

# ERODE SENGUNTHAR ENGINEERING COLLEGE



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

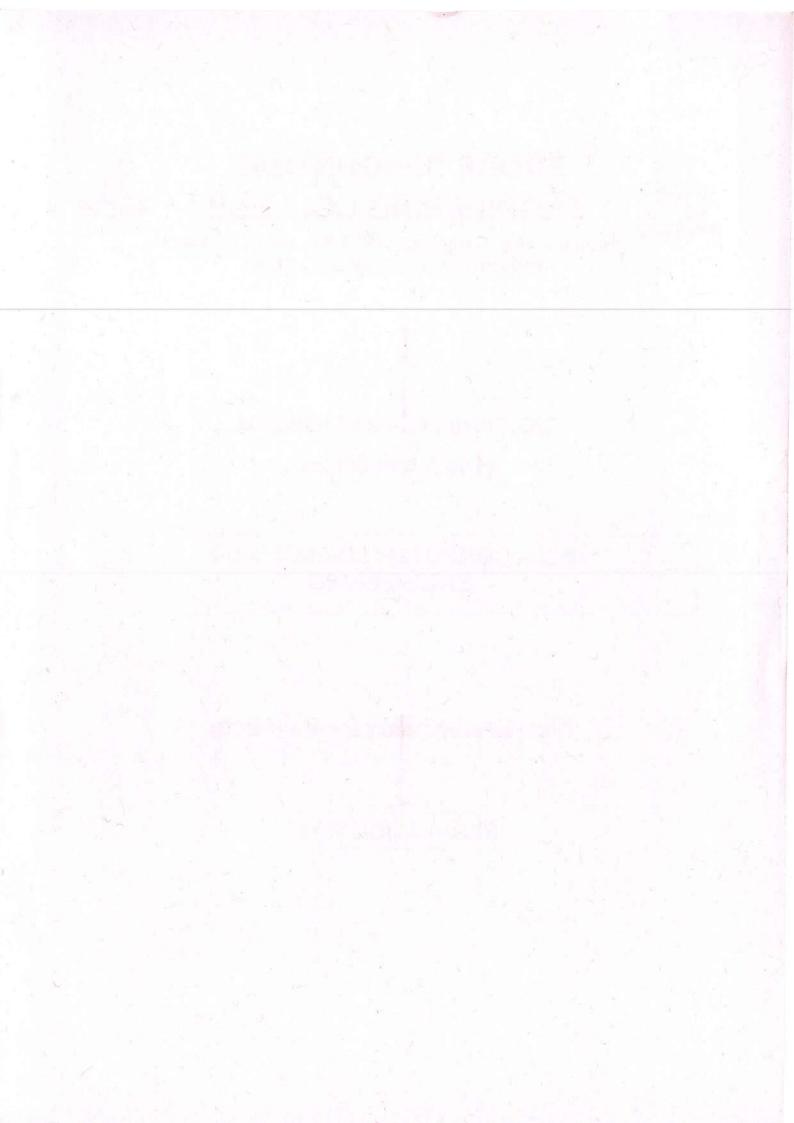
# **UG Curriculum and Syllabus**

(1 to 8 Semesters)

# B.E – COMPUTER SCIENCE AND ENGINEERING

**Choice Based Credit System (CBCS)** 

**REGULATION 2019** 



# ERODE SENGUNTHAR ENGINEERING COLLEGE

#### DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

#### REGULATION – 2019 CHOICE BASED CREDIT SYSTEM I TO VIII SEMESTERS CURRICULAM

Induction Program (Mandatory)	3 weeks duration
Induction program for students to be offered right at the start of the first year	

#### B.E. COMPUTER SCIENCE AND ENGINEERING Minimum credits to be earned: 163 (for Eight Semester) (for the Students Admitted in 2020-2021 onwards) SEMESTER I

Code No	Course	(	Objectives& Outcomes		L	т	Р	с		axim Mark		Category
		PEO	PO	PSO				1.3	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, 111	1,2,3,4,12	1,2	3	0	0	3	40	60	100	ES
19TPS01	Soft Skill -1	11,111	8,9,10,12	3	1	0	1	1.5	40	60	100	EEC
PRACTIC	AL											
19ES104	Python Programming Laboratory	1,111	1,2,3, 4,5,12	1,2	0	0	2	1	60	40	100	ES
19ES106	Engineering Graphics	IV	1,2,3,5, 10,12	-	0	0	4	2	60	40	100	ES
19BS105	Chemistry Laboratory	ш	1,2,3,4, 5,12	-	0	0	4	2	60	40	100	BS
			TOTAL		15	1	13	22.5	420	480	900	-

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THEORY	and the set of the set			10							_	
Code No	Course		bjective Dutcome		L	т	Р	с		Maxin Mar		0.4
		PEO	PO	PSO	i sea		-		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	Î	1,3,4, 5,7		3	0	0	3	40	60	100	BS
19MC201	Environmental Science and Engineering	1, 11	I,2,3,4, 5,6,7,8, 12	- 1	3	0	0	0	40	60	100	MC
a j	Language Elective	III	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19ES202	Advanced C Programming	I, 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 Skill -II	11,111	8,9, 10,12	3	1	0	1	1.5	40	60	100	EEC
PRACTIC	AL							1.7				
19ES214	Advanced C Programming Laboratory	1, 11	1,2,3, 4,12	1,2	0	0	4	2	60	40	100	ES
19ES215	Computer Hardware Installation and Servicing, Laboratory	I, II	1, 2, 3, 12	2	0	0	2	1	60	40	100	ES
			TOTAL		19	1	7	20.5	400	500	900	-

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THEORY							-					
Code No	Course		Objectiv Outcom		1.200					Maxir Mar		Category
obue no	oourse	PEO	PO	PSO	L	Т	P	С	CA	ES	Tot.	Jategory
19BS305	Discrete Mathematics	1,111	1,2,3, 4	2	3	1	0	4	40	60	100	BS
19ES302	Digital Electronics	I, III, IV	1,2,3, 4,12	2	3	0	0	3	40	60	100	ES
19CS302	Computer Architecture	I, III	1,2,3,4, 12	2	3	0	0	3	40	60	100	PC
19 <b>C</b> S303	Object Oriented Programming using Java	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19CS304	Data Structures	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19TPS03	Quantitative Aptitude and Logical Reasoning - I	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
PRACTICA	۱ <b>L</b>											. 6
19ES308	Digital Electronics Laboratory	I, III	1,2,3,4, 5,12	2	0	0	4	2	60	40	100	ES
19CS305	Data Structures Laboratory	1,111	1,2,3,4, 5,9, 11, 12	1,2	0	0	4	2	60	40	100	PC
1908306	Java Programming Laboratory	1, 111	1,2,3, 4,12	1,2	0	0	4	2	60	40	100	PC
			TOTAL		19	1	12	22	460	540	1000	

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THEORY				- 16	100							
Code No	Course		Objective Outcome		L	т	Р	c	IV	laxim Marl		Categor
		PEO	PO	PSO					CA	ES	Tot.	Categor
19BS405	Probability and Stochastic Models	, III	1,2,3, 4,12	2	3	1	0	4	40	60	100	BS
19CS401	Design and Analysis of Algorithms	1, 111	1,2,3,4,12	1, 2	3	0	0	3	40	60	100	PC
19HS402	Universal Human Values 2 : Understanding Harmony				2	1	0	3	40	60	100	HS
19CS403	Computer Networks	I, III	1,2,3,4, 8,10,12	1,2	3	0	0	3	40	60	100	PC
19CS404	Operating Systems	I, III	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19IT302	Data Base Management Systems	I, III	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19TPS04	Quantitative Aptitude and Logical Reasoning - II	I, II, III	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
PRACTIC	AL					5				1.17	19-12	
19CS405	Data Base Laboratory	í, II, III	1,2,3,4, 5,9,10, 11,12	1,2	0	0	4	2	60	40	100	PC
19CS406	Networking Laboratory	I, III	1,2,3, 4,5,12	1,2	0	0	4	2	60	40	100	PC
19HS401	Language Skills	П	5,9, 10,12	3	0	0	2	-	100	-	100	EEC
808 - n			TOTAL		19	2	10	23	500	500	1000	-

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Code No	Course		Objective Outcome					1.	N	laxim Mark		Category
ooue no	oourse	PEO	PO	PSO	L	Т	Ρ	С	CA	ES	Tot.	Category
19CS501	Web Technology	1,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PC
19CS502	Theory of Computation	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
	Open Elective I				3	0	0	3	40	60	100	OE
19 <b>CS</b> 503	Software Engineering	I, III	1,2,3,4,5, 8,9,10, 11,12	1,2	3	0	0	3	40	60	100	PC
	Professional Elective I			-	3	0	0	3	40	60	100	PE
19TPS05	Quantitative Aptitude and Logical Reasoning - III	I, II, III	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
PRACTICA	۱. د				- 1							
19CS504	Mobile Apps Development Laboratory	I, III,IV	1,2,3,4,5, 6,7,8, 9,10, 11 12	1,2	0	0	4	2	60	40	100	PC
19CS505	Web Technology Laboratory	1,111	1,2,3,4, 5,8,9,12	1,2	0	0	4	2	60	40	100	PC
19HS506	Professional Skills for Software Engineer	II	2,3,6,8, 9,12	3	0	0	2		100	-	100	EEC
			TOTAL	201	17	0	10	19	460	440	900	1

	4		SEM	ESTEF	N S							
THEORY		9. TH			0				1			74
Code No	Course		Objective a Outcomes		L	т	Р	с		axim Mark		Category
		PEO	PO	PSO					CA	ES	Tot.	
19CS601	Cryptography and Network Security	1,11,111	1,2,3,4, 5,6,8,12	1,2	3	0	0	3	40	60	100	PC
19CS602	Compiler Design	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PC
19CS603	Foundations of Internet of Things	1,111 IV	1,2,3,4, 5,6,7,10, 11,12	1,2	2	0	2	3	40	60	100	PC
19CS604	Cloud Computing	1,111	1,2,3,4, 5,10,12	1,2	3	0	0	3	40	60	100	PC
19TPS06	Quantitative Aptitude and Logical Reasoning - IV	I, 11,111	1,2,9, 10,12	3	2	0	0	0	40	60	100	EEC
	Open Elective II		6	e F	3	0	0	3	40	60	100	OE
	Professional Elective II				3	0	0	3	40	60	100	PE
PRACTICA	L											and the second
19CS605	Network Security Laboratory	1,11,111	1,2,3,4,5 6,8,12	1,2	0	0	4	2	60	40	100	PC
19CS606	Mini Project	1, 11, 111, 1V	1,2,3,4, 5,6,7, 8,9,10, 11,12	1,2, 3	0	0	2	1	100	-	100	EEC
19CS607	Comprehensive Review	1,111	10,12	1,2	0	0	2	0	100	-	100	EEC
Ry and the	a start when a	-	TOTAL		19	0	10	21	540	460	1000	-

			SEM	ESTER	NIV S			2	1	ā na ka		1
THEORY		21.										
	1		jective a			т	Р	c		axim Mark		Category
Code No	Course	PEO	PO	PSO		1		= 3	CA	ES	Tot.	
19CS701	Big Data Analytics	1,11,111	1,2,3,4, 5,12	1,2	3	0	0	3	40	60	100	PC
19CS702	Artificial Intelligence	1,11,111	1,2,3,4, 5,12	2	3	0	0	3	40	60	100	PC
19ES701	Research Methodology	1, 11	1,2,3,4, 12	-	3	0	0	3	40	60	100	ES
	Professional Elective III				3	0	0	3	40	60	100	PE
	Professional Elective IV				3	0	0	3	40	60	100	PE
	Open Elective III	I,II, IV	1,2,3,4, 5,6,7, 11,12	1,2	3	0	0	3	40	60	100	OE
4		1	PRA	CTICA	AL.							
19CS704	Cloud Computing Laboratory	1,11,111	1,2,3,4, 5,9,10, 11,12	2	0	0	4	2	60	40	100	PC
19CS705	Data Analytics Laboratory	<mark>1</mark> ,11,111	1,2,3,4, 5,9,10, 12	2	0	0	4	2	60	40	100	PC
19CS706	Project work Phase I	I,II,III, IV	1,2,3,4, 5,6,7,8, 9, 10, 11,12	1,2,3	0	0	2	1	60	40	100	EEC
	TOTAL				18	0	10	23	460	440	900	si - Live

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			SEME	STER	VIII							
THEORY			- G.	1.2								
0.1.1.			bjective Outcom		L	т	Р	с		axim Mark		Category
Code No	Course	PEO	PO	PSO					CA	ES	Tot.	3,
	Professional Elective V			e de la compañía de la	3	0	0	3	40	60	100	PE
	Professional Elective VI		- 2		3	0	0	3	40	60	100	PE
PRACTIC	AL			1								
19CS801	Project work Phase II	I, II, III, I∨	1,2,3,4, 5,6,7, 8,9,10, 11,12	1,2,3	0	0	12	6	60	40	100	EEC
6 · ·	TOTAL				6	0	14	12	240	160	400	-

S. No.	Vatonorv			Credi	its Per	Seme	ester			Total Credit	Credits in %	Total	nge of Credits CTE)
		101	11	111	IV	V	VI	VII	VIII			Min	Max
1	BS	12	7	4	4	-	-	-	-	27	16.56	15%	20%
2	ES	6	9	5	- <del>1</del> 1	-	-	3	-	23	14.11	10%	15%
3	HS	3	3	-	3	-	-	- 1	-	9	5.52	5%	10%
4	PC		-	13	16	13	14	10		69	40.49	40%	45%
5	PE	-	-	-	-	3	3	6	6	18	11.04	10%	15%
6	OE	-		-	+	3	3	3	-	9	5.52	5%	10%
7	EEC	1.5	1.5	-	-	-	1	1	6	11	6.75	5%	10%
	Total	22.5	20.5	22	23	19	21	23	12	163	100	90%	125%

