGY									
Course	Course Course Name Hours / Week		lours / Week Credit		Credit	Total	l Maximum Ma				
ooue		L	Т	P	C	Tiours					
19IT504	INTERNET PROGRAMMING LABORATORY	0	0	4	2	60	100				
Course Objectiv Understand Study the v Learn the s Publishing o Expose to t	e (s): The purpose of learning this various Scripts like HTML, XML a arious rich internet applications us erver side programming usingPHF content on the World WideWeb. he basic tools and applications us	s cours andJav ingAja	vaSc vaSc nx Web	to ript	lishing.						
Course Outcome At the end of this Build dynam Build interact Design dyname Implement t Create XML	es: course, learners will be able to: nic web pages using JavaScript (C ctive web applications using HTMI amic web pages using AJAX, PHF the web authoring tools with the da documents andSchemas.	lient s ., DH1 ² andX atabas	ider ML ML e de	orog and esigr	ramming) CSS n for webc	levelopmer	ıt				
1. Programs in ja	va usingservlets										
2. Write programs	s in Java to create three-tier applic	ations	usi	ng J	SP andDa	atabases					
i) for conducting	g on-lineexamination.			38							
ii) For displayin	g student mark list. Assume that s	tuden	t info	orma	ation is av	ailable in a	database				
which has be	een stored in a databaseserver.										
3. Write program	s in Java usingServlets:										
i) To invoke sei	rvlets from HTMLforms										
ii) To invoke ser	vlets fromApplets										
I. Create a web p	age with the following usingHTML										
i) To embed an	image map in awebpage										
ii) To fix thehots	spots										
iii) Show all the	related information when the hot	spots a	arec	licke	ed.						
. Create a web p	age with all types of Cascading st	yleshe	eets								
. Client Side Scr	ipts for Validating Web Form Cont	rols us	singl	DHT	ML						
. Write programs	in Java to create applets incorpo	rating	the	follo	wingfeatu	res:		*			
Create a color pa	lette with matrix of buttons Set bac	ckgrou	ind a	and	foregroun	d of the cor	ntrol text area				
y selecting a col	or from color palette. In order to se	elect F	oreg	grou	nd or						
ackground use o	heck hox control as radio buttons	Tose	t ha	ckar	ound ima	200					

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8. Prog	rams using XML – Schema–XSLT/XSL
9. Prog	rams usingAJAX
10. Cor age	nsider a case where we have two web Services- an airline service and a travel agent and the travel ant is searching for an airline. Implement this scenario using Web Services andDatabase.
TEXT I	BOOK(S)
1.	HTML 5, Black Book, dreamtech Press, 2017
2.	InternetandWorldWideWebHowtoprogram,P.J.Deitel&H.M.Deitel,Pearson, 2017
3.	Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill 2015
REFER	RENCE(S)
1.	Web Technology: Theory and Practice by M. Srinivasan Publisher: Pearson India, 2016
2.	Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India, 2017

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Department	INFORMATION TECHNO	JLOC	έY		_	R 2019	Semester V	EE
Course Code	Course Name	ŀ	lour Wee	s/ k	Credit	Total Hours	Maximun Marks	n
19TPS05	QUANTITATIVE APTITUDE AND LOGICAL REASONING - III	2	0	0	0	30	100	
Course Objec	tive (s):							-
 To design to 	help people make sense of numerical	data.						
 To calculate 	the calendars and series in simplifiedv	vay.						
 To understa 	ind the concept of the interest amount i	n SI a	andC	:I.				
 To know the 	procedure to deal with a situation and	suffic	cient	to d	etermine	theanswer		
 To teach se 	ating arrangements in rows or in smalle	group	s.					
Course Outco	mes: At the end of this course, learners	s will	be a	ble t	o:			
 Demonstration 	te various principles involved in solving	math	iema	atical	problems	and there	by reducing th	e
time taken	to solve AptitudeQuestions.							
 Solve the quality 	uestion based on calendar, odd man ou	it and	seri	es b	y using sh	nortcutmet	hods.	
Calculate th	e interest by using shortcut methods in	stead	of t	raditi	ionalmeth	ods.		
Induce their	critical thinking by solving the syllogisn	n and	cou	rse o	ofaction.			
Analyze the	conditions and dointerpretation.	_	_	_				
UNIT DATA	INTERPRETATION & CLOCKS						A 14	- 2
DATA INTERP	RETATION: Tabulation – Bar graphs –	- Pie (chart	:s – I	_ine graph	IS.		
CLOCKS: Defi	nition – important points – Angular diffe	rence	e bet	wee	n two han	ds at differ	rent timings-	
Incorrect clock.			-	-				_
CALENDARS:	Odd days - Leap year - Ordinary year	- 00	untir		odd dave	- Day of	thowook	-
ODDMAN OUT	* & SERIES: Odd man out – Power ser	ies –	Num	iy oi ber	series-Se	duence of	real numbers	
UNIT 3 SIMP	E & COMPOUND INTEREST		- Turn			4401100 01	Tour number of	-
SIMPLE INTER	EST: Principal – Bate of interest – Nur	nher	of ve	ars	– Usina fa	ormulae an	d shortcuts	_
methods.		11001	0, 30	Juio	oongn	simalao an	ia enerioate	
COMPOUND II	NTEREST: Compounded Annually - Co	ompo	unde	ed H	alf-Yearly	– Compou	unded Quarter	
- Compounded	annually - Rates are different for differ	rent v	ears	e senera e real E		a contraction and a sector	40.4850.0480772.0460.04877.9477.84	V
UNIT 4 STAT		CIIL y						y
	EMENT & COURSE OF ACTION, SYL	LOG	ISM					iy (
STATEMENT A	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses of	LOG	ISM on -	Deci	sion take	n - Improve	ement, Follow-	y (up
STATEMENT A or further action	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses on in regard to the given statement.	LOG of acti	ISM on -	Deci	ision take	n - Improve	ement, Follow-	ly up
STATEMENT A or further actior SYLLOGISM/ L	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses o in regard to the given statement. .OGICAL VENN DIAGRAMS: Relation	LOG of acti	ISM on -	Deci reen	ision take the two th	n - Improve nings or no	ement, Follow- t - Classificatio	up on
STATEMENT A or further action SYLLOGISM/ I of propositions	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses of in regard to the given statement. OGICAL VENN DIAGRAMS: Relation – Immediate deductive inference – Imm	LOG of acti ship nedia	on - betw	Deci een	ision take the two th tive infere	n - Improve nings or no nce.	ement, Follow- t - Classificatio	up on
STATEMENT A or further actior SYLLOGISM/ I of propositions UNIT 5 SEAT	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses of in regard to the given statement. OGICAL VENN DIAGRAMS: Relation – Immediate deductive inference – Imm NG ARRANGEMENTS & DATA SUFF	LOG of acti ship nedia	on - betw te de	Deci een educ	ision take the two th tive infere	n - Improve nings or no nce.	ement, Follow- t - Classificatio	up on
STATEMENT A or further actior SYLLOGISM/ I of propositions UNIT 5 SEAT SEATING ARR	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses of in regard to the given statement. OGICAL VENN DIAGRAMS: Relation – Immediate deductive inference – Imm ING ARRANGEMENTS & DATA SUFF ANGEMENTS: Persons seating in the	LOG f acti ship nedia FICIE circu	on - betw te de NCY	Deci een educt	the two th tive infere tangular -	n - Improve nings or no nce. - Square.	ement, Follow- t - Classificatio	y up on
STATEMENT A or further actior SYLLOGISM/ I of propositions UNIT 5 SEAT SEATING ARR DATA SUFFIC	EMENT & COURSE OF ACTION, SYL ND COURSE OF ACTION: Courses of in regard to the given statement. OGICAL VENN DIAGRAMS: Relation – Immediate deductive inference – Imm ING ARRANGEMENTS & DATA SUFF ANGEMENTS: Persons seating in the ENCY: Reasoning ability using a set of	ship nedia FICIE circu	on - betw te de NCY lar –	Deci een educt Rec s.	ision take the two th tive infere tangular -	n - Improve nings or no nce. - Square.	ement, Follow- t - Classificatio	ly up on
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	INFORMATION TEC	HNOL	.OGY			R 2019	Semester V	EEC
Course	0	Hou	rs/W	eek	Credit	Total	Maximum M	arke
Code	Course Name	L	T	Ρ	С	Hours		ains
19HS504	PROFESSIONAL SKILLS FOR SOFTWARE ENGINEER	0	0	2	0	30	100	
• To de • To im • To en • To pro • To str	pective (s): evelop students' communicative comp prove their ability to communicate effe able the learners to fine-tune their con epare the error-freedocuments. engthen their thinking level and update	etence ectivel mpreh te thei	e in Er y in in ending r know	nglish tervio g lev /ledg	n with Lis ews. el of diffe le for car	eteningskill erenttexts. reergrowth	ls.	
Course Ou Deve Make Unde Enha Stren	tcomes: At the end of this course, lead lop listening skills to comprehend gen effective presentations in group/pair rstand various concepts by reading di nce the writing skills to express the id gthen their softskills.	arners leral / and at ifferen eas of	will be techni ttend j ttexts. f thelea	e abl calta obint arne	e to Ilks. terviews rs.			
Unit I	LISTENING			- 1				6
Formal and	I Informal conversation - Practicing G	roup d	iscuss	sion a	& Preser	ting Ideas	s, Listening inter	views
Linit II	PUBLIC SPEAKING	to Sei	minars	s, ais	cussions		Radio/ Foucasi	6
offering info of sounds -	prmation - Mock interviews - Improvin	g Bod	ly land		niterviev	v ioiniatio fo		liono
Reading dif	ACADEMIC READING	ations	rs, tec	hnica	al articles	s, magazin	es and short sto	ation 6 ories -
Unit III Reading dif Predicting t	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se	ations spaper equence	rs, tecl	hnica e se	al articles	s, magazin	etures) - Articul	ation 6 ories -
Unit III Reading dif Predicting t Unit IV Writing Job in web - Le English - Pi	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - tters(formal & informal) - Memos - Re reparation of Essays	spaper equence E-ma eports	rs, tecl cing th il cont - Inte	hnica e se ent v rpret	al articles ntences writing – ing the v	nguistic te s, magazin Technical <i>v</i> isual texts	es and short sto Content Presers – Common Er	etion 6 ories - 6 ntation rors in
Unit III Reading dif Predicting t Unit IV Writing Job in web - Le English - P Unit V	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - tters(formal & informal) - Memos - Re reparation of Essays IT CAREER SKILLS	spaper equence E-ma eports	rs, tecl cing th il cont - Inte	hnica e se ent v rpret	al articles ntences writing – ing the v	s, magazin Technical <i>v</i> isual texts	es and short sto Content Preser s – Common Er	ation 6 ories - 6 ntation rors in 6
Unit III Reading dif Predicting t Unit IV Writing Job in web - Le English - Pi Unit V Introduction changes - Managing c - Creative a	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - tters(formal & informal) - Memos - Re reparation of Essays IT CAREER SKILLS to Employability and IT Career Skill Time Management during interview changes - Stress management - Leader and Critical thinking	E-ma equence E-ma eports Is - de and ership	rs, tecl cing th il cont - Inte evelop work traits	hnica ent v rpret ing a - G	al articles ntences writing – ing the v a long te seneral a am work	Technical visual texts rm career awareness - Intercult	atures) - Articul les and short sto Content Preser s – Common Er plan - making of Current Af ural communica	ation 6 ories - 6 ntation rors in 6 career fairs - tion
Unit III Reading dif Predicting t Unit IV Writing Job in web - Le English - P Unit V Introduction changes - Managing o - Creative a TEXT BOO	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - teters(formal & informal) - Memos - Re- reparation of Essays IT CAREER SKILLS to Employability and IT Career Skill Time Management during interview changes - Stress management - Leader and Critical thinking K(S):	E-ma equence equence eports ls - de and ership	rs, tecl cing th il cont - Inte evelop work traits	hnica e se ent v rpret ing a - G - Tea	al articles ntences writing – ing the v a long te eneral a am work	Technical visual texts rm career awareness - Intercult	atures) - Articul les and short sto Content Preser s – Common Er plan - making of Current Af ural communica	6 ories - 6 ntation rors in 6 career fairs - ttion
Unit III Reading dif Predicting f Unit IV Writing Job in web - Le English - Pi Unit V Introduction changes - Managing c - Creative a TEXT BOO 1 English - Pi	ACADEMIC READING ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - teters(formal & informal) - Memos - Re- reparation of Essays IT CAREER SKILLS It CAREER SKILLS It o Employability and IT Career Skill Time Management during interview changes - Stress management - Leader and Critical thinking K(S): uresh Kumar et al. Communication for	E-ma equence E-ma eports Is - de and ership	rs, tecl cing th il cont - Inte evelop work traits	hnica e se ent v rpret ing a - G - Tea	al articles ntences writing – ing the v a long te beneral a am work	Technical visual texts rm career awareness - Intercult	atures) - Articul les and short sto Content Preser s – Common Er plan - making s of Current Af ural communica	6 ories - 6 ntation rors in 6 career fairs - tion bad,
Unit III Reading dif Predicting t Unit IV Writing Job in web - Le English - Pi Unit V Introduction chanaging c - Creative a TEXT BOO 1 E. St 2015 REFERENCE	ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - tters(formal & informal) - Memos - Re- reparation of Essays IT CAREER SKILLS n to Employability and IT Career Skill Time Management during interview changes - Stress management - Leader and Critical thinking K(S): uresh Kumar et al. Communication for SE(S):	E-ma equence E-ma eports Is - de r and ership	rs, tecl cing th il cont - Inte evelop work traits	hnica e se ent v rpret ing a - G - Te	al articles ntences writing – ing the v a long te seneral a am work	Technical visual texts rm career awareness - Intercult Drient Blac	atures) - Articul les and short sto Content Preser s – Common Er plan - making of Current Af ural communica	ation 6 ories - 6 ntation rors in 6 career fairs - tion bad,
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Unit III Reading dif Predicting f Unit IV Writing Job in web - Lee English - Pi Unit V Introduction changes - Managing of - Creative a TEXT BOO 1 E. Su 2015 REFERENO 1 Butter 2 Internation 3 Ram	ACADEMIC READING ACADEMIC READING ferent genres ranging from daily news the content - Gap filling exercises - Se WRITING SKILLS applications - Resume preparation - tters(formal & informal) - Memos - Re- reparation of Essays IT CAREER SKILLS n to Employability and IT Career Skill Time Management during interview changes - Stress management - Leader and Critical thinking K(S): uresh Kumar et al. Communication for CE(S): erfield, Jeff Soft Skills for Everyone. C act English Lab Manual for Undergrac an, Meenakshi and Sangeeta Sharma rd. 2014	E-ma equence E-ma eports ls - de and ership r Profe engag duate s a. Prof	rs, tecl cing th il cont - Inte evelop work traits essiona ge Lea Studer fession	hnica e se ent v rpret ing a - G - Tea al Su rning nts, (nal C	al articles ntences writing – ing the v a long te ieneral a am work iccess. (g: New D DrientBa	rm career awareness - Intercult Drient Blac	atures) - Articul les and short sto Content Preser s – Common Er plan - making of Current Af ural communica kswan: Hyderal Hyderabad, 201 ford University I	ation 6 ories - 6 ntation 6 career fairs - tion bad, 6. Press:

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Departr	ment	INFORMATION TECHNOLO	GY				R 2019	Semester V	PC
Cours	e	Course Name	Hoi W	urs ee	s / k	Credit	Total	Maximum	
Code	0		. L	Т	Ρ	С	Hours	Warks	
19IT5	05	COMPUTER NETWORKING LABORATORY	0	0	4	2	60	100	
Course C The purpo • Kno • Uno • Lea	Dbjective ose of lea ow the ba derstand arn the co	(s): Irrning this course is to Isic switch setup LAN and Routersetup Infiguration of Network and Ethernetadd	ress		1				
 Lea Unit 	arn config derstand	uration of DHCP, Port and ACL							
At the end • Und • Set • Cor • Cor • Get	d of this c derstand up switc nfigure No nfigure Di t Cisco Co	ourse, learners will be able to: basic network topology hes & Set up LAN andRouter etwork and Ethernetaddress HCP, Port, RIP andACL CNACertification							
List of Ex 1. Ne 2. Ty 3. Ba 4. VL 5. Ba 6. Pro 7. Co int 8. Co 9. Co 10. Co 11. Ch 12. Co	xperimer etwork top pes of Ca asic switcl AN and V usic route epare the onfigure a erfaces. onfigure the onfigure the onfigure the onfigure the onfigure the onfigure R	nts pology – studyexperiment ables – studyexperiment h setup & Configuring switchinterfaces /TPconfiguration rsetup Network, perform all the necessary bas nd Activate Serial and Ethernet Address ne DHCPconfigurations ne Port Security for the ports connected ne access-list inrouters Connectivity to all the devices inside you IP Routing on the Router and verify the	sic confi ses and to thesy rLAN Configu	gu as wite	rati ssig	ons for n appro es ns &Col	yourdevic opriate ado	e. Iresses to thedev	vice
TEXT BO	OK(S)	;							
1.	Compute	er Networks, James J Kurose, Keith W F	Ross, Pe	ear	sor	n Educa	ation, 2013	, ISBN: 0-273-	
2.	Compute	er Networks,Andrew S Tanenbaum,Pear	son Ed	uca	atio	n,Fifth	Edition		

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Departme	INFORMATION TECHNO	LOG	(R 2019	Semester IV	PC
Course	Course Name	H	our: Wee	s / ek	Credit	Total	Maximun	n
Code		L	Т	Ρ	С	Hours	Warks	
19IT506	COMMUNICATION ENGINEERING	3	0	0	3	45	100	
Course O	bjective (s):						*	
The purpo	ose of learning this course is							
• Une	derstand the basic concepts of communicatio	n and	l itst	ypes				
• Uno	lerstand the concepts of pulsemodulation		14					
• Lea	irn the basics of DigitalModulation							
• Ga	n knowledge on various mobile communication	on teo	chno	logie	es and the	irperforma	ances	
One	derstand the process of satellite and optical fi	berco	omm	unica	ation			_
At the end	d of this course, learners will be able to:							
	ntify different communication systems, their w	orkin	a pr	incin	les andan	nlications		
 Unc 	terstand the pulse modulation systems, then w	VOI KIII	g pi	incip	ics andap	plications		
 Ana 	alvze the performance of various digital modu	lation	tech	niau	es			
• Und	lerstand the basic concepts of Mobile commu	unicat	ionte	echn	ologies			
 Ana 	alyze spread spectrummodulation				J			
Unit I	ANALOG COMMUNICATION							9
Elements	of Communication systems - Basic principles	of A	M, F	M an	d PM - S	pectra – P	ower considera	ation -
Receiver	characteristics and detection of AM, FM and	PMS	yste	ms p	erformand	ce.		
Unit II	PULSE MODULATION						- HE HE	9
Sampling	process - Pulse Amplitude modulation - Pulse	e widt	th m	odula	ation - Pul	lse positio	n modulation	
Bandwidth	Noise trade off - Quantization process - Pul	se Co	ode I	Modu	lation - N	oise consi	derations in PC	CM
systems -		_	_			18 1.1		0
Introductic	DIGITAL MODULATION	and t	rane	mice	ion mode	L - Cohere	ant hinary mod	9 ulation
technique	s: BPSK_OPSK - Coherent Quadrature	modu	ilatio	n te	chniques	· OAM -	Noncoherent	hinar
modulatio	n: BFSK, DPSK - performance of digital mod	ulatio	n sv	stem	s based o	n probabi	lity of error, bar	nd
width.		anatio		otom	0 20000 0	II probabi		
Unit IV	MOBILE COMMUNICATION TECHNOLO	GIES	-					9
Wireless (Communication - Multiple access techniques	in Mo	bile	com	municatio	n - TDMA,	FDMA, CDMA	, W-
CDMA, OI	DMA, GSM technologies - RAKE receiver for	or wire	eless	s com	nmunicatio	on using C	CDMA.	
Unit V	SPREAD SPECTRUM MODULATION			_				9
Pseudo no	bise Sequences - A Notion of spread spectru	m - D	irect	sequ	lence spr	ead spect	rum - signal sp	ace
dimension	ality and processing gain - Probability of erro	r - Fre	eque	ency	hopping s	pread spe	ectrum.	-
TEVT DO	OK(S)							
IEXI BU	Simon Havkin Communication evetome Joh	n \//il	ev a	nd S	ons 2013	3		
1.	Simon naykin, Communication systems, 301		cy a		0110, 2010			
1. 2.	John Proakis, MassoudSalehi, Digital Comm	unica	ation	, 5th	Edition, N	lcGraw-H	ill, 2014.	а. 19
1. 2. 3.	John Proakis, MassoudSalehi, Digital Comm Taub and Schilling, Principles of Communica	unica ation s	ation syste	, 5th ems,	Edition, M Tata McG	icGraw-Hi Braw Hill P	ill, 2014. Jublication, 201	3.
1. 2. 3. REFEREN	John Proakis, MassoudSalehi, Digital Comm Taub and Schilling, Principles of Communica ICE(S)	unica ation s	ition syste	, 5th ems,	Edition, M Tata McG	icGraw-H Braw Hill P	ill, 2014. ublication, 201	3.
1. 2. 3. REFEREN 1.	John Proakis, MassoudSalehi, Digital Comm Taub and Schilling, Principles of Communica I CE(S) K Sam Shanmugam, Digital and Analog Con	ation s	ication	, 5th ems, on Sy	Edition, M Tata McG ystems, Jo	oraw-Hi Braw Hill P Ohn Wiley	ill, 2014. ublication, 201 , 2008.	3.

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Course	e Course Name	Hou We	urs/ eek		Credit	Total	Maximum Marks
Code	3	L	Т	Ρ	C	Hours	
19IT60	01 MACHINELEARNING	3	0	0	3	45	100
Course The pur In Pi Er pr To To Course At the e	Objective(s): pose of learning this course is to troduce applications of machine learni rovide an insight to different supervise nable the students to understand Grap oblems performed by a covering clusters in the given study and evaluate dimensionality re Outcomes: nd of this course, learners will be able explore the acquired knowledge on reca	ng and cas d learning to hical mode ven data duction for	e stud echni Is and the g	dies ques d the iven	s, merits a ir applica data of machi	and demer ibility to rea	its al world
	nderstand the concepts behind differen hoose and apply appropriate learning t nalyze the observations for a given set valuate the effectiveness of different le oplications	nt types of I technique fo of data. arning tech	earni or a g nique	ng ai iven es for	nd their a real worl different	ppropriate d problem t kinds of d	ness lata and
Unit I	INTRODUCTIONTOMACHINELEA	RNING					9
Overvie And Re Unit II Genera	w: Supervised Learning, Learning Ass inforcement Learning. SUPERVISEDLEARNING tive Vs Discriminative Learning, Gauss	sociations, (Class e Moc	ificat lels,	ion, Regi Decision	ression, Ur Tree Lear	nsupervised learning 9 ning, Neural Networks
Unit II		arring, Erro			arring.		9
Bavesia	In Learning ,Markov Random Fields, H	lidden Mark	ov M	odel	, Conditio	onal Rando	om Fields.
Unit IV	REGRESSION						9
LinearR	egression,LogisticRegression,OtherTy	/pesofRegr	essio	n,Ov	erfitting,	ModelSele	ction.
Unit V	UNSUPERVISEDLEARNING	at any lot	100		110	S 19	9
Discove	ring Clusters, Discovering Latent Fact	ors, Discov	ering	Gra	ph Struct	ure	
TEXTBO	DOK(S)						
1. S	ethem Alpaydin,— Introduction to Macl Beries)II, Third Edition,MIT Press,2014.	hine Learni	ng3e	(Ada	aptive Co	mputation	and Machine Learning
2. K	evinP. Murphy, Machine Learning A F	Probabilistic	Pers	pect	ive,MIT F	Press,2012	2.
EFERE	NCE(S)						and the second second
1. C	Christopher Bishop.Pattern Recognition	n and Mach	ineLe	earni	ng.,Sprin	ger,2006.	
2. J E	ason Bell,—Machine learning–Hand dition,Wiley,2014	s on for De	evelo	pers	and Tec	hnical Pro	ofessionals II, First
3. S	Stephen Marsland, —Machine SecondEdition,ChapmanandHall/CR	Learning CMachine	– Lear	An ning	Algorith andPatt	nmic Pe ernRecog	rspectivell, gnitionSeries,2014.

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		NOL	.00	GΥ	1.14	R2019	Semester VI	PC
Course Code	Course Name	H	Ne	rs/ ek	Credit	Total Hours	Maximum Ma	rks
	<u></u>	L	<u>T</u>	Р	С			-
19IT602	WIRELESS SENSOR NETWORKS	3	0	1	4	45	100	1.0
Course Obj	ective(s):							
The purpose	of learning this course is							
 To under 	erstand the state of the art in wireless s	sens	sor	netv	work - are	chitecture	s and applicatio	ns
 To stud 	y the functions of different wireless arc	hite	ctu	res				
 To learn 	n the various aspects of MAC protocols	3						
 To know 	w the concept of infrastructure establish	nme	nt					
 To gain 	knowledge about various tools and pla	atfor	m i	n th	e netwoi	rks		1.1.1
Course Out	comes:							
At the end of	this course, learners will be able							
 To exar 	nine the various wireless sensor netwo	orkin	g s	trate	egies.			
 To eval 	uate the different types of architecture	use	d in	se	nsor netw	vorks.		
 To anal 	yze the technical issues related to netw	vork	ing	ofs	sensors			
 To synth 	hesize knowledge to control the sensor	r net	two	rk.				
 To designation 	gn and build a wireless sensor network	usi	ng	sim	ulators			
Unit I II	NTRODUCTION OF WIRELESS SENS	SOR	NE	ETV	VORKS	6.0		9
Introduction	- Background of WSN Technology - 3	Sen	sor	Ne	etwork St	tandards	- RF Technolog	gies fo
WSN - Diffe	rence between mobile adhoc and ser	nsor	ne	atiar	rke - Ar	nlications	of concor not	vorks
			ne	SLAAC	urs - uh	plications	s of sensor new	
Challenges for	or Wireless Sensor Networks.		ne		лка - <i>А</i> р	plications		
Challenges for Unit II A	or Wireless Sensor Networks. RCHITECTURES				лка - <i>А</i> р	plications		9
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Department	INFORMATIONTEC	HNOL	OG	iΥ		R2019	Semes terVI	EEC
Course Code		Ho	ours	s/	Credit			
	Course Name	W	lee	k D	0	Total	Maxim	num Marks
1017603	BIGDATAANDANAL VTICS	2 (2	3	60	100	-
1911005	BIODATAANDANALTTICS	2		-	Ū	00	100	
Course Objective(s):								
The purpose of learning	this course is to							
 Introduce big data 	technology landscape							
 Understand Hadoo 	op and its ecosystem				VI			
 Work with NoSQL 	data bases such as Mongo DB and	Cassan	Idra	a				
 Understand pig an 	d Hive							
 Understand the bag 	asics of enterprise reporting using ope	en sour	се	too	ls.			- Serie Series
Course Outcomes:				2				
At the end of this course	e, learners will be able to:							
 Understand the bat 	asics of Big Data &Understand the Ha	doop e	eco	sys	tem			
 Write Map Reduce 	Program							
 Install and use No 	SQL databases							
 Write Pig Scripts a 	and Hive Query to access NoSQL dat	а						
•= Generate report us	sing Open Source Tools		i.					
Unit I INTRODUCTIO	NTOBIGDATA				Sec. A.		3	3
ClassificationofDigital Da	ata,Introduction to Big Data							
CharacteristicsofData, Ev	olutionofBigData, DefinitionofBigData	Introdu	ucti	ont	oBigDat	aAnalytic	s-	
WhatisBigDataAnalytics,	Classification, Challenges, Terminolog	iesUse	edin	Big	g DataEi	nvironme	nt	
Unit II THEBIGDATAT	TECHNOLOGYLANDSCAPE							4
NoSQL-TypesofNoSQL	Databases - Why NoSQL? - Ad	vantag	es	of	NoSQL	,SQLvers	us NoSQI	,NewSQL,
Hadoop- Features	of Hadoop, Key Advantag	es d	of	H	Hadoop,	Over	view of	Hadoop
Ecosystems, HadoopDis	tributions,HadoopversusSQL,Integra	tedHad	loo	pS	ystemsC	offeredby	LeadingMa	rket
Vendors.CloudbasedHa	doop solutions							
Unit III HADOOP								9
RDBMS Versus Hadoon	Distributed Computing Challenges.	Hadoo	p C)ve	rview. H	adoop D	istributed F	ile
System Processing Data	with Hadoon Managing Resources	and Ap	plic	ati	on with I	Hadoop)	ARN, Had	qoo
Ecosystem	a mai nadoop,managing noocalooo		P					
Unit IV NOSQL-MON	GODB AND CASSANDRA							9
MongoDB-Terms used i	n RDBMS and MongoDB Data Type	s in M	onc	JOL	B CRU	D(Create	Read, Ur	odate and
Delete)-Cassandra-Feat	ure s of Cassandra, COL Data Type	COL	SH	K	ev Snac	es CRUI	Collection	ns Usina
a Counter Time To Live	(TTL) Alter table data Import and Ex	nort S	vet	,	Tables	00, 01101	, 001100110	no, comg
a counter, Time To Live		pon, o	you	cini	Tables.			
		:*						
Unit V HIVE, PIG,R	EPORTINGTOOL							9
e - Hive Architecture, E	Data Types, File Format, Hive Query	Langu	lag	e, I	RCFILE	Impleme	ntation, SE	RDE,UDF
Pig - Anatomy of Pig, P	ig on Hadoop, Pig Philosophy, Use	Case t	for	Pig	ETL P	rocessing	g, Pig Latir	overview,
Data Types, Running	g Pig, Execution Modes of P	ig, H	DF	S	Comma	ands, R	elational	Operators,
EvalFunction.ComplexD	ataType,PiggyBank.UDF(UserDefine	dFunc	tior	1),F	aramete	erSubstitu	tion,Diagn	ostic
Operator Jasper Re	port Introduction to lasper	Rep	orts	S.	Jasper	soft	Studio.	Connecting
- parata anopor 110	DOLL - INCOLUCION TO JASUER		_				the second se	
toMongoDBNoSQI data	base.ConnectingtoCassandraNoSOL	Databa	ase	s				

8 <u>SM</u>

HANDSON(26Hours)

A project that allows the students to apply Technical, Behavioral, Process concepts learnt in the elective course by:

- Executing near real-life project (with large data)
- Working in teams(project teams will ideally comprise of4members)
- Experiencing expectations from different roles

There will be 1project(at the end of the course)

Project 1:Data in disparate data sources such as Excel, text file, databases etc. will be provided to the students. They will be expected to extract, cleanse, integrate and load it into the data-warehouse. Project 2: Design reports according to given business scenarios. The data for there ports is to be pulled from the data-warehouse built-in the earlier project.