**BS**- Basic Science

ES-Engineering Science OE- Open Elective

HS-Humanities and Social Science PC- Professional Core

PE- Professional Elective MC - Mandatory course

CA – Continuous Assessment

ES- End semester Examination

EEC-Employability Enhancement Course

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# MANDANTORY COURSES

Code No	Course	Objective & Outcomes			L	т	Р	с	20120	aximu Marks		Category
2		PEO	PO	PSO					CA	ES	Tot.	
19MC201	Environmental Science and Engineering	1, 11	I,2,3,4, 5,6,7,8, 12	-	3	0	0	0	40	60	100	MC
19MC301	Indian Constitution	11,111	6,8,10, 11,12	1	2	0	0	0	40	60	100	MC

# LANGUAGE ELECTIVES

Code No	Course	0	bjectives & Outcomes	8				1	N	laxim Mark		Category
Coue No	Course	PEO	PO	PSO	L	Т	P	С	CA	ES	Tot.	
19HX201	English for Engineers	Ш	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX202	Hindi		2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX203	Japanese	III	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS
19HX204	French	Ш	2,3,6, 9,10,12	3	3	0	0	3	40	60	100	HS

### OPEN ELECTIVES OFFERED BY CSE

Code No	Course		ojectives Outcome						M	aximı Mark		Category
Code No	Course	PEO	PO	PSO	L	Т	P	С	CA	ES	Tot.	outegory
19CSOE01	Web Development using .NET		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE02	Fundamentals of Open Source Software		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE03	Machine Learning using R		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE04	Fundamentals of Cloud Computing		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE05	Computer Organization & Architecture		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE06	Principles of User Interface Design	_	1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE07	Fundamentals of Database Management Systems		1,2,3,4, 12		3	0	0	3	40	60	100	OE
19CSOE08	Operating Systems Fundamentals		1,2,3,4, 12		3	0	0	3	40	60	100	OE

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## **PROFESSIONAL ELECTIVES**

### **PROFESSIONAL ELECTIVE - I**

	Course		Objectives & Outcomes						Maximum Marks			0.1
Code No	Course	PEO	PO	PSO	<b>L</b>	Т	P	С	СА	ES	Tot.	Category
19CSPE01	C# and .NET Programming	1,111	1,2,3,4, 12	1, 2	3	0	0	3	40	60	100	PE
19CSPE02	Advanced Java Programming	1, 111	1,2,3,4, 5, 12	1, 2	3	0	0	3	40	60	100	PE
19CSPE03	Open Source Systems	1, 111	1,2,3,4, 5, 12	1, 2	3	0	0	3	40	60	100	PE
19CSPE04	R Programming	1, 111	1,2,3,4, 5, 12	1, 2	3	0	0	3	40	60	100	PE
19CSPE05	XML and Web Services	1,111	1,2,3,4,5 12	1, 2	3	0	0	3	40	60	100	PE
19CSPE06	Graph Theory and Its applications	1, 111	1,2,3,4,1 2	1,2	3	0	0	3	40	60	100	PE
19CSPE07	Computer Vision	I, ÍII	1,2,3,4,5	1,2	3	0	0	3	40	60	100	PE

### PROFESSIONAL ELECTIVE II

		Objectives & Outcomes								ximu Mark		Catamanu
Code No	Course	PEO	PO	PSO		Т	Ρ	С	CA	ES	Tot.	Category
19CSPE08	Human Computer Interface	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE09	Computer Graphics and Multimedia	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE10	Digital Image Processing	1,111	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19CSPE11	Distributed Computing	1,111	1,2,3, 4,12	1,2	3	0	0		40	60	100	PE
19CSPE12	Information Retrieval Techniques	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PE
19CSPE13	Social Network Analysis	1,111	1,2,3, 4,6,7, 12	1,2	3	0	0	3	40	60	100	PE
19CSPE14	Data warehousing and Data mining	1,111	1,2,3, 4,512	1,2	3	0	0	3	40	60	100	PE

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## **PROFESSIONAL ELECTIVE III**

	ner the second se	Objectives & Outcomes				-	Р			ximu Mark		Catagory
Code No	Course	PEO	PO	PSO	L	T	P	С	CA	ES	Tot.	Category
19CSPE15	Software Project Management	1,111	1,12	2	3	0	0	3	40	60	100	PE
19CSPE16	Cyber Security and Ethical Hacking	1,111	1,2, 5,12	1	3	0	0	3	40	60	100	PE
19CSPE17	Wireless Sensor Networks	1,111	1,2,3,4	1	3	0	0	3	40	60	100	PE
19CSPE18	Professional Ethics in Engineering	1,111	1,2,3, 4,12	2	3	0	0		40	60	100	PE
19CSPE19	Semantic Web	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PE

## **PROFESSIONAL ELECTIVE IV**

99		Objectives & Outcomes				-		-	Maximum Marks			Category
Code No	Course	PEO	PO	PSO	L	Т	P	С	CA	ES	Tot.	Category
19CSPE20	Information Storage Management	i,III	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE21	Soft Computing	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE22	Natural Language Processing	1,111	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19CSPE23	Management Information System	1,111	1,2,3, 4,12	1,2	3	0	0		40	60	100	PE
19CSPE24	Speech Processing	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PE

## **PROFESSIONAL ELECTIVE V**

		Objectives & Outcomes				т			Maximum Marks			
Code No	Course	PEO	PO	PSO		T	Ρ	С	CA	ES	Tot.	Category
19CSPE25	Parallel Algorithms	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE26	Software Quality Assurance	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE27	Robotics	1,111	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19CSPE28	Virtual and Augmented Reality	1,111	1,2,3, 4,12	1,2	3	0	0		40	60	100	PE
19CSPE29	Bio Informatics	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PE

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# **PROFESSIONAL ELECTIVE VI**

	Course		Objectives & Outcomes				D			ximu Mark		
Code No	Course	PEO	PO	PSO	L	Т	Ρ	С	CA	ES	Tot.	Category
19CSPE30	Block Chain Technology	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE31	Data Visualization Techniques	1,111	1,2,3, 4,5,12	1,2	3	0	0	3	40	60	100	PE
19CSPE32	Realtime systems	1,111	1,2,3,4	1,2	3	0	0	3	40	60	100	PE
19CSPE33	Design Patterns	1,111	1,2,3, 4,12	1,2	3	0	0		40	60	100	PE
19CSPE34	Quantum Computing	1,111	1,2,3, 4,12	1,2	3	0	0	3	40	60	100	PE

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Course Code	B.E. COMPUTER SCIENCE AND				NG R	2019	Semester I	BS
	Course Name		Hour Wee T		Credit C	Total Hours	Maximum	Mark
19BS101	CALCULUS AND ITS APPLICATIONS	3	1	0	4	60	100	
Course Object	tive (s): The purpose of learning this cours	se is	to			8. A.		
<ul> <li>Interpret 1 phenome</li> <li>Find eige arising in</li> <li>Summariz variables.</li> </ul>		s wi es of t in s	ll en: he p olvin	ower g pro	ful tools oblems re	to handle elated to	e practical pr functions of	oblen
Develop e	enough confidence to identify surface and a	area	a the	re by	solving l	using inte	gration	1
	mes: At the end of this course, learners wi						e	
	erentiation to solve maxima and minima p tion to differentiate functions	orob	lems	s use	both the	e limit de	efinition and r	ules
	nd model the real time problems using first	t orc	der li	near	differenti	ial equati	ons. Recogn	ize a
	higher order ordinary differential equations							
	ne characteristics of a linear system with Ei							
	ize the functions of several variables and g					same.		
and the second distance of the second distanc	he functions for evaluating the surface are	a ar	nd vo	lume	9.	-	10	1
	ITS AND CONTINUITY							12
	of a function-Limit of a function-Contin	nuty	-Deri	ivativ	es-Differ	entiation	rules-Maxim	ia ar
Minima of one						- Astrony		12
a second s	DINARY DIFFERENTIAL EQUATIONS ntial equations of second and higher or	dor	with	000	stant co	officiente	Linear diffe	and the second second
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Chairman - BoS Dept. of Maths - ESEC

Department	COMPUTER SCIENCE	AND EN	GINE	ERIN	NG	R 2019	Semester I	BS
Course	Course Name		urs / eek		Credit	Total Hours	Maximum Marks	1
Code	1800	L	Т	Ρ	С	nouro	Marks	
19BS102	ENGINEERING PHYSICS	2	0	2	3	60	100	
Engineerir To get the To acquire To enhance To unders Course Outcome To gain kno To acquire H To have adde To get know microscop To understa expansion Unit I Pl Elasticity – Stress-s	nd knowledge on the concepts of the of joints and heat exchangers ROPERTIES OF MATTER strain diagram and its uses - torsional	f matters d fibers erties of r s will be f matter a onics an f fiber & l s of quar ermal pro	nater able : and it d the aser ntum pertie	ials s app ir app and theor es of	lications lications their appli y and its a materials a materials a	cations applications and their ap	in tunneling oplications in le - torsion pen	6 dulun
niform bending: th	nent - bending of beams - bending mo neory and experiment - I-shaped gird	ers.	cantil	ever:	theory and	a experimei	nt – uniform an	
Unit II ULTR	ASONICS				os partiz	4	general de la cale	6
avitations-ultrasor nodes- A, B and C Unit III LASER asers: population nd heterojunction	ification of Sound- Ultrasonics Produ nic cleaning-Non Destructive Testin – scan displays- Engineering Applic R AND FIBRE OPTICS of energy levels, Einstein's A and B – Industrial applications of laser. Fib- pres (material, refractive index, mode	g- Pulse ations-C coefficie er optics	ech utting nts de	o sys , wel erivat	ion – Sem	igh transm Irilling. iconductor I aperture a	ission and ref lasers: homoju	flectio
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article duality – el	on – Planck's theory (derivation) – C lectron diffraction – concept of wave ependent and time dependent equati	function	and	its p	hysical sig	nificance -	- Schrödinger's	- wav s wav
Unit V THER	MAL PHYSICS	1	T.			10 V		6
onduction, convec	nergy – thermal expansion of solids ation and radiation – heat conduction onduction through compound media aters.	s in solid	s – tl	nerma	al conduct	ivity - Lee's	disc method:	theor

Chairman - B: Dept. of Physics - E2E3

#### **TEXT BOOK(S):**

- 1. Bhattacharya, D.K. & Poonam, T. Engineering PhysicsII. 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

#### **REFERENCE(S):**

1.	Halliday, D., Resnick, R. & Walker, J. — Principles of PhysicsII. Wiley, 2015
2.	Serway, R.A. & Jewett, J.W. — Physics for Scientists and Engineersll. Cengage Learning, 2010
3.	Tipler, P.A. & Mosca, G Physics for Scientists and Engineers with Modern Physics'. W.H.Freeman, 2007

#### List of Experiments

- PHYSICS (ANY FIVE) 30 hrs
- 1. Determination of rigidity modulus Torsion pendulum
- 2. Determination of Young's modulus by non-uniform bending method
- 3. Determination of Young's modulus by uniform bending method
- 4. Determination of wavelength and particle size using Laser
- 5. Determination of acceptance angle and numerical aperture in an optical fiber
- 6. Determination of thermal conductivity of a bad conductor Lee's Disc method
- 7. Determination of velocity of sound and compressibility of liquid Ultrasonic interferometer
- 8. Determination of wavelength of mercury spectrum spectrometer grating
- 9. Determination of band gap of a semiconductor
- 10. Determination of thickness of a thin wire Air wedge method

Chairman - BoS Dept. of Physics - ESEC

Chairman - BoS Dept. of CSE - ESEC

Department	COMPUTER SCIENCE AND EI	COMPUTER SCIENCE AND ENGINEERING										
Course			our		Credit	Total	Maximu					
Code	Course Name	L	T	Р	С	Hours	Mark	s				
19BS103	ENGINEERING CHEMISTRY	3	1	0	4	45	10 0					
<ul> <li>Understand</li> <li>Know the f</li> <li>Understand</li> <li>Gain know</li> </ul>	e (s): The purpose of learning this co d the basic concepts of water character fundamental concepts of electrochem d the principles and generation of ener eledge on polymers. types of fuels and the manufacture of	erizat iistry ergy i	ion and and n ba	and t corre	osion. es and n	uclear rea						
<ul> <li>Make the</li> <li>Know the</li> <li>Impart le</li> <li>energy</li> <li>Aware the</li> <li>Impart le</li> </ul>	es: At the end of this course, learners ne students conversant with water treater ne reaction involved in corrosion and knowledge on renewable energy sour storage devices the synthesis & industrial application of knowledge on different types of fuels ic) and combustion process.	atme corro ces I of pol	nt te sion ike r yme	chnie prot nucle rs	ques ection m ar and to	) impart kn		n				
and the second se	CHEMISTRY				1.51			9				
Electrochemical problems).Standar corrosion (galvani	<b>ROCHEMISTRY AND CORROSION</b> cell - redox reaction, electrode rd hydrogen electrode-Calomel Elec c, differential aeration) - types-factor nd impressed current cathodic protec	ctroders inf	e. C luen	orro: cing	sion: che	emical &	electrocher	nica				
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reeder reactor. B	ear energy- nuclear fission- nuclear fus atteries and fuel cells:Types of batteri II :H2 -O2 fuel cell.											
Same and the second	IER CHEMISTRY							9				
oolymers based of opolymerization. and thermoplastic Compounding of p	mers - polymerization - functionality on source and applications. Types Preparation, properties and application cs (poly vinyl chloride, poly tetra lastics (blow moulding, injection, extra computer tool	of po ons d afluoi	olym of the oeth	eriza ermo	ation: ad osetting (	dition, co epoxy res	ndensation in and bake	anc elite SBR				
uel: Introduction- f metallurgical co ischer-Trophs a	AND COMBUSTION classification of fuels- solid fuels-coa oke (Otto Hoffmann method) – Liqui nd Bergius processes- knocking- oct n gases(LPG)- water gas- bio diesel. (	d fue tane	ls: F num	Refin ber-	ing of pe cetane i	etroleum- number –	synthetic p Gaseous fi	etro uels				
		M	. Gr		- BoS	Chai	irman - Bo of CSE - ES	SEC				

Chairman - BoS Dept. of Chemistry - ESEC

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
REFER	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.	GowarikerV.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., "Nanochemistry: A Chemical Approach to Nanomaterials", RSC Publishing, 2017.
5.	AshimaSrivastava and Janhavi N N., "Concepts of Engineering Chemistry", ACME Learning Private Limited., New Delhi., 2015.

M.D

Chairman - BoS Dept. of CSE - ESEC

Chairman - BoS Dept. of Chemistry - ESEC

Dept. of CSH - FSC

<ul> <li>To acquire basic English grammar.</li> <li>To develop listening skills to listen lectures and basic videos.</li> <li>To enhance the reading skills to express thoughts freely.</li> <li>To develop seaking skills to sepak fluently in real contexts.</li> </ul> Course Outcomes: At the end of this course, learners will be able to: <ol> <li>Improve language usage in LSRW skills.</li> <li>Develop listening skills to express the ideas of the learners.</li> <li>Acquire the ability to understand different written texts.</li> <li>Enhance the writing skills to express the ideas of the learners.</li> <li>Communicate fluently in real time context.</li> </ol> Int I LANGUAGE FOCUS 9 Parts of speech - Word formation - Sentence types (declarative, imperative, exclamatory & interrogative. Tense forms - Subject - Verb agreement Jnit I LISTENING 9 ats of speech - Word formation: Short conversations / monologues - Gap filling - Telephone competing the lyrics - Clear individual sounds - Word stress Jnit II READING 9 Completing the sentences - Prediction - Skimming for gist - Scanning for specific information - Jnderstanding text and sentence structure - Close reading Jnit IV WRITING 9 Paragraph writing (descriptive, narrative, expository & persuasive) - Letter (formal and informal) - Dialoguariting - Email - Instructions Jnit V SPEAKING 9 Paragraph writing (descriptive, narrative, expository & persuasive) - Letter (formal and informal) - Dialoguariting - Stare and dislikes TEXT BOOK(S): 1. Communicative English by KN Shoba ,Lourdes Joavani Rayen Publised by Cambridge university 2017. REFERENCE(S): 1 1 Acomputed English Crammar in Use – A Self-Study Reference and Practice Book For Intermediate learners Of English Lyd. Writing and Speaking. Indian ed. New Delhi: Oxford University Press. 2020. 2 2 Seely, John. Oxford G	Department	COMPUTER SCIENCE	AND	) EN	GIN	EERING		Semester	1
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<ul> <li>To develop listening skills to listen lectures and basic videos.</li> <li>To enhance the reading skills to comprehend technical writings.</li> <li>To improve writing skills to express thoughts freely.</li> <li>To develop speaking skills to express thoughts freely.</li> <li>To develop speaking skills to speak fluently in real contexts.</li> </ul> Course Outcomes: At the end of this course, learners will be able to: <ol> <li>Improve language usage in LSRW skills.</li> <li>Develop listening skills to comprehend general / technical talks.</li> <li>Acquire the ability to understand different written texts.</li> <li>Enhance the writing skills to express the ideas of the learners.</li> <li>Communicate fluently in real time context.</li> </ol> Jinit I LANGUAGE FOCUS 9 arts of speech - Word formation - Sentence types (declarative, imperative, exclamatory & interrogative Tense forms - Subject - Verb agreement 1 Jinit II LISTENING 9 settions - Telephone etiquette - Note-taking - Listening for gist / interviews - Listening to songs an ompleting the lyrics - Clear individual sounds - Word stress Init III READING 9 Scompleting the sentences - Prediction - Skimming for gist - Scanning for specific information - Inderstanding text and sentence structure - Close reading 1 Init IV WRITING 9 Paragraph writing (descriptive, narrative, expository & persuasive) - Letter (formal and informal) - Dialoguariting - E-mail - Instructions 1 Imit V SPEAKING 9 elf-introduction - Giving personal and factual information - Talking about present circumstances, pas xperiences and future plans - Mini-presentation - Expressing opinions and justifying opinions greement / disagreement - Likes and dislikes EXT BOOK(S): Communicative English by KN Shoba ,Lourdes Joavani Rayen Publised by Cambridge university 2017. EFFERENCE(S): 1 Murphy, Raymond. English Grammar in Use – A Self-Study Reference and Practice Book For Intermediate learners Of Eng									
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<ul> <li>2. Develop listening skills to comprehend general / technical talks.</li> <li>3. Acquire the ability to understand different written texts.</li> <li>4. Enhance the writing skills to express the ideas of the learners.</li> <li>5. Communicate fluently in real time context.</li> <li>Jnit I LANGUAGE FOCUS 9</li> </ul> Parts of speech - Word formation - Sentence types (declarative, imperative, exclamatory & interrogative. Tense forms - Subject - Verb agreement Jnit II LISTENING 9 Parts of specific information: Short conversations / monologues - Gap filling - Telephone conversations - Telephone etiquette - Note-taking - Listening for gist / interviews - Listening to songs an completing the lyrics - Clear individual sounds - Word stress Jinit III READING 9 Completing the sentences - Prediction - Skimming for gist - Scanning for specific information - Jnderstanding text and sentence structure - Close reading Jinit IV WRITING 9 Paragraph writing (descriptive, narrative, expository & persuasive) - Letter (formal and informal) - Dialogue writing - E-mail - Instructions 1 Init V SPEAKING 9 Paragraph writing (descriptive, narrative, expository & persuasive) - Letter (formal and informal) - Dialogue writing - E-mail - Instructions 1 Init V SPEAKING 9 Seelf-introduction - Giving personal and factual information - Talking about present circumstances, pas typeriences and future plans - Mini-presentation - Expressing opinions and justifying opinions typerement / disagreement - Likes and dislikes TEX BOOK(S): 1. Communicative English by KN Shoba ,Lourdes Joavani Rayen Publised by Cambridge university 2017. 3. Cemplish Jved. United Kingdom: Cambridge University Press. 2012. 2. Seely, John. Oxford Guide to Effective Writing and Speaking. Indian ed. New Delhi: Oxford University Press. 2005. 3. Anderson, Kenneth et al. Study Speaking: A Course in Spoken English for Academic Purposes. United		전 집법 가지가 잘 거 때 가지 않는다. 이렇는 다 같은 것 같은	will k	be at	ole to	<b>)</b> :			
<ul> <li>3. Acquire the ability to understand different written texts.</li> <li>4. Enhance the writing skills to express the ideas of the learners.</li> <li>5. Communicate fluently in real time context.</li> <li>Jnit   LANGUAGE FOCUS 9</li> <li>Parts of speech - Word formation - Sentence types (declarative, imperative, exclamatory &amp; interrogative. Tense forms - Subject - Verb agreement</li> <li>Jnit II LISTENING 9</li> <li>LISTENING 9</li> <li>Listening for specific information: Short conversations / monologues - Gap filling - Telephon. conversations - Telephone etiquette - Note-taking - Listening for gist / interviews - Listening to songs an completing the lyrics - Clear individual sounds - Word stress</li> <li>Jnit III READING 9</li> <li>Completing the sentences - Prediction - Skimming for gist - Scanning for specific information - Jnderstanding text and sentence structure - Close reading Jnit IV WRITING 9</li> <li>Paragraph writing (descriptive, narrative, expository &amp; persuasive) - Letter (formal and informal) - Dialogue vriting - E-mail - Instructions Jnit V SPEAKING 9</li> <li>Self-introduction - Giving personal and factual information - Talking about present circumstances, pas experiences and future plans - Mini-presentation - Expressing opinions and justifying opinions (greement / disagreement - Likes and dislikes TEXT BOOK(S):</li> <li>1. Communicative English by KN Shoba , Lourdes Joavani Rayen Publised by Cambridge university 2017.</li> <li><b>TEFERNCE(S):</b></li> <li>1 Murphy, Raymond. English Grammar in Use – A Self-Study Reference and Practice Book For Intermediate earners of English Ived. United Kingdom: Cambridge University Press. 2012.</li> <li>2 Seely, John. Oxford Guide to Effective Writing and Speaking. Indian ed. New Delhi: Oxford University Press. 2005.</li> <li>3 Anderson, Kenneth et al. Study Speaking: A Course in Spoken English for Academic Purposes. United</li> </ul>			/ <b>4 b</b>		1 4 - 11.				
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Department	COMPUTER SCIENCE AND E					R 2019	Semester I EE
Course Code	Course Name		Hour Wee		Credit	Total	Maximum
Jourse Coue		L	Т	Р	С	Hours	Marks
19TPS01	SOFT SKILLS - I	1	0	2	2	45	100
Course Object	tive (s): The purpose of learning this o	cours	e is				
<ul> <li>To enha</li> <li>To impression</li> <li>To development</li> </ul>	elop basic grammar knowledge in Engli ance Speaking Skills in English ove Verbal and Non-verbal Communica elop Confidence and Emotional Intellige elop Inter Personal Skills.	ation	Skills	S			
<ul> <li>Have co</li> <li>Speak fl</li> <li>Have go</li> <li>Handle a</li> <li>Work in</li> </ul>	mes: At the end of this course, learner ompetent knowledge of grammar luent English by enriching Vocabulary I ood Presentation Skills through verbal a any Situation with confidence by being a team by having team coherence and ctive English – Written English Grammar - Parts of Speech – Tense	Know and n emot I deal	ledge on ve tiona ing v	e. erbal Ily st vith p	commun able. beople.		6 n Dialogues, and
	– Writing. Exercises to practice and im					onstructio	n.Dialogues and
	ctive English – Spoken English						6
	Idioms & Phrases – Synonyms – Ar	ntony	ms.D	ialog	gues an	d Convers	sations -Writing
	actice and improve these skills.  f Communication & The Hidden Date	ta Inv	olve	h			6
	unication - Effective Communication -				g –Parapl	nrasing -	
Non Verbal Co	mmunication - Body Language of sel	f and	othe	ers.			
	eelings in communication - dealing with	h feel	ings	in co	ommunica	ation.	
	d of Teams – Part -01	vo el	illo	dovo	loning co	If confider	6 developing
emotional intelli	ent - importance of developing asserti	ve sr	1115-	ueve	loping se	in connuer	ice – developing
	d of Teams – Part -02					2	6
mportance of T	eam work - Team vs. Group - Attribute	es of a	a suc	cess	ful team -	- Barriers i	involved Working
	Dealing with People- Group Decision M	laking	<b>j</b> .		12.0		ny tree report of
PRACTICAL : 1	15 Hours						
<ol> <li>All the box</li> <li>Man's seat</li> <li>The great</li> <li>Goal - Eli</li> <li>Working w</li> <li>Excel in E</li> <li>Developin</li> <li>Essentials</li> <li>Effective I</li> <li>Strategic</li> <li>Wiley Indi</li> </ol>	en Habits of Highly Effective People - oks in the "Chicken Soup for the Soul" arch for meaning – Viktor Frankl test miracle in the world – Og Mandino iyahu Goldratt. with Emotional Intelligence - David Gold English – Sundra Samuel, Samuel Publ ng Communication Skills by Krishna Mo s of Effective Communication, Ludlow a Presentation Skills (A Fifty-Minute Seri interviewing" by Richaurd Camp, Mar ia Pvt. Ltd Group Discussion: Theory and Practic	emar licatic ohan and F es Bo y E. \	s. ons and Panth ook) /ielha	Mee ion; I by S aber	ra Banerji Prentice H teve Man and Jack	Hall of Indi del L. Simon	a. etti – Published k
808 - 1181		2.4	r.			Chai Dept. c	rman - BoS of CSE - ESEC

Departme	nt COMPUTE	R SCIENCE AND	ENGIN	EER	ING		R 2019	Semester	
Course	Cour	se Name	ŀ	lours Wee		Credit	Total	Maximu Marks	
Code			L	Т	Р	С	Hours	Warks	
19ES104		ROGRAMMING DRATORY	0	0	2	1	30	100	
The purpo To To Us Re Re Course O At the end	se of learning this con write, test, and debug implement Python pro- e functions for structu- present compound da ad and write data from utcomes: of this course, learned ite, test, and debug si	simple Python programs with condi- ring Python progra ta using Python li n/to files in Python ers will be able to	itionals a ams. ists, tupl n.	and lo					
<ul> <li>Imp</li> <li>De</li> <li>Us</li> <li>Re</li> </ul>	blement Python progra velop Python program e Python lists, tuples, ad and write data from periments	ams with condition as step-wise by de dictionaries for re	nals and efining fu present	Inctic	ons a				
<ul> <li>Imp</li> <li>Cree</li> <li>Exp</li> <li>Imp</li> <li>Imp</li> <li>Re</li> <li>De</li> <li>De</li> <li>De</li> <li>De</li> <li>Cree</li> </ul>	neration of Prime Nur plement a sequential s pate a calculator progr plore string functions plement Selection Sor plement Stack ad and write into a file monstrate usage of ba monstrate use of adva monstrate use of List monstrate use of Dicti nate Comma Separate needed : Python 3 in	search ram t asic regular expre anced regular exp onaries e Files (CSV), Loa	ressions ad CSV f	iles i	nto ir			ture	
TEXT BO									
1,	David Riley and Ker Chapman & Hall/CR		outationa	al Th	inkin	g for the	Modern	Problem S	Solver",
2	Michael Dawson ,"Py	thon Programmir	ng for the	e Abs	solute	e Beginne	er", 3rd E	Edition, 2010	
REFERE	ICE(S)	sate of the first	20 YA	1					
1.	M. Sprankle, "Problem New Delhi, 2011.								18.6
2.	Brian Heinold, "Intro 2013.			-			Y. Marke		
	Allen Downey, Green	n Tea Press Nee	dham, "	Think	< Pyt	thon, How	w to Thin	k Like a Co	mputer
3.	Scientist", Massachu								