TEX	TBOOK(S)
1.	Big Data and Analytics-Seema Acharya and Subhashini C-Wiley India
2.	Big Data for Dummies-Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman
3.	Hadoop: The Definitive Guide by Tom White
REFE	ERENCE(S)
1.	Hadoop in action–Chuck Lam.
2.	Hadoop for Dummies – Dirk Deroos, PaulC. Zikopoulos, RomanB. Melnyk, Bruce Brown

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Department	INFORMATIONTECHN	IOLOG	iΥ		S	R2019	SemesterVI	PC
Course Code	Course Name	F	lou Wee	rs/ ek	Credit	Total Hours	Maximum Ma	irks
1905604	CLOUDCOMPUTING	3	0	0	3	45	100	
Course Object	ive(s):				0.00			
The purpose of Understat Know abo Gain know Be familia Appreciat	learning this course is to ad the concept of Cloud Computing ut the Cloud Services. vledge on the various issues in Clo r with the lead Players in Cloud.	i. oud Coi	mpu	iting	computin	g paradigi	n and web	
based co	nmunication.	•						
Course Outco	nes:							
 Articulate Learn the Develop t Understate Evaluate and use c 	the main concepts , key technolog key and enabling technologies tha heabilitytounderstandandusetheard nd Service and delivery models. and choose the appropriate techno f cloud	ies, str t help i chitectu logies,	reng in th urec alg	iths and de ofcon	and limita evelopme nputeand nms and a	tions of C nt of cloud storageclo approache	loud Computing. I. bud. s for implementat	ion
	ERSTANDING CLOUD COMPLIT	INC			*		*	9
Cloud Compu	ting- History of Cloud Computi	na – (Clou	ud A	Architectu	ire- Clou	d Storage-Why	Cló
Computing Ma	tters- Advantages of Cloud Comp	uting-	Dis	adva	antages o	of Cloud C	omputing-Compa	anies
the Cloud Toda	v–CloudServices	U						
Unit II DE	ELOPING CLOUD SERVICES					1		9
Web-Based A	pplication-Pros and Cons of Clou	ud Ser	vice	e De	velopme	nt Types	of Cloud Service	
Development-	Software as a Service–Platform a	as a S	ervi	ce-	Web Ser	vices-On-	Demand Compu	iting
-Discovering (Cloud Services Development Ser	vices a	and	Тоо	ls–Amaz	on Ec2-C	Boogle App Engli	ne-
IBM Clouds								Q
	OUDC OMPUTING FOR EVERTOR	rating	on	Sch	adulas -	- Collabo	rating on To-Do	Lists
Collaborating E	Contact Lists-Cloud Computing	for th	e C	Com	munity-C	Collaborat	ing on Group P	rojec
and Events-	Cloud Computing for the Corpo	oration	1 .					
Unit IV US	NGCLOUDSERVICES	X.					ew .	9
			_					
Collaborating or Exploring Onl Collaborating Word Processin	n Calendars, Schedules and Task ne Planning and Task Man on Contact Management—Colla ng -Collaborating on Databases—S	Manag ageme aborat Storing	eme ent- ing and	ent– -Col on d Sh	Exploring laboratin Project aring File	g Online S g on Ev Manager es	cheduling, Applic vent Managem ment—Collaborat	ation ent ing o
Collaborating or Exploring Onl Collaborating Word Processin	Calendars, Schedules and Task ne Planning and Task Man on Contact Management—Colla ng -Collaborating on Databases—S NCEDWAYTOCOLLABORATEO	Manag ageme aborat Storing NLINE	eme ent- ing and	ent– -Col on d Sh	Exploring laboratin Project aring File	g Online S g on Ev Manager es	cheduling, Applic vent Managem ment—Collaborat	ation ent ing 9
Collaborating on Exploring Onl Collaborating Word Processin Jnit V ADVA Collaborating Web Conferen Wikis	n Calendars, Schedules and Task ine Planning and Task Man on Contact Management—Colla ng -Collaborating on Databases—S NCEDWAYTOCOLLABORATEOI via Web – Based Communicatio ce Tools—Collaborating via Social I	Manag ageme aborat Storing NLINE on Too Networ	eme ent- ing and ls-	ent– -Col on d Sh Eva	Exploring laboratin Project aring File luating V Group Wa	g Online S g on Ev Manager es Veb Mail are–Collat	cheduling, Applic vent Managem ment—Collaborat Services–Evalua porating via Blogs	ation: ent ing 9 ating and
Collaborating on Exploring Onl Collaborating Word Processin Jnit V ADVA Collaborating Web Conferen Wikis TEXTBOOK(S	a Calendars, Schedules and Task ine Planning and Task Man on Contact Management—Colla ing -Collaborating on Databases—S NCEDWAYTOCOLLABORATEOI via Web – Based Communicatio ce Tools—Collaborating via Social I	Manag ageme aborat Storing NLINE on Too Networ	eme ent- ing and ls-	ent– -Col on d Sh Eva	Exploring Project aring File luating V Group Wa	g Online S g on Ev Manager es Veb Mail are–Collat	cheduling, Applic vent Managem ment—Collaborat Services—Evalua porating via Blogs	ation ent ing 9 ating and
Collaborating on Exploring Onl Collaborating Word Processin Unit V ADVA Collaborating Web Conferen Wikis TEXTBOOK(S 1. Micha	a Calendars, Schedules and Task ine Planning and Task Man on Contact Management—Colla ing -Collaborating on Databases—S NCEDWAYTOCOLLABORATEOI via Web – Based Communication ce Tools—Collaborating via Social I el Miller,Cloud Computing,9 th Edit	Manag ageme aborat storing VLINE on Too Networ	eme ent- ing and Is- ks a arso	ent– -Coll on d Sh -Eva and (Exploring laboratin Project aring File luating V Group Wa ducation,	g Online S g on Ev Manager es Veb Mail are–Collat 2014.	cheduling, Applic vent Managem ment—Collaborat Services–Evalua porating via Blogs	ation ent ing ating ating and
Collaborating on Exploring Onl Collaborating Nord Processin Jnit V ADVA Collaborating Web Conferen Wikis TEXTBOOK(S 1. Micha 2. Antho	a Calendars, Schedules and Task ine Planning and Task Man on Contact Management—Colla og -Collaborating on Databases—S NCEDWAYTOCOLLABORATEOI via Web – Based Communicatio ce Tools—Collaborating via Social I el Miller,Cloud Computing,9 th Edit ny T. Velte, Cloud Computing,12 th E	Manag ageme aborat storing NLINE on Too Networ tionPe Edition,	eme ent- ing and Is- ks a arso	ent- -Coll on d Sh -Eva and (onEc	Exploring laboratin Project aring File luating V Group Wa ducation, grawHill,	g Online S g on Ev Manager es Veb Mail are–Collat 2014. 2013.	cheduling, Applic vent Managem ment—Collaborat Services–Evalua porating via Blogs	ation ent ing ating and

& AM. Chairman - BoS Dept. of IT - ESEC

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

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Dep	artment	INFORMATIONTECHNOL	OGY				R2019	SemesterVI	PC
Co	urse	Course Name		Hou Wee	rs/ ek	Credit	Total	Maximum M	arks
00	ue		L	Т	P	С	Hours		
1917	604	CLOUDCOMPUTING LABORATORY	0	0	4	2	60	100	
Cours	e Objective(s):								
The pu	irpose of learning	g this course is to							
• •	earnhowto instal	Il Virtual Box							
. •=	DevelopWebAppl	icationsinCloud							
• [earnConfiguratio	ons ofCloudsim							
• [earnthe designa	nd developmentprocess involvedinc	reatinga	cloud	bas	sedapplica	ation		
Cours	earnto implement	ntanduseparallel programming using	Hadoop			<u> </u>			
Atthee	e outcomes.	earnerswillbe ableto:							
Aunee	onfigurevarious	virtualizationtoolssuchasVirtualBox	VMware	work	retati	ion			
	esian anddenlou	a webapplicationinaPaaSenvironme	ont	WOIR	Stati	1011.			11
•= 1	earn howtosimul	ateacloudenvironmenttoimplementn	ewsche	duler	s				
•••	stallanduseager	periccloudenvironmentthatcanbeuse	dasapriv	/atec	loud.				
•• N	/anipulatelargeda	atasets inaparallelenvironment	adoap						
Listof	Experiments						17. A.		
1. Ins	tallVirtualbox/VM	IwareWorkstationwith different flavo	ursofLin	uxor\	Wind	ows OS o	ontopofwi	ndows	
2. Ins	tallaCompilerinth	eVirtualMachinecreatedusingVirtual	boxand	execu	utesi	mpleprog	rams		- 1,
3. Ins	tallGoogleAppEn	gine.Createhelloworldappandothers	imple w	ebap	plica	tions usir	ngPython/	Java.	
4. Us	e GAElauncher t	o launchtheWebApplications.							e.
5. Sin	nulate a cloud sc	enario using Cloud Sim and run a so	chedulin	g alg	orith	m that is	not prese	nt in	
Cloud	ISim.								$ \in \{1\}$
6. Fin	daprocedure totr	ansferthefilesfromone VirtualMachin	ne toano	ther∨	/irtua	al Machine	Э.		
7. Fin	daproceduretola	unch VirtualMachine usingtrystack(C	Online O	penS	Stack	DemoVe	rsion)		
8. Ins	tallHadoopSingle	e nodeClusterandrunsimple applicati	ons like	word	cour	nt	yn i'		
TEXTE	BOOK(S)		i te stage Line li						
1.	CloudInfrastruc	tureandServicesParticipantGuideVo	olume1&	2(EN	ICEd	lucationS	ervices,O	ct2011)	
REFER	RENCE(S)		1.0.		щ				
1	S.R.SmootandN Infrastructure" Selvi, "Mastering	I.K.Tan,"Private Cloud Computing: C (Elsevier, 2012, ISBN: 978-0-12-384 in Cloud".MHI.2013	Consolid 4919-9)	ation, Rajkı	, Virt umar	ualization Ɓuyya,Cł	and Serv Aristian Ve	vice - Oriented ecchiola,S.Than	narai

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		LOG	Y			R2019	SemesterVI	EEC
Course	Course Name	ł	Hour Wee	rs/ k	Credit	TotalH	Maximum Marks	19
Code		L	Т	Ρ	C	ours	Warks	
19TP601	QUANTITATIVE APTITUDE, LOGICALREASONING,VERBAL ABILITY-V& RECRUITMENTPROCESS	2	0	0	0	30	100	
Course Obj The purpose	ective(s): e of learning this course is to							
 To calcu To find t To work To deter To get a 	late the work capacity by chocolate based he ratio in which two or more ingredients a with time, speed and distance by relative s mine how various phenomena are related. most suitable candidate available for the jo comes:	metl t the spee ob.	hod. give d coi	en pri ncep	ice. ts.			
At the end o	f this course, learners will be able to:							
 Crack al Know the Analyze Know the 	legations and mixture problem by using she e concepts of Time, Speed and Distance a the cause and effect of problems by using	ortcu nd co critic	ut me once cal th	ethoo epts o ninkir	ls. of Boats a ng.	and Stream	ns.	
tricks an UNIT 1 TIN TIME AND 1 works start	d tips through and lingit. IE& WORK,PIPE & CISTERNS WORK: Introduction–Basicconcepts–Leaving and ending.	vinga	andjo	ion a oinin	g–Altern	Interview ativedays	s by knowing it: in between da	s 6 ays the
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank.	d tips through and lingit. IE& WORK,PIPE & CISTERNS WORK: Introduction–Basicconcepts–Leaving and ending. CISTERNS: Introduction-Basic concepts–C	Disc vinga Capa	andjo	ion a oinin of th	g–Altern e totallite	Interview ativedays rs–Water	s by knowing its —in between da flow in the	s 6 ays the
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A	e Importance and do's and don'ts of Group d tips through and lingit. IE& WORK,PIPE & CISTERNS WORK:Introduction–Basicconcepts–Leav ing and ending. CISTERNS:Introduction-Basic concepts–C LLIGATIONS&MIXTURE	vinga Capa	andjo acity	ion a oinin of th	g–Altern e totallite	Interview ativedays rs–Water	s by knowing its —in between da flow in the	s 6 ays the 6
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A ALLIGATIO -Sixgoldenru	WORK:Introduction-Basicconcepts-Leaving and ending. CISTERNS:Introduction-Basic concepts-Leaving and ending. CISTERNS:Introduction-Basic concepts-C LLIGATIONS&MIXTURE NS ANDMIXTURES:Definition-Allegationrulestosolveproblemsonmixture-Removalan	vinga Capa ule–l nong	andjo acity Mean	ion a oinin of th nvalu	g–Altern e totallite ue(orcost titiesmore	Interview ativedays rs–Water price)ofthe	s by knowing its	s ays the 6
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A ALLIGATIO –Sixgoldenru UNIT 3 TI	e Importance and do's and don'ts of Group d tips through and lingit. ME& WORK,PIPE & CISTERNS WORK:Introduction–Basicconcepts–Leaving and ending. CISTERNS:Introduction-Basic concepts–C LLIGATIONS&MIXTURE NS ANDMIXTURES:Definition–Allegationrulestosolveproblemsonmixture–Removalant ME & DISTANCE,TRAINS,BOATSANDS	vinga Capa ule–l nong TRE	andjo acity Mean gtheo AMS	ion a oinin of th nvalu	g–Altern e totallite ue(orcost titiesmore	Interview ativedays rs–Water price)ofthe sthantwo.	s by knowing its	s ays the 6
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A ALLIGATIO –Sixgoldenru UNIT 3 TIME AND different–Sta and distance PROBLEMS each other BOATSAND Directions–ir	 Importance and do's and don'ts of Group d tips through and lingit. ME& WORK,PIPE & CISTERNS WORK:Introduction-Basicconcepts-Leaving and ending. CISTERNS:Introduction-Basic concepts-C LLIGATIONS&MIXTURE INS ANDMIXTURES:Definition-Allegationrulestosolveproblemsonmixture-Removalant IME & DISTANCE,TRAINS,BOATSANDS DISTANCE: Definition - Average speed op page time per hour for a train-Time between two moving bodies. ON TRAINS: Basic concepts-Basic form in both directions-Shortcuts. STREAMS: Introduction-Speed of man(Basic conceptation) 	vinga vinga Capa ule– nong TRE take sulae	andjo acity Mean of theo AMS istan w —Diff	ion a pinin of th nvalu quant cce c vith t ferer Strea	g–Altern e totallite ue(orcost titiesmore covered i wo differ nt types c ams) – M	Interview ativedays rs–Water price)ofthe ethantwo. s same – ent mode of Objects- oving sam	s by knowing its -in between da flow in the emixture Distance cove es of transport -Two trains cro ne and opposite	6 ays the 6 ered is –Time ossing
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A ALLIGATIO –Sixgoldenru UNIT 3 TI TIME AND different–Sta and distance PROBLEMS each other BOATSAND Directions–ir UNIT4 S	 Importance and do's and don'ts of Group d tips through and lingit. ME& WORK,PIPE & CISTERNS WORK:Introduction-Basicconcepts-Leaving and ending. CISTERNS:Introduction-Basic concepts-C LLIGATIONS&MIXTURE NS ANDMIXTURES:Definition-Allegationrulestosolveproblemsonmixture-Removalant IME & DISTANCE,TRAINS,BOATSANDS DISTANCE: Definition - Average speed op page time per hour for a train-Time to between two moving bodies. ON TRAINS: Basic concepts-Basic form in both directions-Shortcuts. STREAMS: Introduction-Speed of man(Basic concents) TATEMENT & ARGUMENTS,CAUSE & E 	vinga Vinga Capa Capa Nong TRE L TRE Soat a Boat a	andjo acity Mean theo AMS istan w —Diff and theo CT, A	ion a pinin of th uan ce c vith t ferer Strea	g–Altern e totallite ue(orcost titiesmore wo differ nt types c ams) – M ERTION &	Interview ativedays rs–Water price)ofthe ethantwo. s same – ent mode of Objects- oving sam & REASO	s by knowing its in between da flow in the emixture Distance cove es of transport -Two trains cro he and opposite N	s 6 ays the 6 ered is –Time ossing
tricks an UNIT 1 TIM TIME AND works start PIPES AND tank. UNIT 2 A ALLIGATIO –Sixgoldenru UNIT 3 TI TIME AND different–Sta and distance PROBLEMS each other BOATSAND Directions–ir UNIT4 S STATEMEN Cause ar REASON:As (A)isfalsebu	 Importance and do's and don'ts of Group d tips through and lingit. ME& WORK,PIPE & CISTERNS WORK:Introduction-Basicconcepts-Leaving and ending. CISTERNS:Introduction-Basic concepts-C LLIGATIONS&MIXTURE NS ANDMIXTURES:Definition-Allegation rulestosolveproblemsonmixture-Removalant IME & DISTANCE,TRAINS,BOATSANDS DISTANCE: Definition - Average speed op page time per hour for a train-Time to between two moving bodies. ON TRAINS: Basic concepts-Basic form in both directions-Shortcuts. STREAMS: Introduction-Speed of man(Binportant formulae. TATEMENT & ARGUMENTS: Arguments strong vid effect relationship between issertion(A)andReason(R)-Both(A)and(R)ant t(R)istrue. 	vinga Vinga Capa Capa Ule–I nong TRE, – D take Boat a soat a soat a the reind	andjo acity Mean theo AMS istan en w —Diff and t trespo t t lividu	ion a pinin of th nvalu quan ce c tith t ferer Strea Strea ASSE ect to wo uallyt	g–Altern e totallite ue(orcost titiesmore wo differ at types o ams) – M ERTION a o the stat statem rueand(F	Interview ativedays rs–Water price)ofthe ethantwo. s same – rent mode of Objects- oving sam & REASO ement. C/ ents. / R)-(A)istru	s by knowing its —in between da flow in the emixture Distance cove es of transport —Two trains cro he and opposite N AUSE AND EFI AUSE AND EFI AUSE AND EFI AUSE AND EFI AUSE AND EFI	6 ays the 6 ered is –Time ossing 6 FECT: AND

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COMMUNICATION SKILLS: Verbal Communication Skills–Non-Verbal Communication Skills–SelfIntro– Presentation Skills–Public Speaking. **RECRUITMENT PROCESS:** CV Making– Industry Expectations–Company Pattern Discussion–Group Discussion–Interview Handling.

REFERENCES:

- 1. Murphy, Raymond .English in Use- A Self- Study Reference and Practice Book for Intermediate Learners of English.IV. United Kingdom: Cambridge University Press.2012.
- 2. Lewis, Norman. Word Power Made Easy. New York: PocketBooks.1991.
- 3. Baron's The Official Guide for New GMAT Review 2015. NewJersey: John Wiley & Sons, Inc.
- 4. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Fourth Edition, Tata McGraw-Hill Publishing Company Ltd, 2012
- 5. Arun Sharma, How to prepare for Data Interpretation for the CAT, First Edition, Tata McGraw-Hill Publishing Company Ltd, 2012.
- 6. The CV Book: Your Definitive Guide to Writing the Perfect CV Book by James Innes
- 7. Group Discussion and Interview Skills Paper Back Sep 2015 by Priyadarshi Patnaik(Author)

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Department	INFORMATION TECH	NOL	.OG	Υ		R2019	SemesterVI	EEC
Course Code	Course Name		Hours/ Week Cre		Credit	TotalH	Maximum Marks	
NITCOF		L	T	Ρ	С	ours		
1911605	COMPREHENSIVEREVIEW-I		0	2	0	30		
Course Objecti Toencouragethe ech. DegreeCou	ve(s): The purposeoflearningthis constructed by the purpose of the	gead	es cqui	red	fromthef	irstSemes	terto6 th Semeste	rofB.T
Course Objecti Toencouragethe ech. DegreeCou Course Outcon	ve(s): The purposeoflearningthis co estudentstocomprehendtheknowled irse throughperiodic exercise. nes: At theendofthis course, learne	gead rs w	es cqui illbe	red abl	fromthef eto:	irstSemes	terto6 th Semeste	rofB.T

• The students will be assessed100% internally through weekly test with objective type questions

onallthesubject relatedtopics.

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Department	INFORMATIONTECH	INOLOG	iΥ			R2019	SemesterVI EE	
Course	Course Name	ŀ	Hours/ Week Credit			Total	Maximum Marks	
Code		L	Т	Ρ	С	Hours		
19IT606	MINIPROJECT	0	0	2	1.	30	100	

Course Objective(s):

The purpose of learning this course is to

- Developknowledge toformulatearealworldproblemandproject'sgoals.
- Identifythevarioustasksoftheprojecttodeterminestandardprocedures.
- •- Identifyandlearn newtools,algorithmsandtechniques.
- Understandthevariousproceduresforvalidationoftheproductandanalysisthecosteffectiveness.
- Understandtheguidelineto preparereportfororaldemonstrations.

Course Outcomes:

At the end of this course, learners will be ableto

- Formulatearealworldproblem, identify the requirement and develop the design solutions.
- Expressible technicalideas, strategies and methodologies.
- Utilize the newtools, algorithms, techniques that contribute to obtain the solution of the project.
- Test and validate through conformance of the developed system/application and analysis thecosteffectiveness.
- Preparereportandpresenttheoraldemonstrations. •

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Course C. Code Init 1 CRYPTOGF 19IT701 CRYPTOGF Course Objective(s): The purpose of learning thi Toknowthemethodsof Tounderstandthecond Tounderstandthecond Tounderstandthecond Tounderstandthecond Tounderstandauthent Toknowthemethodsof Tounderstandauthent Tounderstandauthent Toknowthecurrent tre Course Outcomes: Attheendofthiscourse, learn Todesignandconducte TouseCryptographyind Toimplement Public kee To apply Hash algorith Tousethebestsolutionfe Tousethebestsolutionfe Unit I INTRODUCTION Security trends - Need for Security attacks, services techniques: substitution Implementations using C Unit II VATHEMATICS OF SYMME Suclid's algorithm- Congrue CIPHERS: Block cipher Printic Block cipher design princip MATHEMATICS OF ASY Factorization – Euler's to Theorem – Exponentiation distribution – Key manage Theorem – Exponentiation	INFORMATION TECHN	IOLO	GΥ		R2019	SemesterVII	PC
Code CRYPTOGE 19IT701 CRYPTOGE Course Objective(s): The purpose of learning thi Toknowthemethodsof Tounderstandthecond To acquire the metho Tounderstandthecond To acquire the metho Tounderstandauthent Toknowthecurrent tre Toknowthecurrent tre Course Outcomes: Attheendofthiscourse, learr Attheendofthiscourse, learr Todesignandconducte TouseCryptographyind Toimplement Public kee To apply Hash algorith Tousethebestsolutionfor Unit I INTRODUCTION Security trends - Need for Security attacks, services techniques: substitution Implementations using C Unit II SYMMETRICC IATHEMATICS OF SYMME uclid's algorithm- Congruer IPHERS: Block cipher Printlock cipher design princip dvanced Encryption Standa Unit III MATHEMATICS OF ASY Factorization – Euler's to Theorem – Exponentiation distribution – Key manage	ourse Name	Hou We	rs/ ek	Credit	Total	Maximum Ma	
19IT701 CRYPTOGE Course Objective(s): The purpose of learning thi Toknowthemethodsof Tounderstandthecond To acquire the method Tounderstandthecond To acquire the method Tounderstandauthent Tounderstandauthent Toknowthecurrent tree Course Outcomes: Attheendofthiscourse, learr Attheendofthiscourse, learr Todesignandconducte TouseCryptographying Toimplement Public kee To apply Hash algorith Tousethebestsolutionf Unit I INTRODUCTION Security trends - Need for Security attacks, services techniques: substitution Implementations using C Unit II SYMMETRICC MATHEMATICS OF SYMME Guarded Encryption Standa Unit III ASYMMETRICS OF ASY Factorization – Euler's to Theorem – Exponentiation distribution – Key manage Theorem – Exponentiation		LT	Ρ	С	Hours		
Course Objective(s): The purpose of learning thi Toknowthemethodsof Tounderstandthecond To acquire the metho Tounderstandauthent Toknowthecurrent tre Course Outcomes: Attheendofthiscourse, learr Todesignandconducte TouseCryptographyind Toimplement Public ke To apply Hash algorith Tousethebestsolutionf Unit I INTRODUCTION Security trends - Need for Security attacks, services techniques: substitution Implementations using C Unit II SYMMETRICO MATHEMATICS OF SYMME uclid's algorithm- Congruer IPHERS: Block cipher Print lock cipher design princip dvanced Encryption Standa Unit III ASYMMETRICO MATHEMATICS OF ASY Factorization – Euler's to Theorem – Exponentiation distribution – Key manage	RAPHYANDNETWORK SECRUITY	3 0	1	4	45	100	24
TouseCryptographying Toimplement Public ke To apply Hash algorith Tousethebestsolutionfe Unit I INTRODUCTIO Security trends - Need for Security attacks, services techniques: substitution Implementations using C Unit II SYMMETRICC ATHEMATICS OF SYMME fuclid's algorithm- Congruen IPHERS: Block cipher Printlock cipher design princip dvanced Encryption Standa Unit III ASYMMETRIC MATHEMATICS OF ASY Factorization – Euler's to Theorem – Exponentiation	is course is ofconventionalencryption to cepts of Symmetric Key C ods of Asymmetric Key Cry ticationandHashFunctions ands in networksecuritytoc nerswillbe able	echniq Cryptog yptogr 3. blsanda	ues grap aph app	hy. y. lications.	conventio	onal techniques	
Unit II SYMMETRICC ATHEMATICS OF SYMMI uclid's algorithm- Congruen IPHERS: Block cipher Prir ock cipher design princip dvanced Encryption Standa Unit III ASYMMETRIC MATHEMATICS OF ASY Factorization – Euler's to Theorem – Exponentiation distribution – Key manage	differentfieldsofEngineerin ey Cryptography algorithm hms and authentication pr forasecuritythreat. ONTOCRYPTOGRAPH Security at Multiple levels s and mechanisms – OS techniques, transposi	ngand ns for a rotocol Y s, Secu SI sec tion	Math an a s fo urity curit tecl	r an applicatio r an appl Policies y archite	n. ication. - Model ecture – stegano	of network secu Classical encry ography- Algo	9 urity - ptior prithm
MATHEMATICS OF AS' Factorization – Euler's to Theorem – Exponentiation distribution – Key manage	CRYPTOGRAPHY ETRIC KEY CRYPTOGR ence and matrices - Group nciples of DES – Strengtl ples – Block cipher mod ard - Key distribution- Alg CCRYPTOGRAPHY	APHY os, Rin h of D le of o orithm	: Al Igs, ES ope Im	gebraic s Fields- F – Differe ration – plementa	structures Finite field ential and Evaluations utions usir	- Modular arith s- SYMMETRIC linear cryptana on criteria for A ng Cryptool	9 Imetio C KE alysis AES 9
Unit IV MESSAGEAU	YMMETRIC KEY CRYF otient function, Fermat's and logarithm - ASYMME ement – Diffie Hellman ke rve cryptography- Algorith THENTICATION AND IN	PTOGI and ETRIC ey exc m Imp NTEG	RAF Eul KE char blem	PHY: Pri er's The Y CIPHE nge - EK nentation Y	imes – orem - RS: RSA Gamal cry s using C	Primality Testi Chinese Rema cryptosystem - vptosystem – E	ng – iinder – Key Illiptic 9
Authentication requirement DSS- Entity Authentication applications - Kerberos, X.	t – MAC – MD5 –SHA – n: Biometrics, Passwords, 509- Algorithm Implement	Digital Chall tations	sig eng susi	nature a e Respo ng Crypt	nd authe inse proto ool	ntication protoc ocols- Authentic	ols - ation
	CURITY PRACTICES						9

ESM.

TEXTE	OOK(S)
1.	William Stallings, Cryptography and Network Security: Principles and Practice, 8 th Edition, PHI, 2017.
REFER	ENCE(S)
1.	C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and Network Security, Wiley IndiaPvt.Ltd,2011
2.	BehrouzA.Foruzan, Cryptography and Network Security, Tata McGraw Hill 2015.
3.	Charlie Kaufman, Radia Perlman, and Mike Speciner, Network Security: Private Communicationin a PUBLIC World, Prentice Hall, ISBN 0-13-046019-2,2016.

8 Jul.

Charanan - Lao Dobhan II - Esta

Depart	tment	INFORMATION TEC	HNC	DLC	GY		R2019	SemesterVI	PC
Cour	se	Course Name	H	lou We	rs/ ek	Credit	Total	Maximum M	larks
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19IT7	702	2 INTERNETOF THINGS 3 0 0 3					45 100		
Cours The pu • T • T • T	o unde o identi o unde o unde o unde	of learning this course is rstand what Internet of Things is. fy the various elements of an IoT S rstand the various means of commu- rstand Cloud Computing & its relevant fy types of data analytics and data	ystem unicat ance i	ion inlo	fron T	n Node/G	ateway to	CloudPlatforr	ns
To Course At the e D	o make e Outc end of t escribe	students aware of security concern omes: his course, learners will be able to: components of IoT Architecture ar	ns and Id pla	d ch	msio	nges whi	le implem	enting loT sol	utions
• D • D • D	escribe escribe escribe lentify t	and implement edge network Big Data Analytics, transform data	and o	drav	v m	eaningful	conclusio	ons	
pi	rototype	es	elect	1011	100 1	Jacoms		1g 10 I	
Unit I	nototype Intro	es oduction to IoT	elect		103 1	Jacoms			9
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Cours	e	Course Name We		oui Vee	rs/ ek	Credit	Total Hours	Maximum Marks
Coue			L	Т	P	С		
19IT70	4	IOT LABORATORY	0	0	4	2	60	100
Course O	bjective(s):			-		<u>la</u>	I	
The purpos	se of learning	this course is						
 To in 	nplement LED) operations						
 To ir 	nplement IOT	sensors in motion devices						
 To in 	nplement IOT	for Alarm Systems						
 To in 	nplement IOT	for Music Systems				1		
• To in	nplement IOT	for Security Systems						
Course Ou	itcomes:							
Attheendof	thiscourse, le	arnerswillbeableto						
• Deve	op Sensors fo	or LED Operations						
• Devel	op Sensors fo	or Motion Devices						
• Devel	op Sensors fo	or Alarm Systems						
 Devel 	op Sensors fo	or Music Systems						
Devel	op Sensors fo	or Security Systems						
ListofExp	eriments					*		
Programs	could be imp	olemented using Ardinuo/Raspe	rry Pi/Ti	nke	erc	ad/etc.		
2. Push B	utton Control	with LED Pattern						
3. Push B	utton Counter							
Fire Al	rature and Hu	midity Sensor Interface						
6. Remote	e Controlled A	C Fan Regulator						
7. Motion	Detection							
3. Playing	Music							
9. Control	ling and Moni	toring a Traffic Light Controller				2		
IU. Passwo	Security L	ock System						
FEXTBOO	K(S)		Ni Marina					11 S.
1	lersent, David	Boswarthick,OmarElloumi,TheInte	netofTh	ing	s: ł	Key App	lications	
A	ndProtocols,	VileyPublications.Oliver,2012	· A Mida		10.10	o Doron	active" CD	C Drage 2012
2.	iondo Znou,	The Internet of Things in the Cloud	: A Midd	llev	var	e Perspe	ective", CR	C Press, 2013
3. C T	ieter Uckelma hings,Springe	ann, Mark Harrison, Florian Michał erPublications,2011	elles, A	rch	ited	cting the	Internet of	
4. N	larco Schwati	z,InternetofThingswithArduinoCoc	kbook, F	ac	k I	Publicati	ons,2016.	
EFEREN	CE(S)							
1. Ir	nternetofThing	sandDataAnalytics,WileyPublication	ons,2016	5.				