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Course	COMPUTER SCIENCE AND	Н	NEE Iour Wee	s /	G Credit	R 2019 Total	Semester Maximun	-
Code	Course Name	L	T	P	С	Hours	Marks	
19ES108	ENGINEERING GRAPHICS	0	0	4	2	45	100	
<ul> <li>To prov metal a</li> </ul>	ective (s): The purpose of learning vide hands on training for fabricat and welding equipment / tools. the skills for making fitting joints	tion o	f co	mpo	nents us			
<ul> <li>To deverse electric</li> <li>To prov</li> </ul>	e tools. Hop the skills for preparing the gree cal connection Hide hands on training for dismantl d pumps.							
	elop the skills for making wood/she comes: At the end of this course,						tools	
Make f	ment/tools itting joints and household pipe line				using su	itable to	ols.	
suitab • Dismai	e green sand mould and make sin le tools ntle and assemble petrol engines, simple models using wood and she	gear b	oox a			cal conn	ections usi	ng
suitab • Dismai • Make s	le tools htle and assemble petrol engines, simple models using wood and she	gear b	oox a			cal conn	ections usi	ng
suitab Dismai Make s List of Expo 1. Formi Soap 2. Fabric	le tools ntle and assemble petrol engines, simple models using wood and she eriments ng of simple object in sheet meta Box sation of a simple component using	gear b et me using thin a	oox a tal. g su	itabl	oumps. e tools ( plates. (	Example Example	e: Dust Par e: Book rac	n ž
suitab Dismai Make s List of Exp 1. Formi Soap 2. Fabric 3. Makin box/ L	le tools ntle and assemble petrol engines, simple models using wood and she eriments ng of simple object in sheet metal Box eation of a simple component using g a simple component using carpe etter box.	gear b et me using thin a ntry p	oox a tal. g su and t owe	itabl thick	oumps. e tools ( plates. ( bls. (Exai	Example Example mple: Pe	e: Dust Par e: Book rac en stand/To	h اُ
suitab Dismai Make s List of Expension 1. Formi Soap 2. Fabric 3. Makin box/ L 4. Prepa 5. Const elbow	le tools ntle and assemble petrol engines, simple models using wood and she e <b>riments</b> ng of simple object in sheet metal Box sation of a simple component using g a simple component using carpe	gear b et me using thin a ntry p e joint tions t (or) C	box a tal. and t owe fron usin	itable thick thick fr too n the g pip truct	e tools ( plates. ( ols. (Exal given m pes, Tee a pipe o	Example Example mple: Pe nild Stee joint, Fo connecti	e: Dust Par e: Book rac en stand/To I flat. our way joir ons of hous	k)
suitab Disman Make s List of Expension 1. Forming Soap 2. Fabrico 3. Making box/ L 4. Prepa 5. Construe elbown applico 6. Prepa 7. Construe calling	le tools Intle and assemble petrol engines, simple models using wood and she <b>ariments</b> Ing of simple object in sheet metal Box Box ation of a simple component using g a simple component using carpe etter box. Inter a "V" (or) Half round (or) Square ruct a household pipe line connect , union, bend,Gate way and Taps	gear b et me using thin a ntry p joint ions u (or) C bend patter ectior	oox a tal. g su and t owe fron usin cons , gat cn/sp ns us	itabl itabl thick thick r toc truct truct te va blit p sing	e tools ( plates. ( ols. (Exal given m oes, Tee a pipe o lve, flang attern. indicator	Example Example mple: Pe nild Stee joint, Fo connecti ges and	e: Dust Par e: Book rac en stand/To I flat. our way joir ons of hous foot valve. ay switch wi	n k oo nt se

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Department	I YEAR B.E/B.TECH (COMMON	TO AL	LBF	RANC	HES)	R 2019	Semester
Course Code	Course Name	Hour	s / W	/eek	Credit	Total	Maximum
		L	Т	P	С	Hours	Marks
19BS105	CHEMISTRY LABORATORY	0	0	2	1	30	50

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

- 1. Determination of total, temporary & permanent hardness of water by EDTA method.
- 2. Determination of chloride content of water sample by Argentometric method.
- 3. Estimation of iron content of the given solution using potentiometer.
- 4. Determination of strength of given hydrochloric acid using pH meter
- 5. Conductometric titration of strong acid vs strong base.

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

- 1. Make the student to acquire practical skills in the determination of water quality parameters through volumetric analysis.
- 2. Acquire the knowledge about chloride content in water sample.
- 3. Make the student to acquire practical skills about strength of iron using potentiometric titrations.
- 4. Understand the how to estimate hydrochloric acid in water sample using pH meter.
- 5. Gain the knowledge about conductance of ions.

Exp No.	Name of Experiments (Any Five)
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 strength of given hydrochloric acid using pH meter.
4	Determination of strength of acids in a mixture of acids using conductivity meter.
5	Estimation of iron content of the given solution using potentiometer.
6	Conductometric titration of strong acid vs strong base.
7	Determination of molecular weight of polyvinyl alcohol using Ostwald viscometer
8	Estimation of iron content of the water sample using spectrophotometer

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20051 2010 AUTO AUTO AUTO AUTO	t COMPUTER SCIENCE AND E	NGINE	EERI	NG		R 2019	Semester	11
Course		Ho	urs/V	Veek	Credit	Total	Maximum N	larke
Code	Course Name	L	Т	Ρ	С	Hours	Waxintuni	ains
19BS20	VECTOR CALCULUS AND COMPLEX VARIABLES	3	1	0	4	60	100	
	ective (s): The purpose of learning this course							
of Cal Imple electro Devel	narize and apply the methodologies involved in culus viz: Vector, Vector Differentiation and Ve ment the Complex Analysis, an elegant method ostatics. op enough confidence to identify and model m priate solutions, using the skills learned in their	ector In d in the athem	ntegra e stud atica	ation. dy of I I patte	neat flow, erns in rea	fluid dyna Il world an	mics and d offer	S
	ng a complex function and solving through con							
Course Out	comes: At the end of this course, learners will						10	
	cterize the calculus of vectors.	17 i hi hi						
	the theoretical aspects of vector integral calcu nize the differentiation properties of complex f			core a	areas.			
and a state of the second state of the	y the complex functions and their mapping in c			nlex r	lanes			
	e concepts of integration to complex functions							
	FFERENTIATION OF VECTORS			- 3			- 18 S S	12
/ector point f	unction- Directional derivative - Gradient -Diver	gence	-Cu	rl - So	olenoidal -	- Irrotatior	al vector field	Is –
Scalar potenti		J		_				
Unit II 🛛 🛛 IN	TEGRATION OF VECTORS							12
	Line Integral - Surface integral- Green's theore	em in a	a plai	ne- St	oke's The	orem- Ga	uss divergend	e
	cations involving cubes and parallelepiped.		1.11	144	1	- Andrew	1	
	NALYTIC FUNCTIONS					-		12
	ions- Necessary and Sufficient conditions of A of Analytic Function using Milne Thompson m							
and the second	APPING OF COMPLEX FUNCTIONS			~	S			12
conformal ma	pping- Application of transformation: translation	n, rota	tion,	magn	ification a	nd inversi	on of multi	
alued functio	ns - Linear fractional Transformation (Bilinear t							
CARGE AND AND A STORE	OMPLEX INTEGRATION						Stelle - The	12
	amental Theorem - Cauchy's Integral Formula	a - Tay	lor's	and L	aurent's s	eries-Clas	sification of	
REFERENCE	Cauchy's Residue Theorem				-			_
the second s	eyszig , Advanced Engineering Mathematics,	Tenth	Editi	on, W	iley India	Private Lir	nited,New De	lhi
	Vylie and C. Louis Barrett, Advanced Engineer	ring Ma	ather	natics	, Tata Mc	Graw-Hill	Publishing	
2015 2 C. Ray \	v Ltd. 2003							
<sup>1</sup> 2015 2. C. Ray V Compar 3. J. A. Bro	y Ltd, 2003 wn and R. V. Churchill, Complex Variables an 196	d Appl	licatio	ons, S	Sixth Editi	on, McGra	w Hill,New	
2015 2. C. Ray V Compar 3. J. A. Bro Delhi, 19	wn and R. V. Churchill, Complex Variables an 196 O. Neil, Advanced Engineering Mathematics,							

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Chairman - BoS Dept. of Maths - ESEC

Department	COMPUTER SCIENCE AND	Sector and the	ours	Second Second	,		Semester	11
Course			Weel		Credit	Total	Maxim	
Code	Course Name	L	т	Ρ	С	Hours	Marl	(S
19MC201	ENVIRONMENTAL SCIENCE AND ENGINEERING	3	0	0	0	45	100	
<ol> <li>Study th</li> <li>Finding</li> <li>Know th</li> <li>Apply th</li> </ol>	tive (s): The purpose of learning this course in the nature and facts about environment. and implementing scientific, technological an the types of natural resources and the individua the knowledge to various social issues by under the integrated themes and biodiversity, natural	d eco al role erstan	in co ding	onsei the e	ving the r	esources. ntal legislati	ion laws.	
1. Extend of biodiv	mes: At the end of this course, learners will be their knowledge in maintaining ecological bala versity. the role of human being in maintaining a cle	ince ai	nd m					
generat	ions.							
resourc								
<ol> <li>Find the technique</li> </ol>	role of government and Non-Government or ues.	ganiza	ation	and	explain the	e various ra	in water harv	vesti
5. Develop	their awareness about population growth, I						//AIDS and	exte
their kn	owledge in role of information technology in e	nviron	men	t & h	uman hea	alth.		
Unit I ECC	OSYSTEMS AND BIODIVERSITY	s -Coi	ncep	ts of a	an ecosys	stem - Struct	ture and func	tion
Unit I ECC nvironment: So n ecosystem - nd functions o roductive use paching of wild	DSYSTEMS AND BIODIVERSITY cope – importance - need for public awarenes Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – B social - ethical - aesthetic values - Hotspot life and man wildlife conflicts.Conservation of	s -Cor ood c Biodiv ts of b	ncep hains ersity	ts of a s- foo y - va versity	an ecosys od webs - alue of bi y -Threats	stem - Struct types of eco odiversity - s to biodiver	osystem - str consumptiv sity - Habitat	tion uctu e us los
Unit I ECC nvironment: So n ecosystem - nd functions o roductive use oaching of wild	DSYSTEMS AND BIODIVERSITY cope – importance - need for public awarenes Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – f social - ethical - aesthetic values - Hotspot	s -Cor ood c Biodiv ts of b	ncep hains ersity	ts of a s- foo y - va versity	an ecosys od webs - alue of bi y -Threats	stem - Struct types of eco odiversity - s to biodiver	osystem - str consumptiv sity - Habitat	tion uctu e us los
Unit I ECC nvironment: So n ecosystem - nd functions of roductive use oaching of wild Unit II EN ollution: Cause olid waste mar	DSYSTEMS AND BIODIVERSITY cope – importance - need for public awarenes Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – B social - ethical - aesthetic values - Hotspot life and man wildlife conflicts.Conservation of	s -Cor ood c Biodiv ts of b f biodir on - W es of u	ncep hains ersity iodiv versi versi	ts of a s- foc y - va versity ty - Ir pollu	an ecosys od webs - alue of bi y -Threats n-situ and ution - Soi industrial	stem - Struct types of eco odiversity - to biodiver Ex-situ con	osystem - str consumptiv sity - Habitat servation. nd Noise pol	uctu e us t loss 8 ution
Unit I ECC nvironment: So n ecosystem - nd functions of roductive use - oaching of wild Unit II EN ollution: Cause olid waste man prevention of	DSYSTEMS AND BIODIVERSITY cope – importance - need for public awareness Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – B social - ethical - aesthetic values - Hotspot life and man wildlife conflicts.Conservation of VIRONMENTAL POLLUTION es - effects and control measures of Air pollution agement - Causes - effects -control measures	s -Cor ood c Biodiv ts of b f biodir on - W es of u	ncep hains ersity iodiv versi versi	ts of a s- foc y - va versity ty - Ir pollu	an ecosys od webs - alue of bi y -Threats n-situ and ution - Soi industrial	stem - Struct types of eco odiversity - to biodiver Ex-situ con	osystem - str consumptiv sity - Habitat servation. nd Noise pol	e us los: 8 utio
Unit I       ECC         Invironment: So       So         n ecosystem -       Ind functions of         nd functions of       So         roductive use -       So         oaching of wild       Init II         Unit II       EN         ollution: Cause       So         olid waste man       Init III         orest resource       No         orest resource - Food       So         ertilizer- pestici       So	DSYSTEMS AND BIODIVERSITY cope – importance - need for public awareness Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – B social - ethical - aesthetic values - Hotspot life and man wildlife conflicts.Conservation of VIRONMENTAL POLLUTION es - effects and control measures of Air pollution hagement - Causes - effects -control measures pollution - Disaster managements - Floods - control measures	es -Cor ood c Biodiv ts of b f biodir on - W es of u cyclon er resc on-env cause le ene	ncep hains ersity iodiv versi urbar urbar e- la ource viron d by ergy	ts of a s- foc y - va versity ty - Ir pollu ndslid and ndslid e - us ment agric source	an ecosys od webs - alue of bi y -Threats n-situ and industrial des. se-over ut al effects culture - E ces - sola	ilization of s of extracting ffects of m r energy - v	osystem - str consumptive sity - Habitat servation. nd Noise poll ole of an ind surface and g g and using n odern agrice wind energy	etion ructu e us t loss t loss ividu ividu grou nine ilture
Unit I       ECO         Invironment: Son ecosystem -       -         Ind functions of roductive use -       -         Ind functions of roductive use -       -         Ind functions of roductive use -       -         Ind functions of wild       Init II         Init II       EN         Init III       Init III         Init III       N/         Init IV       SO	DSYSTEMS AND BIODIVERSITY Cope – importance - need for public awareness Producers, consumers and decomposers - F f forest ecosystem and river ecosystem – H social - ethical - aesthetic values - Hotspot life and man wildlife conflicts.Conservation of VIRONMENTAL POLLUTION es - effects and control measures of Air pollutin hagement - Causes - effects -control measures pollution - Disaster managements - Floods - of ATURAL RESOURCES - Use-over exploitation -deforestation - Wate over water - Mineral resource - use-exploitation resources - world food problems changes of de problems - Energy resource - Renewabl degradation - soil erosion - Role of an individ CIAL ISSUES AND THE ENVIRONMENT	s -Cor ood c Biodiv ts of b f biodir on - W es of u cyclon er resc on-env cause le ene dual in	versi vater versi versi versi virbar e- la ource viron d by ergy con	ts of a s- foc y - va versity ty - Ir pollu ndslid and ndslid e - us ment agric sourc serva	an ecosys od webs - alue of bi y -Threats n-situ and industrial des. se-over ut al effects culture - E ces - sola ation of na	stem - Struct types of eco odiversity - s to biodiver Ex-situ con I pollution ar wastes - R ilization of s of extracting Effects of m r energy - v tural resour	osystem - str consumptive sity - Habitat servation. nd Noise poll ole of an ind surface and g g and using n odern agricu- wind energy rces.	etion ructu e us t los t los s utio ividu 9 grou nine ilture . La 9
Unit I       ECC         Environment: So       So         In ecosystem -       In ecosystem -         Ind functions of       Ind         roductive use -       So         Init II       EN         Pollution: Cause       So         Solid waste man       Init III         Init III       IN         Orest resource       So         Vater - conflicts       So         Sources - Food       Init IV         Sources - land       Init IV         Unit IV       SO         Sustainable & U       Hange-global w         f pollution) Act       SO	DSYSTEMS AND BIODIVERSITY         cope – importance - need for public awareness         Producers, consumers and decomposers - F         f forest ecosystem and river ecosystem – If         social - ethical - aesthetic values - Hotspot         life and man wildlife conflicts.Conservation of         VIRONMENTAL POLLUTION         es - effects and control measures of Air pollution         aggement - Causes - effects -control measures         pollution - Disaster managements - Floods - of         ATURAL RESOURCES         - Use-over exploitation -deforestation - Wate         over water - Mineral resource - use-exploitation         resources - world food problems changes of         de problems - Energy resource - Renewabl         degradation - soil erosion - Role of an individual	es -Cor ood c Biodiv ts of b f biodir on - W es of u cyclon er resc on-env cause le ene dual in ion - r	versi vater versi versi versi versi versi viron d by ergy con	ts of a s- foc y - va versity ty - Ir pollu ndslid e - us ment agric sourc serva vater t prof	an ecosys od webs - alue of bi y -Threats n-situ and industrial des. se-over ut al effects culture - E ces - sola ation of na harvestir	stem - Struct types of eco odiversity - s to biodiver Ex-situ con I pollution an wastes - R ilization of s of extracting Effects of m r energy - v tural resour	osystem - str consumptive sity - Habitat servation. nd Noise poll ole of an ind surface and g g and using n odern agrice wind energy rees. method)- cli ention and co	etion ructu e us t loss t loss st ution ividu 9 groun nine ilture . Lan <b>9</b> mate