Department	INFORMATIONTECHNOLO	DGY				R 2019	Semester V	PE
Course Code	Course Name	Ho W	urs eek	1	Credit	Total	Maximum N	larks
		L	Т	Ρ	C	Hours		
19ITP01	WEB APPLICATIONDEVELOPMENT USINGC#AND .NET	3	0	0	3	45	100	
Course Objectiv	ve(s):							1.1.1
The purpose of le	earningthiscourseisto							
 Understa 	nd the foundations of CLR execution.							
Learn the	e technologies of the .NET frame work	κ.						
 Know the 	object oriented aspects of C#.							
Beaware	of application development in .NET.	>						
Course Outcom	b based applications on NET (ASP. N	=1).					and the second	
At the end of this	course learners will beable to:							
List the ma	jor elements of the .NET frame work	and e	xpla	ain	how C# fi	its into the	.NET platform.	
 Understand 	d Object based concept of C#			_				
 Debug, cor 	npile, andrinuo simple application.							
 Analyze the 	e basic structure of a C# application a	ind w	eb k	base	ed develo	pment of	C#	
 Discuss CL 	R and security in .NET.							
Unit I INTR	RODUCTION TO C#							9
Introducing C#	Understanding NET overview of C#	Lite	rals	Va	ariables I	Data Type	s Operators ch	ecked
and unchecked	operators, Expressions, Branching	Lo	opir	na.	Methods	implicit	and explicit ca	stina.
Constant. Arrays	Array Class Array List, String, String	Build	ler.	Str	ucture.En	umeration	s, boxing and	.og,
unboxing	,		,				-,	
Unit II OBJ	ECT ORIENTED PROGRAMMING IN	C#						9
Class,Objects,Co	onstructors and its types, inher	itance	e,	pro	perties,	indexers,	index overloa	ading,
polymorphism, s	sealed class and methods, interfa	ce, a	abst	ract	class,	abstract a	and interface,op	erator
overloading,dele	gates, events,errorsand exception,Th	readi	ng					
Unit III APPI	LICATION DEVELOPMENT & CONN	IECT	ING	W	TH DAT	ABASE		
Building window		1.1		1.12				9
creation, inheriting	vs application, Creating our own	winc	low	fo	rms with	n events	and controls,	9 menu
	s application, Creating our own g window forms, SDI and MDI appli	winc catio	low n, E	fo Dialo	rms with og Box(N	n events lodal and	and controls, Modeless), acce	9 menu essing
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Chairman - BoS Dept. of IT - ESEC

2.	ChristianNageletal."ProfessionalC#2012with.NET4.5",WileyIndia,2012
REFE	RENCE(S)
1.	AndrewTroelsen, "ProC#2010andthe.NET4Platform, Fifthedition, APress, 2010.
2.	Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition,O'Reilly,2010

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	INFORMATIONTECHNOLOGY	(R 2019	Semester V	PE
Course	Course Name	Ho	ours /eek	1	Credit	Total	Maximum M	arke
Code		L	Т	Ρ	С	Hours		
19ITP02	WEB DEVELOPMENT USING JAVA PROGRAMMING	3	0	0	3	45	100	
Course Obje The purpose Underst	ctive(s): of learning this course is to and the basic concepts of core principles	of the	e Ja	va La	anguage			
 Gain kn Discuss Gain kn Introduction 	basic principles of HTML,JavaScript and owledge to develop dynamic Web application to the tools, technologies and framework Hibe	ns. XML tions rnate	like e and	Serv d Sp	vlet ring			
Course Outc At the end of t Develop Solve th Analyze HTML5, Design a Explore	omes: this course,learners will beable to: the application based onthejava concepts e real world problems using concepts like and design web-based information syster CSS, JavaScript and Develop interactive,client-side,server-	s swin ms to side	igs, o me exec	JDB et ce	C ertain bus ble web	iness need	ds using	
webapp Unit I JA Overview of J Objects as an ofsuper in ca super():super Swings-Event CallableState	Icationsdevelopment VAFUNDAMENTALS Iava - Java modifiers-Wrapper classes-Anguments-Returning objects- Passing an alling parent class constructor-java.lang. (int), super(String) - super(String, Stri Handling-JDBC-JDBC Dr ement-preparedstatements-Scrollablean	gume array .Obje ng)-F ivers dupo	ent p ent p -cor ect a Pack s-JD latal	bassi nstru and BCc blere	ing in clas ictors – th its metho s-User d configurat	Spring, st ss & objec nis keywor ods – Pas efined ex tion(conne	truts used in t Returning a va rd- Inheritance- ssing argument acception-Collection ection)-Stateme	9 Use ts ir ions ent—
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webapp Unit I JAV Overview of J Objects as an ofsuper in ca super():super Swings-Event CallableState Unit II BAV HTMLcommo Java Scripts-s Array-Conver Unit III SEI Overview of	VAFUNDAMENTALS lava - Java modifiers-Wrapper classes-Arguments-Returning objects- Passing an alling parent class constructor-java.lang. (int), super(String) - super(String, Stri Handling-JDBC-JDBC Dr ement-preparedstatements-Scrollablean SICWEBDEVELOPMENTTECHNOLOGII ontags-List-Tables-Images-Forms-Fra storing data (data types) - Objects- Proper rsions-ProcessingHTMLformsandvalidat RVLET& JSP servlet- Servlet configuration- Servlet A	gume array Obje ng)-F ivers dupo E S ties-I ionus	ent p ent p cor ect a Pack S-JD latal latal Ever sing	ike h passi nstru and ages BCc blere ML5 Dava	ing in clas ictors – th its metho s-User d configurat esultsets- i-Formde Decision n aScript-X	Spring, st ss & objec his keywor ods – Pas efined ex tion(conne Queryexe sign-CSS haking-Loo MLDTD,	truts used in t Returning a van rd- Inheritance- ssing argument acception-Collection ecution -Introductionto oping Functions ervlet Request	9 Use ts ir ions- ent- 9 - 12 and
webapp Unit I JAV Overview of J Objects as an ofsuper in ca super():super Swings-Event CallableState Unit II BA HTMLcommo Java Scripts-s Array-Conver Unit III SEI Overview of Response-Ge servlet.Introdu	AFUNDAMENTALS VAFUNDAMENTALS VAFUNDAMENTALS Vava - Java modifiers-Wrapper classes-Arg guments-Returning objects- Passing an alling parent class constructor-java.lang. (int), super(String) - super(String, Stri Handling-JDBC-JDBC Dr ement-preparedstatements-Scrollablean SICWEBDEVELOPMENTTECHNOLOGII ontags-List-Tables-Images-Forms-Fra storing data (data types) - Objects- Proper rsions-ProcessingHTMLformsandvalidat RVLET& JSP servlet- Servlet configuration- Servlet Al eneric Servlet, Http Servlet- web.xml and action toJSP-Problem with servlet-Life cyc and declarations tag)-JSP Directive Eleme	gume array Obje ng)-F ivers dupo E S ites-E ionus rchite I its cle of ents-J	-HT Ever sing JSF page	ike h passi nstru and ages BCc blere ML5 blere ML5-D Java re- S d-Se c-scr e dire	iibernate, ing in clas ictors – th its metho s-User d configurat esultsets- i-Formde Decision n aScript-X Servlet life ervlet con ipting Ele ective-JS	Spring, st ss & object nis keywor ods – Pas efined ex tion(conne Queryexe sign-CSS naking-Loc MLDTD, e cycle-Se figuration- ements(Exp P objects-	truts used in t Returning a vard- rd- Inheritance- ssing argument aception-Collection cection)-Statement ecution -Introductionto oping Functions ervlet Request Session Track pression tag, Action Elements	9 Use ts in ions- ent- 9 - 12 and ting-
webapp Unit I JAV Overview of J Objects as an ofsuper in ca super():super Swings-Event CallableState Unit II BA HTMLcommo Java Scripts-s Array-Conver Unit III SEI Overview of Response-Ge servlet.Introdu Scriptlets tag Unit IV EJE EJB-Overvie	VAFUNDAMENTALS VAFUNDAMENTALS Vava - Java modifiers-Wrapper classes-Arguments-Returning objects- Passing an alling parent class constructor-java.lang. (int), super(String) - super(String, Stri Handling-JDBC-JDBC Dr ement-preparedstatements-Scrollablean SICWEBDEVELOPMENTTECHNOLOGIE ontags-List-Tables-Images-Forms-Fra- storing data (data types) - Objects- Proper rsions-ProcessingHTMLformsandvalidat RVLET& JSP servlet- Servlet configuration- Servlet Al- meric Servlet, Http Servlet- web.xml and uction toJSP-Problem with servlet-Life cyc and declarations tag)-JSP Directive Eleme B w-CreatingEJB-StatelessandStatefulbe	gume array Obje ng)-F ivers dupo E S ties-E ionus rchite I its cle of ents-	-HT Ever sing Call	ike h passi nstru and ages BCc blere ML5 Dats-D Java re- S d-Se c-scr e dire back	iibernate, ing in clas ictors – th its metho s-User d configurat esultsets- ictors ascript-x Servlet life ervlet con ipting Ele ective-JS	Spring, st ss & object his keywor ods – Pas efined ex tion(conne Queryexe sign-CSS haking-Loc MLDTD, e cycle-Se figuration- ements(Exp P objects-/	truts used in t Returning a vard- rd- Inheritance- ssing argument aception-Collection cection)-Statement ecution -Introductionto oping Functions ervlet Request Session Track pression tag, Action Elements Bean-	9 Use ts in ions- ent- 9 - 12 and ing- 5 6
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Hiberr	nate Introduction- features- Architecture- Mapping and Configuration Files in Hibernate - Hibernate
O/R	Mappings-Hibernate Query Language-Simple Examples using hibernate-Spring Introduction-
Archit	ecture-IOC container- Dependency Injection Bean - Getting started with Spring MVC framework-
Simple	e examples using Spring-STRUTS-Introduction, Struts frame work core components-Installing and
Setting	g up struts–Getting started with struts.
TEXT	BOOK(S)
1.	Herbert Schildt, "Java The Complete Reference", 8th Edition, McGraw-Hill Osborne Media, 2015
2.	Paul Deitel,"Internet & World Wide Web:How to Program", PrenticeHall,5 th Edition, 2011.
2	Gavin King, Christian Bauer, "Java Persistence with Hibernate", Dream tech press, Kogent Learning
5.	Solutions Inc.2008
4#	CraigWalls, "SpringinAction", Manning, Dream tech press, 2014
REFE	RENCE(S)
1.	CayS.Horstmann and Gary Cornell,"CoreJava™,Volume I–Fundamentals"9 th Edition,Prentice Hall, 2012
2.	Robert W.Sebesta, "Programming the World Wide Web", Addison-Wesley, 7thEdition, 2012.
3.	UttamK.Roy, "Web Technologies", Oxford University Press, 1 st Edition, 2011

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Department	INFORMATION TECHN	OLO	GY			R2019	Semester V	PE
Course	Course Name	Ho	ours Veel	s/ K	Credit	Total	al Maximum Ma	
Code		L	Τ	Ρ	С	Hours		
19ITP03	OPEN SOURCE SYSTEMS	3	0	0	3	45	100	
Course Obje Impart k	ective(s): nowledge on Open Source System and fferent open source Database	its b	enef	its i	in applica	tion deve	lopment	
 Know ho 	ow to configure Open Source servers							
Learn th	e basics of Firewall and CVS				1			
Underst	and the basics of Open Source Server	Side 7	Fech	nol	logies			
At the end of t	this course learners will beable to:							
Understa	and basics of Open Source Software							
Use Mvs	SQL database							
Configur	e Open Source Servers							
 Understa 	and firewall rules, Build Systems and C	/S						
Configur	e web application using Open Source S	Serve	r Sic	le T	echnolog	lies		
	TRODUCTION TO OPEN SOURCE	OPER	TAS	INC	SYSTE	MS		9
ofOpen Sourc -AdvancedCo Signals-Deve	Sources LINUX Introduction Gene incepts-Scheduling-Personalities-Clonir lopment with Linux.	eral O ng-	verv	iew	Kernel M	lode and	User Mode Pr	ocess
Unit II OI	PEN SOURCES DATABASE							9
MySQL:Introc Record Selec Summary-Wo Unit III CC Setting up er	luction-Setting up account-Starting, I e tion Technology- Working with Strings rking with Metadata-Using Sequences-	rmina s-Date MyS	ting e an QL a	an d T and	id Writing ïme-sortii Web.	g your O ng Query	wn SQL prog Results-Gene	rams
	DNFIGURING SERVERS	rvices	a). C	our	ier (IMAF	2 & POP	3 services), so	9 1uirre
mail(web mai windowsnetwo squid (http spooler),foom	DNFIGURING SERVERS nail servers using postfix (SMTP se I services) Setting up file services o prks),usingNFS(fileservicesforgnu/Linux / ftp / https proxy services) ;Setting atic (printerdatabase).	rvices using x/Unix	s), c san cnetv print	our nba wor ter	ier (IMAF i (file an ks);Settin services	2 & POP: d authen gupproxy -using (3 services), so tication service servicesusin CUPS (print	9 Juirre es foi g
mail(web mai windowsnetwo squid (http spooler),foom Unit IV FII	DNFIGURING SERVERS nail servers using postfix (SMTP se I services) Setting up file services orks),usingNFS(fileservicesforgnu/Linux / ftp / https proxy services) ;Setting atic (printerdatabase). REWALL, BUILD SYSTEM, CVS	rvices using x/Unix up	s), c san metv print	our nba wor ter	ier (IMAF i (file an ks);Settin services	2 & POP d authen gupproxy -using C	3 services), so tication service servicesusin CUPS (print	9 quirre es fo g 9
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mail(web mai windowsnetwo squid (http spooler),foom Unit IV FII Setting up a F Compiler Too assembler(ga conf and au environments code revisions Unit V SE	DNFIGURING SERVERS nail servers using postfix (SMTP se I services) Setting up file services orks),usingNFS(fileservicesforgnu/Linux / ftp / https proxy services) ;Setting atic (printerdatabase). REWALL, BUILD SYSTEM, CVS irewall-Using Net Filter and IP tables; U ols;the C Preprocessor (CPP), the s); Understanding Build Systems—cor utogen to automatically generate r Using source code versioning and ma s,patch & diff. RVER TECHNOLOGIES	rvices using x/Unix up Jsing C Construct nake anage	i), c san cnets print the omp file eme	our nba wor ter GN iler ma ss nt te	ier (IMAF (file an ks);Settin services U Compil (gcc) an (gcc) an ake files tailored ools us	er Collect d the Collect d the Collect d the Collect d the	3 services), so tication service servicesusin CUPS (print tion— (++compiler (g g make,using rent developr to manage so	9 quirre es fo g SNU ++), auto nent urce 9

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TEXT	BOOK(S)
1.	N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B, S Publishers;2005
2.	PeterWainwright, Professional Apache. WroxPress, NewDelhi, 2010
3.	M. N. RAO, Fundamentalsof OpenSourceSoftware, PHILearningPrivateLimited, 2015
REFE	ERENCE(S)
1.	H.S. LahmanModel-BasedDevelopment: Applications1st editionPearson, EducationInc,2011
2.	StephenJ. Mellor, Marc Balces, "ExecutableUMS: Afoundationfor MDA", Addison, 2002.

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Department	INFORMATIONTECHNO	R 2019	Semester V	PI				
Course Code	Course Name /Week Cred	Credit	Total	Maximum Marks				
		L	Т	Ρ	С	Hours		
19ITP04	COMPILERDESIGNPRINCIPLES	3	0	0	3	45	100	
Course Objecti	ve(s): earning this course is							
 Tounderst TodesignE 	and, designandimplementalexicalanal DFA &NFA withdifferent conversiontec	yzer: hnig	and ues	par	ser.			
Toimpleme	entcodegenerationschemes.							
ToperformToUnderst	optimizationofcodesandgainknowledg andLexandYACCtools.	eabo	outr	unti	meenviro	nments.		
Course Outcon	ies:							
At the end of this	s course,learners will beable to:							
 Designa le 	xicalanalyzertoidentifythetokens inapr	ogra	m					
 Constructa 	parser through the application of grammer	nar.						
Understan	dintermediatecodegenerationand sym	bol t	able	eorg	anization	techniques		
Designaco	mpiler forasmall languagewithcodege	nera	tion	۱.				
		TIC	A 1			_		0
introduction to	programming language translators	class	AL	atio	n of proc	ramming		Jiew
ofvariousprogra	mminglanguagetranslators CompilerV	sInte	rnr	eter	crosscon	npiler boots	straparrangement	
ogical phases	of compiler, pass Vs phase-co	usin	s (of	compilers	Lexical	Analysis phase	., a: .
Designissues.pa	tterns levemes Tokens-attributes-sne	cifica	atio	noft	okens.Re	aularexpre	ssions-	
Overviewofautor			nim			3		
	nata, Thompson constructionNFA-DF/	4-mi		ized	DFA-lexi	calerrors-L	ex	
Jnit II SYN	nata,Thompson constructionNFA-DF/	A-mi		Ized	DFA-lexi	calerrors-Lo	ex	9
Unit II SYN	nata,Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars: BN	A-mi	nd	EBI	NF -Pars	e Tree- Ar	ex mbiguity- Elimina	9 tion
Unit II SYN Role of parser ofambiguity-Top	nata,Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi	A-mi IF a ng,N	nd on-	EB	NF -Pars	calerrors-Lo e Tree- Ar dictiveparsi	ex mbiguity- Elimina ng;LL(1)gramma	9 ition
Unit II SYN Role of parser- ofambiguity-Top 3ottom-Up pa	ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi rsing:- Shift-Reduce parsers,	A-mi IF a ng,N Ope	nd on-	EBI	NF -Pars ursivepree	calerrors-Lo e Tree- Ar dictiveparsi ence pa	ex mbiguity- Elimina ng;LL(1)gramma rsing: design	9 ition rs, of
Unit II SYN Role of parser- ofambiguity-Top Bottom-Up pa operatorprecede	mata, Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi irsing:- Shift-Reduce parsers, ncetable, parsing–LR parsers:-Constru	A-mil IF a ng,N Ope	nd on- erati	EBI	NF -Pars ursivepred preced	e Tree- Ar dictiveparsi ence pa lesandpars	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing-	9 ition rs, of
Unit II SYN Role of parser- ofambiguity-Top Bottom-Up pa operatorprecede _ALRparsing-Sy	ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi irsing:- Shift-Reduce parsers, ncetable,parsing–LRparsers:-Constru ntax errors-YACC	A-mii IF a ng,N Ope ictior	nd on- erati	EBI recu ing	NF -Pars ursivepree preced parsertab	calerrors-Lu e Tree- Ar dictiveparsi ence pa lesandpars	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing-	9 itior rs, o
Unit II SYN Role of parser- ofambiguity-Top Bottom-Up pa operatorprecede ALRparsing-Sy Jnit III SEM	mata, Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi irsing:- Shift-Reduce parsers, ncetable, parsing–LRparsers:-Constru ntax errors-YACC ANTIC ANALYSIS	A-min NF a ng,N Ope Iction	nd on- erati	EBI recu ing SLR	NF -Pars ursivepree preced parsertab	calerrors-Lu e Tree- Ar dictiveparsi ence pa lesandpars	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing-	9 itior rs, of 9
Unit II SYN Role of parser- ofambiguity-Top Softem-Up Softem-Up paradisperator ALRparsing-Sy Jnit III Syntax Directer	TAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi irsing:- Shift-Reduce parsers, ncetable,parsing–LRparsers:-Constru ntax errors-YACC ANTIC ANALYSIS d Translations: Syntax-directed de	A-min NF a ng,N Ope Iction	nd on- erati nofS	EBI recu ing SLR s,	NF -Pars ursivepred preced parsertab	e Tree- Ar dictiveparsi ence pa lesandpars	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing- es, construction	9 itior rs, of 9 of
Unit IISYNRole of parser- ofambiguity-TopBottom-UpBottom-UpCoperatorprecedeALRparsing-SyUnit IIISyntaxDirecteSyntaxDirectesSyntaxtrees, DAC	mata, Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi insing:- Shift-Reduce parsers, incetable, parsing–LR parsers:-Constru- ntax errors-YACC ANTIC ANALYSIS d Translations: Syntax-directed de b'S-bottom-upevaluationofs-attributed	A-min NF a ng,N Ope Iction efinit	nd on- erati nofs ion: itioi	EBI recu ing SLR s, -	NF -Pars ursivepree preced parsertab	e Tree- Ar dictiveparsi ence pa lesandpars	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing- es, construction finitions; F	9 tior rs, 0 9 0
Unit II SYN Role of parser- ofambiguity-Top Bottom-Up pa operatorprecede ALRparsing-Sy Jnit III SEM Syntax Directe syntaxtrees,DAG imeenvironment	Items, lexemes, rokens-attributes-speemata, Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi irsing:- Shift-Reduce parsers, incetable,parsing-LRparsers:-Construction ntax errors-YACC ANTIC ANALYSIS d Translations: Syntax-directed Sissection s: Source language issues, storage	A-min NF a ng,N Ope Iction efinit definit orga	nd on- erati nofS iition	EBI recu ing SLR s, -	NF -Pars ursivepred preced parsertab Translatic attributed	e Tree- Ar dictiveparsi ence pa lesandpars on Scheme l de le-allocatio	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing- es, construction finitions; F n strategies, syn	9 ttior rs, 0 9 0 8 un
Unit II SYN Role of parser- ofambiguity-Top Data Deperator Deperator Call ALR Parsing-Sy Jnit III Syntax Directer Syntax Directer Syntax Directer Syntax Directer Syntax Directer Syntax Directer Syntax	ITAX ANALYSIS ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi ursing:- Shift-Reduce parsers, ncetable,parsing-LRparsers:-Constru ntax errors-YACC ANTIC ANALYSIS d Translations: Syntax-directed de s: Source language issues, storage global symbol table structures and	A-min NF a ng,N Ope Iction efinit defin orga mar	nd on- erati nofS ition aniz	EBI recuing SLR s, ns,l- zatio eme	NF -Pars ursivepred preced parsertab Translatic attributed n, storag ent. Type	e Tree- Ar dictiveparsi ence pa lesandpars on Scheme l de le-allocatio checking	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing- es, construction finitions; F n strategies, syn Systems: Data t	9 tior rs, or 9 of Run- hbol ype
Unit II SYN Role of parser- ofambiguity-Top Data Bottom-Up parator Deperator perator ALR Rearsing-Sy Jnit III SEM Syntax Directer Syntaxtrees, DAC Imeenvironment ables:local and asset of values w	mata, Thompson constructionNFA-DF/ ITAX ANALYSIS Formal definition of grammars; BN downparsing:Recursive-Descentparsi ursing:- Shift-Reduce parsers, ncetable,parsing-LRparsers:-Construction ntax errors-YACC ANTIC ANALYSIS d Translations: Syntax-directed des s: Source language issues, storage global symbol table structures and ith set of operations; data types; type	A-min NF a ng,N Ope iction efinit defin orga mar e che	nd on- erati nofs ition aniz aniz	EBI recu ing SLR s,	NF -Pars ursivepred parsertab Translatic attributed in, storag ent. Type nodels; s	e Tree- Ar dictiveparsi ence pa lesandpars on Scheme le-allocatio checking emantic mo	ex mbiguity- Elimina ng;LL(1)gramma rsing: design sing,CLRparsing- es, construction finitions; F n strategies, syn Systems: Data t odels of user-defi	9 tior rs, o 9 of Run- nbo ype ned

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Unit	V INTERMEDIATE CODE & CODE OPTIMIZATION	9
Intern	nediate languages, Three Address code: declarations, assignment statements, addressing a	array
eleme	ents, Boolean expressions, case statements, back patching. Code optimization: The principle so	urce
of opt	imization,optimization of basic blocks,Loop optimizations	
Unit	CODEGENERATION&OTHERTRANSLATIONSISSUES	9
explo interp macro	iting addressing modes-peephole optimizations, basic blocks, DAG's-Iterativevs.recu retation; Elements of Assembly language- assemblers-Passes of an assembler-Macros- designo pprocessors-passes of a macroprocessor BOOK(S)	s by rsive f
1.	A. V.Ahoetal, Compilers: Principles, techniques, & tools, Second Edition, Pearson Education, 2007	
2.	K.D. Cooper and L. Torczon, Engineering a Compiler, Morgan Kaufmann, 2004	
REFE	RENCE(S)	
3.	Steven S.Muchnick "Advanced Compiler Design Implementation" Elsevier Science India.	
4.	D.M.Dhamdhere"Systems Programming and Operating Systems"Tata McGraw-HillPub.	

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Department	INFORMATIONTECHNOLOGY					R 2019	Semester V	PE
Course	Course Name	1	Hou We	ırs / eek	Credit	Total	Maximum N	lark
Code		L	т	Р	С	Hours		aina
19ITP05	DATA WAREHOUSING AND DATAMINING	3	0	0	3	45	100	
Course Obje	ctive(s):	2						
The purpose	of learning this course is to							
Understa	ind basics of dataware house			_	-		14	
Learn da	tamining and association mining							
Understa	ind classification and prediction	ina						
 Know ciu Familiari: 	ster analysis technique Cloud Comput	ing						
Course Outo								
At the end of t	this course learners will beable to:							
Indersta	ind the basics of data warehouse							
Apply as:	sociation rule mining							
Apply cla	ssification and prediction techniques							
 Analyze (data using cluster techniques							
 Apply gra 	aph and multimedia mining							
Unit I INT	RODUCTION TO DATA WAREHOUS	E		10				9
Introduction-a	Multidimensional Datamodel-Datacu	be Te	chr	nology	y-Data Wa	arehouse	Architecture-Ty	pes
of OLAP serv	ers-Data warehouse implementation-D	ata w	are	housi	ng to Data	a Mining		
Unit II INT	RODUCTIONTODATAMININGANDA	ssoc	IAI	ION	MINING			9
Data mining -	 functionalities - Major issues - Dat 	a clea	anir	ng - D	Data integ	ration and	Transformatio	n –
Data reductio	n-Discretization and concept thierarch	y gen	erat	tion-E	Efficient ar	nd scalable	e frequent item	set
mining metho	ds-Mining various kinds of association	rules-	Ass	sociat	tion Mining	g to Correl	ation Analysis-	
Constraint ba	sed Association Mining	181						_
	ASSIFICATION AND PREDICTION							9
Introduction-Is	sues-Classification by decision t	ree	indi	uction	-Bavesiar	n classifi	cation-Rule	
1	based				,			
Classification.	Classification by backpropagation-Oth	ner cla	assi	ificatio	on method	ds- Predic	tion-Accuracy a	and
Error Measure	s-Evaluating the accuracy					<pre>////////////////////////////////////</pre>		
Unit CII	JSTER ANALYSIS							9
IV OL				ioror	chicalmeth	ada Don	situbasedmetho	de
IV Clusteranalys	s-Types ofdata-Partitioningme	ethods	s-H	leran		IOUS-DELL	SIVUASCULLELLU	u.ə-
IV Clusteranalys Gridbased me	is-Types ofdata-Partitioningme thods - Model based Clustering methods	ethods	s–H - Cl	luster	ina Hiah	dimension	al data-Constra	aint
IV Clusteranalys Gridbased me	is–Types ofdata–Partitioningme ethods – Model based Clustering meth analysis–outlier analysis-Datamining A	ethods nods -	s—H - Cl atio	luster ns-Da	ing High of the state of the st	dimension	al data–Constra	aint al
IV Clusteranalys Gridbased me based cluster Themesondat	is–Types ofdata–Partitioningme ethods – Model based Clustering meth analysis–outlier analysis-Datamining A amining.	ethods nods - Applica	s—H - Cl atio	luster ns-Da	ing High o atamining	dimension system pr	al data–Constra oducts-Addition	aint al
IV Clusteranalys Gridbased me based cluster Themesondat Unit V GR	is–Types ofdata–Partitioningme ethods – Model based Clustering meth analysis–outlier analysis-Datamining A amining. APH MINING AND MULTIMEDIA MIN	ethods nods - Applica	s—H - Cl atio	luster ns-Da	ing High atamining	dimension system pr	al data–Constra oducts-Addition	aint al 9
IV Clusteranalys Gridbased me based cluster Themesondat Unit V GR Graph mining	is–Types ofdata–Partitioningme ethods – Model based Clustering meth analysis–outlier analysis-Datamining A amining. APH MINING AND MULTIMEDIA MIN a- Multi relational data mining-Mult	ethods nods - Applica ING idime	s–H - C atio	luster ns-Da	atamining	dimension system pr	al data–Constra oducts-Addition	aint al 9 of
IV Clusteranalys Gridbased me based cluster Themesondat Unit V GR Graph mining complexdata	is–Types ofdata–Partitioningmo ethods – Model based Clustering meth analysis–outlier analysis-Datamining A amining. APH MINING AND MULTIMEDIA MIN g- Multi relational data mining-Multi objects. Spatial data mining-Multimed	ethods nods - Applica ING idimen	s-H - Cl ation nsic	ns-Da	analysis g-Text min	and desc	al data–Constra oducts-Addition criptive mining ng the world w	aint al 9 of ide

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TEXT	FBOOK(S)
1.	Jiewei Han, Micheline Kamber, "Data mining concepts and techniques", Morgan Kaufmann Pub,2006
2.	William H.Inmon, "Buildingthedatawarehouse", WileyDreamtech(p)Ltd., IVEdition, 2005.
REFE	ERENCE(S)
1.	Ian H.Witten,Eibe Frank, DataMining: PracticalM/c Learning tools and techniques withJava implementation",ThirdEdition,MorganKaufman,2000
2.	K.P.Soman,ShyamDiwakar,V.Ajay,"Insight into DataMining, theory and practice",PHI Learning Private Limited,2010.
3.	Ronen Feldman, James Sangee, "The Text Mining Handbook: Advanced Approaches in analyzing unstructured data", Cambridge University Press, 2007

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Department	INFORMATIONTECHNOLOGY			R 2019	Semester V	PE		
Course	Course Name		Hours /Week		Credit	Total	Maximum Marks	
Code		L	Т	Ρ	С	Hours		
19ITP06	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	3 0 0 3			3	45	100	
Course Objecti	ve(s):							
The purpose of	learning this course is							
To understa	and the basic output primitives							
To understa	and the three dimensional concepts							
 To know ba 	asics of Multimedia System							
To understa	and the design of Multimedia Systems							
 To develop 	a multimedia application							
Course Outcon	nes:							
At the end of this	s course,learners will beable to:							
 Understan 	d the basic output primitives							
 Apply three 	e dimensional concepts							
 Design mu 	Iltimedia system							
 Understan 	d the various multimedial technologies							
 Understan 	d theApplications of Multimedia System							
Unit I OUTF	PUTPRIMITIVES			1				9
Introduction-Line	e-Curve And Ellipse Drawing A	Igorit	hms	-Att	ributes-	Two-Dim	ensional	
Geometric Trans	formations-Two-Dimensional Clippi	ng ar	nd V	iewi	ing			
Unit II THR	EE-DIMENSIONALCONCEPTS	0			0			9
Three-Dimension	onal Object Representations-Three Dimensional Viewing Color Mo	ee-Dii dels	men	sion	al Ge	ometric	and Model	ling
Unit III MUL	TIMEDIA SYSTEMS DESIGN		, and	auc				9
An Introduction Architecture –E Multimedia Databases.Con Schemes–Colo Compression	on – Multimedia Elements – Mul Evolving Technologies for Multimedia Data Interface Standards–Nee npression and Decompression:Types r,Gray Scale and Still–VideoImag	ltimed – D ed of C e Co	lia efini For Comp	App ng (pres ress	lications Objects Data sion –B sion-Auc	s – Mu for Multi Compr inary Im dio Com	ltimedia Syste media Systems ession-Multime age Compress pression–Frac	ms s – dia ion ctal
Unit IV MUL	TIMEDIA INPUT/OUTPUT TECHNOLO	GIES						9
Key Technolo Technologies–I Full-Motion Vid Hierarchical Stor	gy Issues – Pen Input – Video mage Scanners-Digital Voice and Audio leo.Storage and Retrieval Technologi rage Management–Cache Managem	and DDigi ies:Ma ient fo	Imag tal C agne or S	ge Came tic tora	Display era-Vide Media ∃ ge Syst	Systems o Images Fechnolog ems	s – Print Out and Animatic gy–Optical Med	put on– ia–

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Unit	MULTIMEDIA APPLICATION DESIGN	9
Multin Multin Applic	nedia Application Classes–Types Of Multimedia Systems–Virtual Reality Design–Components of nedia Systems–Organizing Multimedia Databases–Application Workflow Design Issues–Distributed cation DesignIssues.	d
TEXT	BOOK(S)	
1.	Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.	
2.	Prabhat K Andleigh and Kiran Thakrar," Multimedia Systems and Design", PHI, 2003. ISBN: 81-2 2177-4	203
3.	Pakhira, "Computer Graphics, Multimedia and Animation", 2 nd Edition, PHI 2010	_
4.	Tay Vaughan,"Multimedia Making it work,Fourth Edition",Tata McGraw-Hill.ISBN:0-07-463953-6.	
REFE	RENCE(S)	
1.	Ze-Nain Li, Mark S.Drew, "Fundamentals of Multimedia", PHI.ISBN:81-203-2817-5.	
2.	John F.Koegel Buford, "Multimedia Systems", Third Edition, 2000. ISBN: 8177588273	
3.	Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998	
4.	Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.	

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Depart	ment	INFORMATIONTECHNO	LOG	Y	. /		R 2019	Semester V	PE
Cours	e Code	Course Name	V	Vee	k	Credit	Total	Maximum Mark	
19ITF	P07	DISTRIBUTED SYSTEMS	2 3	0	Р 0	С 3	45	100	1
CourseC The purp • Un • Kn • De • Eva per	Dbjectiv bose of l derstan ow abou sign and aluate th formand	e (s): earning this course is to d the basics of networking and the protoc it operating systems and sequential prog d develop fault tolerant and efficient distri- be impact of memory on parallel/distribute se	cols u ram buteo ed alo	sed desi d alg gorit	in d gn gorith	istributed nms ormulatic	l environme	ent. idate their	
Course (At the en • Ana • Ca • Ide like • Ap • Una Unit I	Outcom Id of this alyseval tegorize ntify the mutual ply the k derstand	es: course, learners will be ableto: iousissues in thedesignandimplementati the various system models,communicat advantages and challenges in designing exclusion,deadlock detection nowledge of deadlock methods and its a thesignificanceofdistributedfilesystemwing INTRODUCTION	onofo ion b disti Igorit threa	listri etwe ribut hms Itime	ibute een (ted a s eapp	dcomput Client and Igorithms lications	ingsystems d Server s for differe	s nt primitives	7
design o Unit I Introduct Buffering Commur	f a distri ion to i, Remo nication.	buted Operating System. COMMUNICATION MessagePassing, Advantages and feat te Procedure Call, Extended RPC Mo	ures dels,	of Re	mes	sage pas e Object	ssing,Mess Invocatior	age format,Mess n, Message Orie	9 sage
Unit I Threads, exclusior Commun detection	code n,Distrib nication n,distribu	PROCESSES,SYNCHRONIZATIONANI migration, clock synchronization, logic uted transaction. Distributed Dead Deadlocks, Deadlock Prevention, avoid ted deadlock detection,path pushing and	DDIS al clo llock ance, d edg	Decks Decks Decks Decks	BUT s, gl etecti etecti nasin	EDDEAD obal stat tion Sy on and F g algorith	DLOCK te, Election vstem mo Resolution, nm	n algorithms, m odel,Resources Centralized dead	l 11 utual Vs. llock
Unit IV Distribute andimple	ed Sha mentati hrashing	DISTRIBUTEDSHAREDMEMORY red Memory Introduction, General at on, Issues of DSM, Granularity, advantagesofDSM	rchite struc	ctur ture	re o e of	f distribu shared	uted share memory	ed memory, De space, consiste	sign ency
models,ti	- 1	DISTRIBUTED FILE SYSTEM							T
models,ti Unit V Distributed Iccessing Services)	d File ,sharing	System Introduction, Desirable feature ,caching methods,file replication,faul	s of t tol	go era	od c nce,0	listributed Case St	d file syst tudy:CORE	em, file models BA(CORBA,RMI	file and
Models,tr Unit V Distributed accessing Services) TEXTBO	d File ,sharing OK(S) Andrey	System Introduction, Desirable feature ,caching methods,file replication,faul v Tanenbaum, Maarten Van Steen, "Dist	s of t tol	go erai	od c nce,(Syste	listributed Case Si m- Princi	d file syst tudy:CORE ipals Parac	em, file models 3A(CORBA,RMI ligm'', Maarten va	file and

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REFE	ERENCE(S)
17	Sunita Mahajan, Seema Shah, "Distributed Computing", Oxford, 2 nd edition, 2013
2.	Pradeep K.Sinha"Distributed Operating Systems", Prentice Hall of India Private, 2012
3.	George Coulouris, Tim Kindberg, Jean Dollimore, Distributed Systems: Concepts and Design, Academic Internet Publishers, 2006

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Department	INFORMATIONTECHNOLOGY				R2019	SemesterVI	PE	
Course	Course Name	Ho V	ours /eek	/	Credit	Total	Maximum Ma	arks
Code	*	L	Т	Ρ	С	Hours	· · · · · · · · · · · · · · · · · · ·	
19ITP08	GRAPHTHEORY	3	0	0	3	45	100	
Course Objectiv	e(s):	2						
The purpose of le	earning this course is	a.						
To unders	tand the basics of graph data struc	ture						
To familiar	ize Tree and its properties							
To underst	and the Representation of graph							
To know th To learn Di	irected graph and its applications							ā.
Course Outcome	rected graph and its applications							
At the end of this	course learners will be able to:							
 Understand 	graph fundamentals							
 Apply tree p 	principles to solve problems				1.1.4			
 Represent (Graph							
 Apply Graph 	h to Solve Problems							
 Analyze the 	properties of Directed Graph							
Unit I INTRO	DUCTION							9
Definitions impor	tance isomorphism walk paths c	ircuits	conn	ecte	d discon	nected a	raphs operation	1
ongraphs, Eulera	nd Hamiltoniangraphs	nouno, i			a, alooon	nootou g	icipiio, opoiotioi	1.
Unit II TREES	a contraction graphic			-			-	9
Properties, distar	nce and centers, trees, spanning	trees. f	unda	ame	ntal circu	its, minin	nal spanning tre	ee .
Cutsets Propertie	es fundamental circuits and cut	sets. c	onne	ectiv	ity, sepa	rability.	network flows	.1-2
isomorphism,Plar	nar and dual graphs,Combinatorial	represe	entat	tion,	planar gra	phs,Kura	atowski's	
graphs,detection	of planarity, dual graphs							
Unit III MATRI	X REPRESENTATION OF GRAPH	IS						9
Incidence matrix,	circuit matrix, cut set matrix, funda	mental	matr	ices	, relations	hips amo	ongst matrices,	path
				_				0
Chromatic Number	Chromatic Partitioning Matching	Coveri	na F	our	Color Pro	hlem		9
	FDGRAPHS	,covern	ily,i	our		biem		9
Different type	s Directed Paths and (onnect	odna	200	Fuler	Dia	ranhs Trees-ma	triv
representation to	imament Graph theoretic algorith	ms Com	nute	or R	enresenta	ation of a	aranhs— innu	t &
output algorithms	for connectedness spanning tree	- funda	amer	ntal	circuits o	ut vertic	es directed circ	uits
and Shortest Path	is	s, ranac		nai	onouno, e			ano
TEXTBOOK(S)			1	_				
Narasing D	eo Granh Theory with Application	To Engi	neer	ing	And Com	outer Scie	ence Prentice H	all
1. India,2010	eo, Graph meory with Application	ro Engi	neer	ing /			ence,i renuce ri	aii
2. Tulasirama	n and M.N.S.Swamy,Graph,Netwo	rks and	Algo	orith	ms,John \	Niley,199	92	
REFERENCE(S)							1 h	
1. F.Harary,G	raphTheory,AddisonWesley/Naros	a, 2013						
2. E.M.Reingo 1977	old,J.Nievergelt, N.Deo,Combinator	ial Algo	rithn	ns:T	heory and	l Practice	e,Prentice Hall,N	1.J.
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Department	INFORMATIONTECHNOL	OG	Y			R2019	SemesterVI	PE
Course	Course Name	He /	our We	s ek	Credit	Total	Maximum M	arks
Code		L	Т	Ρ	С	Hours		
19ITP09	HUMAN COMPUTER INTERACTION	3	0	0	3	45	100	
Course Obje The purpose To lear To und To beco To be a	ective(s): of learning this course is n the foundations of Human Computer Int erstand the GUI concepts ome familiar with the design technologies aware of screening in HCI.	erac for i	ctior ndiv	n. vidu	als and p	ersons wit	h disabilities.	
To lear	n the software tools used in user interface).						
At the end of Unders Design Explain Develop	comes: this course, learners will be ableto: tand fundamentals of HCI effective HCI for graphical user interface. effective dialog for HCI. the HCIimplications for designing multime o meaningful user interface using software	edia/ e too	ec/	omr	merce/ e-	learning W	/ebsites.	
Unit I INT	RODUCTION						1112 111	9
Introduction: design.A brie	mportance of User Interface–Definition, ir f history of Screen design	npo	rtar	ice	of good c	lesign.Ber	nefits of good	
Unit II GR	APHICALUSERINTERFACE					10000		9
The Graphic system, Cha	al User Interface—popularity of graphics racteristics, Web user–Interface popularity	s,the /,cha	e co arao	once	ept to dir istics- Pri	ect manip nciples of	ulation,graphic User Interface	al
Unit III DES	BIGNOFGUI							9
Design proce consideratior	ess–HumanInteraction with Computers,Im n,Human Interaction Speeds,understandin	port g bi	anc usin	e o iess	f human junction	characteris s	stics human	
Unit IV COI	RE METHOLOGIES OF HCI							9
Screen Des Ordering of S – amount of Information I Jnit V SOF	signing:Design goals–Screen Planning Screen Data and Content – Screen Nav information–Focus and Emphasis–Pre Retrievalon Web–Statistical Graphics–Tec TWARETOOLS	g a igat eser chno	ind ion ntat olog	Pu and ion ical	urpose,O d Flow – Informati Conside	rganizing Visually p on Simply ration in In	Screen Elem bleasing compo y and Meaning hterface Design	ients sitior fully- 9
Windows-Ne	w and Navigation schemes selection controls. Components – text and mess	n of age spec	wi s, l ifica	ndo cor atior	ow, sele ns and in n method	ction of o creases – ls, interfac	devices based - Multimedia, co ce – Building T	and olors, ools
screenbased uses problen nteraction D and Generati	evices–KeyboardandFunctionKeys–Poi on–Image and Video Displays–Drivers	nting	g C)evi	ces–Spe	ech Reco	ognition Digitiz	ation
screenbased uses problen nteraction D and Generati EXTBOOK(evices–KeyboardandFunctionKeys–Poin on–Image and Video Displays–Drivers S)	nting	g C	Devi	ces–Spe		ognition Digitiz	ation
screenbased uses problen nteraction D and Generati EXTBOOK(1. The E	evices–KeyboardandFunctionKeys–Poir on–Image and Video Displays–Drivers S) Essential Guide to User Interface ",Wilber	nting to G	g D Salit	Devi z,W	/iley Drea	m Tech,T	ognition Digitiz hird Edition,200	ation 7

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REFE	RENCE(S)
1.	Human–Computer Interaction, Alan Dix,Janet Fincay,Gre Goryd,Abowd,Russell Bealg,Pearson,Third Edition, PrenticeHall(2004).
2.	Interaction Design: Beyond Human-Computer Interaction, 5th Edition,2019, Sharps.WileyDream Tech
3.	User Interface Design: A Software Engineering Perspective, Soren Lauesen, Pearson Education, 2004.

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	nt	INF	ORMATIONTI	ECHN	OLO	GY		R2019	SemesterVI	PE
Course		Course N	lame		Hour Wee	rs/ ek	Credit	Total	Maximum M	arks
oout	110	1.1.1		L	. Т	Ρ	С	Hours		3
19ITP10		BIOINFORM	IATICS	3	3 0	0	3	45	100	
 Prov Unde Unde Prov Stud 	ide an intro erstand the erstand the ide an ove y about the	oduction to what purpose and c Neural Networ rview of the app Microarray An	t bioinformatic ategories of Bi k concepts in blication areas alysis.	is is an io info Bioinfo of bio	nd wh rmati prmat infor	tics te mati	is importa echnolog ics	ant ies.		
At the end Und Eva and Des Und App	of this cou lerstand th luate bio ir Monte Ca ign various erstanding ly Microarr	irse, learners wi e concepts of g nformatics algor rlo s bio informatics o of the intersec ray Analysis for	Il be able to: enomics,prote ithms such as tools for patte tion of life and Gene classific	eomics dynar ern ma inform	and nic p atchir nation and c	Data rogra ng ar n sci	amining i amming, nd visuali iences ome expre	n Bioinforr Hidden M zation ession	natics arkov Models	
Jnitl	INTRODU	CTION				,	ine enpir		1.1	9
Need for	Bio Info	rmatics techno	logies-Overvie	ew of	Bic	oinfo	rmatics	Technolog	gies-Structural	Bio
nformatics	s-Data For	mat and Proce	ssing – Secor	ndary I	Reso	urce	es and A	pplications	-Role of Struct	ural
Bio Information	atics.									
Inital										
JIII	DATA WA	REHOUSING A	ND DATAMIN	NING I	N BI	OIN	FORMAT	ICS		9
Bio inform	natics da	REHOUSING A ata-Data Ware	ND DATAMIN housing Arcl	NING I hitectu	N BI	OIN ata	FORMA Quality-	T ICS Biomedica	al DataAnalysi	9 s-DN
Bio inforr DataAnaly	DATA WA natics da sis-Protein	REHOUSING A ata-Data Ware DataAnalysis	ND DATAMIN housing Arcl -Neural Netw	NING I hitectu vork	N BI Ire-D Archi	OIN ata tectu	FORMAT Quality- ure-Neura	T ICS Biomedica al Networ	al DataAnalysi k Applications	9 s–DN inB
Bio inforr DataAnaly nformatics	DATA WA natics da sis-Protein	REHOUSING A ata-Data Ware DataAnalysis	ND DATAMIN housing Arcl -Neural Netw	NING I hitectu vork	N BI Ire-D Archi	OIN ata tectu	FORMAT Quality- ure-Neura	T ICS Biomedica al Networ	al DataAnalysi k Applications	9 s-DN inB
Bio inforr DataAnaly nformatics Jnit III	DATA WA matics da sis-Protein MODELING	REHOUSING A ata-Data Ware DataAnalysis G FOR BIO INF	ND DATAMIN housing Arcl Neural Netw	NING I hitectu vork	N BI	OIN ata tectu	FORMA Quality- ure-Neura	TICS Biomedica al Networ	al DataAnalysi k Applications	9 s-DN inB 9
Bio inforr DataAnaly nformatics Jnit III I Hidden M Classificati Aodeling-F	DATA WA natics da sis-Protein MODELIN Markov M ion-Multiple Probabilisti	REHOUSING A ata-Data Ware DataAnalysis G FOR BIO INF Modeling for e Alignment c Modeling-Bay	ND DATAMIN housing Arcl Neural Netw ORMATICS Biological E Generation-C	NING I hitectu vork / Data ompar ks-Boo	N Bl Ire-D Archi Ana rative	OIN ata tectu lysis M Net	FORMAT Quality- ure-Neura -Sequen lodeling- works- M	TICS Biomedica al Networ ce Ident Protein M lolecular M	al DataAnalysi rk Applications ification-Sequer Modeling–Genor	9 s-DN inB 9 nce mic
Bio inform DataAnaly nformatics Jnit III I Hidden M Classificati Modeling-F	DATA WA matics da sis-Protein MODELING Markov M ion-Multiple Probabilisti PATTERN	REHOUSING A ata-Data Ware DataAnalysis G FOR BIO INF Modeling for e Alignment c Modeling-Bay MATCHING A	ND DATAMIN housing Arcl Neural Netwo ORMATICS Biological E Generation-C resian Network	NING I hitectu vork / Data ompar ks-Boo ATION	Archi Archi Ana rative blean	OIN ata tectu lysis M Net	FORMAT Quality- ure-Neura -Sequen lodeling-l works- M	TICS Biomedica al Networ ce Ident Protein M lolecular M	al DataAnalysi k Applications ification-Sequer Modeling–Genor lodeling	9 s-DN inB 9 nce mic 9
Bio inform DataAnaly nformatics Jnit III I Hidden M Classificati Modeling-F Jnit IV I Gene Reg FractalAna Represent	DATA WA matics da sis-Protein MODELIN Markov M ion-Multiple Probabilisti PATTERN ulation - M lysis-DNA ation of Bi	REHOUSING A ata-Data Ware DataAnalysis G FOR BIO INF Modeling for e Alignment c Modeling-Bay MATCHING AI lotif Recognition Walk Models	ND DATAMIN housing Arcl Neural Network ORMATICS Biological E Generation-C resian Network ND VISUALIZ n - Motif Detection -One Dimension	Data ompar ks-Boc ATION ction - sion-Ty	Archi Archi Archi Ana rative blean Stra wo [OIN ata tectu lysis Net Net	FORMAT Quality- ure-Neura -Sequen lodeling- works- M es for Ma ension-H	TICS Biomedica al Networ ce Ident Protein M lolecular M otif Detecti igher Dim	al DataAnalysi rk Applications ification-Sequer Aodeling–Genor lodeling	9 s-DN inB 9 nce mic 9 on- me
Bio inform DataAnaly nformatics Jnit III 1 Hidden M Classificati Aodeling-F Jnit IV 1 Sene Reg FractalAna Represent	Matics da sis-Protein MODELING Markov M Probabilisti PATTERN ulation - M Nysis-DNA ation of Bi	REHOUSING A ata-Data Ware DataAnalysis G FOR BIO INF Modeling for e Alignment c Modeling-Bay MATCHING AI lotif Recognition Walk Models ologicalSequel RAY ANALYS	ND DATAMIN housing Arcl Neural Network ORMATICS Biological I Generation-C resian Network ND VISUALIZ - Motif Detector -One Dimension nces	NING I hitectu vork / Data ompar ks-Boc ATION ction - sion-Ty	Archi Archi	OIN ata tectu lysis M Net tegie	FORMAT Quality- ure-Neura -Sequen lodeling- works- M es for Ma ension-H	TICS Biomedica al Networ ce Ident Protein M lolecular M otif Detecti igher Dim	al DataAnalysi rk Applications ification-Sequer Modeling–Genor Modeling ion - Visualizati iension – Ga	9 s-DN inB 9 nce mic 9 on- me
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d rC Chairman - BoS Dept. of IT - ESLo

	INFORMATIONTEC	HNO	.OG	Y		R2019	SemesterVI	PE	
Course	Course Name	Hc W	ours /eek	1	Credit	Total	Maximum N	num Marks	
Code		L	Т	Ρ	С	Hours			
19ITP11	INFORMATION STORAGE MANAGEMENT	3	0	0	3	45	100		
Course Objec	tive(s):								
The purpose of	of learning this course is to								
 Understand 	and data creation, the amount of data being	g crea	ted,t	he v	alue of d	ata to a			
 Evaluate environn 	storage architectures and key data cente	r elem	ents	s in c	classic, vi	rtualized	and cloud		
 Describe and unifi 	e storage networking technologies such as ed storage	FCSA	AN, I	P-S	AN, FCol	E, NAS a	nd object-base	ed	
 Understa 	and and articulate business continuity solu	tions-	bacl	k up	and repli	cations, a	along with arch	nive	
for mana	aging fixed content					- 31			
Understa	and solutions available for data storage,Co	ore ele	mer	its o	f a data c	enter infr	astructure, role	e of	
	ment in supporting business activities	d		1		1			
At theendofthis	scourse learnerswillbe able to:								
 Understa 	and the concept of data storage in distribut	ted en	viror	nmei	nt in data	centre.			
challeng	esin datastorageandmanagementtechnolo	aies				,			
 Evaluate 	storage architectures and understand log	ical ar	nd pl	nysio	cal compo	onents of	a storage		
infrastruc	sture						Ű		
 Identify c 									
	lifferent storage virtualization technologies	and t	heir	ben	efits				
Understa	lifferent storage virtualization technologies and and articulate business continuity solution	and t tions i	heir nclu	ben ding	efits ,backup t	echnolog	lies		
UnderstationDefine in	lifferent storage virtualization technologies and and articulate business continuity solution formation security and storage security do	and t tions i mains	heir nclu	ben ding	efits ,backup t	echnolog	lies		
Understa Define in Unit I INT	lifferent storage virtualization technologies and and articulate business continuity solut formation security and storage security do RODUCTION	and t tions i mains	heir nclu 3	ben ding	efits ,backup t	echnolog	jies	9	
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Chairman - Bos Dept. of IT - ESEC

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entations-Managing the storage infrastructure:Monitoring-Activities-Challenges-Solutions Data busing with OracleBI	
BOOK(S)	
Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, New Delhi, 20	06.
Somasundaram G, Alok Shrivastava, "ISM—Storing, Managing and Protecting Digital Information", EMC Education Services, Wiley India, New Delhi, 2012.	
RENCE(S)	
Gerald J Kowalski, Mark T May bury, "Information Storage and Retrieval Systems: Theory and Implementation", B S Publications, New Delhi, 2009.	
Marc Farley Os borne, "Building Storage Networks", Tata McGraw Hill, New Delhi, 2001	
Meeta Gupta, "Storage Area Network Fundamentals", Pearson Education, New Delhi, 2002.	
	SECURING THE STORAGE INFRASTRUCTURE ag the storage infrastructure:Security terminology-Security framework-Risk triad-Security domai entations-Managing the storage infrastructure:Monitoring-Activities-Challenges-Solutions Data busing with OracleBI BOOK(S) Robert Spalding, "Storage Networks:The Complete Reference", Tata McGraw Hill,New Delhi,20 Somasundaram G, Alok Shrivastava, "ISM-Storing, Managing and Protecting Digital Information",EMC Education Services,Wiley India,New Delhi,2012. RENCE(S) Gerald J Kowalski, Mark T May bury, "Information Storage and Retrieval Systems:Theory and Implementation",B S Publications,New Delhi, 2009. Marc Farley Os borne, "Building Storage Networks",Tata McGraw Hill,New Delhi,2001 Meeta Gupta, "Storage Area Network Fundamentals",Pearson Education,New Delhi,2002.

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Departmen	nt	INFORMATION	TEC	HNC	DLO	GY	R2019	Semeste	erIV	PC
Course		Course Name	Ho V	ours Veel	/ K	Cre dit	Total Hours	Max	imum arks	
ooue			L	Т	Ρ	С	nouro		unite	
19ITP12		OBJECT ORIENTED ANALYSIS AND DESIGN	3	0	0	3	45		100	
Course Ob	ojective (s	5):								
The purpos	se of learn	ing this course is to								
UncHovGai	lerstandir v software ning com	ng object basics, classes and e objects are altered to build s petence in OOAD and unders	obje softw stand	cts, /are I the	Inhe syst issu	eritano tems t ues ar	ce hat are m nd options	ore robust. in reuse.	•	-
Course Ou	itcomes:									
At the end	of this cou	irse,learners will beable to:								
• L	earn abo	ut Object relationship.								
• A	nalyze U	ML and Unified process								
• L	earn Obj	ect oriented analysis			1		1 6		1.1	-
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Chairman - BoS Dept. of IT - ESEC

Departmen	INFORMATION TECHNOLOG	GΥ				R2019	Semester	/I F	Έ
Course	e Course Name	Hours /Week			Credit	Total	Maximum		
oout		L	Т	Ρ	С	lineare	Marks		E
19ITP13	SERVICEORIENTEDARCHITECTUR E	3	0	0	3	45	100		
Course Ob	jective(s):								
The purpos	e of learning this course is to								
Learn Be ev	AML fundamentals.							+):	
Under	rstand the key principles behind SOA.								
 Be far 	miliar with the web services technology elem	nent	s for	rea	lizing SO	A.			
• Learn	the various web service standards.				5				
At the end of Design Build a Learn Evalua	of this course, learners will be able to: n,develop and test Web Services applications based on XML. standards related to Web Services. ate emerging and proposed standards for th	e m	ain o	com	ponents	of Web S	Services arch	itectu	ure
Build S	SOA-based applications for intra-enterprise	and	inte	r-en	terprise a	applicatio	ons.		
Unit I	INTRODUCTION TO XML			-				9	
XML Docur	ment Structure–Well Formed and Valid Do	cum	ente	s–Na	ame spa	ces–DTI	D–XML Sch	ema-	-X-
Unit II	BUILDING XML-BASED APPLICATIONS	;						9	
Parsing XM XML.	L–using DOM, SAX–XMLTransformation an	nd X	SL-	XSL	Formatt	ing–Mode	eling Databa	ises i	n
Unit III	SERVICE ORIENTED ARCHITECTURE	- 110						9	
Characterist —Principles	tics of SOA,Comparing SOA with Client-Ser s of Service Orientation–Service Layers.	ver	and	Dist	ributed A	rchitectu	ıres–Benefit	s of S	iO/
Unit IV	WEB SERVICES				1.5.7.8	12. 10. 10		9	
Service De Exchange P	scriptions–WSDL–Messaging with SOA Patterns–Orchestration–Choreography–\	P-S	Serv Tra	ice nsa	Discover ctions.	y–UDDI	–Message	^u r	
nit V	BUILDING SOA-BASED APPLICATIONS			4				9	
Service Ori Compositio	iented Analysis and Design–Service Mod n–WS-BPEL–WS-Coordination–WS-Polic	deli :y–V	ng–l VS-S	Des Seci	ign Star urity–SO	idards a A suppo	nd Guidelir rt in J2EE	ies—	-
техтвоок	((S)							8	
1. F	Ron Schmelzer et al. "XMLandWebServices"	,Pea	arso	n Ed	lucation,2	2002.			
2. T	homas Erl, "Service Oriented Architecture: Education, 2016.	Cor	icept	ts, T	echnolog	gy, and D	Design",Pear	son	

8 Chairman - Bos Dept. of IT - ESEC

Department	INFORMATIONTECHNO	INFORMATIONTECHNOLOGY									
Course	Course Name	Hours/ Week			Credit	TotalH	Maximum				
Code	¥2	L T P C		Marks							
19ITP14 WEB SERVICES PROGRAMMING ANDXML		3	0	0	3	45	100				
 Beableto Beable to Learnthe Provide a 	tive(s):The purpose of learning this co understandand writewell-formedXMLdo writetheschema for thegiven XMLdocu XMLTechnologiesandmodelingdatabas un overviewofService OrientedArchitect	urse cun mer esin urea	e is t nent ntsin XM andt	to s both L heimp	DTD and) portanceo	KMLSchen fWeb serv	nalanguages ices				
 Beable to 	create, deployandcallWebServices										
Course Outco	mes:										
At the end of th	is course, learners will be ableto										
 Understa 	ndWebServicesandits Infrastructure										
 Impartkno 	owledgeinXMLtechnologiestobuildrobus	stXN	1Lap	oplica	tions						
 Familiariz 	ewithconcepts ofSOA,standards andte	chn	olog	iesfo	rbuildingth	neWebSer	vices				
 Use the a 	pproaches for providing security for XM	/L d	ocu	ment	s and the	messages	5				
exchange	edamongWebServices										
 Deploying 	g andPublishingWebService										
Jnit I XML	TECHNOLOGY							9			
KML-benefits	-AdvantagesofXMLoverHTML,EDI,Da	atab	ase	s-XN	ALbased	Standards	-Structuring				
vith Schemas	-DID-XML Schemas-XML process	sing	I —L		-SAX -P	resentation					
		mai	lion	-791		N-APAT	-AQuery.	0			
	HITECTURE OF WEB SERVICES	-						9			
Jusiness Moti	vations for Web Services-B2B-B2C-	-1e	chni	cal N	lotivation	s–limitatio	ons of Corba	an			
Com – Servi	ce-Oriented Architecture (SOA) – Arc	chite	ectin	ig We	eb Servic	es – Impl	ementation \	/ie			
Web Ser	vices Technology Stack-Logical	1 \	/iew	/—Co	mpositio	n of V	Veb Servic	es-			
DeploymentV	iew—FromApplicationservertopeertop	beer	-Pr	ocess	sView-Li	reinthe rur	n time.	-			
	SERVICES BUILDING BLOCKS							9			
ransport Pro	tocols for Web Services-Messagi	ng	WIT	n vv	eb Servi	ces- Pro	tocols- SOA	λΡ-			
rescribing vv	eb Services-VVSDL -Anatomy of	om				Service I	nspection_/				
Policy - Disc		om	y UI	UDL	J-web	Gervice I	inspection—/	٦u-			
Policy – Disc	-Securing Web Services										
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Policy – Disc loc Discover Init IV IMPL B2B–B2C Abi	y-Securing Web Services EMENTING XML IN E - BUSINESS plications–Different types of B2B Inter	racti	ion-	- Con	nponents	of E-Busi	ness XML	9			
Policy – Disc loc Discovery Init IV IMPL 32B–B2C App systems– eb >	y-Securing Web Services EMENTING XML IN E - BUSINESS blications–Different types of B2B Inter KML–Rosetta Net-Applied XML inverti	ract	ion– indi	- Con ustry-	nponents -Web Se	of E-Busi rvices for	ness XML Mobile Devid	9 ces			
Policy – Disc loc Discovery Jnit IV IMPL B2B–B2C App Systems– eb 2 Init V XML	y-Securing Web Services EMENTING XML IN E - BUSINESS blications–Different types of B2B Inter (ML–Rosetta Net-Applied XML inverting CONTENT MANAGEMENT AND SEC	ract ical	ion- indi ITY	- Con ustry-	nponents -Web Se	of E-Busi rvices for	ness XML Mobile Devic	9 ces 9			
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Policy – Disc loc Discover Init IV IMPL 32B–B2C App Systems– eb > Init V XML Semantic Wel Schema–Archi	y-Securing Web Services EMENTING XML IN E - BUSINESS blications—Different types of B2B Inter KML—Rosetta Net-Applied XML inverti CONTENT MANAGEMENT AND SEC D—Role of Meta data in Web Content- tecture of Semantic Web—Content Ma	racti ical :UR Res	ion- indi ITY	- Con ustry- ce De	nponents -Web Se escription	of E-Busi rvices for Framewo	ness XML Mobile Devid ork–RDF WSFL–	9 ces 9			

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TE)	TBOOK(S)
1.	Ron Schmelzer et al."XML and WebServices", Pearson Education, 2002.
2.	Keith Ballinger, ".NET Web Services Architecture and Implementation", Pearson Education, 2003.
REF	ERENCE(S)
1.	David Chappell, "Understanding .NET A Tutorial and Analysis", Addison Wesley, 2002.
2.	Kennard Scibner and Mark C.Stiver," Understanding SOAP", SAMS publishing 2000.
3.	Alexander Nakhimovsky and Tom Myers, "XML Programming : Web Applications and Web Services with JSP and ASP", A press, 2002.