Chairman - BoS Dept. of Chemistry - ESEC Dept. of CSE - ESEC

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.

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

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Chairman - BoS Dept. of Chemistry - ESEC

Dep	artment		ENGLISH					R 2019	Semester	H
	ourse	Course N	ame		ours Neek		Credit	Total	Maximum	1
С	ode			L	Т	Ρ	С	Hours	Marks	
19	HX201	ENGLISH FOR E	NGINEERS	3	0	0	3	45	100	
•	To devel To enha To impro To devel se Outcom . Improve	re the usage of gramma op listening skills which nee the reading skills to co we writing skills to expre op speaking skills to sp es: At the end of this co their language usage in listening skills to unders	will enable to lis comprehend tect ess thoughts free eak fluently in re- purse, learners w n LSRW skills.	sten lect hnical w ely. eal conte vill be al	riting exts. ple to	s. :		end differer	nt types of tex	ts.
34	. Acquire	the ability to understand the writing skills to exp	I different writter	n texts.						
5	. Commun	nicate fluently in pair / te				J.				
Unit I		GUAGE FOCUS	naach Canditia	nolo (	Colloo	otion	a Discou	urso marke	are One wor	9
		& Passive) - Reported s Phrasal verbs - Error ide		onais - C	01100	ation	s - Discoi		ers - One wor	u
Unit I		ENING							C	9
		pecific information - Ide	entifying sentend	ce stres	s - Rł	nythm	n - Intonat	tion		
Unit I	II REA	DING							ll ais anni - I	9
		ns and charts - Skimmir	ng and scanning	texts -	Ident	ifying	topic ser	ntences - l	Inderstanding	9
	structure o									9
Unit I		n, Letter and Resume -	Recommendati	ons - Re	anort	writir	na (accide	ent and su	vev) - Writing	-
rev	view ( book	and movie) - Transcod	ling (interpreting	charts	& diag	gram	s)	and out	voj) vinang	,
Unit \	/ SPE	AKING								9
La	nguage Fui d opinions	task - Turn taking (initia actions: suggesting - co	ting and respon- mparing and cor	ding app ntrasting	propri J - Ex	iately (pres	) - Negoti sing - finc	ating - Exc ling out fac	changing - cts, attitudes	
1. ( F	Revised Ed	itive English by KN Sho ition 2018	bba ,Lourdes Joa	avani Ra	ayen	Pub	lished by	Cambridge	e university	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	RENCE(S)					-				
1=	Jeremy Co Speaking	omfort, Pamela Rogerso Skills for Business Engli	on, Trish Stott, a ish, Cambridge:	and Der Cambri	ek Ut dge L	ley, S Jnive	Speaking rsity Pres	Effectively s, 2002.	and Develop	bin
2	Purposes.	lendinning and Beverly United Kingdom: Camb	oridge University	Press,	2004	•				_
3	Intermedia								actice Book	Fc
	and the second se	f English .Ived. United k		1.79-10 C						
	Cooky Joh	n. Oxford Guide to Effe	a ation Multimer an	ad Char	101020-000	I to all.	an od No	W Dolhi (	hytord I hivor	cit

Chairman - BoS Dept. of CSE - ESEC

Chairman - BoS Dept. of English - ESEC

Department	ENGLIS	SH				R 2019	Semester	1
Course	Course Name	1.	Hours / Week		Credit	Total Hours	Maximu Marks	
Code		L	Т	Р	С	nours	WIATKS	
19HX202	HINDI	3	0	0	3	45	100	
<ul><li>To help s</li><li>To teach</li></ul>	ve (s): The purpose of learning this countudents to acquire the basics of Hindi them how to converse in Hindi on variou To help learners acquire the ability to unnes: At the end of this course, learners we	us occasio derstand a	a sim	iple te	echnical te	ext in Hindi		
1. An at	oility to communicate effectively with: (a of the Hindi language (c) Proper vocabu	a) Improve		iency	in Hindi	(b) Clarity	on the basic	
Unit I HIND	I ALPHABET			100				9
the second se	NS IN HINDI		- avel		<b>Familia</b>	Decilia	, Evensione	9
Genders (Masci Init III PROM	uline & Feminine Nouns ending in a ,e,i,							9
Genders (Masci Jnit III PRON Categories of Pl	uline & Feminine Nouns ending in a ,e,i,	person (yo	ou &	hone	orific) - De	efinite & Ind	lefinite prono	uns
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Futur SIFIED VOCABULARY	person (yo e tense - A	ou & Asse	hono rtive	orific) - De & Negativ	efinite & Ind re Sentence	lefinite prono es - Interroga	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future	person (yo e tense - A	ou & Asse	hono rtive	orific) - De & Negativ	efinite & Ind re Sentence	lefinite prono es - Interroga	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS	uline & Feminine Nouns ending in a ,e,i, IOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege	person (yo e tense - A	ou & Asse	hono rtive	orific) - De & Negativ	efinite & Ind re Sentence	lefinite prono es - Interroga	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA	uline & Feminine Nouns ending in a ,e,i, IOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege	person (yc e tense - A etables - C	ou & Asse	hono rtive	orific) - De & Negativ	efinite & Ind re Sentence	lefinite prono es - Interroga	9 uns tive
Genders (Masci Jnit III PRON Categories of Pr - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Futur SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege KING	person (yc e tense - A etables - C	ou & Asse	hono rtive	orific) - De & Negativ	efinite & Ind re Sentence	lefinite prono es - Interroga	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences EXT BOOK(S):	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Futur SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege KING	person (yc e tense - A etables - C ns.	ou & Asse	hono rtive es - [	Drific) - De & Negativ	efinite & Ind re Sentence -Seasons -	lefinite prono es - Interroga Professions.	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences EXT BOOK(S): 1.	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege KING a - Speaking practice for various occasio	person (yc e tense - A etables - C ns. ay Situation	ou & Asse Clothe	hono rtive es - [	Drific) - De & Negativ	efinite & Ind re Sentence -Seasons -	lefinite prono es - Interroga Professions.	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences EXT BOOK(S): 1. Elementary I 2 Colloquial Hi REFERENCE(S)	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege KING - Speaking practice for various occasio Hindi: Learn to Communicate in Everyda ndi: The Complete Course for Beginners :	person (yc e tense - A etables - C ns. ay Situation s by Tej K.	Du & Asse	honc rtive es - [ y Ric atia	Directions	efinite & Ind re Sentence -Seasons -	Professions.	9 uns tive
Genders (Masci Jnit III PRON Categories of Pro- Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences EXT BOOK(S): 1. Elementary I 2 Colloquial Hi REFERENCE(S)	uline & Feminine Nouns ending in a ,e,i, <b>IOUNS AND TENSES</b> ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future <b>SIFIED VOCABULARY</b> elatives - Spices- Eatables- Fruit & Vege <b>KING</b> - Speaking practice for various occasio Hindi: Learn to Communicate in Everyda ndi: The Complete Course for Beginners	person (yc e tense - A etables - C ns. ay Situation s by Tej K.	Du & Asse	honc rtive es - [ y Ric atia	Directions	efinite & Ind re Sentence -Seasons -	Professions.	9 uns tive
Genders (Masci Jnit III PRON Categories of Pl - Relative prono Sentences. Unit IV CLAS Parts of body - R Unit V SPEA Model Sentences EXT BOOK(S): 1. Elementary I 2 Colloquial Hi REFERENCE(S) 1 B. R. Kisho (P) Ltd., Ne 2 Syed, Pray	uline & Feminine Nouns ending in a ,e,i, NOUNS AND TENSES ronouns - Personal Pronouns - Second uns - Present tense - Past tense - Future SIFIED VOCABULARY elatives - Spices- Eatables- Fruit & Vege KING - Speaking practice for various occasio Hindi: Learn to Communicate in Everyda ndi: The Complete Course for Beginners : pre, Self Hindi Teacher for Non-Hindi Spi	person (yc e tense - A etables - C ns. ay Situation s by Tej K eaking Per akasan, N	Du & Asse Cloth ns by . Bha ople	hono rtive es - [ y Ric atia , Vee Delhi,	Directions	efinite & Ind re Sentence -Seasons -	Professions.	9 uns tive

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Chairman - BoS Dept. of CSE - ESEC