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Course Code Course Name Hours / Week Credit Total Maximum Marks 191TP15 SOFTWARE TESTING 3 0 0 3 45 100 Course Objective (s): The purpose of learning this course is to To learn the criteria for test cases. To learn the criteria for test cases. To apply test metrics and measurements. Course Outcomes: To auderstand test management and test automation techniques To apply test metrics and measurements. Course Outcomes: At the end of this course, learners will be able to: • Develop Quality plans and use SQA components in project life cycle. Analyze the product Quality. Judge the use of infrastructure components and use configuration items for Quality control. 9 Testing as an Engineering Activity – Testing as a Process – Testing Maturity Model - Testing axioms – Basic definitions – Software Testing Principles – The Tester Support of Developing axioms – Basic definitions – Software Testing Principles – The Tester Support of Developing axioms – Basic definitions – Software Testing Principles – Testing Maturity Model - Testing axioms – Basic definitions – Software Testing Principles – The Tester Support of Developing axioms – Basic definitions – Software Testing Principles – Test Support of Developing a Dinitil TEST CASE DESIGN 9 Test case Design Strategies – Using Black Box Approach to Test Case Design – Bondary Value Analysis – Equivalence Class Parithoning – State based testing – Cause-effect graphing – Sortastin	Department	INFORMATION	ITE	CHI	NOLOG	Ϋ́Υ	R2019	SemesterVII	PC
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> Chairman - BoS Dept. of IT - ESEC

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TEX	TBOOK(S)
1.	Daniel Galin, "Software Quality Assurance – from Theory to Implementation" Pearson Education, First Edition, 2014.
2.	Yogesh Singh, "Software Testing", Cambridge University Press, 2012
REF	ERENCE(S)
1.	Aditya Mathur, "Foundations of Software Testing", Pearson Education, 2011.
2.	Ron Patton, "Software Testing", Second Edition, Pearson Education, Second Edition, 2007
3.	Srinivasan Desikan, Gopalaswamy Ramesh, "Software Testing – Principles and Practices", Pearson Education, 2009.
4.	Alan C Gillies, "Software Quality Theory and Management", Cengage Learning, Second Edition, 2003

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Chairman - BoS Dept. of IT - ESEC

	INFORMATION TECHNOLOGY					R2019	Semester V	II PC
Course	Course Name	Hours/ Week			Credit	Total	Maximum Mark	
Code		L	Т	Ρ	С	Hours		
19ITP16	HIGH PERFORMANCE COMPUTING	3	0	1	4	45	100	
Course Obje	ctive(s):							
 Introduce science a Illustrate performa 	 of learning this course is students the design, analysis, and ir and engineering applications. on advanced computer architecture nce-oriented computing. 	mple es,	eme pai	ntat	tion, of I algori	high perfo thms, pa	ormance comp rallel languag	outation es, ar
Course Outo At the end of t Illustrate Illusrate r	comes: this course, learners will be able the key factors affecting performance of C mapping of applications to high-performan	CSE	ap	olica	ations. ing syste	ms.	lications	
Unit I	NTRODUCTION: COMPUTATIONAL SC	IEN	ICE	AN	D ENGIN	IEERING		9
Computationa Computationa Cocality: temp drawn from r	al Complexity, Performance: metrics an poral/spatial/stream/kernel, Basic methods nultiscale, multi-discipline applications)	nd nd s for	me r pai	asu ralle	rements, l prograr	Granular mming, Re	rity and Partit	ioning, studies
emory Hiera	archies, Multi-core Processors: Homo- ltiprocessors. Vector Computers. Distril	gen bute	eou ed l	is i Nem	and He hory Cor Computir	terogeneo nputers, S	us, Shared-m Supercomputer	iemory s and
ultithreaded,	tems, Application Accelerators / Recon and purpose	ingt				ng, Novel	computers. S	tream,
Unit III P Parallel mode and Conque Algorithms: Li	tems, Application Accelerators / Recon and purpose ARALLEL ALGORITHMS els: ideal and real frameworks, Basic Tec r, Partitioning, Regular Algorithms: M sts, Trees, Graphs, Randomization: Para echniques ARALLEL PROGRAMMING	hnio atriz	que: x o Pse	s: B pera	alanced ations a p-Randor	ng, Novel Trees, Po Ind Linea n Number	inter Jumping, r Algebra, In Generators, S	tream, 9 Divide regular forting,
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TEXTB	DOK(S)
1.	Introduction to Parallel Computing, AnanthGrama, Anshul Gupta, George Karypis, and Vipin Kumar, 2nd edition, Addison-Welsey, 2003.
2.	Petascale Computing: Algorithms and Applications, David A. Bader (Ed.), Chapman & Hall/CRC Computational Science Series, 2007.
REFER	ENCE(S)
1.	Grama, A. Gupta, G. Karypis, V. Kumar, An Introduction to Parallel Computing, Design and Analysis of Algorithms: 2/e, Addison-Wesley, 2003.
2.	G.E. Karniadakis, R.M. Kirby II, Parallel Scientific Computing in C++ and MPI: A Seamless Approach to Parallel Algorithms and their Implementation, Cambridge University Press,2003.
3.	Wilkinson and M. Allen, Parallel Programming: Techniques and Applications Using Networked Workstations and Parallel Computers, 2/E, Prentice Hall, 2005.
4.	. M.J. Quinn, Parallel Programming in C with MPI and OpenMP, McGraw-Hill, 2004.

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Department	INFORMATION	TEC	HN	OLO	GY	R2019	SemesterVII	PC
Course	Course Name	H	our: Wee	s/ ek	Credit	Total	Maximum	
Code		LTP			С	Hours	Marks	
19ITP17	GREEN COMPUTING	3	0	0	3	45	100	
Course Objective (s	i):	•						-
The purpose of learn	ing this course is to							
analyse the G	Preen Computing Grid Frame	iy. work						
 understand th 	be issues related with Green	comr	nlian	ice				
 study and dev 	elon various case studies	comp	Jian	100.				
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Course Outcomes:	waa laamara will ha ahla tar							
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environment.	suge to adopt green compati	19 P	uou			20 nogat		lino
 Enhance the sl 	kill in energy saving practices	s in th	neir	use	of hardw	are.		
Evaluate techn	ology tools that can reduce p	aper	wa	ste a	and carb	on footpr	int by the	
stakeholders.								
	wave to minimize equipmen	t die	pos	al re	quireme	nts		
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Chairman - BoS

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TEXTBO	DOK(S)
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2.	Woody Leonhard, Katherine Murray, ?Green Home computing for dummies, August 2012
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1.	John Lamb, The Greening of IT, Pearson Education, 2009.
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3.	Carl speshocky, ? Empowering Green Initiatives with IT, John Wiley & Sons, 2010.
4.	Wu Chun Feng (editor), ?Green computing: Large Scale energy efficiency, CRC Press

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Departm	ent	INFORMATIC	NTE	CHN	OLC	OGY	R2019	SemesterVII	PC
Cours Code	e	Course Name	Hours / Week			Credit	Total Hours	Maximum Marks	
			L	Т	P	С			
19ITP1	8	PROCESSING	3	0	0	100	45	100	
Course C	Objective (s):							
The purp	ose of lear	rning this course is to							
• lop	rovide bac	kground and fundamental n	nateria	al for	the	analysis	and proce	essing of digital	
To fa	ans. amiliarize t	he relationships between filt	erina	and	free	nuency t	echniques		
• To st	tudy the fu	ndamentals of Image restor	ation			1			
 To st 	tudy the de	esigns and structures of ima	ge co	lor p	roce	essing te	chniques		
Course C	Outcomes	n the strang year							
At the end	d of this co	urse, learners will beable to:	ما مى						
CO2: Unc	derstand th	amerent types of signals ar	nd sys nital fi	Iter s	s struc	ture			
CO3: Knc	ow to imag	e restoration techniques	gitai ii		uuo	ture			
CO4: App	oly the kno	wledge of image color proce	essing	tecl	hniq	ues in th	e real time	applications	
CO5: Und	derstand th	e various segmentation tec	hniqu	es			- 4		
UnitI	IN	TENSITY TRANSFORMAT	IONS		D SF	PATIAL	FILTERIN	G	9
	and the second se		Contraction of the						
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Department	INFORMATION	GY	R2019	SemesterVII	PC			
Course	Course Name		Hours / Week		Credit	Total	Maximum	
Code		L	Т	Ρ	С	Hours	Marks	
19ITP19	INFORMATION RETRIEVAL	3	0	0	3	45	100	
Course Objective (s):							
The purpose of learn	ing this course is to	nfor	mati	on r	etrieval	system		
 To learn to eva 	luate information retrieval sys	tem	IS		culoval	oyotom		·
To learn about	text similarity measure and V	ecto	or m	odel				
 To be exposed 	to Link Analysis.							
 To Understand 	ing about search engine							
Course Outcomes:						1.5.1		
At the end of this cour	rse, learners will beable to:							
CO1 : Apply informat	tion retrieval models							
CO2 : Performance e	evolution metric for IR							
CO3 : Apply docume	ent text mining techniques and	l Ve	ctor	mo	del			
CO4 : Use Link Anal	ysis .							
CO5 : Desian web se		-		-				0
Definition - Objectives	- Relationship to DBMS - Info	rma	tion	Vor	eue Dat	Retriev	al - The Softwa	J
Architecture of the IR S	System – Digital Libraries and	Da	ta V	/are	houses	- Informa	ation Retrieval S	System
Unit II			-	-		-		0
	DEX CONSTRUCTION	tio	-		Indoving		Inform	Jotion
Extraction - Stemmi Distributed indexing	ng Algorithms - Inverted Fi - Dynamic indexing - Sta	le tisti	Stru cal	cture prop	es - Blo perties	ocked so of terms	ort-based index in IR - Dicti	ing - onary
Unit III VEC	TOR SPACE MODEL AND E	VA	LUA	TIO	N			9
Term frequency and scores - IR system retrieval sets	d weighting - Vector space evaluation - Standard text o	moo colle	del -	Qu ns -	eries a Evalua	s vectors ition of i	s - Computing unranked and r	vector anked
Unit IV USE	ER SEARCH TECHNIQUES		0				1	9
Search Statements and Dissemination of Inforn nternet and Hypertext	d Binding - Similarity Measure nation Search - Weighted Sea - information Visualization Te	es a arch chn	nd F es c olog	ank f Bo ies.	ing - Re olean S	elevance Systems -	Feedback - Sel Searching the	ective
Unit V WE	B SEARCH							9
Web characteristics - shingling - Web crawl PageRank algorithm -	Search user experience - Ind er features and architecture - - Hubs and authorities	ex s UR	size L fro	and ontie	estimat er - Link	ion - Nea analysis	ar-duplicates an - Web as a gra	d oh -

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ТЕХТВО	OK(S)
1	Manning C, Raghavan P, Schutze H, "Introduction to Information Retrieval", Cambridge University Press, New Delhi, 2008
2.	Ricardo Baeza-Yates, Berthier Ribeiro-Neto , "Modern Information Retrieval: The Concepts and Technology behind Search", Addison Wesley, USA, 2011.
REFERE	NCE(S)
1.	Bruce Croft W, Metzler D, StrohmanT, "Search Engines: Information Retrieval in Practice", Addison Wesley, USA, 2009.
2.	Gerald K, "Information Retrieval Architecture and Algorithms", Springer, Heidelberg, 2013.
3.	Stefan Büttcher, Charles L. A. Clarke, Gordon V. Cormack, "Information Retrieval: Implementing and Evaluating Search Engines", MIT Press, Cambridge, USA, 2016.
4.	Hang Li, "Learning to Rank for Information Retrieval and Natural Language Processing", 2nd Edition, Morgan & Claypool Publishers, USA, 2014.

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Department	INFORMATION TECHNOLOGY		Y	R2019	Semester VII	P		
Course	Course Name		Hours/ Week		Credit	Tota IHour	Maximum Marl	
ooue		L	Т	Ρ	С	s		
19ITP20	MULTICORE AND COMPUTING COMMUNICATION SYSTEMS	3	0	0	3	45	10 0	
The purpose • To u • To u • To k • To c	of learning this course is to inderstand the need for multi-core pr inderstand the challenges in parallel earn about the various parallel progr levelop multicore programs and desi	roc an am	ess id n imir pa	ors nulti ng p ralle	, and thei -threaded paradigms el solutior	r architec d progran s, is.	ture. nming.	
 Des Iden Writ Des Comproce 	tify the issues in programming Paral e programs using OpenMP and MPI ign parallel programming solutions to pare and contrast programming for essors.	ntil llel o co ser	Pro Pro omi rial	mon	cnaracte ssors. n problem cessors a	nstics and s. and progra	a chailenges. amming for parall	el
Unit I IN	TRODUCTION TO MULTI CORE							9
ingle core to symmetric and Parallel prog	Multi-core architectures – SIMD and I Distributed Shared Memory Archite ram design.	MI	MD ires) sys - (stems – I Cache co	nterconne herence -	ection networks – – Performance Is:	- sue:
Unit II P	ARALLEL PROGRAM CHALLENG	ES				5. 6.		9
Performance primitives (m between threa	 Scalability – Synchronization an utexes, locks, semaphores, barrier ads (condition variables, signals, me 	id (rs) issa	data 	a sh dea que	haring <i>—</i> dlocks a eues and	Data rac nd livelo pipes).	es – Synchroniz cks – communic	atio atio
Unit III O	penMP PROGRAMMING	3						9
OpenMP Exe Library functi Overheads - I	cution Model – Memory Model – (ons – Handling Data and Functio Performance Considerations.	Op ona	enN I P	/IP ara	Directives Ilelism –	s – Work Handling	s-sharing Constru g Thread Loops	icts an
Unit IV M	PI PROGRAMMING							9
MPI program		ies	- [Data	a Decomp	position-	MPI send and reg	ceiv
- Point-to-poi	execution – MPI constructs – librari nt and Collective communication – N	ΛPI	uc	1100	u ualaly	bes – Per	formance evaluat	tion
	execution – MPI constructs – librari nt and Collective communication – N ULTITHREADED PROGRAM DEVI	/PI	OP	ME	NT	bes – Per	formance evaluat	tion 9

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TEX	FBOOK(S)
1.	Peter S. Pacheco, —An Introduction to Parallel Programming, Morgan-Kauffman/Elsevier, 2011.
2.	Darryl Gove, —Multicore Application Programming for Windows, Linux, and Oracle Solaris, Pearson, 2011 (unit 2)
RE	FERENCE(S)
1.	Michael J Quinn, —Parallel programming in C with MPI and OpenMP, Tata McGraw Hill,2014.
2.	Victor Alessandrini, Shared Memory Application Programming, 1 st Edition, Concepts and Strategies in Multicore Application Programming, Morgan Kaufmann, 2015.
3.	Yan Solihin, Fundamentals of Parallel Multicore Architecture, CRC Press, 2015.
4.	Shameem Akhter and Jason Roberts, "Multi-core Programming", Intel Press, 2010.

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Departme	ent INFO	ORMATIONTEC	R2019	SemesterIV	PC				
Course	Course Nam	e	Hours / Week			Credit	Total	Maximum	
Code			L	Т	Р	С	Hours	Warks	
19ITP2	ARTIFICIAL IN	TELLIGENCE	3	0	0	3	45	100	
The purpo The purpo To algo	bjective (s): ose of learning this co gain a characteristic p become familiar with l prithms	ourse is to perspective of AI basic principles o	an of A	d its I to	found wards	dations. problem	solving u	sing various sea	rch
To To intro Course C	earn to represent kno know the overview of oduction to learning. utcomes:	wledge in solvin machine learning	g A g a	l pr lgor	oblem ithms	ns, inferer both sup	ice and pe ervised ar	erception, nd unsupervised	and
At the enc CO1: Der fou CO2: App CO3: Pro CO4: Lea	of this course,learne nonstrate fundament ndations. bly basic principles of vide the appropriate a irn how to analyze the	rs will be able to al understanding Al in solutions th and a fundament e complexity of a	: of nat tal u giv	the requ unde	histor uire pr erstan proble	y of artific roblem so ding to so am and co	cial intellig lving. blve Al pro ome with s	ence (Al) and its oblems suitable optimiza	s tions.
CO5: Lea	irn to design applicati	ons for NLP that	ma	ake	use of	IAI			•
ntelligence ntelligent Unit II Searching search - I decisions	Non Al and Al te Agents, Structure o PROBLEM S for solutions: Uninfo nformed Search - G in Games, alpha - be	chniques, Applic f Intelligent Ag SOLVING AGEN prmed search - E reedy Best First ta pruning	cati ent ITS BFS se	ons s - S, D arch	of A Ratior FS, U	rtificial Ir nality-Nati Iniform co search, A	telligence ure of E ost search	a, Structure of A nvironments- E n, Iterative deep h - Games - Op	Agent xamp 9 ening otimal
Unit III	KNOWLEDGE	AND REASONI	NG	1					9
Proposition haining, F ayesian N	al logic, Theory of F Resolution - Probab etworks - Hidden Mai	First order logic, ilistic Reasoning rkov Models (HM	Int g: 1M)	fere Rep	nce ir preser	n First or nting kno	der logic, wledge i	, Forward & Ba n uncertain do	ckwa main
Unit IV	PLANNING A	ND LEARNING					4		9
lgorithms upervised	for Planning as state learning, unsupervise	space search - F d learning, reinfo	Plan orce	ining eme	g Gra nt lea	phs - Lea Irning - R	rning: For einforcem	ms of learning - ent learning task	(- Q
Unit V	APPLICATIO	NS							9
Principles robotics -	of Natural Language Current trends in Inte	e Processing - R lligent Systems	Rule	Ba	sed S	Systems /	Architectu	ire - Al applicati	on to
TEXTBOO	OK(S)								
1. S	tuart J Russell and P rentice Hall of India/ I	eter Norvig , "Art Pearson Educatio	tifici on,	ial II Nev	ntellig w Dell	ence – A hi, 2018.	Modern A	Approach", 3rd E	dition
2. E	laine Rich, Kevin Knig IcGraw Hill Publishing	ght and Shivasha Company, New	ank / De	ar E elhi.	8 Nair 2017	, "Artificia	al Intellige	nce", 3rd Editior	, Tat

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REFE	ERENCE(S)
1.	George F Luger, "Artificial Intelligence: Structures and Strategies for Complex Problem Solving", 5th Edition, PearsonEducation, New Delhi, 2017.
2.	Nils J Nilsson, "Principles of Artificial Intelligence", Narosa Publishing House, New Delhi, 2002.
3.	Patrick Henry Winston, "Artificial Intelligence", 3rd Edition, Pearson Education, New Delhi, 2013.
4.	Husain, Amir. The sentient machine: The coming age of Artificial Intelligence.Simon and Schuster, 2017.
5.	Kaplan, Jerry. Artificial intelligence: What everyone needs to know. Oxford University Press, 2016.

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	INFORMATION TECH		R2019	9 SemesterVII	Ы		
Course	Course Name	Ho	urs/ eek	Credit	Total Hours	Maximum Mar	ks
Code			P	C		100	
1911P22	R PROGRAMMING	3 0	0 0	3	45	100	
The purpose To under function To learr	of learning this course is erstand the basics in R programming is in to apply R programming for Text pro	in terms ocessing	s of c g	onstructs	, control s	tatements, string	g
• To unde	erstand the use of RBig Data analytic	s					
I o able	to appreciate and apply the R progra	mming	from	a statistic	al perspec	ctive	-
Course Out	comes:						
At the end of	this course, learners will be ableto						
Create a	artful graphs to visualize complex dat	a sets a	and fu	inctions			
 Write m 	ore efficient code using parallel R and	d vector	rizatio	on			
 Interface 	e R with C/C++ and Python for increa	ised spe	eed o	or functiona	ality		
 Find nev 	w packages for text analysis, image r	nanipula	ation				
 Perform 	statistical analysis of the same						-
	TRODUCINGTOR		. 2				9
Unit II M	-thenelse–VectorEquality–Vector ATRICES,ARRAYSANDLISTS	lemen	itnan	nes			9
Adding and Reduction—F components Unit III D Creating D Applyingfund functions us Control state arguments - ssues Toolsforcom Unit IV OC S3 Classes- Vonitor – re —Creating timensional	Applied to the second s	ying Fu -Vector/ eating li lists-re ations and T es - Of opera- ctions a - ationsin ects-Ir g the ir -Savin	in ther ators are of Reconstruction of the second s	ons to Ma ix Distin General lis ive lists frames – s – factor factors ar and val objects – ursion /Output–a net–String raphs to	atrix Row ction-Ave st operations ors and I nd table ues - E Environ -Repla accessin g Manipu o files-	s and Column biding Dimens ons-Accessing ng DataFrame evels – Comm related function Default values ment and Sco acementfunction g Keyboard an lation-Graphic Creating thre	s sion lis 9 es- nor ns fo ope ns- 9 nd cs ee-
Adding and Adding and Reduction—I- components Unit III D/ Creating D/ Applyingfund functions functions use Control state arguments - ssues Toolsforcomp Unit IV OC S3 Classes Monitor – re –Creating timensional Jinit V IN	Applied to the second s	ying Fu -Vector/ eating li lists-re ations and T es - Of opera- ctions a - ationsin ects-Ir g the ir -Savin	in ther ators are of Recharged and the recharged	ons to Ma ix Distin General lis ive lists frames – s – factor factors ar and val objects – ursion /Output–a net–String raphs to	atrix Row ction—Ave st operation - Mergin ors and I nd table ues – E Environ -Repla accessin g Manipu o files—	s and Column biding Dimensions-Accessing DataFrame evels – Comm related function Default values ment and Sco acementfunction g Keyboard an lation-Graphic Creating thre	s - sion lis 9 es- nor ns fo ope nd cs ee- 9
Adding and Reduction—F components Unit III D/ Creating D/ Applyingfund functions use Control state arguments - ssues Toolsforcomp Unit IV 00 S3 Classes- Monitor – re —Creating dimensional Jnit V IN nterfacing R nodels—Non-	Applied to the formation of the formatio	ying Fu -Vector/ eating li lists-re ations and T es - Of opera- ctions a - ationsin ects-Ir g the ir -Savin	in ther ators are of Reconstruction R are of Reconstruction R and the r ators are of Reconstruction R are of	ons to Ma ix Distin General lis ive lists frames – s – factor factors ar and val objects – ursion /Output–a net–String raphs to –Linear Mon–Cluster	atrix Row ction-Ave st operations - Mergin ors and I nd table ues - E Environ -Repla accessin g Manipu o files- lodel-Ge	s and Column biding Dimens ons-Accessing ng DataFrame evels – Comm related function Default values ment and Sco acementfunction g Keyboard an lation-Graphic Creating thre	s - sion lis 9 9 - s- nor 1s fo ope ns- 9 nd cs e- 9 1
Adding and Adding and Reduction—I- components Unit III D/ Creating D/ Creating D/ Applyingfund functions functions usic Control state arguments - ssues Toolsforcomp Unit IV OC S3 Classes- Monitor – re —Creating dimensional Jnit V IN nterfacing R nodels—Non-	Applied to the formation of the formatio	ying Fu -Vector/ eating li lists-re ations and T es - Of opera- ctions a - ationsin ects-Ir g the ir -Savin	in Table ther ators are of Reco Reco Reco Reco Reco Reco Reco Reco	ons to Ma rix Distin General lis ive lists frames – s – factor factors ar and val objects – ursion /Output–a net–String raphs to –Linear Mon–Cluster	atrix Row ction-Ave st operation - Mergin ors and I nd table ues - E Environ -Repla accessin g Manipu o files- lodel-Ge	s and Column biding Dimensions-Accessing DataFrame evels – Comm related function Default values ment and Sco accementfunction g Keyboard an lation-Graphic Creating thre	s - sion lis 9 es- nor ns fo ope ns- 9 nd cs e- 9 ar
Adding and Reduction—F components Unit III D. Creating Da Applyingfund functions use Control state arguments - ssues Toolsforcom Unit IV OC S3 Classes- Monitor – re —Creating dimensional Jnit V IN nterfacing R nodels—Non- EXTBOOK(Norman M Press,20	Apple deleting rows and columns- ligher Dimensional arrays-lists-Cre and Values – applying functions to ATA FRAMES ata Frames – Matrix-like oper ctions to Data frames – Factors ed withfactors – Working with table ements –Arithmetic and Boolean Returning Booleanvalues – func – Writing Upstairs bosingfunctioncode-MathandSimul DP –S4 Classes-Managing your obj ading and writing files- accessin Graphs-Customizing Graphs- I plots TERFACING to other languages-Parallel R-Bas -linear models-Time Series and Au (S) Matloff, "The Art of R Programming : A	ying Fu -Vector/ eating li lists-re ations and T es - Of o opera ctions a - ationsin ects-Ir g the ir -Savin sic Stati to-corre	in ther ators are of Reconstruction ators ators	ons to Ma ix Distin General lis ive lists frames – s – factor factors ar and val objects – ursion /Output–a net–String raphs to –Linear Mon–Cluster	atrix Row ction-Ave st operation - Mergin ors and I nd table ues - E Environ -Repla accessin g Manipu o files- lodel-Ge ing	s and Column biding Dimensions-Accessing DataFrame evels – Comm related function Default values ment and Sco acementfunction g Keyboard an lation-Graphic Creating thre neralized Linea	s sion lis 9 es- non ns fo ope ns- 9 nd cs e- 9 nd

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RE	REFERENCE(S)						
1.	Mark Gardener, "Beginning R-The Statistical Programming Language", Wiley, 2013						
2.	Robert Knell, "Introductory R: A Beginner's Guide to Data Visualization, Statistica IAnalysis and Programming in R", Amazon Digital South Asia Services Inc,2013.						