Department	ENGLI	SH				R 2019	Semester	1	
Course	Course Name	2.9	lour: Wee		Credit	Total Hours	Maximur Marks		
Code		L	т	Р	С	nours	Marks		
19HX203	JAPANESE	3	0	0	3	45	100		
<ul> <li>To help st</li> <li>To teach t</li> </ul>	<b>ve (s):</b> The purpose of learning this cou udents acquire the basics of Japanese them how to converse in Japanese in v he students the Japanese cultural face	language arious occ	casio		te				
<ol> <li>Improved</li> <li>Clarity on</li> <li>Proper vol</li> </ol>	es: At the end of this course, learners fluency in Japanese the basic sounds of the Japanese lan cabulary fuction		e to	com	nunicate		with.	9	
troduction to Jap ronunciation of ir	panese - Japanese script - Pronunciation n,tsu,ga - Letters combined with ya,yu,y a N2 ja arimasen - S ka - N1mo - N1 no	yo - Daily	Gree	tings	and Expr	essions Nu	imerals. N1		
			1 1 1		reorniou	Jupanooo			
	umbers) - Phonetic and semantic resen			een T					
Discription of the second seco	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a	nblances k no N1 - so chira - N1	des · wa N	- so j 12 (P	amil and a arimase lace) des	Japanese n - S1 ka - - dhoko-N1	S2 ka - N1 no no N2 - Kanji	) -	
Decabulary (25 Nu       Jnit II     Vocal       troduction - Kore       1 - so des ka ' ko       - imaji-fun des       1 kara N2 des - N       Jnit III       Noun       1(Place) ye ikima       kayerim	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a s - Introduction of verb - V mas - V ma N1 tho N2 / S ne Kanji-10 - Technical Ja & Types 名詞とタイプ as - ki mas - kayerimasu - Dhoko ye mo asu - N1(Personal or Animal) tho V iths	nblances b no N1 - so chira - N1 sen - V ma apanese V skimasen - su - S yo	des wa N ashiti ′ocat ikima	- so ji 12 (P ha-V bulary aseno wo V	a arimase ace) des masen de / (25 Num dheshitha (Transitiv	Japanese - dhoko-N1 eshitha - N ibers) - Dict - N1(vehicl e) - N1 wo s	S2 ka - N1 no no N2 - Kanji 1(Time) ne V tionary Usage le) de ikimasu shimus - Nani	0 - - 9	
ocabulary (25 Nu       Jnit II     Vocal       troduction - Kore       1 - so des ka ' ko       0 - imaji-fun des       1 kara N2 des - N       Jnit III     Noun       1(Place) ye ikima       kimasu - kayerim       o shimasu ka - N       Nord / Sentence	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 e - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a s - Introduction of verb - V mas - V ma N1 tho N2 / S ne Kanji-10 - Technical Ja & Types 名詞とタイプ as - ki mas - kayerimasu - Dhoko ye mo asu - N1(Personal or Animal) tho V iths an & Nani - N1(Place) de V - V masen wa go nan des ka - N1(Person) ne ag	nblances k no N1 - so chira - N1 sen - V ma apanese V kimasen - su - S yo ka - V ma emus - N1	des wa N wa N ashiti ′ocat ikima N1 v sho - ( Per	- so ja N2 (P ha-V bular) aseno wo V - Oo. rson	a arimase lace) des masen de (25 Num dheshitha (Transitiv Kanji-10 ) ne mora	Japanese - dhoko-N1 eshitha - N' bers) - Dict - N1(vehicl e) - N1 wo s , N1( tool - imus - mo V	S2 ka - N1 no no N2 - Kanji 1(Time) ne V tionary Usage le) de ikimasu shimus - Nani means ) de V / shimashitha	0 - - 9	
ocabulary (25 NuUnit IIVocalutroduction - Kore1 - so des ka ' ko0 - imaji-fun des1 kara N2 des - NUnit IIINoun1(Place) ye ikimakimasu - kayerimo shimasu ka - NWord / SentenceKanji-10 - Japar	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 e - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a s - Introduction of verb - V mas - V ma N1 tho N2 / S ne Kanji-10 - Technical Ja & Types 名詞とタイプ as - ki mas - kayerimasu - Dhoko ye mo asu - N1(Personal or Animal) tho V iths lan & Nani - N1(Place) de V - V masen wa go nan des ka - N1(Person ) ne ag mese Typewriting using JWPCE Softwa	nblances k no N1 - so chira - N1 sen - V ma apanese V kimasen - su - S yo ka - V ma emus - N1	des wa N wa N ashiti ′ocat ikima N1 v sho - ( Per	- so ja N2 (P ha-V bular) aseno wo V - Oo. rson	a arimase lace) des masen de (25 Num dheshitha (Transitiv Kanji-10 ) ne mora	Japanese - dhoko-N1 eshitha - N' bers) - Dict - N1(vehicl e) - N1 wo s , N1( tool - imus - mo V	S2 ka - N1 no no N2 - Kanji 1(Time) ne V tionary Usage le) de ikimasu shimus - Nani means ) de V / shimashitha	9	
Ocabulary (25 NuUnit IIVocalIntroduction - Kore1 - so des ka ' ko0 - imaji-fun des1 kara N2 des - NUnit IIINoun1(Place) ye ikimaskimasu - kayerimo shimasu ka - NWord / Sentence, Kanji-10 - JaparUnit IVVocabtroduction to Adjadho des ka - N11 gakiraimasu - je arimasu - S1 kara Se arimasu - iimas	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 e - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a s - Introduction of verb - V mas - V ma N1 tho N2 / S ne Kanji-10 - Technical Ja & Types 名詞とタイプ as - ki mas - kayerimasu - Dhoko ye mo asu - N1(Personal or Animal) tho V iths an & Nani - N1(Place) de V - V masen wa go nan des ka - N1(Person) ne ag nese Typewriting using JWPCE Softwa bulary & Grammar 語彙と文法 ectives - N1wanaadj des. N1 wa ii adj o wadhonna N2 des ka - S1 ka S2 - dho ozu des - hetha des - dhonna N1 - Us S2 - dhoshithe, N1 gaarimasu - imasuN su - N1(Person,Place,or Thing ) no N2	nblances k no N1 - so chira - N1 sen - V ma apanese V ikimasen - su - S yo ka - V ma emus - N1 are, Techn des - naad ore - N1 ga ages of yo 1(Place) n (Position)	des - wa N ashiti 'ocat ikima 'ocat ''ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat	- so ji N2 (P ha-V bular) aseno wo V - Oo. rson Japar N1 - ii nasu dhait gaan ya N	a arimase lace) des masen de (25 Num dheshitha (Transitiv Kanji-10 ) ne mora nese Voca i adj ii N1 - wakarim thai - thak rimasu - ii 2, Kanji-1	Japanese - dhoko-N1 eshitha - N1 eshitha - N1 bers) - Dict - N1(vehicle - N1(vehicle - N1 wo s , N1( tool - imus - mo Va bulary (25 - Thothemo hasu - N1 ga usan - suk masu - N1 yo	S2 ka - N1 no no N2 - Kanji 1(Time) ne V tionary Usage le) de ikimasu shimus - Nani means ) de V / shimashitha Numbers) o - amari - N1 a suki masu - oshi - amari - wa N2(Place)	9	
ocabulary (25 NuUnit IIVocalutroduction - Kore1 - so des ka ' ko0 - imaji-fun des1 kara N2 des - NUnit IIINoun1(Place) ye ikimakimasu - kayerimo shimasu ka - NNord / SentenceKanji-10 - JaparJnit IVVocabtroduction to Adjadho des ka - N11 gakiraimasu - jenzen - S1 kara Se arimasu - iimassage using JWPC	umbers) - Phonetic and semantic resen bulary & Grammar 語彙と文法 e - Sore - are - Kono N1 - Sono N1 - an ko - soko - asoko - kochira - sochira - a s - Introduction of verb - V mas - V ma N1 tho N2 / S ne Kanji-10 - Technical Ja & Types 名詞とタイプ as - ki mas - kayerimasu - Dhoko ye mo asu - N1(Personal or Animal) tho V iths lan & Nani - N1(Place) de V - V masen wa go nan des ka - N1(Person ) ne ag nese Typewriting using JWPCE Softwa pulary & Grammar 語彙と文法 ectives - N1wanaadj des. N1 wa ii adj o I wadhonna N2 des ka - S1 ka S2 - dho ozu des - hetha des - dhonna N1 - Us S2 - dhoshithe, N1 gaarimasu - imasuN	nblances k no N1 - so chira - N1 sen - V ma apanese V ikimasen - su - S yo ka - V ma emus - N1 are, Techn des - naad ore - N1 ga ages of yo 1(Place) n (Position)	des - wa N ashiti 'ocat ikima 'ocat ''ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat 'ocat	- so ji N2 (P ha-V bular) aseno wo V - Oo. rson Japar N1 - ii nasu dhait gaan ya N	a arimase lace) des masen de (25 Num dheshitha (Transitiv Kanji-10 ) ne mora nese Voca i adj ii N1 - wakarim thai - thak rimasu - ii 2, Kanji-1	Japanese - dhoko-N1 eshitha - N1 eshitha - N1 bers) - Dict - N1(vehicle - N1(vehicle - N1 wo s , N1( tool - imus - mo Va bulary (25 - Thothemo hasu - N1 ga usan - suk masu - N1 yo	S2 ka - N1 no no N2 - Kanji 1(Time) ne V tionary Usage le) de ikimasu shimus - Nani means ) de V / shimashitha Numbers) o - amari - N1 a suki masu - oshi - amari - wa N2(Place)	9 9	

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Chairman - BoS Dept. of CSE - ESEC

. (	ourse Code	Course Norma	Hou	re / 1					-
	Code			15/1	Neek	Credit	Total	Maximur	n
19		Course Name	L	T	P	С	Hours	Marks	3
	HX204	FRENCH	3	0	0	3	45	100	
Cou • •	To help s	ve (s): The purpose of learning this co tudents acquire the basics of French la them how to converse in French in var	anguage	sions					
		<b>nes</b> : At the end of this course, learners vill become familiar with the basics of F				start conv	versing in F	French.	
Unit	I Alpha	abet Français	5.070010	-		N. Carlos		The second	(
édille		s (alphabets) - Les Accents Français (th n nom dans le français (spellingone -s <)							
Unit	ll Num	bers, month & year ( Nombre, mois et	année)	1			NS I I I I		6
es no	oms de moi	s de l'année (Months) - Numéro 1 à 10	0 (Number	rs 1 to	o 100	) GRAM	MAIRE :Co	njugaison	1
Unit	III Lang	uage Skills & Grammar (Compétence	s linguistiq	ues et	t gram	maire)			10
Unit		nmar (et grammaire)							12
omm	uns (Comm	ns) - Noms communs masculins et de on verbs)COUTER :couter et crier les j utilisateurs d'interlingua (alter ego)PAR	ornoms - C	bser	ver le	s dessins	et couter l	es dialogues	
Unit	V Spea	aking & Writing (Parler et écrire)							11
u terr onver	nps - La Fra	om et l'endroit où on vit - Son âge et da nce en Europe PARLER :Conversatior ) alter ego)ÉCRIRE :Écrireune carte po	n entre deu						
1.	• •	age by M. Grevisse Publisher- Duculot	14 edition	(25 .	Janua	ry 2001)			
2	Advanced	French by Monique L'Huillier, Cambridg	ge Univers	ity P	ress,2	2013			8
REFE	ERENCE(S)	:	-	-	-				
1		Niveau a1			1				
2		e Progressive du Français							
3	and a share the state of the	sy Learning French Verbs& Practice		i.k				And inc. (A	
3	Francais	nguaphone					N. S. S. R. S.		11.5
4 5	and the second se	Harrisonburg: The Rosetta Stone: Fairl	Gald Lanau		Tealer	la ete -	Contraction and the		

	artment	COMPUTER SCIENCE AND EN	IGINE	EERI	NG		R 2019	Semester	1
Course Co	se Code	Course Name	Hour			Credit	Total	Maximu Marks	n
	/		L	Т	Ρ	С	Hours	IVIdINS	
19E	S202	ADVANCED C PROGRAMMING	3	0	0	3	45	100	
Course	e Objective	e (s):							
The pu	rpose of lea	arning this course is							
•**	To develop	C Programs using basic programming	g cons	struc	ts				
Boall	To develop	C programs using arrays and strings							
•=	To develop	applications in C using functions, poi	nters	and	struc	tures			-
•**	To do input	output and file handling in C							
		rrupts in C Programming							
		vel programming	-			2			
	e Outcome								
		course, learners will be able to							
		pplications using Arrays and Strings.					- A		
	and the second	pplications using Function and Pointe	rs.						
•= D	evelop app	lication using structure and union.							
• D	esign a C a	application using Sequential and Ranc	lom a	cces	s file	2			
• D	evelop pro	gram using Interrupts & bit level opera	tions						
Unit I	CONST	RUCTS OF C							9
l exical	elements -	- Operators - data types – I/O stateme	nte -	form	at an				nto
		operators data types no staterne	1113 -	IOIIII	alsp	ecificatio	ns – cont	rol stateme	nus
		and looping	1113 -	IOIIII	atsp	ecificatio	ns – cont	rol stateme	nis
- decis	sion making		1113 -			ecificatio	ns – cont	rol stateme	
– decis Unit II	sion making	and looping S & FUNCTIONS						_	9
– decis <b>Unit II</b> Array multidir	aion making ARRAY handling i mensional	and looping <b>S &amp; FUNCTIONS</b> n C – declaration – single dime arrays, sorting and searching on sir	nsion Igle a	al a nd t	array: wo d	s, two - limensior	- dimena	sional arra s. Array oro	9 ys, der
– decis Unit II Array multidir reversa	sion making ARRAY handling i mensional al, array cou	and looping <b>S &amp; FUNCTIONS</b> n C – declaration – single dime arrays, sorting and searching on sir unting or histogramming, finding the m	nsion igle a	al a nd t um n	arrays wo d	s, two - limensior er in a se	- dimena nal arraya t, remova	sional arra s. Array oro al of duplica	9 ys, der tes
<ul> <li>decis</li> <li>Unit II</li> <li>Array</li> <li>multidir</li> <li>reversa</li> <li>from ar</li> </ul>	sion making ARRAY handling i mensional al, array cou n ordered a	and looping <b>S &amp; FUNCTIONS</b> n C – declaration – single dime arrays, sorting and searching on sir unting or histogramming, finding the m array, partition an array, finding the k	nsion igle a aximu th-sm	al a nd t um n alles	arrays wo d umb	s, two - limensior er in a se ment stri	- dimens nal arrays t, remova ngs: Cha	sional arra s. Array oro al of duplica aracter array	9 ys, der tes
<ul> <li>decis</li> <li>Unit II</li> <li>Array</li> <li>multidir</li> <li>reversa</li> <li>from ar</li> <li>string h</li> </ul>	sion making ARRAY handling i mensional al, array cou n ordered a nandling fu	and looping <b>S &amp; FUNCTIONS</b> In C – declaration – single dime arrays, sorting and searching on sir unting or histogramming, finding the m array, partition an array, finding the k nctions – manipulation on strings. Pr	nsion ngle a aximu th-sm	al a nd t um n alles pe –	arrays wo c umb t ele decla	s, two - limensior er in a se ment stri aration -	- dimens nal arrays t, remova ngs: Cha argumen	sional arra s. Array oro al of duplica aracter array ts (formal a	9 ys, der tes
<ul> <li>decis</li> <li>Unit II</li> <li>Array</li> <li>multidir</li> <li>reversa</li> <li>from ar</li> <li>string h</li> <li>actual)</li> </ul>	sion making ARRAY handling i mensional al, array cou n ordered a handling fu – return typ	and looping <b>S &amp; FUNCTIONS</b> In C – declaration – single dime arrays, sorting and searching on sir unting or histogramming, finding the m array, partition an array, finding the k inctions – manipulation on strings. Pr bes – types of functions difference bet	nsion ngle a aximu th-sm	al a nd t um n alles pe –	arrays wo c umb t ele decla	s, two - limensior er in a se ment stri aration -	- dimens nal arrays t, remova ngs: Cha argumen	sional arra s. Array oro al of duplica aracter array ts (formal a	9 ys, der tes / -
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1.	Pradip Dey, Manas Ghosh, —Fundamentals of Computing and Programming in C, Firs Edition, Oxford University Press, 2009.
2.	Byron S. Gottfried, "Schaum's Outline of Theory and Problems of Programming with C", McGraw-Hill Education, 1996.
3.	Ivor Hortan, Instant C Programming, Wrox Press, 1995

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Department	nent COMPUTER SCIENCE AND E		INEE	RING	G	R 2019	Semester I	11
Course	Course Name		lours Wee		Total		Maximum	1
Code		L	т	Р	С	Hours	Marks	
19BS204	PHYSICS FOR INFORMATION SCIENCE	3	0	0	3	45	100	

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

To understand the essential principles of Physics of semiconductor device and Electron transport properties. Become proficient in magnetic, super conducting and optical properties of materials and applications of Nanomaterials in computer

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

- To acquire knowledge on basics of semiconductor physics and its applications in various devices, .
- To get knowledge on magnetic properties of materials and their applications .
- To gain knowledge on super conducting materials and quantum computing ....
- To have the necessary understanding on the functioning of optical materials for optoelectronics, .
- To understand the basics of nanomaterials and carbon nanotubes. .....

#### Unit I SEMICONDUCTOR PHYSICS

Introduction- types of semiconductors - Intrinsic Semiconductors - Energy band diagram - direct and indirect band gap semiconductors - Carrier concentration in intrinsic semiconductors - extrinsic semiconductors - Carrier concentration in N-type & P-type semiconductors - Hall effect theory (n-type and p-type semiconductors) and its experiment- Applications- FET, MOSFET and Silicon control rectifier (qualitative treatment only).

#### MAGNETIC PROPERTIES OF MATERIALS Unit II

Magnetism in materials - magnetic field and induction - magnetization - magnetic permeability and susceptibility-types of magnetic materials - microscopic classification of magnetic materials Ferromagnetism: origin and exchange interaction- Domain Theory, Hysteresis, soft and hard magnetic materials-Ferrites-applications-magnetic recording and readout-storage of magnetic data-Tapes, Floppy disc and magnetic disk drives and GMR

#### SUPER CONDUCTING MATERIALS Unit III

Introduction-super conducting phenomena-Properties of super conductors-Meissner effect-isotope effect-Type I & Type II super conductor, High TC super conductor-Applications of super conductor-Magnetic levitation and SQUIDS- super conducting computing-quantum computing (qualitative concepts)

#### OPTICAL MATERIALS Unit IV

Classification of optical materials - carrier generation and recombination processes - Absorption emission and scattering of light in metals, insulators and Semiconductors (concepts only) - Excitons - Traps Luminescence - Flourescence and phosphorescence - LCD, Optical storage device-CD ROM-DVD ROM-Blu ray-DVD RAM 9

#### NANOELECTRONIC DEVICES Unit V

Introduction - Nanomaterials-Synthesis-physical vapour deposition-quantum confinement - quantum dot-Applications of nanomaterials- 3D printers-magnetic semiconductors- spintronics - Nanobots-Single electron transistor-DNA computing- Carbon nanotubes: preparation-Chemical Vapour Deposition technique- Properties and applications

Chairman - BoS Dept. of Physics - ESEC

hairman - BoS Dept. of CSE - ESEC

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ILA.	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.
REFI	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

/ Chairman - Dos Pept. of Physics - ESEC

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Department Course	COMPUTER SCIENCE AND	ENGINE Hour Wee	s /	Credi	R 2019 Total	Semester Maximur	 n								
Code	Course Name	L T P C Hours		Hours		Hours		Hours		Hours		L Hours			
19ES205	FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING	3 0		3	45	100									
<ul> <li>To know</li> <li>To under</li> <li>To explation</li> <li>To explation</li> </ul>	ctive (s): The purpose of learning th about the Electric circuit laws, singl rstand the Function of electrical mac in the fundamentals of semiconduct in the principles of digital electronics rstand the various measuring instrur	e and thr chines. or and ap s	ee pha		s and wiring										
<ol> <li>Apply the</li> <li>Analyze</li> <li>Understa</li> </ol>	omes: At the end of this course, lea e concept of electric circuit laws to a the working principles of electrical m and the concepts of various electron	nalyze th nachines.	e elec		S.										
5. Choose	he logic gates, Half and Full adder. appropriate instruments for electrica ECTRICAL CIRCUITS	l measur	ement	for a spe	cific applica	tion	9								
5. Choose : Jnit I ELI Ohm's Law – Waveforms a Circuits.	appropriate instruments for electrica	olution o	FDC (	Circuits -	Introduction	n to AC Circu	its - nced								
5. Choose : Jnit I ELI Ohm's Law – Waveforms a Circuits. Jnit II EL Construction, Motors, Single	appropriate instruments for electrica ECTRICAL CIRCUITS - Kirchoff's Laws – Steady State S and RMS Value – Power and Power ECTRICAL MECHANICS Principle of Operation , Basic E e Phase Transformer, single phase	olution o er factor Equations induction	f DC ( – Sing and Motor	Circuits – gle Phase Applicati	Introduction and Three	n to AC Circu e Phase Balar	its – nced 9 DC								
5. Choose a Unit I ELI Ohm's Law – Waveforms a Circuits. Unit II EL Construction, Motors, Single Unit III SE Characteristic and Full wave and Characte	appropriate instruments for electrica ECTRICAL CIRCUITS - Kirchoff's Laws – Steady State S and RMS Value – Power and Power ECTRICAL MECHANICS Principle of Operation, Basic E e Phase Transformer, single phase i EMICONDUCTOR DEVICES AND A is of PN Junction Diode – Zener Eff Rectifiers – Voltage Regulation. Bip ristics	olution or er factor Equations induction PPLICA	f DC ( – Sing and Motor <b>FIONS</b>	Circuits – gle Phase Applicati	Introduction and Three ons of DC	n to AC Circul e Phase Balar Generators, ristics – Half w	nced 9 DC 9 vave								
5. Choose a Jnit I ELI Ohm's Law – Waveforms a Circuits. Jnit II EL Construction, Motors, Single Jnit III SE Characteristic and Full wave and Characte Jnit IV DI	appropriate instruments for electrica ECTRICAL CIRCUITS - Kirchoff's Laws – Steady State S and RMS Value – Power and Power ECTRICAL MECHANICS Principle of Operation , Basic E Phase Transformer, single phase MICONDUCTOR DEVICES AND A is of PN Junction Diode – Zener Eff Rectifiers – Voltage Regulation. Bip ristics GITAL ELECTRONICS	olution of er factor Equations induction <b>PPLICA</b> fect – Zen olar Junc	and Motor <b>FIONS</b> TIONS	Circuits – gle Phase Applicati ode and in ransistor	Introduction and Three ons of DC s Characte – CB, CE, 0	n to AC Circui e Phase Balar Generators, ristics – Half w CC Configurat	its – nced 9 DC 9 vave tions								
5. Choose a Jnit I ELI Ohm's Law – Waveforms a Circuits. Jnit II EL Construction, Motors, Single Jnit III SE Characteristic and Full wave and Characte Jnit IV DI Binary Numb Registers and	Appropriate instruments for electrical ECTRICAL CIRCUITS - Kirchoff's Laws – Steady State S and RMS Value – Power and Power ECTRICAL MECHANICS Principle of Operation , Basic E Phase Transformer, single phase in EMICONDUCTOR DEVICES AND A Constant of PN Junction Diode – Zener Effe Rectifiers – Voltage Regulation. Bip ristics GITAL ELECTRONICS Der System – Logic Gates – Boole I Counters – A/D and D/A Conversion	olution or er factor Equations induction <b>PPLICA</b> fect – Zer olar Junc ean Alge	and Motor FIONS Der Did tion T	Circuits – gle Phase Applicati ode and in ransistor Half and	Introduction and Three ons of DC s Characte – CB, CE, 0	n to AC Circui e Phase Balar Generators, ristics – Half w CC Configurat	lits – nced DC DC 9 vave tions 9 lops								
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1.	D P Kothari and I.J Nagarath, "Electrical Machines "Basic Electrical and Electronics Engineering", McGraw Hill Education(India) Private Limited, Third Reprint ,2016
2.	Thereja .B.L., "Fundamentals of Electrical Engineering and Electronics", S. Chand & Co. Ltd., 2008
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1.	Del Toro, "Electrical Engineering Fundamentals", Pearson Education, New Delhi, 2007
2.	Allan S Moris, "Measurement and Instrumentation Principles", Elseveir, First Indian Edition, 2006
3.	Rajendra Prasad, "Fundamentals of Electrical Engineering", Prentice Hall of India, 2006

Chairman - BoS Dept. of CSE - ESEC

A

Course Objective (s): The purpose of learning this course is         • To train the Students on Group Discussion Do's and Don'ts.         • To coach the students on Interview Skills.         • To develop Presentation Skills.         • To teach importance of Ethics and Values.         Course Outcomes: At the end of this course, learners will be able to:         • Participate Group Discussion with Confidence by knowing the tips and Tricks.         • Attend the interview with positive attitude by having Mock Interviews.         • Present them very well by enhancing their Presentation Skills.         • Behave very well in official gathering and Meeting by knowing Etiquette.         • Have good ethics and values in their Personal and Professional Life.         JNIT 1 GROUP DISCUSSION       6         GD skills – Understanding the objective and skills tested in a GD – General types of GDs - Roles in a GD – Do's & Don'ts – Mock GD & Feedback.         JNIT 2 INTERVIEW SKILLS       6         resentation Skills – Self preparation checklist – Grooming tips: do's & don'ts – mock interview & aedback.         JNIT 3 PRESENTATION SKILLS       6         resentation Skills – Stages involved in an effective presentation – selection of topic, content, aids – ingaging the audience – Time management – Mock Presentations & Feedback.         JNIT 4 Business Etiquette       6         Grooming etiquette – Telephone & E-mail etiquette – Dining etiquette – do's & Don'ts in a formal setting how to impress.	Course Name         Week         Credit         Total         Marks           Gode         L         T         P         C         Hours         Marks           9TPS02         SOFT SKILLS - II         1         0         2         2         45         100           ourse Objective (s): The purpose of learning this course is         - <th>Department</th> <th>COMPUTER SCIENCE AND</th> <th></th> <th></th> <th></th> <th></th> <th>R 2019</th> <th>Semester II EE</th>	Department	COMPUTER SCIENCE AND					R 2019	Semester II EE
Course       L       I <th>Coule       L       I       P       C       Matrix         igTPS02       SOFT SKILLS - II       1       0       2       2       45       100         iourse Objective (s): The purpose of learning this course is       .       .       To train the Students on Group Discussion Do's and Don'ts.       .</th> <th>C. 5939405, 359</th> <th>Course Name</th> <th></th> <th>Wee</th> <th>k</th> <th></th> <th></th> <th>25-27 S</th>	Coule       L       I       P       C       Matrix         igTPS02       SOFT SKILLS - II       1       0       2       2       45       100         iourse Objective (s): The purpose of learning this course is       .       .       To train the Students on Group Discussion Do's and Don'ts.       .	C. 5939405, 359	Course Name		Wee	k			25-27 S
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To coach the students on Interview Skills.     To develop Presentation Skills.     To develop Discusses Etiquette.     To teach importance of Ethics and Values.     To teach importance of Ethics and Values.     Participate Group Discussion with Confidence by knowing the tips and Tricks.     Attend the interview with positive attitude by having Mock Interviews.     Present them very well by enhancing their Presentation Skills.     Behave very well in official gathering and Meeting by knowing Etiquette.     Have good ethics and values in their Personal and Professional Life.     INIT 1 [GROUP DISCUSSION [6]     GROUP DISCUSSION [6]     Discussion with Cost and values in their Personal and Professional Life.     INIT 2 [INTERVIEW SKILLS [6]     Therreview handling Skills – Self preparation checklist – Grooming tips: do's & don'ts – mock interview & eedback.     INIT 3 [PRESENTATION SKILLS [6]     resentation Skills – Sales involved in an effective presentation – selection of topic, content, aids – ingaging the audience – Time management – Mock Presentations & Feedback.     INIT 3 [PRESENTATION SKILLS [6]     foresentation Skills – Stephone & E-mail etiquette – Dining etiquette – do's & Don'ts in a formal setting how to impress.     INIT 5 [Ethics [6]     for Impress.     INIT 5 [Ethics [6]     for The books in the "Chicken Soup for the Soul" series.         3. Man's search for meaning – Viktor Frankl         The greatest miracle in the world – Og Mandino         Goal - Eliyahu Goldratt.         Working with Emotional Intelligence - David Goleman.         Excel in English – Sundra Samuel, Samuel Publications         Beveloing Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi,         Seesentials of Effective Communication, Ludlow and Panthon, Prentice Hall of India.         Colhida Pvt. Ltd         Center Presentation Skills by Krishna Mohan and Jack L. Simonetti – Published twiley India Pvt. Ltd         Centerviewing" by Richaurd Camp, Mary E. Vielhaber and Jack L. Simonetti	<ul> <li>To coach the students on Interview Skills.</li> <li>To develop Presentation Skills.</li> <li>To teach importance of Ethics and Values.</li> <li>ourse Outcomes: At the end of this course, learners will be able to:</li> <li>Participate Group Discussion with Confidence by knowing the tips and Tricks.</li> <li>Attend the interview with positive attifude by having Mock Interviews.</li> <li>Present them very well by enhancing their Presentation Skills.</li> <li>Behave very well in official gathering and Meeting by knowing Etiquette.</li> <li>Have good ethics and values in their Personal and Professional Life.</li> <li>NIT 1 GROUP DISCUSSION</li> <li>D skills - Understanding the objective and skills tested in a GD – General types of GDs oles in a GD – Do's &amp; Don'ts – Mock GD &amp; Feedback.</li> <li>NIT 2 INTERVIEW SKILLS</li> <li>Interview handling Skills – Self preparation checklist – Grooming tips: do's &amp; don'ts – mock interview &amp; edback.</li> <li>NIT 3 PRESENTATION SKILLS</li> <li>resentation Skills – Stages involved in an effective presentation – selection of topic, content, aids ngaging the audience – Time management – Mock Presentations &amp; Feedback.</li> <li>NIT 5 Ethics</li> <li>To Settics – Time management – Mock Presentations &amp; Feedback.</li> <li>NIT 5 Ethics</li> <li>Intres.</li> <li>RACTICAL : 15 Hours</li> </ul> EFERENCES: <ul> <li>And the books in the "Chicken Soup for the Soul" series.</li> <li>Man's search for meaning – Viktor Frankl</li> <li>The greatest miracle in the world – Og Mandino</li> <li>Goal – Eliyahu Golfratt.</li> <li>Working with Emotional Intelligence - David Goleman.</li> <li>Excel in English – Sundra Samuel, Samuel Publications</li> <li>Bereelong Communication Skills by Krishna Mohan and Meera Banerji; MacMillan India Ltd., Delhi.</li> <li>Essentials of Effective Communication, Ludlow and Panthon; Prentice Hall of India.</li> <li>Effective Presentation Skills A Firty-Minute Series Book) by Steve Mandel</li> <li>Strategic interviewing" by Richaurd Camp, Mary E. Vielhaber and</li></ul>	Course Objective	e (s): The purpose of learning th	is cours	e is				
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Chairman - BoS Dept. of CSE - ESEC