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Course Code Course Name Hours/ Week Credit I Tota Hours/ I Maximum Mark 191TP23 BLOCK CHAIN TECHNOLOGY 3 0 0 3 45 10 Course Objective(s): The purpose of learning this course is to -	Department	INFORMATION TECHNOL	R2019	019 SemesterVII					
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191TP23 BLOCK CHAIN TECHNOLOGY 3 0 0 3 45 10 Course Objective(s): The purpose of learning this course is to	Code		L	Т	P	С	s		
Course Objective(s): The purpose of learning this course is to • learn the basic models of Block Chain. • study the functions and challenges in crypto currency domain. • Design, build, and deploy smart contracts using bitcoin and Etherum. • Have a knowledge on various Consensus Algorithms. • Explore the significance of a hyperledger Course Outcomes: Attheendofthiscourse, learners willbeableto: • understand emerging abstract models for Block Chain Technology. • experiment with cryptocurrency trading and crypto exchanges • Develop smart contracts using Bit Coin and Etherum. • Secure distributed ledgers through consensus. • build the Hyperledger architecture and the consensus mechanism applied in the hyperledge Tobic train Block Chain Technology Mechanisms & Networks, Blockchain Origin Objective of Blockchain, Blockchain Achallenges, Transactions And Blocks, P2P Systems, Ke als Identify, Digital Singatures, Hashing, and public key cryptosystems, private vs. pub Blockchain, Merkle Tree, Life of Block Chain Mechanisms. Unit II CRYPTOCURENCY 1 Hittacks, Sidechain, Namecoin Payments and double spending, FORTH - the precursor for Bitcc scripts, Block in network Block Dios Scripts , Bitcoin P2P Network, Transaction in Bitcoin Network, Block Block Mining Bick Tops and houble spending, FORTH - the precursor for Bitcc ascripting, Bitcoin Script - Usage, storage, selling, transactions, working- InvascitonsParameters that invalidate the transacti	19ITP23	BLOCK CHAIN TECHNOLOGY	3	0	0	3	45	10 0	
The purpose of learning this course is to I earn the basic models of Block Chain. Study the functions and challenges in crypto currency domain. Design, build, and deploy smart contracts using bitcoin and Etherum. Have a knowledge on various Consensus Algorithms. Explore the significance of a hyperledger Course Outcomes: Attheendofthiscourse, learners willbeableto: understand emerging abstract models for Block Chain Technology. experiment with cryptocurrency trading and crypto exchanges Develop smart contracts using Bit Coin and Etherum. Secure distributed ledgers through consensus. build the Hyperledger architecture and the consensus mechanism applied in the hyperledge Unit 1 INTRODUCTION TO BLOCK CHAIN '''' What is Block Chain? Blockchain Challenges, Transactions And Blocks, P2P Systems, Ke As Identity, Digital Signatures, Hashing, and public key cryptosystems, private vs. pub Blockchain, Markle Tree, Life of Block Chain Mechanisms. Unit 1 CRYPTOCURRENCY '''' History, A basic crypto currency, Creation of coin, Distributed Ledger, Bitcoin protocols - Minin Block propagation and block relay. Consensus introduction, Distributed consensus in ope environments-Consensus in a Bitcoin network Unit 11 BITCOIN & ETHERUM '''' Bitcoin Scripts Bitcoin P2P Network, Bitcoin protocols - Minin Block propagation and block relay. Consensus introduction, Distributed consensus in ope environments-Consensus in a Bitcoin network Unit 11 BITCOIN & ETHERUM '''' Bitcoin Consersus, Proof of Work (POW)- HashcashPoW , Bitcoin PoW, Attacks on Po monopoly problem - Proof of Stake- Proof of Burn - Proof Elapsed Time - Bitcoin Miner, Minin Diffuelty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Biockchain, elosed environment-Paxos Unit V HYPERLEDGER ''''' ''''''''''''''''''''''''''''''	Course Obje	ctive(s):	-						
Course Outcomes: Attheendoffhiscourse, learners willbeableto: • understand emerging abstract models for Block Chain Technology. • experiment with cryptocurrency trading and crypto exchanges • Develop smart contracts using Bit Coin and Etherum. • Secure distributed ledgers through consensus. • build the Hyperledger architecture and the consensus mechanism applied in the hyperledge Unit 1 INTRODUCTION TO BLOCK CHAIN 1 What is Block Chain? Blockchain Challenges, Transactions And Blocks, P2P Systems, Ke As Identity, Digital Signatures, Hashing, and public key cryptosystems, private vs. pub Blockchain. Merkle Tree, Life of Block Chain Mechanisms. 1 Unit II CRYPTOCURRENCY 1 History, A basic crypto currency, Creation of coin, Distributed Ledger, Bitcoin protocols - Mini strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerabili Attacks, Sidechain, Namecoin Payments and double spending, FORTH - the precursor for Bitcc scripting, Bitcoin Scripts , Bitcoin P2P Network, Transaction in Bitcoin Network, Block Minin Block propagation and block relay, Consensus introduction, Distributed consensus in openvironments-Consensus in a Bitcoin network 1 Unit II BITCOIN & ETHERUM 1 Bitcoin in story- Bitcoin - usage, storage, selling, transactions, working- Inva TransactionsParameters that invalidate the transactions- Scripting language in Bitcoi Applications of Bitcoin sign and issue Crypto currency, Mining, DApps, DAO 1 <tr< td=""><td>The purpose of learn the study the Design, I Have a k Explore t</td><th>of learning this course is to basic models of Block Chain. In functions and challenges in cryp build, and deploy smart contracts nowledge on various Consensus he significance of a hyperledger</th><td>to cu using Algo</td><td>irrei g bi rith</td><td>ncy tcoii ms.</td><td>domain. n and Eth</td><td>nerum.</td><th></th><td></td></tr<>	The purpose of learn the study the Design, I Have a k Explore t	of learning this course is to basic models of Block Chain. In functions and challenges in cryp build, and deploy smart contracts nowledge on various Consensus he significance of a hyperledger	to cu using Algo	irrei g bi rith	ncy tcoii ms.	domain. n and Eth	nerum.		
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What is Block Chain? Blockchain Technology Mechanisms & Networks, Blockchain Origir Objective of Blockchain, Blockchain Challenges, Transactions And Blocks, P2P Systems, Ke As. Identity, Digital Signatures, Hashing, and public key cryptosystems, private vs. pub Blockchain.Merkle Tree, Life of Block Chain Mechanisms. Unit II CRYPTOCURRENCY History, A basic crypto currency, Creation of coin, DAO, Smart Contract, GHOST, Vulnerabili Katacks, Sidechain, Namecoin Payments and double spending, FORTH – the precursor for Bitco scripting, Bitcoin Scripts, Bitcoin P2P Network, Transaction in Bitcoin Network, Block Minin Block propagation and block relay, Consensus introduction, Distributed consensus in op- environments-Consensus in a Bitcoin network Unit III BITCOIN & ETHERUM Bitcoin: history- Iticoin cusage, storage, selling, transactions, working- Inva Transactions of Bitcoin script-Nodes and network of Bitcoin- Bitcoin ecosystem Etherum: Ethereum network, EVM, Transaction fee, Mist Browser, Ether, Gas, Solidity, Sma contracts, Truffle-Design and issue Crypto currency, Mining, DApps, DAO S Unit IV DISTRIBUTED CONSENSUS S Bitcoin Consensus, Proof of Work (PoW)- HashcashPoW, Bitcoin PoW, Attacks on Po monopoly problem-Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Minin Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Slockchain, Exerce Consensus- Consensus & its interaction with architectur consensus in cl		TRODUCTION TO BLOCK CH		-					9
Unit III BITCOIN & ETHERUM Image: storage, selling, transactions, working- Invator inveterization index indeterector invetor involuted invator invator in	Unit II CR History, A bas strategy and Attacks, Sidec scripting, Bitco Block propaga environments-	APPTOCURRENCY ic crypto currency, Creation of c rewards, Ethereum - Construction hain, Namecoin Payments and do bin Scripts, Bitcoin P2P Networ ation and block relay, Consens Consensus in a Bitcoin network	oin, on, E ouble rk, T sus i	Dis DAC sp ran intro	tribu), S end sact oduc	ited Ledg mart Co ling, FOR tion in B ction, Dis	ger, Bitco ntract, G TH – the itcoin Ne stributed	in protocols - M HOST, Vulneral precursor for Bi twork, Block Mi consensus in o	9 bility, tcoin ning, open
Bitcoin: history- Bitcoin- usage, storage, selling, transactions, working- Inva Bitcoin: history- Bitcoin- usage, storage, selling, transactions, working- Inva Applications of Bitcoin script- Nodes and network of Bitcoin- Bitcoin ecosystem Etherum: Etherum network, EVM, Transaction fee, Mist Browser, Ether, Gas, Solidity, Smacontracts, Truffle-Design and issue Crypto currency, Mining, DApps, DAO 9 Unit IV DISTRIBUTED CONSENSUS 9 Bitcoin Consensus, Proof of Work (PoW)- HashcashPoW , Bitcoin PoW, Attacks on Po monopoly problem- Proof of Stake- Proof of Elapsed Time - Bitcoin Miner, Minin Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, Execute contracts- Consensus models for permissioned blockchain-Distribute consensus in closed environment-Paxos 9 Unit V HYPERLEDGER 9 Hyperledger Architecture- Consensus- Consensus & its interaction with architecture Application model -Hyperledger framework Hyperledger Fabric -Various ways to create Hyperledger Fabric Blockchain network- Creating and Deploying a business network on Hyperledger Composer Playground- Testing the businese network definition- Transferring the commodity between the participants		COIN & ETHERUM		-	-		×:		9
Bitcoin Consensus, Proof of Work (PoW)- HashcashPoW , Bitcoin PoW, Attacks on Po ,monopoly problem- Proof of Stake- Proof of Burn - Proof of Elapsed Time - Bitcoin Miner, Minii Difficulty, Mining Pool-Permissioned model and use cases, Design issues for Permissioned Blockchains, Execute contracts- Consensus models for permissioned blockchain-Distribute consensus in closed environment-Paxos Unit V HYPERLEDGER Hyperledger Architecture- Consensus- Consensus & its interaction with architecture layersApplication programming interface- Application model -Hyperledger framework Hyperledger Fabric -Various ways to create Hyperledger Fabric Blockchain network- Creating an Deploying a business network on Hyperledger Composer Playground- Testing the busines network definition- Transferring the commodity between the participants	Bitcoin: hist TransactionsP Applications of Etherum: Ethe contracts, Truf	ory- Bitcoin- usage, storage arameters that invalidate the Bitcoin script- Nodes and networe reum network, EVM, Transaction fle-Design and issue Crypto curre STRIBUTED CONSENSUS	ge, tra rk of on fe ency,	se nsa Bito e, I Mi	elling octio coin Mist ning	g, trans ns- Scri - Bitcoin e Browser , DApps,	sactions, ipting la ecosyster r, Ether, DAO	working- In nguage in Bito m Gas, Solidity, S	valid coin- mart
Hyperledger Architecture- Consensus- Consensus & its interaction with architecture layersApplication programming interface- Application model -Hyperledger framework Hyperledger Fabric -Various ways to create Hyperledger Fabric Blockchain network- Creating an Deploying a business network on Hyperledger Composer Playground- Testing the busines network definition- Transferring the commodity between the participants	Bitcoin Conse ,monopoly pro Difficulty, Mini Blockchains, consensus in c	nsus, Proof of Work (PoW)- H blem- Proof of Stake- Proof of Bu ng Pool-Permissioned model a Execute contracts- Consensus closed environment-Paxos	lash Irn - nd ι mod	cas Pro ise lels	hPc of c cas for	oW , Bit of Elapse ses, Des permiss	coin PoV d Time - ign issue sioned b	V, Attacks on Bitcoin Miner, M es for Permissio lockchain-Distrib	PoW ining oned outed
TEXTEOOLUO	Hyperledger layersApplicati Hyperledger F Deploying a t network definit	Architecture- Consensus- Cor on programming interface- abric -Various ways to create Hyp ousiness network on Hyperledge ion- Transferring the commodity b	nsen Appl berle er C betwe	sus icat dge om een	ion r Fa pos the	its in model abric Bloc er Playg participa	teraction -Hyperl kchain n round- T ants	with architec edger framewo etwork- Creating esting the busi	tural orks- and ness
TEXTBOOK(S)	TEXTBOOK(S)							

1.	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.
2.	Joseph Bonneau et al, SoK: Research perspectives and challenges for Bitcoin and Cryptocurrency, IEEE Symposium on security and Privacy, 2015
REF	RENCE(S)
, 1 .	Mastering Bitcoin: Unlocking Digital Cryptocurrencies, by Andreas M Antonopoulos 2018
2.	DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014
3.	Antonopoulos, Mastering Bitcoin: Programming the Open Block Chain, O Reilly, 2017
4.	https://www.coursera.org/learn/ibm-blockchain-essentials-for-developers
5.	https://museblockchain.com/

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Department	INFORMATION TECH	NOLO	GY		R2019	SemesterVII	PC
Course	Course Name	Hou	rs/ ek	Credit	Total	Maximum Ma	arks
Code		LT	P	С	Hours		1.
19ITP24	EMBEDDED SYSTEM	3 0	1	4	45	100	
The purpose of To under To become To be ex To learn To design	of learning this course is rstand the concepts of embedded sy me familiar with the embedded hardw posed to the basic concepts of embed the real time operating systems.	stem de vare. edded p	esig prog	n and and ramming	alysis.		
Attheendofthis To analys To unders Outline th Explain th Illustrate t Unit I Complex syst Model train of Dequirement	comes: scourse, learnerswillbe able se and design embedded systems co stand embedded system hardware. se concepts of embedded systems. he basic concepts of real time operat the code for constructing a system. INTRODUCTION TO EMBEDDED (ems and micro processors– Embed controller- Instruction sets prelimina Analysis – Specifications System	ncept. ing syst COMPL Ided sy ries -	ITIN Ster	design. I G m design sign meth	process	–Design exam s- Design flows	9 ole: s -
Assurance tec platform-level	chniques -Designing with computing performance analysis. REVIEW OF EMBEDDED HARDW	platform	ns -	- consum	er electro	nics architectur	e – 9
erminology – (Interrupts – mbedded sys escheduling a Unit III I	Gates – Timing diagram – Memory – Built interrupts – Interrupts basis tem evolution trends – Round-Ro rchitecture – algorithm. EMBEDDED PROGRAMMING	Microp – Shar bin –	oroc ed Roι	essor bus data prol ind Robii	ses – Dire plems – n with in	ect memory acce Interrupt latenc terrupt functior	ess y - 1 - 9
Components compilation te - Program le program size- Unit IV	for embedded programs- Models of chniques- Program level performanc vel energy and power analysis an Program validation and testing. REAL TIME OPERATING SYSTEM	of prog e analy d optin	ram sis niza	is- Assen – Softwai tion – Ai	nbly, linki re perforn nalysis ai	ing and loading nance optimizat nd optimization	ion of 9
Fask and Tasl - Message qu RTOS environ	k states – Task and data – Semaph ieues timing functions – Events – M ment – Basic design using RTOS.	ore and lemory	d sh ma	ared data inagemer	a operatin nt – Interr	g system servic upt routines in	an
Unit V E	EMBEDDED C PROGRAMMING						9
Introduction-C Structure to th hardware dela timeouts-Testi	reating hardware delays' using Tir le code-Generating a minimum and ly- Timeout mechanisms-Creating I ng a hardware timeout	ner 0 maxim oop tin	anc ium neoi	l Timer delay-Ex uts-Testin	I-Reading ample: C g loop ti	g switches-Add reating a porta meouts- hardwa	ing ble are

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TEXT BOOK(S):

- 1. Marilyn Wolf, —Computers as Components Principles of Embedded Computing System DesignII, Third Edition —Morgan Kaufmann Publisher (An imprint from Elsevier), 2012.
- 2. Frank Vahid and Tony Gwargie, "Embedded System Design", John Wiley & sons, 2002.

REFERENCE (S):

1. Steve Heath, "Embedded System Design", Elsevier, Second Edition, 2004.

Department	INFORMATION TEC	HNO	LO	GY	3 - 1 - ¹ -	R2019	Semester VI	PC
Course	Course Name	Н	our We	rs/ ek	Credit	Total	Maximum M	arks
Code		L	Т	Ρ	С	Hours		
19ITP25	VIDEO ANALYTICS	3	0	1	4	45	100	
The purpose of To under To under To under To get ex	learning this course is stand the need for video Analytics stand the basic configuration of vid stand the functional blocks of a vid posed to the various applications	deo a deo a of vid	naly naly eo a	tics tic :	s system lytics			
At the end of th • Design vi • Design vi • Design ci	is course, learners will be able deo analytic algorithms for security deo analytic algorithms for busine ustom made video analytics system	y app ss inte n for	licat ellig	tion enc give	s e en target	applicatio	on	
Need for Video classifier - Prep Unit II FO Background e Segmentation- Tracking in a m Unit III CL Neural network	 Analytics-Overview of video Analytics-Overview of video Analytics-edge detection- smoot REGROUND EXTRACTION MOD stimation- Averaging- Gaussian Region growing- Region splinultiple camera environment ASSIFIERS (back propagation) - Deep learn 	alytics henin ELS Mixitting- itting	s- F g- F ture Mor	ore eat a h pho orks	ground e ture space Model- (C blogical s- Fuzzy (extraction e-PCA-F Optical F operation	- Feature extra LD-SIFT featur Flow based- I ns- erosion-Dil - Bayesian clas	es 9 mage ation- 9 sifier-
Unit IV VID	EO ANALYTICS FOR SECURITY	,	1.11	-	-			9
Abandoned ob security- crowd	ject detection- human behaviora analysis and prediction of crowd of	al ana conge	alys stio	is - n	human	action re	cognition- peri	meter
Unit V AN	ALYSIS OF BUSINESS INTELLIC SISTANCE	BENC	E &	TF	RAFFIC N	IONITIRI	NG AND	9
Customer beha identification fo	avior analysis - people counting- r route planning- driver assistance	Traff - lane	ic r cha	ule ang	violation e warnin	detectio g	n- traffic cong	estion
1. Graeme A. Surveillance 2001.	Jones (Editor), Nikos Paragios Systems: Computer Vision and I	(Edito Distrib	or), oute	Car d P	lo S. Re rocessing	egazzoni g , Kluwe	(Editor) Video- r academic pul	Based
2. Nilanjan De Processing	ey (Editor), Amira Ashour (Editoring System) in Surveillance and Monitoring System)	or) ai stems	nd (IG	Suv il gl	vojit Ach obal) 20′	arjee (Ed 16	ditor), Applied	Video
REFERENCE B	OOKS							
1 Zhihao C (Author), Intelligent	hen (Author), Ye Yang (Author), The Next Generation of Video Video Analytics Suite, CreateSpa	Jingy Sur ice In	u Xu veill dep	ue (land end	Author), ce and lent Publ	Liping Ye Video Ar ishing Pla	e (Author), Fen nalytics: The I atform, 2014	g Guo Unified
2 Caifeng S Analytics	han (Editor), Fatih Porikli (Editor) for Business Intelligence, Springe	, Tao r, 201	Xia 2	ng ((Editor), S	Shaogan	g Gong (Editor)	Video

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Department	INFORMATION TECHNOLC)G	Y	1		R2019	Semester VII	PC
Course	Course Name	H	lou We	rs/ ek	Credit	Total	Maximum Ma	rks
Code		L	Т	P	C	Hours	*	
19ITP26	EMBEDDED SECURITY	3	0	1	4	45	100	
Course Obj	jective(s):					6 N.		
The purpose	of learning this course is to							
 Underst 	tand concepts, issues, principles, and me	ech	anis	sms	in embe	dded syst	ems security such	
is embedded s	security trends, software vulnerabilities,	ph	ysic	cal a	attacks a	nd securit	y policies;	
 To prov 	vide a clear understanding on the basic c	on	cept	ts, E	Building	Blocks of	Embedded Syste	m
• To teac	h the fundamentals of Embedded proces	sso	r M	ode	ling, Bu	is Commu	inication in	
process	ors, Input/output interfacing		Nacional					
• Obtain I	hands-on skills in securing practical emb	bed	ded	sys	stems;	unonono f	'an anaduata nagaar	ah in
• Learn re	scent research advances in embedded sy	ste	ms	sect	irity and	prepare i	or graduate resear	ch m
embedded	systems security.	-	-	-	-			
At the end of	this course learners will be able							
At the end of	has course, learners will be able,	ster	ne					
 apply cr 	vptographic techniques to Embedded Sys	Jste	ems					
 apply ci analyze 	and implement the memory management	nt n	nap	ping	r technio	ues		
 develop 	certain applications for specific case stu	ıdie	es	e6				
• explore	research topics in security based Embed	Ideo	d Sy	ste	ms			
Unit I I	NTRODUCTION TO EMBEDDED S	SEC	CU	RIT	Y			9
Introduction	to Embedded Security: Goals - Secur	rity	in	the	produc	t Life cyc	cle - Attack and	Threa
Classification	ns- Practical Design Solutions - Embra	aci	ng 1	Eml	bedded S	Systems S	Security: Introduc	tion t
embedded sy	stems - Embedded system trends - Soft	wa	re S	ecu	rity: But	ffer overfl	ow exploits - Mit	igatio
of buffer ov	erflow attacks - Return-to-libc attack.	Ha	rdw	are	Securit	y: Hardwa	are trojans - Intel	Hom
Security and	Privacy Vulnerability analysis - Count	erm	eas	ung	g - Side	-channel	analysis - Smart	TIOIII
Unit II F	EMBEDDED CRYPTOGRAPHY	2111	cas	urea	,			9
Embedded Ci	ryptography: Secret key cryptography	у.	- p	ubli	c key	cryptogra	phy - hash fund	ctions
uthentication	techniques - etc Key management for	or e	emb	edd	ed syste	ms - Data	Protection Proto	cols f
Embedded Sys	stems:Data-in-motion protocols: IP-base	ed 1	ietv	vork	security	y - Data-a	t-rest protocols	0
	Embedded Systems Structurel unit	YS 	E	IVI S) addad m		alastion of prog	9
ntroduction to	D Embedded Systems –Structural units	s II	1 E	nem	ory mai	nning car	selection of proc	concer
Timer and Cou	inting devices. Watchdog Timer, Real T	Tim	e C	loci	k.	pping, cat	the replacement v	Joneel
Unit IV E	MBEDDED SYSTEM APPLICATIO	N	DE	VE	LOPME	ENT		9
	fferent Direct & Madeline of the Em	1		J	aduat D) av al anna	ant Life Cycle (E	DIC
Tase studies of	n Smart card- Adaptive Cruise control i	n a	Ca	r _M	Iohile Pl	none softw	vare for key input	s s
ase studies 0	lopment of embedded Products like : Sr	nar	t ca	rd -	Adaptiv	e Cruise o	control in a Car -	Mobil
Design, Deve								
Design, Deve hone -Autom	ated Robonoid	0.00	ICC	1				
Design , Deve Phone - Autom Unit V 0	ated Robonoid THER EMERGING RESEARCH TO	OP.	ICS	5				9

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TEXT BOOK(S):

1. Peckol, "Embedded system Design", John Wiley & Sons, Second Edition, 2019.

2. Lyla B Das," Embedded Systems-An Integrated Approach", First Edition, Pearson, 2013.

3. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc graw Hill, 2017.

REFERENCE(S):

1. Raj Kamal, 'Embedded System-Architecture, Programming, Design', Mc Graw Hill, 2013.

2. C.R.Sarma, "Embedded Systems Engineering", University Press (India) Pvt. Ltd, 2013.

3. Tammy Noergaard, "Embedded Systems Architecture", Second Edition, Elsevier, 2012.

4. Han-Way Huang, "Embedded system Design Using C8051", First Edition, Cengage Learning, 2009.

5. Rajib Mall "Real-Time systems Theory and Practice" Pearson Education, 2006.

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	INFORMATION TECHN	OLOGY			R2019	Semester VII	PO
Course	Course Name	Ho W	urs. 'eel	Credit	Total	Maximum Marks	
Code		L	Г І	P C	Hours		
19ITP27	ROBOTICS	3 () 1	4	45	100	
The purpose of To unde To study To impa To learn	f learning this course is rstand the functions of the basic c the use of various types of End o rt knowledge in Robot Kinematic Robot safety issues and economic	omponen of Effector s and Pro- cs.	s of s ai grar	f a Robot. nd Sensors nming	S		
Course Outc At the end of t • apply the • impart kt • implemen • develop s	omes: his course, learners will be able basic engineering knowledge for nowledge on Drive Systems and E at sensors and image recognition to imple programs for robotics	the design ffectors echniques	n of in 1	robotics. Robo deve	elopment		
• apply safe	ety measures for Robotics	DBOTS	-				6
Robot - Defini Specifications- Sunctions-Need	tion - Robot Anatomy - Co ordin Pitch, Yaw, Roll, Joint Notation I for Robots-Different Application	nate Syste is, Speed is.	ems of	, Work E Motion,	nvelope T Pay Load	ypes and Classification - Robot Parts and the	on- eir
unemente ricee					1.0		
Unit II	ROBOT DRIVE SYSTEM	S AND F	ND	EFFEC	FORS		9
Unit II Pneumatic Dri Motors, A.C. S Effectors-Gripp Acuum Grippo Election and D Unit III	ROBOT DRIVE SYSTEM ves-Hydraulic Drives-Mechanica Servo Motors-Salient Features, A ers-Mechanical Grippers, Pneuers; Two Fingered and Three Fingersign Considerations. SENSORS AND MACHIN	S AND E I Drives- Application matic ar gered Gri E VISIO	ND Elec ons id ppe	EFFECT etrical Dr and Com Hydraulic rs; Interna	FORS ives-D.C. parison o - Grippe al Gripper	Servo Motors, Stepp of all these Drives, E rs, Magnetic Grippe s and External Grippe	9 per nd rs, rs; 1:
Unit II Pneumatic Driv Motors, A.C. S Effectors-Gripp Vacuum Grippe Selection and D Unit III Requirements of Piezo Electric S Griangulations Meters, Touch Sensors, Camer Lighting Techn Object Recogn	ROBOT DRIVE SYSTEM ves-Hydraulic Drives-Mechanica Servo Motors-Salient Features, A ers-Mechanical Grippers, Pneuers; Two Fingered and Three Fingered and Three Fingeresign Considerations. Sensor Considerations. SENSORS AND MACHINE f a sensor, Principles and Applica Sensor, LVDT, Resolvers, Optica Principles, Structured, Lighting A sensors , binary Sensors., Anal a, Frame Grabber, Sensing and D iques, Image Processing and Ana ition, Other Algorithms, Applica	S AND E I Drives- Application matic and gered Grive E VISIO tions of the I Encode Approach og Sensco igitizing ilysis-Dat cations- I	ND Electrons ad ppe N ne fe rs, j rs, Ti ors, Ima a R nsp	EFFECT etrical Dr and Com Hydraulic rs; Interna ollowing to oneumatic me of Fli Wrist Se ge Data- ge Data- eduction, Id	FORS ives-D.C. parison of - Gripper al Gripper cypes of se Position ight, Rang msors, Co Signal Co Segmenta lentificatio	Servo Motors, Stepp of all these Drives, E rs, Magnetic Grippe s and External Grippe ensors- Position sensor Sensors, Range Senso ge Finders, Laser Ran ompliance Sensors, SI nversion, Image Storag tion, Feature Extraction on, Visual Serving an	9 per nd rs, rs; 1: s - ors ge lip ge, on, nd

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Department	INFORMATION TECHN	OL	OGY			R 2019	Semester VII P
Course		H	ours	/ Week	Credit	Total	Maximum Mark
Code	Course Name	L	Т	Р	С	Hours	
19ITP28	INFORMATION AND CODING THEORY	3	0	0	3	45	100
Course Obj	ective (s): The purpose of learning this	coui	se is	to	- 10 A-1	ar ar a	2
 To intrapplication 	oduce information theory, the fundamen ations, and basic cryptography.	tals	of e	rror cont	rol codi	ng techni	ques and their
 To pro 	vide a complementary U/G physical laye	er co	omm	unication	ns cours	se to ECE	E4601 and
ECE4	606. 						the channel
Inis ci	ass will first introduce the basic concept	S OT	Into	mation t	neory, I	leading to	o the channel
 Afterw 	ards the course will consider error cont		odin	a technic	ues an	d applica	tions
Finally	, the basic concepts of cryptography will	be	intro	duced.	1000 000	e eppnee	
Course Out	comes: At the end of this course, learne	rs v	vill be	e able to			
 Compr 	rehend probability and statistics in Inform	natio	on Th	neory.			
 Evalua 	ate the performance of source coding alg	jorit	hms	such as	Huffma	n, Arithm	etic and dictionar
technic	ques.						
 Analyz Analyz 	e BER performance with convolution co	doe	in A	MGN			
 Evaluation 	te the performance of the communication	on s	vster	n with Ite	erative o	lecodina	in AWGN for Turk
codes	and LDPC codes.		,				
Unit I IN	FORMATION THEORY						1
Entropy, rela Symmetric C	ative entropy and mutual information hannel (BSC). Network information theo	n, c rv	hanı	nel capa	acity, C	Gaussian	channel, Binary
Unit II S	OURCE CODING						5
Lossless data	a compression, entropy coding, Huffma	n co	oding	, Arithm	etic coo	ding, Sha	annon fano codes
Dictionary tec	chniques, LZ77 and LZW techniques.						
		- 1	1				1 1
Likelihood (N	IL) detection, syndrome decoding, BCF	s, r l an	d R	S codes,	Reed-	amming Muller co idth	odes, soft-decisior
Unit IV CO	NVOLUTION CODES	wee	in pe		bandw		1
Viterbi decor	ding, state diagrams, Trellis diagram	Ca	atasti	ophic e	ncoder	s, soft-d	ecision decoding
Product code	s, Trellis coded modulation.						,
Unit V IT	ERATIVE DECODING	_					1
Turbo codes	, constituent encoder, Interleaver, Sof	t in	form	ation, L	ow-Den	sity Pari	ty Check (LDPC)
codes, MAP a	algorithms.	-			×		
TEAT BOOK	(5).	mot	ion T	boony		av Saaa	nd Edition 2006
1. 1. M. Co	Ver and J. A. mornas, Elements of mor	mat		neory, J		Edition Of	
Z. S. LIN, D	. J. Costello, Error Control Coding, Pear	son	Eau	cation, S	econa	Edition,2	004.
1 T K Mc	oon Error Correction Coding Mathem	atic	al M	ethods	and Alc	orithms	John Wiley, Firs
Edition, 2	005.			m Kenf			ion 2012
2. Knalid Sa	ayood, introduction to Data Compressio	n, IV	lorga	in Kauff	iann,Fo	unn Ealt	01,2012.

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Forward Kinematics, Inverse Kinematics and Difference; Forward Kinematics and Reverse Kinematics of manipulators with Two, Three Degrees of Freedom (in 2 Dimension), Four Degrees of freedom (in 3 Dimension) Jacobians, Velocity and Forces-Manipulator Dynamics, Trajectory Generator, Manipulator Mechanism Design-Derivations and problems. Lead through Programming, Robot programming Languages-VAL Programming-Motion Commands, Sensor Commands, End Effector commands and simple Programs.

Unit V

IMPLEMENTATION AND ROBOT ECONOMICS

5

RGV, AGV; Implementation of Robots in Industries-Various Steps; Safety Considerations for Robot Operations - Economic Analysis of Robots.

TEXT BOOK(S):

1. Klafter R.D., Chmielewski T.A and Negin M., "Robotic Engineering - An Integrated Approach", Prentice Hall, 2009.

 Groover M.P., "Industrial Robotics -Technology Programming and Applications", Second Edition, McGraw Hill, 2017.

REFERENCE(S):

1. Craig J.J., "Introduction to Robotics Mechanics and Control", Pearson Education, 2008.

2. Deb S.R., "Robotics Technology and Flexible Automation" Tata McGraw Hill Book Co., 2005.

3. Koren Y., "Robotics for Engineers", Mc Graw Hill Book Co., 1992.

4. Janakiraman P.A., "Robotics and Image Processing", Tata McGraw Hill, 1995

5. Rajput R.K., "Robotics and Industrial Automation", S.Chand and Company, Second Edition, 2008.

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Department	INFORMATION TECHNO	DLOG	βY			R 2019	Semester VIII	PC
Course	Course Name	H	lour Wee	s/ ek	Credit	Total	Maximum	
Code		L	Т	Р	С	Hours	Marks	
19ITP29	SOFTWARE PROJECT AND QUALITY MANAGEMENT	3	0	0	3	45	100	

Course Objectives:

The purpose of learning this course is

- To understand the Software Project Planning and Evaluation techniques.
- To plan and manage projects at each stage of the software development life cycle
- To manage software projects and control software deliverables
- To learn about the activity planning and risk management principles.
- to measure software quality and how to use measurements to improve the software development process.

Course Outcomes:

At the end of this course, learners will be able to:

- Understand Project Management principles while developing software.
- Gain knowledge about the basic project management concepts, framework and the process models.
- Obtain adequate knowledge about software process models and software effort estimation techniques.
- Understand the project reporting structure, project progress and tracking mechanisms in project management.
- · Estimate the risks involved in various project activities
- Analyze SQM process and evaluate the quality of a software product

Unit I PROJECT EVALUATION AND PROJECT PLANNING

Introduction to Software Project Management – Software Projects – ways of categorizing software projects – problems with software projects – Project Life Cycle – Overview of Project Management activities; Software requirements and specifications – Stakeholders – Project Team – Step Wise:

Unit II PROJECT LIFE CYCLE AND EFFORT ESTIMATION

Software process and Process Models – Choice of Process models - mental delivery – Rapid Application development – Agile methods – Extreme Programming – SCRUM – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points - COCOMO II A Parametric Productivity Model - Staffing Pattern.

Unit III SOFTWARE VALIDATION AND MAINTENANCE

Software validation: Validation planning; Testing fundamentals, including test plan creation and test case generation; Black-box and white-box testing techniques; Unit, integration, validation, and system testing; Object-oriented testing; Inspections. Software evolution: Software maintenance; Characteristics of maintainable software; Reengineering; Legacy systems; Software reuse.
Unit IV ACTIVITY PLANNING AND RISK MANAGEMENT 9

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Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Formulating Network Model – Forward Pass & Backward Pass techniques – Critical path (CRM) method – identifying critical activities – crashing and fast tracking – PERT technique – Monte Carlo simulation – Resource Allocation –Cost schedules.

Unit V INFORMATION RETRIEVAL AND LEXICAL RESOURCES

Information Retrieval: Design features of Information Retrieval Systems-Classical, Nonclassical, Alternative Models of Information Retrieval – valuation Lexical Resources: World Net-Frame Net-Stemmers-POS Tagger- Research Corpora.

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Department	INFORMATION TECHNOLO	GY				R2019	SemesterVIII	PE
Course	Course Name	H	lou We	rs/ ek	Credit	Total Hours	Maximum Mai	rks
Code		L	T	Р	C			
19ITP30	QUANTUM COMPUTING	3	0	0	3	45	100	
Course Object	tive(s):							
The purpose of	learning this course is to							
 Introd under 	atend the quantum computing per	com	puu m	ng				
 under study 	the principles of Various typical Q	uant	um	Ala	orithms			
under	stand the quantum error and its co	orrec	tion				×	
Course Outco	mes:							
At the end of th	is course, learners will be able to:							
 apply and 	d formalize the basic concepts of (Quar	ntun	۱ Cc	omputing			
 understa 	nd the fundamental differences	betv	vee	n c	onventior	nal comp	outing and quant	um
computin	g. nd how quantum parallelism is u	hood	in f	ho	oimplact	quantum	algorithms such	20
understa Deutsch	period finding and quantum Fouri	er tr	anst	form	simplest	quantum	algorithms such	as
 apply el 	ementary operations to develor	p m	ore	so	phisticate	ed applic	ations of quant	um
computin	g. Analyze and simulate the	Qua	ntur	n C	Computing	metho	dologies with Er	ror
Correctio	n Strategies					·		
Unit I BAS	IC CONCEPTS TO QUANTUM C	OMF	νUT	ING	i .			9
Overview of trad	itional computing – Church-Turing	thes	sis -	- cir	cuit mode	el of comp	outation – reversil	ble
computation – qu	uantum physics – quantum physic	s an	d co	mp	utation -	Dirac not	ation and Hilbert	
Spaces – dual ve	ectors – operators – the spectral the	heore	em ·	– fu	nctions of	f operato	rs – tensor produc	cts –
Schmidt decomp		ECO	2041		ATION			Q
State of a gu	antum system – time evolution	of of	a	clos	ed syste	m – co	mposite systems	5 -
measurement	- mixed states and general q	uanti	um	ope	erations	- quanti	um circuit mode	i –
quantum gates	s – universal sets of quantun	n ga	ates	-	unitary	transform	nations – quant	um
	ANTUM ALCODITUME						and the second second	0
	ding guestum teleportation		000	licat	tions of	tolonort	ation probabi	listic
versus quantum	algorithms – phase kick-ha		app	ho	Deutsch	algorith	allon – probabl	sch_
lozsa algorithm	- Simon's algorithm – Qua	antur	ni	ohas	se estim	ation ar	nd quantum Fo	urier
Fransform – eige	envalue estimation							
Unit IV QU	ANTUM ALGORITHMS – II							9
Order-finding	problem - eigenvalue estimation	ation	a	ppr	oach to	order	finding - Sho	or's
algorithm for	order finding – finding discret	e lo	gar	thm	is – hid	den sub	groups – Grove	er's
quantum sear	on algorithm – amplitude am		atio	n -	- quantu	m ampi	itude estimation	
Unit V QU	ANTUM COMPUTATIONAL CON	IPLE	XIT	YA	ND ERR	ORCORI	RECTION	9
Computational of	complexity - black-box model - lo	wer l	bou	nds	for searc	hing - a	eneralblack-box lo	ower
bounds - polyn	omial method - block sensitivity	- ac	lver	sary	/ method	s –classi	cal error correction	on –
classical three-b	it code - fault tolerance - quantu	ım e	rror	corr	ection -	three- an	d nine-qubit quar	ntum
codes - fault-tol	erant guantum computation							

Chairman - BoS Dept. of IT - ESEC

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1.	P. Kaye, R. Laflamme, and M. Mosca, "An introduction to Quantum Computing"
FFF	RENCE(S)

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Department	INFORAMATION TEC	INFORAMATION TECHNOLOGY						
Course	Course Name	Ho W	Hours/ Week Credi		Credit	Total Hours	Maximum Ma	rks
Code		L	Т	Ρ	С		100	
19ITP31	NATURAL LANGUAGE PROCESSING	3	0	0	3	45	100	
Course Objectiv	ve(s):							
The purpose of le learn the fu understand understand be exposed apply the N	earning this course is to undamentals of natural language I the semantic analysis of speech I the role of semantics of sentend I to the machine translation princ ILP techniques to IR applications	procent and ces a ciples	essir I par nd p	ng sing rag	g gmatics			
Jourse Outcom	ies:							
 tag a given To design a To impleme Generate tl 	text with basic Language feature an innovative application using N ent a rule based system to tackle	es LP c mor	omp phole	one ogy	ents //syntax c	of a langua	ge	
Apply infor Unit I INT Drigins and chall	rmation retrieval techniques. RODUCTION lenges of NLP – Language Mo	delin	ig: G	Gra	mmar-ba	sed LM, S	tatistical LM - R	9 egula
Apply infor Unit I INT Drigins and chall xpressions, Fin	rmation retrieval techniques. RODUCTION lenges of NLP – Language Mo nite-State Automata – English	delin Mo	ig: G	Gran	mmar-bas gy, Tran	sed LM, S sducers fe	tatistical LM - R or lexicon and	9 egula rule:
Apply infor Unit I INT Drigins and chall xpressions, Fin okenization, Det	rmation retrieval techniques. RODUCTION lenges of NLP – Language Mo nite-State Automata – English ecting and Correcting Spelling E	odelin Mo rrors,	ng: G prpho , Min	Gran	mmar-bas gy, Tran um Edit D	sed LM, S sducers fo Distance	tatistical LM - R or lexicon and	9 egula rules
Apply inform Apply inform Unit I INT Drigins and chall xpressions, Fin okenization, Det Unit II Word Level Analy Detection and co Rule Based, Stoc Context-free Gram	mation retrieval techniques. RODUCTION lenges of NLP – Language Mo ite-State Automata – English ecting and Correcting Spelling E ORD LEVEL AND SYNTACTIC ysis: Regular Expressions-Finite rrection -Words and Word class chastic Part-of Speech Tagging mmar-Constituency- Parsing-Pro	odelin Mo rrors, LEVE -State es -P – Tra babil	ig: Corpho , Min EL A e Au Part-co ansfo listic	Bran blog imu NA tor pof S porm Pa	mmar-bas gy, Tran um Edit E NLYSIS nata-Mor Speech T nation Bas ursing.	sed LM, S sducers fo Distance phological agging. Pa sed Taggin	tatistical LM - R or lexicon and Parsing-Spelling Int of Speech Tag Ing -Syntactic Ana	9 egula rules 9 Error ging: lysis:
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Apply infor Unit I INT Drigins and chall xpressions, Fin okenization, Det Unit II Word Level Analy Detection and co Rule Based, Stoc Context-free Gran Unit III CON Parsing with Cor Finite State Pars Meaning Structu Semantic Analys Parser, Robust S Unit IV MAC Dialogue and M nterpretation of E Similarities and d Statistical Technic UNIT V INFORI	mation retrieval techniques. RODUCTION lenges of NLP – Language Mo ite-State Automata – English ecting and Correcting Spelling E ORD LEVEL AND SYNTACTIC ysis: Regular Expressions-Finite rrection -Words and Word class chastic Part-of Speech Tagging mmar-Constituency- Parsing-Pro VTEXT FREE GRAMMARS ntext Free Grammars – Top down ing Methods - Representing Mea- re of Language – First Order H is – Attached for a Fragment of Semantic Analysis CHINE TRANSLATION Machine Translation - Dialogue Dialogue Acts – Dialogue Structur ifferences – The Transfer Metap ques – Usability and System Dev MATION RETRIEVAL AND LEX	odelin Mo rrors, LEVE State es -P Tra babil wn P aning Predic Engl Predic Engl e Ac ire ar hor yelopi ICAL	g: G prphc , Min EL A e Au Part-c ansfc listic Parse g: Co cate lish- tts - nd co - The men - RE	Brain Dologi Inni Pa Torma Ca Int Ca Int Ca So	mmar-bas gy, Tran um Edit D LYSIS nata-Mor Speech T nation Bas ursing. - Problem putational alculus- S egrating Automatic erences – nterlingua	sed LM, S sducers fo Distance phological agging. Pa sed Taggin hs with Bas Desiderat Semantic A Semantic A Semantic A Semantic A Dialogue Idea- Dire	tatistical LM - R or lexicon and Parsing-Spelling rt of Speech Tag g -Syntactic Ana sic Top Down Pa a for Representat Analysis: Syntax Analysis into the ferential, Cue b Managers - Lang ct Translation – L	9 egula rule 9 Frron ging: lysis: 9 srser cions drive Earle 9 ased uage Jsing 9

TEXTE	BOOK(S)
1.	Allen, James. Natural Language Understanding. The Benjamin/Cummings Publishing Company,
1	Inc., Redwood City, Second Edition, 1995.
2.	Daniel Jurafsky, James H. Martin Speech and Language Processing: An Introduction to Natural
	Language Processing, Computational Linguistics and Speech, 2014.
REF	ERENCE(S)
1.	C. Manning and H. Schutze, "Foundations of Statistical Natural Language Processing",
	Massachusetts Institute of Technology, 2003.





Course Code	Course Name	e Course Name Hou We		our Wee	ek Credit		Total	Maximum Mar	S
		L	Т	Ρ	C	Hours			
19ITP32	SOFT COMPUTING	3	0	0	3	45	100		
Course Obj	ective(s):	-			37				
Fhe purpose • und	of learning this course is to erstand Soft Computing concepts, tecl	nnolo	gies	, an	d applicat	tions.	•		
• stud	ly about Fuzzy Logic, Various fuzzy sy	stem	s ar	d th	eir functio	ons.			
stud	ly Neural Networks, architecture, funct	ions a	and	vari	ous algori	ithms invo	lved.		
• know	w Genetic algorithms, its applications a	and a	dva	nces	S.				
Course Out	comes:	mput	ing	pior	Jenis.		<i>w.</i>		
At the end of	this course, learners will be able to:								
 learn al 	bout soft computing techniques and th	eir ap	plic	atio	ns				
 apply fi 	uzzy logic and reasoning to handle und	certai	nty	and	solve var	ious engir	eering problems.		
 analyze 	e various neural network architectures								
 apply g use var 	enetic algorithms to combinatorial opti-	miza	tion	prot	blems.				
• use va	ieus toois to solve solt computing prot	Joine							
Unit I II	NTRODUCTION TO SOFT COMPUTI	NG						9	
troduction to	Soft Computing-Soft Computing Vs So	oft Co	omp	uting	g-Various	Compone	ents of Soft Compu	ting-	
rom Conventi	ional AI to Computational Intelligence-	Appl	icati	ons	of Soft Co	omputing		5	
								9	
-uzzy Sets, (Operations on Fuzzy Sets, Fuzzy Rela	ations	s, M	emb	pership Fu	unctions:	Fuzzy Rules and F	Fuzzy	
Reasoning, F	Juzzy Inference Systems, Fuzzy Exp	pert \$	Syst	ems	s, Fuzzy	Decision	Making-Application	ns o	
Unit III	& NEURAL NETWORKS			1000				9	
Biological n	aurons and its Working Simulation of	hiolog	nico	noi	irone to n	roblom co	wing Different ANN		
chitectures-T	raining techniques for ANNs.	010105	jica	net	atons to p	TODICITI SC	wing-Dinerent Aivi	13	
achine Learn	ing Using Neural Network: Adaptive N	letwo	orks	Fee	ed forward	d Network	s, Supervised Lea	rning	
aural Network	ks, Radial Basis Function Networks : F	Reinfo	orce	mer	nt Learnin	g, Unsupe	ervised Learning N	eura	
etworks, Ada	ENETIC AL CORITHM	ces II	n Ne	eura	Inetworks	3		9	
Unit IV G	basia concenta working principle		000	ina	fitnooo	function	reproduction Co	9	
	neritance operator, cross over, inver	sion sion	& s &	dele ad	tion, mut	ation ope	rator, Bitwise ope ferences & simila	erator	
modeling: Inf Generational Detween GA 8	so ther traditional methods.							intro o	
modeling: Inf Generational Detween GA & Unit V N	& other traditional methods. Iatlab/Python Lib							9	

8-8/m.

TEXT	BOOK(S)
1.	S.N. Sivanandam& S.N. Deepa, Principles of Soft Computing, Wiley Publications, 2nd Edition, 2011.
2.	S, Rajasekaran& G.A. VijayalakshmiPai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & applications, PHI Publication, 1st Edition, 2009.
REF	ERENCE(S)
1.	E. Goldberg, Genetic Algorithms: Search and Optimization, Thirteen Edition, 1989.
2.	Rich E, Knight K, Artificial Intelligence, TMH, 3rd Edition, 2012.
3.	Martin T Hagen, Neural Network Design, Nelson Candad, 2nd Edition, 2008.

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Dept. of Fr. 4532

	INFORMATION TECH	INFORMATION TECHNOLOGY R 2019 Semester VII								
Course	Course Name	Н	ou We	rs/ ek	Credit	To	tal	Maximun	n Marks	
Code		L	T	Р	С	Ho	urs	Maximum Ma		
19ITP33	DEEP LEARNING	3	0	0	3	4	5	1(00	
Course Obje	ective(s):									
The purpose	of learning this course is to									
 stud 	y the fundamentals of Deep Learnir	ng								
• stud	y about various techniques in Feed	Forv	vard	l Ne	tworks					
 knov 	w about RNN and CNN.			1 III 122						
• stud	y Neural Networks, architecture, fur	nctior	ns a	ind v	various a	lgorit	hms	involved.		
• expo	osure on recent trends and application	ons i	n d	eep	learning.					
Course Outo	comes:		-						1000	
At the end of	this course, learners will be able to:									
 apply th 	the fundamentals of Deen Learning									
 use var 	ious techniques of FEN to solve sof	t con	npu	tina	problem					
Apply F	NN and CNN to real world scenario)S	npu	mg	problom					
 Identify 										
	the applications of deep learning in	rese	earc	h ad	civities					
	the applications of deep learning in	rese	earc	h ac	civities					
Unit I IN	the applications of deep learning in ITRODUCTION TO DEEP LEARNI	rese	earc	h ac	civities	d Th	re e b		9	
Unit I IN Biological Neu	the applications of deep learning in ITRODUCTION TO DEEP LEARNI ron, Idea of computational units, Me	rese NG Cull	och	h ac -Pit	ts unit ar	nd Th	resh	olding logic,	9 Linear	
Unit I IN Biological Neu Perceptron, Pe	the applications of deep learning in ITRODUCTION TO DEEP LEARNI ron, Idea of computational units, Me erceptron Learning Algorithm, Linearithm	rese NG Cull r sep	och	-Pit	ts unit ar .conve	nd Th rgeno	resh ce the	olding logic, eorem for Pe	9 Linear erceptro	
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Unit I IN Biological Neu Perceptron, Perceptron, Perceptron, Perceptron, Perceptron, Perceptron Unit II FI Multilayer Perceptron, Perceptron, Perceptron Topit II FI Multilayer Perceptron, Perceptron, Perceptron, Perceptron Topit II FI Multilayer Perceptron, Perceptron, Perceptron Topit II FI	the applications of deep learning in ITRODUCTION TO DEEP LEARNI ron, Idea of computational units, Me erceptron Learning Algorithm, Linearithm. EEDFORWARD NETWORKS ceptron, Gradient Descent, Backpro autoencoders. IN & CNN	rese NG Cull r sep paga	och bara	-Pit abilit	civities ts unit ar y. Conve mpirical F	nd Th rgend Risk N	resho ce tho Ainim	olding logic, eorem for Pe nization,	9 Linear erceptron 9	
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TEXT	300K(S)
1.	Deep Learning, Ian Goodfellow and Yoshua Bengio and Aaron Courville, MIT Press, 2016.
REF	ERENCE(S)
1.	Neural Networks: A Systematic Introduction, Raúl Rojas, 1996
2.	Pattern Recognition and Machine Learning, Christopher Bishop, 2007

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Politici II - 1508

Department	INFORMATION TECHN	IOL	.00	ΞY		R2019	SemesterVII	PC
Course	Course Name	H \	our Nee	s/ ek	Credit	Total	Maximum Ma	arks
Code		L	Т	Ρ	С	Hours		
19ITP34	Mobile and Pervasive Computing	3	0	1	4	45	100	
Course Obj The purpose • To unde • To unde • To be fa • To know • To appl	ective(s): of learning this course is erstand the basic concept s of mobile co erstand the wireless network. amiliar with the network layer protocols w the basis of transport and application y the pervasive concepts in mobile envi	omj and lay iror	outi d ro er p nme	ng. utir prot	ig. ocols.			
At the end of • Underst • Able to • Able to • Explain • To apply UNIT I N Cellular Wire Frequency A UMTS – IMT	this course, learners will be able anding of Basic architecture and conce use different wireless network. use different routing Technology. the functionality of Transport and Appli- y the pervasive concepts in mobile envi IOBILE NETWORKS less Networks: GSM – Architecture – P llocation – Routing – Mobility Managem	cat iron	ion ime oco t – 3	layent Is – Sec	ers - Connec curity –GI	tion Estat PRS.DEC	olishment – T – TETRA –	9
UNIT II M Wireless LAN HiperLAN – Bl	VIRELESS NETWORKS ls and PANs – IEEE 802.11 Standa ue Tooth- Wi-Fi – WiMAX	ard	-	Ar	chitectur	e – Ser	vices –Networ	9 k –
	Iobile IP AND ROUTING							9
Mobile IP pro GPRS – EDG and Reactive	otocols -WAP push architecture-WML s GE – Hybrid Wireless100 Networks – A Routing Protocols – Multicast Routing.	crip TM	ots : - V	and Vire	applicat less ATM	ions. Data /I.DHCP -	a networks – SM - AdHoc– Proac	/IS – tive
	RANSPORT AND APPLICATION LAT	ER	3					9
Mobile TCP- WSP – WAE	 WAP – Architecture – WWW Prog – WTA Architecture – WML – WML Sci 	gra ript	mm s.	ning	Model-	WDP -	WTLS – WT	P –
UNIT V P	ERVASIVE COMPUTING						1. Carl 1. 1911	9
Technology T Awareness - Processing - Systems - Re Data Manage	rend Overview - Pervasive Computing: Resource Management - Human–C Infrastructure and Devices - Wireless N esource Management - User Tracking- ment - Security Management.	Com letv Co	onc nput vorl	ept ter ks - ext	s - Challe Interacti Middlew Manager	enges - M on - Per vare for Per nent -Ser	iddleware - Cor vasive Transac ervasive Compu vice Manageme	ntext stion uting ent -
1. Joche	(S): n Schiller, "Mobile Communications", P	ΉI,	Se	cor	d Editior	n, 2009.		
2. Joche Intern	n Burkhardt, Pervasive Computing: Teo et Applications, Addison-Wesley Profes	chn ssio	olo	gy a ; 14	and Arch	itecture of n, 2007.	fMobile	

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3.	Alan Colman, Jun Han, and Muhammad AshadKabir, Pervasive Social Computing Socially- Aware Pervasive Systems and Mobile Applications, Springer, 2016.

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Department	INFORMATION TECH	INFORMATION TECHNOLOGY					R2019 Semester		11	PC
Course	Course Name	H \	oui Ne	rs/ ek	Credit	Tota	ul rs	Maximum N	lark	s
oouc		L	Т	Ρ	С			Maximum Ma		
19ITP35	Data Visualization Techniques	3	0	1	4	4	5	100		
Course Obje	ctive(s):									
The purpose of	of learning this course is	.								
To Intro	duce visual perception and core skills i	tor	VIS	uai	analysis	n onchu	ala			
To unde	visiting visualization for distribution and		ig a	anu Cor		ond Mu	sis. Utivori	ato analysis		
• To unde	erstand visualization for distribution and	alys	sis, not		dachba	and wit	nuvan an	ale analysis	52	
• To unde	erstand the graphical dashboard design	on te	nat	nia	uashbua	aru uesi	gn.			
			5011	inqu	ues					
At the end of t	his course, learners will be able									
 Explain 	principles of visual perception									
 Apply co 	bre skills for visual analysis									
 Apply vi 	sualization techniques for various data	ar	naly	sis	tasks					
Design	nformation dashboard			*						
UNIT I CC Information vi making abstra analytical nav	DRE SKILLS FOR VISUAL ANALYSIS sualization – effective data analysis act data visible – building blocks of vigation – optimal quantitative scale	S inf	trai orm – r	its natio	of mean on visua rence li	ingful c lization	lata – – an d reg	visual percep alytical interac ions – trellise	tion tion	9 - - nd
UNIT I CO nformation vi making abstra analytical nave crosstabs – m - analytical pa JNIT II TII Time-series o-whole and r	DRE SKILLS FOR VISUAL ANALYSIS sualization – effective data analysis act data visible – building blocks of vigation – optimal quantitative scales ultiple concurrent views – focus and co atterns – pattern examples. ME-SERIES, RANKING, AND DEVIAT analysis – time-series patterns – time- anking patterns – part-to-whole and ra	s info s ont IO -se	trai orm – r ext N A ries	ts efe – c ANA dis	of mean on visua rence li letails or ALYSIS splays – splays –	ingful c lization nes an demar time-se best pra	lata – – an d reg nd – o eries l	visual percep alytical interactions – trellise ver-plotting red pest practices - s – deviation ar	tion tion s a ucti pa	9 nd on 9 urt- sis
UNIT I CC Information vi making abstration abstration and the second se	DRE SKILLS FOR VISUAL ANALYSIS sualization – effective data analysis act data visible – building blocks of vigation – optimal quantitative scales ultiple concurrent views – focus and co atterns – pattern examples. ME-SERIES, RANKING, AND DEVIAT analysis – time-series patterns – time- anking patterns – part-to-whole and ra alysis displays – deviation analysis bes STRIBUTION, CORRELATION, AND I	S info s ont TIO -se ank st p	trai orm – r ext N A ries ing orac	its nation refe – co ANA dis ctice	of mean on visua rence li letails or ALYSIS splays – splays – es. ARIATE	ingful c ilization nes an i demar time-se best pra	lata – – an d reg nd – o eries l actices	visual percep alytical interactions – trellise ver-plotting red pest practices - s – deviation ar	tion tion s a ucti - pa naly	9 nd on 9 urt- sis 9
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UNIT I CC Information vimaking abstration analytical naveralitical naveralitical participation Consideration analytical participation analytical naveralitical naveralitical naveralitical participation Consideration analytical participation analytical naveralitical naveralitical naveralitical participation Consideration UNIT II TII Time-series Co-whole and reduction and reduction analytical participation Obstribution and correlation Correlation UNIT IV IN Information de Consideration Consideration	PRE SKILLS FOR VISUAL ANALYSIS sualization – effective data analysis act data visible – building blocks of vigation – optimal quantitative scale ultiple concurrent views – focus and conterent views – focus and views – focus and conterent views – focus and views –	S infi sont -se ank st p lysi qua aria y rd	trai orm – r ext ries ing orac orac is – es ate i des on	its of refe dis dis tribu and ana sigr – A	of mean on visua rence li letails or ALYSIS splays – splays – es. ARIATE ution pa escribing d best p alysis tec n issues achieving	ingful c lization nes an demar time-se best pra ANALY tterns correla ractices hniques s and eloque	lata – – an d reg nd – o eries l actices SIS – dis tions - s and s and asses nce.	visual percep alytical interactions – trellise ver-plotting red pest practices - s – deviation ar tribution displa- correlation parallel best practices.	tion s a ucti pays ays atter ysis	9
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UNIT I CC Information vimaking abstration analytical naveralitical naveralitical parametric stabs – m – analytical parametric stabs – m – correlation analiticariate parametric stabs – correlation multivariate parametric stabs – m – nultivariate p	DRE SKILLS FOR VISUAL ANALYSIS sualization – effective data analysis act data visible – building blocks of vigation – optimal quantitative scales ultiple concurrent views – focus and con- terns – pattern examples. ME-SERIES, RANKING, AND DEVIAT analysis – time-series patterns – time- anking patterns – part-to-whole and ra- alysis displays – deviation analysis best STRIBUTION, CORRELATION, AND I analysis – describing distributions – alysis best practices – correlation anal- displays – correlation analysis techni- atterns – multivariate displays – multiva IFORMATION DASHBOARD DESIGN ashboard – Introduction– dashboar s for designing dashboard-visual percest aphical DASHBOARD DESIGN f Graphics Library of Graphs – De- splay Media –Critical Design Practices	S - inf - se ank - se ank - se ank - se -	trai orm – r reext N / riest ing prac JLT dist is – es ate a dea ion	ANA s dis ctice iv iv and sigr - A sigr - A	of mean on visua rence li letails or ALYSIS splays – plays – es. ARIATE ution pa escribing d best p alysis tec n issues achieving Bullet G n it all tog	ingful c lization nes an demar time-se best pra ANALY tterns correla ractices hniques and eloque	lata – – an d reg nd – o eries l actices SIS – dis tions – s and asses nce. – Des Jnveil	visual percep alytical interactions – trellise ver-plotting red best practices - s – deviation ar tribution displa- correlation pa ultivariate anal best practices. ssment of near signing Sparkli ing the dashbo	tion tions a uction - pa naly ays ays tter ysis	9
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REFERENCE(S)

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2. Nathan Yau, "Data Points: Visualization that means something", Wiley, 2013.

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INFORMATION TECHNOLOGY R201	Semester VIII PC
Course Name Hours/ Week Credit Tota	Maximum Marks
L T P C Hours	
ETHICAL HACKING 3 0 1 4 45	100
tive(s):	
learning this course is	
ce the methodologies and framework of ethical hacking for en	ancing the security.
tand Business Perspective.	
ifferent type of attack.	*
mes:	
is course, learners will be able	
id the basic of an ethical hack	
nowledge of interpreting the results of a controlled attack	ics for planning of a test
and the dangers associated with penetration testing	ics for plaining of a test
e Vulnerability and Enumeration	
RODUCTION TO ETHICAL HACKING	9
: Introduction - Networking & Basics - TCP/IP Protocol stack	IP addressing and routing
Google Hacking – Scanning - Windows Hacking - Linux Hack	ng - Trojans & Backdoors
- Proxy& Packet Filtering - Denial of Service - Sniffer - Social	Engineering
SINESS PERSPECTIVE	
tives - Security Policy - Previous Test Results – Busines	9 sChallengesPlanning for
tives - Security Policy - Previous Test Results – Busines : Inherent Limitations - Imposed Limitations - timing is Everyth Knowledge - Multi-Phased Attacks - Teaming and Attack stru rity Consultant - The Tester – Logistics – Intermediates - Law	9 sChallengesPlanning for a ing - Attack Type - Source ture - Engagement Planne inforcement.
tives - Security Policy - Previous Test Results – Business : Inherent Limitations - Imposed Limitations - timing is Everyth Knowledge - Multi-Phased Attacks - Teaming and Attack stru rity Consultant - The Tester – Logistics – Intermediates - Law CKS AND SECURITY - Steganography – Cryptography – Wireless Hacking – Eirew	9 sChallengesPlanning for a ing - Attack Type - Source ture - Engagement Planne Inforcement. 9
tives - Security Policy - Previous Test Results – Busines : Inherent Limitations - Imposed Limitations - timing is Everyth Knowledge - Multi-Phased Attacks - Teaming and Attack stru rity Consultant - The Tester – Logistics – Intermediates - Law CKS AND SECURITY - Steganography – Cryptography - Wireless Hacking - Firew Penetration Testing - Session Hijacking - Hacking Web Serv xploit Writing - Buffer Overflow – Reverse Engineering - Email uetooth Hacking – Mobile Phone Hacking	9 sChallengesPlanning for ing - Attack Type - Source ture - Engagement Planne Inforcement. 9 III & Honeypots - IDS & IPS ers - SQL Injection - Cros Hacking - Incident Handling
tives - Security Policy - Previous Test Results – Business (Consultant - The Tester – Logistics – Intermediates - Law CKS AND SECURITY - Steganography – Cryptography - Wireless Hacking - Firew Penetration Testing - Session Hijacking - Hacking Web Serv xploit Writing - Buffer Overflow – Reverse Engineering - Email Jetooth Hacking – Mobile Phone Hacking PARING FOR A HACK	9 sChallengesPlanning for a ing - Attack Type - Source ture - Engagement Planne Inforcement. 9 II & Honeypots - IDS & IPS ers - SQL Injection - Cros Hacking - Incident Handling
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	INFORMATION TECH	нио	LO	GY		R2019	SemesterVIII	PC
Course Code	Course Name	Н	oui We	rs/ ek	Credit	Total	Maximum Ma	rks
		L	Т	Ρ	С	Hours	100	
19ITP37	E-COMMERCE	3	0	1	4	45	100	
Course Object	ive(s):							
 The purpose of Discuss ful Evaluate the relationship 	learning this course is ndamentals of e-commerce, types ne role of the major types of inform to each other	and natio	app n sy	olica vstei	tions. ms in a b	ousiness e	environment and	their
 Assess the electronic be a second to be second to be second to be a	impact of the Internet and Internet business major management challenges for appropriate solutions to those cha tegies for e-commerce, Mobile and Mobile Information devices.	or bui allenç Com	ildin ges. ime	ig a rce,	y on busi nd using Wireles	informations Applica	ation Protocol,	e and learn WAP
ourse Outcon	nes:	-	-					
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monoging	organizational change acception	with	inf	niei	nt and i	earn abo	ut the importar	nce o
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Department	INFORMATION TE	CHNC	LC)GY		R2019	Semester VII	I PO
Course	Course Name	H N	lou Ne	rs/ ek	Credit	Total	Maximum Ma	arks
Code	L T P C COMPUTER VISION 3 0 0 3	С	Hours	S				
19ITP38	9ITP38 COMPUTER VISION	3	0	0	3	60	100	
Course Obj	ective(s):	7						6
The purpose	of learning this course is							
 To stud 	the basics of Computer Vision	-			÷.			
To knov	about the fundamentals of image	format	ion					
To stud	the major ideas in Appearance ba	ased m	etn	oas				
To stud	retand the concents in 3D geomet	rical m	, athr	ahe				
Course Out	comes:	ncar m	Stric	543				
At the end of	this course, learners will be able to	:						
 Recogn 	ze and describe both the theoretic	al and	pra	ctica	al aspects	s of comp	uting with image	es.
 Describe 	e the foundation of image formation	n and ii	mag	ge a	nalysis		station 2	
 Become 	familiar with the major technical a	pproac	hes	s inv	olved in o	computer	vision	
 Build co 	mputer vision applications	1					the Survey	1
Unit I COI	IPUTER VISION OVERVIEW							9
Operators - L	inear Filtering - Neighborhood Ope	on - Th erators EATUR		DET	ECTION	a - Image	Processing - Po	oint
Fourier Trai Matching - F	sforms - Pyramids and Wavelet Points and Patches - Edges - Li	s - Gl nes -	oba Pat	l O tern	ptimizatio is to Fea	on - Feat atures - F	ure Detection a Features Scalin	and g -
Unit III AP	PEARANCE-BASED METHODS	1.0	1	1				9
Statistical Lir Factorization Recognition	ear Models: PCA, ICA, FLD - No - Statistical Tensor Models: Multili	n-nega near P	tive CA,	Ma Mu	atrix Facto Iltilinear I	orization, S CA- Perso	Sparse Matrix on and Activity	
Unit IV 2D	SHAPE MODELS							9
Physically B regularizatio Kalman Filte	ased Models: Mass-Spring System n Statistical Shape Models- Act rs- Particle Filters,Condensation &	ns- Ac ive Sha & Mear	tive ape n Sl	Co Mo hift	ntours (S dels- Acti	nakes) - e ive Appea	energy minimiza rance Models-	ation
Unit V ES	FIMATION OF 3D GEOMETRY					14 A. 15		9
Camera calib	ation, Epipolar Geometry- Stereo,	Multi-V	/iev	v Ge	eometry-	Shape fro	m Shading-	
Structure fron	Motion,Optical Flow- Surface Rec	constru	ctic	on -	energy m	inimizatio	n, regularization	1
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1. Richa	u Szellski, Computer Vision: Algo	nunms a	and	Ap	plications	h	acand	
Z. David Editio	1) David Forsyth and Jean Ponce, Compute	er visio	n: A	A IVIO	Jaern Ap	oroach (S	econa	
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REFERENCI	S(S)	1			Lines I			
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		OLOGY		R2019	Semest er VIII	P	
Course	Course Name	Hou	rs/ ek	Credit	Total	Maximum Marks	
Code		LT	P	С	Hours		
19ITP39	CYBER FORENSICS	3 0	0	3	60	100	
The purpose of the pu	ctive(s): of learning this course is arstand the basics of computer fore	neice					
To Appl To Anal	y a number of different computer for vze and validate forensics data	prensic to	ols	to a given	scenario		
 To Ident To Imple 	tify the vulnerabilities in a given net ement real-world hacking technique	work infrest to test	astr sys	ucture tem secu	rity		
Course Outc	omes:						
At the end of t	his course, learners will be able to:					×	
 Understation Apply a r 	and the basics of computer forensic number of different computer forens	sic tools	to a	given sce	enario		
 Analyze Identify t 	and validate forensics data he vulnerabilities in a given networl	k infrastr	uctu	re			
 Impleme 	nt real-world hacking techniques to	test sys	tem	security			
Unit I INTF	RODUCTION TO COMPUTER FO	DRENSI	cs		1. P.	9	
Creating resp Computer Inve	onse tool kit and IR team. – Fore estigation – Data Acquisition.	ensics Te	n ar echn	id invest ology an	igation. Pr d Systems	eparation for IR: – Understanding	
Creating resp Computer Inve Unit II EVI Processing C Computer For Evidence	onse tool kit and IR team. – Fore estigation – Data Acquisition. DENCE COLLECTION AND FOR Crime and Incident Scenes – Wo rensics Tools: Software/ Hardware	RENSIC rking with Tools-	s ar schn s T(th W -Du	id investi ology and DOLS /indows a iplication	and DOS and Prese	eparation for IR: – Understanding 9 Systems. Current ervation of Digital	
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REFERENCE (S)
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- 3. AnkitFadia Ethical Hacking Second Edition, Macmillan India Ltd, 2006
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Department	INFORMATION TECH	INFORMATION TECHNOLOGY							
Course Code	Course Name Hours/ Week Cred				Credit	Total	Maximum I	Narks	
		L	Т	Ρ	С	nours			
19ITP40	INFORMATION SECURITY	3	0	1	4	45	100		
Course Objec	tive(s):	1 1	-				d		
The purpose of	learning this course is		_			1. State 1.			
To unders	stand the basics of Information Secu	rity				~			
 To know t 	he legal, ethical and professional is	sues	In	Info	ormation	Security			
 To know t 	he aspects of risk management								
 To becom 	e aware of various standards in this	are	а						
 To know t 	he Physical and Logical Design		_						
Course Outco	omes:								
At the end of th	is course, learners will be able								
 Discuss th 	he basics of information security								
Illustrate ti	he legal, ethical and professional is	sues	in	info	ormation	security			
 Demonstration 	ate the aspects of risk management								
 Become a 	ware of various standards in the Inf	orma	atic	on S	Security S	System			
 Design an 	d implementation of Security Techn	ique	S.						
	oduction to Information Security		7				1	9	
Professionals and Attacks Espionage – Attacks – Teo	s and the organization – CommUn – Compromises to Intellectual F Force of Nature – Human Error – chnical Hardware failures – Technic	it le: Prope Info al So	s o erty rm oftv	of In / atic vare	terest. Ir Deviatic on Extorti e failures	nformation ons in Q on – Sat	n Security: Th uality of Serv potage – Softv	vice- vare	
	sues in information Security		1.0	. 12				9	
Bodies – Eth Key U.S. Fed and Practice Awareness P	ics in Information Security – Relevances and Information Security – Conderal Agencies – Planning for Security B rogram isk Management	ant u des urity luep	of – I rint	Eth	ics at Pr rmation S Security	ofessiona Security I Educatio	al Laws and L al Organization Policy, Standa on, Training,	egai ns – ards, and 9	
Risk Identific	ation: Planning and Organizing	he	Pro	oces	ss – Ide	entifyina.	Inventorving	and	
Categorizing Risk Assess Frequency – Assessment Recommende	Assets – Classifying and Prioritizin ment : Planning and Organizing Calculating Risk – Assessing Risl – Risk Control – Quantitative Vers ed Risk Control Practices.	ng T Ris (Ac (us (hre k cep Qua	eats Ass otat alita	– Speci essment pility – Tl ative Risk	fying Ass – Dete ne FAIR Manage	set Vulnerabili rmining the I Approach to ement Practice	ties; ₋oss Risk es –	
UNIT IV Se	ecurity Technology				11.			9	
Firewalls and Models; Fire Configuring a	VPNs – Access Control Mechanism walls: processing Modes – arch	ns – itect	Bi	ome	etrics – A Selectii	Access Co ang the F	ontrol Architec Right Firewall	ture s –	

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UNI	T V Design	9
Log ISC for Cry	jical Design: Blueprint for Security, Information Security Policy, Standards and Practice) 17799/BS, VISA International Security Model, Design of Security Architecture, Planni Continuity. Physical Design : Security Technology, IDS, Scanning and Analysis Too ptography, Access Control Devices, Physical Security, Security and Personnel.	es, ng ls,
TEXT	BOOK	
2.	Michael E. Whitman and Herbert J. Mattord, "Principles of Information Security" Edition, Cengage Learning, India, 2015	', 5
REFE	RENCE (S)	
1.	Charles P. Pfleeger and Shari Lawrence Pfleeger, "Security in Computing", 5 Edit Prentice Hall, 2018.	ion,
2.	Micki Krause, Harold F. Tipton, "Handbook of Information Security Management Vol 6 Edition, CRC Press, 2012	;", 6

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Department	INFORMATION TEC	CHNO	LO	GY		R 2019	Semester VIII P
Course	Course Name	H V	our Vee	rs/ ek	Credit	Total	Maximum Marks
Code		L	Т	Ρ	С	Hours	
19ITP41	FUNDAMENTALS OF NANO SCIENCE	3	0	0	3	60	100
Course Obje	ctive(s):						
The purpose o	f learning this course is						
Io under	stand the basics of Nano technolog	ЗУ					51
Io identii	ry the various methods of preparati	on me	ecna	inis	m -tion and		
To under	stand the different properties and	es for p	prep	oara	ation and	patterning	9
To under	stand the different preparation env	ironme	ent a	and	i their sai	ety issues	n
• To chara	cienze various environmental tech	niques	5 101	pre	oper char	actenzatic	211
Course Outco	omes:				2.17		
At the end of the	his course, learners will be able to:						
 Describe 	components and properties of Nar	no part	ticle	S			
 Describe 	and choose various preparation m	echan	ism	is fo	or nano te	echnology	components
Learn ab	out various Nano scale devices						
 Describe 	the different safety issues during I	Nano p	orep	bara	ation in sp	pecific env	ironment
 Characte 	rize the different techniques for Na	no par	rticle	e pr	reparatio	and impl	ementation
- onaraoto	- N	no pai		2.5	a han an an an an	i ana impi	entententen
Unit I IN Background Nanoscale Engineering- wires-ultra-th	TRODUCTION TO NANO SCIEN to nanoscience and nanotechnolo Science and Technology- Impl Classifications of nano structured in films-multilayered materials. L	ICE Dgy - s ication I mate ength	scie is l erial Sca	ntifi for s- i ales	ic revolu Physics nano par s involve	tions – na , Chemis ticles- qu d and eff	ano sized effects - stry, Biology and antum dots, nanc ect on properties:
Unit I IN Background Nanoscale Engineering- wires-ultra-th Mechanical, motivation fo	TRODUCTION TO NANO SCIEN to nanoscience and nanotechnolo Science and Technology- Impl Classifications of nano structured in films-multilayered materials. Le Electronic, Optical, Magnetic and r study (qualitative only).	ICE pgy - s ication I mate ength Therm	scie is f erial Sca ial p	ntifi for s- i ales prop	ic revolu Physics nano par involve perties. Ir	tions – na , Chemis ticles- qu d and eff troduction	ano sized effects stry, Biology and antum dots, nand ect on properties to properties and
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2.	N John Dinardo, "Nano Scale Characterization of Surfaces & Interfaces", 2nd Edition, Weinheim Cambridge, Wiley-VCH, 2000
REFE	RENCE(S)
1.	G Timp (Editor), "Nanotechnology", AIP press/Springer, 2012.
2.	Akhlesh Lakhtakia (Editor), "The Hand Book of Nano Technology, Nanometer Structure, Theory, Modeling and Simulations". Prentice-Hall of India (P) Ltd, New Delhi, 2007.

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Course	Course Name	H V	our Vee	s/ k	Credit	Total	Maximum Marks
Code		L	T	P	С	nours	
19ITP42	PROCESSING	3	0	0	3	60	100
ourse Object	tive(s):						
he purpose of	learning this course is						
Know the	medical imaging modalities				4		
Identify the	aliagnostic tasks for which image	jes are	nee	ae	a 4.		
Analyze b:	sic image compression algorith	me for r	non		iy arome in	2005	
 Study the study the stu	various schemes associated with	n medic	al ir	mar	nome in ne analv	sis	
Course Outco	mes:	Theate		nas	jo unary		
t the end of thi	s course, learners will be able to						
Classify imag	jing systems according to differe	ent crite	ria				
Describe the	operations of various fundament	ital clas	ses	of	image p	rocessing	
Create an er	hanced image based on spatial	and fre	que	ency	/ domair	operation	IS
Formulate a	image degraded model for image	es affec	cted	by	various	types of n	oise
Elaborate the	morphological operators and te close if the schemes approximate	echnique	es l	lse	d for ima	ige segme	entation
Analyse and	classify the schemes associated		leui	Cal	inage a	naiysis	
	DUCTION	~					9
ligital image – Radiations: Me isk – Ultrasoun Systems (PACS	Color images. Medical imag dical imaging modalities – Imag	es obt	ain	ed	with lo	nizina ar	x x x x x x x x x x
Init II IMAGE	d imaging – Magnetic resonance	es from e imagir	ו x- וg –	ray: - Pi	s – Imag cture Ar	les from γ chiving an	-rays – Does and d Communication
	d imaging – Magnetic resonance) E ENHANCEMENT AND RESTO	e imagir DRATIC	א ר ng – N	ray: - Pi	s – Imag cture Ar	jes from γ chiving an	rays – Does and d Communication
undamentals mage Enhance perations – Ge ransform – Sa mage Restora egradations	d imaging – Magnetic resonance E ENHANCEMENT AND RESTO of digital image processing: G ement in Spatial & Freque cometric operations – Convoluti ampling – Cross Correlation ar tion: Image degradation – Noise	DRATIC DRATIC Dray lev ncy D on base nd auto a – Nois	n x- ng - N el h om ed co se r	- Pi iisto ain ope orre	s – Imag cture Ar ogram – : Algeb rations – lation – uction fil	Histogram raic opera - Fourier Frequenc ters – Blur	ad Non Ionizing -rays – Does and d Communication 9 n transformations. ations – Logical domain – Fourier by Domain filters. rring – Geometric
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8 Chairman - BoS Dept. of IT - ESEC

TEXT	BOOK(S)
1.	Geoff Dougherty. <i>Digital Image Processing for Medical Applications</i> , Cambridge University Press, 2010
REFE	RENCE(S)
1.	Rafael C. Gonzalez & Richard E. Woods, <i>Digital Image Processing</i> , Pearson Education, Fourth Edition, 2017.
2:	William K. Pratt, Introduction to Digital Image Processing, CRC Press, Fourth Edition, 2014.
1.	https://nptel.ac.in/courses/108105091/

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Code No	Course	Obje Outo	ctives &	& ·	L	TF		c	Ma	ximu Mark	Category	
		PEO	РО	PSO			8		CA	ES Tot.		
PROFESS	SIONALELECTIVE III		1									
19ITO01	C Programming				3	0	0	3	40	60	100	OE
19ITO02	Basic Java Programming				3	0	0	3	40	60	100	OE
19ITO03	Artificial Intelligence				3	0	0	3	40	60	100	OE
19ITO04	Data Analytics		2.5		3	0	0	3	40	60	100	OE
19ITO05	Front End Web Design				3	0	0	3	40	60	100	OE
19ITO06	Mobile Application Development				3	0	0	3	40	60	100	OE
19ITO07	Cloud Computing		ř.		3	0	0	3	40	60	100	OE
19ITO08	Multimedia and Animation	- 4		5								OE

OPEN ELECTIVE OFFERED BY IT TO OTHER DEPARTMENTS

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	n	INFORMATION TECHNOLOGY			R 2019	Semester	OE		
Course Coo	de	Course Name		Credit	Total Hours	Maximum N	larks		
1917001	-	C PROGRAMMING	2 L	0	P 0	2	45	100	-
Course Ohi	octivo (c):	o i Rooraaning	J	U	0	5	45	100	-
The purpose	ective (s).	this course is							11
• To kr	now how to	write, compile and debug progr	ams in C	ang	lade				
• To de	evelop C Pro	ograms using basic programmi	na constru	icts	lago				
 Ident 	tifv the differ	ence between call by value and	d call by re	efere	nce-				
• Use i	pointers to u	nderstand the dynamics of me	morv						
• To do	, o input/outpu	ut and file handling in C							
Course Out	comes:							4	
At the end of	f this course	, learners will be able to							*
• Use d	ifferent data	types in a computer program							
Design	n programs	involving decision structures ar	nd loops.						
Devel	op C applica	tions using Arrays and Strings.							
 Development 	op C applica	tions using Function and Point	ers.	÷1.,					
Development	op applicatio	on using structure and union.							
Design	n a C applic	ation using Sequential and Ran	ndom-acce	ess fi	le				
Unit I C	STATEMEN	ITS							9
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Chairman - Bos Dept. of IT - ESEO

1110000 -	INFORMATIONTECHNO	INFORMATIONTECHNOLOGY			R2019	9 Semester		
Course	Course Name Hours/ Week		Credit	Total Hours	Maximum Marks			
Code		L	•	Р	C			
19ITO02	BASIC JAVA PROGRAMMING	3	0	0	3	45	100	
Course Obje	ective(s):	, 1 E						
The purpose	of learning this course is to				1.1.1.1		The Part of the Pa	
 Gain k 	nowledge about basic Java language s	yntax	and	sema	antics to v	write Java	programs and use	Э
conce	ots such as variables, conditional and it	erative	exe	ecutio	on method	ds etc.		
 Underst 	stand the fundamentals of object-oriente	ed pro	gran	nmin	g in Java	including	defining classes,	
objects	s, invoking methods etc.							
 Underst 	stand the principles of inheritance, pack	ages	and	inter	faces.			
 Know 	now to handle events							
Unders	stand the basics of JDBC connectivity	<u> </u>						
Course Outo	comes:							
At the end of	this course, learners will beable to:							
Know t	he basic structure of java			* =				
Write .	ava application programs using OOP p	rincipl	es a	nd p	roper prog	gram struc	turing	
 Demor 	istrate the concepts of Packages and ir	nherita	nce			1997 - W		
 Write a 	n event based Java program							
 Development 	n interactiva lava programa vaina data							
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TEX	TBOOK(S)
1.	The Complete Reference, Java(11thEdition), Herbert Schild, TMH
2.	Core Java Volume-I Fundamentals, Eight Edition, Horstmann & Cornell, Pearson Education
REF	ERENCE(S)
1.	E.Balagurusamy, Java Programming with premier, second edition, Tata Mcgraw Hill, 2016.
2.	Kenarnold, Java Programming Language, Addison Wesely, 2000
3.	John R Hubbard, Programming with Java, Tata Mcgraw Hill, 1998

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Department	INFORMATION TECHNO	R 2019	Semester	PC				
Course	Course Name		Hours / Week		Credit	Total	Maximur	n
Code		L	Т	Р	С	Hours	Warks	
19ITO03	ARTIFICIAL INTELLIGENCE	3	0	0	3	45	100	
Course Objecti	ve (s):				2.4			
The purpose of	learning this course is							
To know	the overview of artificial intelligence p	orinci	ples	and	approach	es.		
To know	the basic understanding of the buildir	ng blo	ocks	of A	I in terms	of intelliger	nt agents	
To deve	lop the representation using Prolog Pr	ogra	mmi	ng la	nguage			
To know	the search strategies in Al							
 To anal 	yze the applications of fuzzy logic and	neur	al n	etwo	rk for vari	ous applicat	ions	
Course Outco	omes:				•			1.12
 At the er 	nd of this course, learners will be able	to:						
 Acquire foundation 	a fundamental understanding o ons	f the	e p	orinci	ples of	artificial ir	ntelligence ar	nd its
 Understand 	and the basics of Intelligence agents				ι. E			
 Develop 	the application using Prolog program	ming						
Gain kno	owledge about the Search stretegies							
 Obtain a 	dequate knowledge to develop the AI	appli	catio	ons				
Unit I Introc	luction to Artificial Intelligence					4		9
Introduction, B Program, Four AI, Future of A	rief History, Intelligent Systems, Categ idations of AI, Sub-areas of AI, Applica I.	oriza	ition s, De	of In evelo	telligent S pment of	Systems, Co Al Language	mponents of A es, Current Tre	l ends in
	aont Agonte	-		-				9
Dational Ar	vente Menning from Convence		10	٨	tiono	reportion	of Environm	nonto
Structure of I Based Agents.	Intelligent Agents, Types of Agents	: Sin	nple	Ref	lex Agen	ts, Goal B	ased Agents,	Utility
Unit III Prolo	g Programming language							9
Introduction, P Manipulation in Recursive Date	rolog Program, Control Strategy of Pro n Prolog, System Predicate, Cut, Effect a Types in Prolog, System-Defined Pro	olog, t of F edica	Prog Rule tes.	gram and	ming Tec Goal Orde	hniques in F ers, Structur	Prolog, List ing of Data in I	Prolog,
Unit IV Searc	ch Strategies							9
Uninformed S Analysis of Sea Informed Sear	Search Strategies:Breadth-First Se arch Methods ch Strategies: Heuristic Functions, Be	earch st-Fir	, L st Se	Unifor earcl	rm Cost n, Greedy	Search, Search, A*	Depth-First	Search
Unit V Case	Studies							9
Application of – Signal Proce	fuzzy logic and neural networks to ssing and Image Processing	Mea	asur	eme	nt- Contr	ol- Adaptive	e Neural Cont	rollers
TEXT BOOK	3)		1	1				11.2

S.Sh.

1	Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI, Pearson Education.
2	Prolog Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.
REF	ERENCE(S)
1.	Artificial Intelligence – Structures and Strategies for Complex Problem Solving , George F Luger, Addison Wesley, Fifth Edition
1. 2.	Artificial Intelligence – Structures and Strategies for Complex Problem Solving , George F Luger, Addison Wesley, Fifth Edition Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition

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Departmen	INFORMATION TECH	INFORMATION TECHNOLOGY						
Course	Course Name	H	Hours / Week Cr		Credit	Total	Maximum	
Code		L	Т	Р	С	Hours	Warks	
19ITO04	DATA ANALYTICS	3	0	0	3	45	100	
The purpose To ki To	 of learning this course is now the pattern in data. now the basic to interpret of data evelop the analytic algorithm now the handle large applications analyze the applications of support sys itcomes: f this course, learners will be able to: a meaningful pattern in data hically interpret data 	tems						
ImpleHandDevelopment	ement the analytic algorithms lle large scale analytics projects from lop intelligent decision support system	various o ns	doma	ains				
Unit I Da	ata Definitions and Analysis Techni	ques	-				в.	9
Elements, indexing,In	Variables, and Data categoriza troduction to statistical learning and R	tion,Lev -Prograr	els nmir	of ng	Measure	ment,Data	management	and
Unit II I	Descriptive Statistics	-				1		9
Measures	of central tendency-Measures of locati	on of dis	pers	sions	-Practice	and analysis	s with R	
Unit III E	3asic Analysis Techniques					15.11		9
Basic analy variance-C	ysis techniques-Statistical hypothesis orrelation analysis-Maximum likelihoo	generat d test-Pr	ion actio	and ce an	testing-Ch id analysis	ii-Square te s with R	st-t-Test-Analysis	s of
Unit IV [Data analysis techniques						•	9
Regression with R	analysis-Classification techniques-C	lustering	J-As:	socia	ation rules	analysis-P	ractice and analy	sis
Unit V 0	Case Studies		-	S. S				9
Understand with Hadoo	Ing business scenarios-Feature engi p and Map-Reduce-Sensitivity Analys	neering is	and	visu	alization-S	Scalable and	d parallel compu	ting
TEXT BOO	K(S)			- 10				
1. Prob Shar	ability & Statistics for Engineers & Sci on L. Myers and Keying Ye, Prentice	entists (Hall Inc.	9 th E	dn.),	Ronald E	. Walpole, F	Raymond H. Mye	rs,
2. Seer	naAcharya, SubhasiniChellappan, "Bi	g Data A	naly	tics"	Wiley 20	15. Reference	ces.	
REFEREN	CE(S)		1)	
1. Mich	CE(S) ael Berthold, David J. Hand, "Intellige	nt Data /	Anal	ysis"	, Springer	, 2007.)	

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Department	INFORMATION TECHNO		R 2019	Semester	ter	F			
Course	Course Name	Hours / Week		Cred	it	Total	Maximu	imum	
Code		L	TP	С		Hours	Ma	rks	
19ITO05	FRONT END WEB DESIGN	3	0 0	3		45		100	
Course Objectiv	/e (s):						1		1
The purpose of le To demon To demon To demon To demon To unders To handle Course Outcor At the end of this Describe Discuss th Use funct Examine Assess dy Unit I Overv Fundamentals Margin propert JavaScript fund	earning this course is Instrate the use of singular, plural and Instrate tables,forms and frames in H Instrate the use of css,single style sh stand the syntax for javascript,operate advanced javascript concept mes: I course, learners will be able to: the principles and tools that are used he enhanced techniques used by we ions and events for user input and variad advanced technologies to make web ynamic websites using HTML5, CSS iew of HTML, CSS and JavaScript of HTML, Creating Style Sheet, C ies, Introduction to JavaScript, We ctions and events, JavaScript Tim	d paired TML, leet ,mu tors,fun d to dev b profe alidation pages 3, and a SS Boy Vorking	l tags ultiple ctions velop ' ssion n respo advar	in HTMI style sh a, events Web app als for c onsive a ced Jav el- Boro Web F	eet a and blica eati ad n asci	and css sel l error ing dynamic nore interac ript properties, ns and va	lectors. c web page ctive Padding p lidating u	es propert ser in	tie
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Department	INFORMATIONTECHNO	LOGY	(R2019	Semester	OE
Course	Course Name		Hours/ Week		Credit	Total	Maximum	
Code		L	Т	Ρ	С	Hours	Warks	
19ITO06	MOBILE APPLICATION DEVELOPMENT	3	0	0	. 3	45	100	
 Course Object The purpose o Gain kno Understation To facilit To help To incul 	f learning this course is to owledge about basic Android and the design and interface tate students to understand android SI students to gain a basic understandin lcate working knowledge of Android St	DK g of A tudio (Andro	oid a	pplication	developm	ent	
At the end of the light of the	omes: his course,learners will beable to: various concepts of mobile programmi ns, Critique mobile applications on the apid prototyping techniques to design a mobile applications for the Android op	ng tha ir des and de peratir	at ma ign p evelo ng sy	ake if pros a pp so /sten	t unique fr and cons, ophisticate n that use	rom progra ed mobile i basic and	mming for other nterfaces, advanced phone	
Deploy a	applications to the Android marketplace	e for o	distri	butio	n.			0
Introduction t Building you F	o Android: The Android Platform, A First Android application, Understandin	ndroi g Ana	d SI atom	DK, y of a	Eclipse II Android A	nstallation,	Android Installa Android Manifes	tion, t file
Unit II DI	ESIGN	-			2			9
Android Appl Application Co and its commo	lication Design Essentials: Anatomy ontext, Activities, Services, Intents, Re on settings, Using Intent Filter, Permise ITERFACE	of a ceivir sions	an / ng ai	Andro nd Bi	oid applic roadcastir	cations, A ng Intents,	ndroid terminolo Android Manifest	gies, File
Android User	Interface Design Essentials: User Inte	erface	Scr	een	elements,	Designing	g User Interfaces	with
Unit IV A		1		-	-			9
Testing Andre	oid applications, Publishing Androic sources in a hierarchy, working with di	l app fferer	licat	ion, ies o	Using A f resource	ndroid pro	eferences, Mana	ging
Unit V Al	NDROID APIS				r hari			9
Using Commo Data between APIs, Using A	on Android APIs: Using Android Data a Applications with Content Providers ndroid Telephony APIs, Deploying And	and S , Usir droid .	itora ng A Appl	ge A ndro icatio	Pls, Mana id Networ	aging data king APIs Vorld.	using Sqlite, Sha , Using Android	aring Web
TEXTBOOK(S	i)				in the s			
1. Lauren I 2nd ed. (2	Darcey and Shane Conder, "Android V 2011)	Virele	ss A	pplic	ation Dev	elopment"	, Pearson Educat	ion,
REFERENCE(S)	-			19 10/1		4.4	
1. Reto Me	eler, "Protessional Android 2 Application	on De	velo	omer	nt", Wiley	India Pvt L	.ta	
2. Mark L I	Murphy, "Beginning Android", Wiley In	dia P	/t Lto		Port D	und Edition	a: I	
3. Anarola	Application Development All in one f		11111	es b	y Dally Bl	aru, Euliioi	l. I	-

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	INFORMATION TECH	INFORMATION TECHNOLOGY							
Course	Course Name	Н	Hours / Week		Credit	Total	Maximum		
Code		L	Т	Р	С	Hours	Iviarks		
19ITO07	CLOUD COMPUTING	3	0	0	3	45	100	a.	
ourse Objec	ctive (s):								
he purpose c	of learning this course is							Ľ,	
 Unde Know Gain Be fa 	erstand the concept of cloud computin v about the cloud services. knowledge on the various issues in c amiliar with the lead players in cloud.	g. loud co	mpu	iting.					
• Appro	eciate the emergence of cloud as the	next ge	enera	ation	computing	g paradigm	and web based		
commu	unication.	11.0							
Course Outo	comes: his course, learners will be able to:								
Artici	late the main concents, key technolo	nies st	renc	ths a	and limitat	ions of clou	d computing		
• Learr	the key and enabling technologies th	hat help	o in t	he d	evelopme	nt of cloud.	a company.		
• Deve	lop the ability to understand and use	the arcl	hitec	ture	of comput	e and stora	ge cloud		
• Unde	rstand Service and delivery models.	÷.							
• Evalu	ate and choose the appropriate tech	nologies	s, alç	gorith	nms and a	pproaches 1	for implementation	on	
Unit I		TING	-	-				9	
Cloud Cor	multing-History of Cloud Compu	ting_Cl	oud	Are	hitecture-	-Cloud Str	orage_Why Clo	ud	
Computing Ma	atters- Advantages of Cloud Comput	ina – D	isad	vant	ages of C	loud Comp	uting – Compan	ies	
the Cloud To	oday – Cloud Services	5	P		5		3 1		
Unit II	DEVELOPING CLOUD SERVICES				1.1.1.1			9	
Web-Based Development	Application – Pros and Cons of C	loud Se	ervic	e D	evelopme	nt – Types	of Cloud Serv		
 Discovering Clouds 	t – Software as a Service – Platform g Cloud Services Development Servic	as a Se ces and	ervice Toc	e – V ols –/	Veb Servie Amazon E	ces – Ón- D c2 – Google	emand Computi e App Engine –If	ce ng BM	
– Discovering Clouds Unit III	t – Software as a Service – Platform g Cloud Services Development Service	as a Se ces and ONE	Toc	e – V ols –/	Veb Servie Amazon E	ces – Ón- D c2 – Google	emand Computi App Engine –If	ce ng 3M	
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- Discovering Clouds Unit III Centralizing Collaborating Events - Clou	t – Software as a Service – Platform g Cloud Services Development Service CLOUD COMPUTING FOR EVERYO Email Communications – Collabora Contact Lists–Cloud Computing for ud Computing for the Corporation.	as a Se ces and DNE ating our the Co	n So	e – V ols –/	Veb Servid Amazon E ules – C y–Collabo	ces – Ón- D c2 – Google ollaborating rating on G	on To-Do List Group Projects a	ce ng 3M 9 s- nd	
Discovering Clouds Unit III Centralizing Collaborating Events – Clou Unit IV	t – Software as a Service – Platform g Cloud Services Development Service CLOUD COMPUTING FOR EVERY Email Communications – Collabora Contact Lists–Cloud Computing for ud Computing for the Corporation. USING CLOUD SERVICES	as a Se ces and DNE ating our the C	n So	e – V ols –/ ched	Veb Servid Amazon E ules – C y–Collabo	ces – Ón- D c2 – Google ollaborating rating on G	on To-Do List	ce ng 3M s- nd 9	
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2.	Anthony T.Velte, Cloud Computing, 12th Edition, Tata Mcgraw Hill, 2013
REFE	RENCE(S)
1.	Gautam Shroff, "Enterprise Cloud Computing Technology Architecture Applications", Cambridge University Press; 1 edition, [ISBN: 978-0521137355],2010.
2.	Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach" McGraw- Hill Osborne Media; 1 edition [ISBN: 0071626948], 2009.

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Department	INFORMATIONTECHNO	R2019	Semester	0				
Course Code 19ITO08	Course Name		Hours/ Week		Credit	Total	Maximum	
		L	Т	Р	С	Hours	Marks	
	MULTIMEDIA AND ANIMATION	3	0	0	3	45	100	1
Course Obje The purpose • Studen • The pu	ctive(s): of learning this course is to ts will be able to understand the releva rpose of the course for the students is	ance a to app	nd u Iy co	nderl onten	ining infra	astructure of r	of multimedia sys nultimedia learnin	tem. Ig to
 Unders etc) ap Acquire 	velopment of multimedia products. tand informational media (audio/ visua plied with multimedia techniques. e knowledge about multimedia software	al mate e tools	rials	, wet	based m	aterials, g	ames and simula	tions
ourse Outc	omes:		2					1
 Analyze Unders Know a Apply c Undersi 	ins course, learners will beable to. instructional and informational media tand the architecture and design bout multimedia software tools ontemporary theories of multimedia lea tand the design and development proc	arning cess of	to th mul	ne de timeo	velopmen dia project	t of multim	nedia products	
Jnit I INTE	RODUCTION							9
Definition of	multimedia, Multimedia Basics, When	e to u	se N	lultim	nedia, Mu	ltimedia E	lements -Multime	dia
Jnit II MI	JLTIMEDIA SYSTEMS ARCHITECTU	JRE						9
Multimedia V	Vorkstation Architecture, High resolution	on Gra	phic	disp	olays, Mul	timedia Ar	chitecture Based	on
Jnit III EV	OLVING TECHNOLOGIES FOR MUL	TIME	DIA	SYS	TEMS			9
Android User Lavouts, Dra	Interface Design Essentials: User Interface Working with Animation.	erface	Scre	en e	lements, l	Designing	User Interfaces w	ith
Jnit IV DE	FINING OBJECTS FOR MULTIMEDI	A SYS	STEN	/1				9
Text, Images	, Audio and Voice, Full Motion and	Live V	ideo	, Mu	Itimedia [Data Interf	ace Standards, F	ile
Init V MI	IL TIMEDIA SOFTWARE	standa	rds.					0
Overview of Authoring, Sc	Multimedia Software Tools, Open ome Useful Editing and Authoring Tool	Sources, VRM	ce F ML, (Repla Open	cements, GL, Wind	Multimed ows and C	lia OS, Multime Open Source API	dia 2.
EXTBOOK(S)			1				
1. Compu	ter Graphics Multimedia and Animation	n, Mala	ay K	. Pak	hira PHI s	second edi	tion	
REFERENCE	(S)							
1. Principle	s of Multimedia, RanjanParekh TMGH	l, New	Dell	ni	11			
2. Multimed	lia Systems John F. Koegel Buford Pe	arson	Edu	catio	n			
3 Multimer	tia Technology & Applications David L	lillmor	Ga	laotic	Publicati	one Dut I t	4	

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