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1. S	015. ike Meyers, Scott Jernigan, "A+ Guide to Mar ill, 2010	nagir	ig an	id Tro	oublesho	ooting PC	s", Tata McG	rav
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Departme	COMPUTER SCIENCE AND E	NGIN	EER	ING		R 2019	Semester	1
Course Co	le Course Name	F	lour: Wee		Credit	Total	Maximum	1
		L	Т	Р	С	Hours	Marks	
19ES215	ADVANCED C PROGRAMMING LABORATORY	0	0	4	2	60	100	D H
Course O	jective (s):							
The purpo	e of learning this course is							
	levelop C Programs using basic program	-	cons	struct	S			
	levelop C programs using arrays and st						11	
	evelop applications in C using functions	s, poin	ters	and s	structures	5		
	o input/output and file handling in C							
•- Iol	andle signals and Process and access	peripri	erais				Man	
1711711727170170171177118	of this course, learners will be able to							
and the second se	a C Program using basic programming	constr	ucto					
	lop C applications using Function and P							
	lop application using structure and union		5.					
					. Ela			
	n a C application using Sequential and	Rando	om ad	cess	stile			
	op a C program to interact with device	-						
List of Ex								
	s using only I/O Functions s to study operators and data types							
	s based on control Structures							
	s using For and While loops							
5. Program	s using single dimensional arrays							
	s using multi Dimensional arrays							
	s on Sorting and searching using arrays	5						
	s based on string Manipulations s based on User defined function progra	ame						
	ns using Functions with parameters	anis						
	n using storage classes							
2. Progra	ns to introduce pointers							
	ns using structures							
	ns using array of structures							
	n to send and receive signals to handle process							
	n to display device details							
EXT BOC			e					1.1
1, B	ian W Kernighan, The C programming I	angua	ge, s	econ	d edition	pearson E	ducation Asia,	200
	Balagurusamy, C Programming, Secon				•	lill, 2009		
	aswant Kanitkar, Let Us C, 16 <sup>th</sup> Edition,	BPB P	ublic	ation	, 2015			
EFERENC								
	aul Deitel and Harvey Deitel, —C How to	-		and and the	and the second second second	searcher interessions versions	THE REPORT OF A CONTRACT OF A	
0	adip Dey, Manas Ghosh, —Fundamen ford University Press, 2009.							
B	ron S. Gottfried, "Schaum's Outline of	I heory	and	Prot	plems of	Programm	ing with C" McC	TAM
	Il Education, 1996.	-	1		*	0	ing mar e ,me	Jian

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Department	COMPUTER SCIENCE AND	ENGIN	EER	ING	1.00	R 2019	Semester	11
Course Code	Course Name		Hour Wee		Credit	Total Hours	Maximum Marks	
1.2.5.1.2.5		L	Т	P	C			
19BS305	DISCRETE MATHEMATICS tive (s): The purpose of learning this con	3	2	0	4	60	100	_
problem • Understa determi • Develop e appropr Course Outco • Formula • Use log	nd the notion of mathematical thinking, management of and use the terms Cardinality, finite, of the which of these characteristics is asso enough confidence to identify and model iate solutions, using the skills learned in the short proofs using the following metho- pical notation to define and reason about s, functions and integers.	countabl ciated v mathen their int will be ods: dire	ly inf vith a matic erac able ect pr	inite a give al pa tive a to: oof, i	and unco en set. tterns in r and suppo ndirect pr	untably infi real world a prting envir	nite, and and offer onment oof by contradio	
<ul><li>discrete</li><li>Recogn</li></ul>	strate the ability to solve problems using probability. ize properties of graphs and its application oolean functions and minimize circuits us	ions		hniq	ues and c	combinator	ics in the conte	ext
	GIC AND PROOFS			-				1
	gic – Applications of Propositional logic- fiers – Rules of inference – Introduction			al equ	livalences	s – Predica	tes and Quant	ifie
	NTING		10					1:
he basics of c	ounting – The pigeonhole principle – Pe	ermutati	ions	and	combinati	ions – Ger	erating function	ons
	ision and Exclusion							4
	ATIONS	Applice	otion	o De	procentir	a relation	Closuros	12
	eir properties – n-ary Relations and their lence relations- partial orderings.	Applica	ation	S- Re	epresentin	ig relations	s – closules of	
Jnit IV GRA			-			Contraction of	in the second	1:
raphs and gra	oh models – Graph terminology and spec orphism – Connectivity – Euler and Ham							
Constraint and the second s	LEAN ALGEBRA							12
Boolean function	ons- representing Boolean functions – log	gic gate	s-mi	nimiz	ation of c	ircuits.		
	5).		1	197	1280	9 A		
REFERENCE(	<b>5</b> <i>j</i> .		tions	" Se	venth Edi	tion Tata I	McGraw Hill 2	012
and the second standard and the second standard standard standard standards and standard standards and standard	H Rosan, "Discrete Mathematics and Its	Applica	auona	5 00		and any indication is	nooran rini, 2	
1. Kennath 2. Ralph. P Pearson	H Rosan, "Discrete Mathematics and Its Grimaldi,"Discrete and Combinatorial M Education Asia, New Delhi, 2007.	lathema	atics:	An A	Applied In	troduction"	, Fifth Edition,	
<ol> <li>Ralph. P Pearson</li> <li>Bernard</li> </ol>	H Rosan, "Discrete Mathematics and Its Grimaldi,"Discrete and Combinatorial M	lathema Ross, '	atics:	An A	Applied In	troduction"	, Fifth Edition,	
<ol> <li>Kennath</li> <li>Ralph. P Pearson</li> <li>Bernard edition, P</li> </ol>	H Rosan, "Discrete Mathematics and Its Grimaldi,"Discrete and Combinatorial M Education Asia, New Delhi, 2007. Kolman, Robert C. Busby, Sharan Cutler	lathema Ross, ' 010.	atics: "Disc	An A	Applied In Mathema	troduction" tical Struct	, Fifth Edition,	

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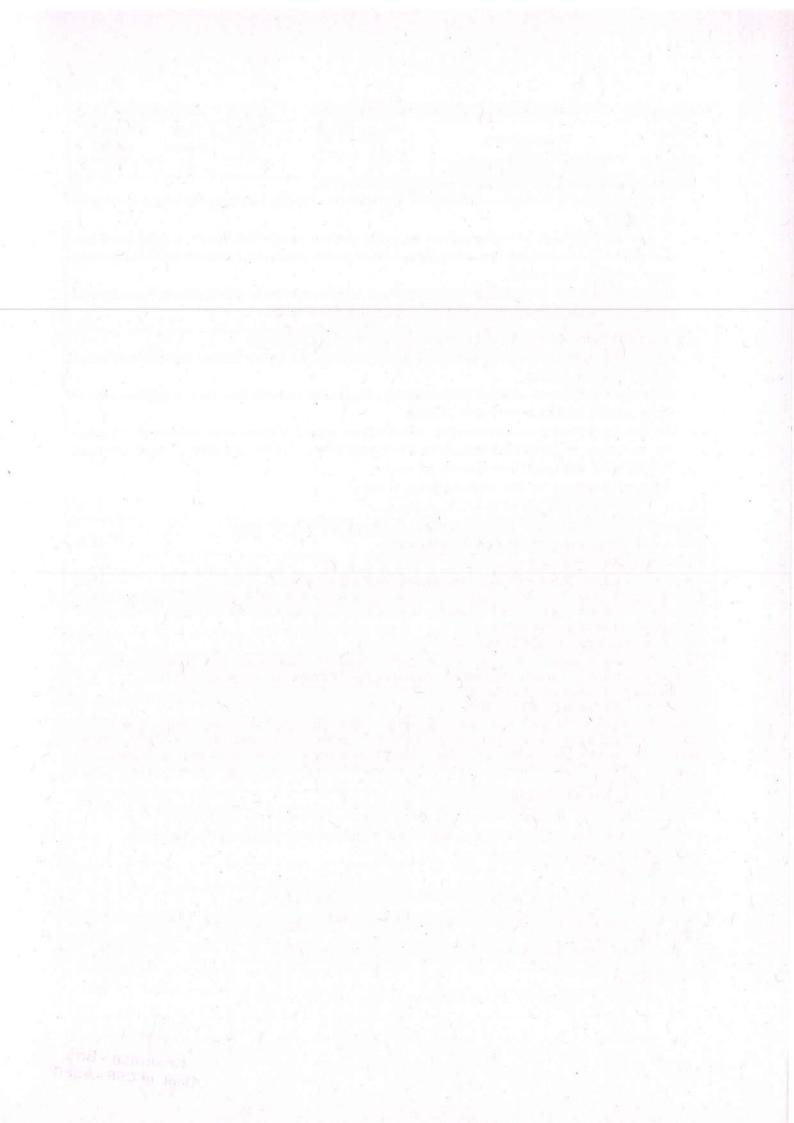
Chairman - BoS Dept. of Maths - ESEC

Departm	nent	COMPUTER SCIENCE AND	ENGIN	EER	ING		R 2019	Semester	-11
Course C	Code	Course Name		lour: Wee		Credit	Total	Maximum	
oouroo e	Jour	oouloo humo	L	T	Р	С	Hours	Marks	
19CS3	01	DIGITAL ELECTRONICS	3	0	0	3	45	100	
The purp • T • T • T • T • T • T • T • T	o design o analyz o analyz o unders o write H Outcom	earning this course is digital circuits using simplified B e and design combinational circu e and design synchronous and a tand Programmable Logic Devic DL code for combinational and s	uits Isynchro Ies	nous	s seq		rcuits		
• S • D • In	implify B lesign an nplemen	oolean functions using KMap d Analyze Combinational and Se designs using Programmable L code for combinational and Sec	ogic Dev	vices	5				
Unit I	BOOL	EAN ALGEBRA AND LOGIC G	ATES						9
function: Special Unit II Introduc	s - Cano Characte GATE tion, The	igned Binary Numbers, Introdu nical and Standard Forms-Digita ristics, Different Logic Families <b>LEVEL MINIMIZATION</b> Map Method, Four Variable Ma tions, NAND and NOR implement	al Logic	gate Varia	s –Di able l	igital Inte Map, Pro	grated Cir	cuits-Introduct	tion 9 tion
Languag Unit III	ge	INATIONAL LOGIC					4.5.61		9
Combina	ational ci	rcuits- Analysis and Design Pro – Magnitude Comparator – Deco							er -
Unit IV		HRONOUS AND ASYNCHRON				the local matters of the state			9
sequenti Procedu Hazards	ial Circuit ire- Circu - Design	ts- Latches – Flip flops – Analy sState Reduction and Assignme its with Latches – Reduction of Example.	nt- Desig State F	gn Pr	roced	lure. Asyı	nchronous	Circuits-Anal	ysis nt -
Unit V	REGIS	TERS, COUNTERS AND MEM	ORY	-					9
Random Program	n access nmable L es, Binary OOK(S)	Registers, Ripple Counters, Syn memory, Memory Decoding, I ogic Array. Register Transfer Multiplier, HDL for ASM and Bir	Error De Level I nary Mul	etect ntroc tiplie	ion a ductio er	and corre on, RTL	ection, Re in HDL,	ad only Mem Algorithmic S	ory, tate
. 1.		o, Paul Albert , Leach, Donald P, ition, 2010.	Jautam	Saha	a: Dig	ital Princ	iples And	Applications, I	NIF
	Morris	Mano and Michael D. Ciletti,"Dig	jital Des	ign",	4 <sup>th</sup> E	Ed.,Pears	on Educat	tion, 2008	
2.									
	ENCE(S)	PSON .							
		Thomas C: Digital Computer Fi	undame	ntals	, 6th	Edition,	TMH.2010	l.	

Chairman - BoS Dept. of CSE - ESEG

Department	COMPUTER SCIENCE A		and constrained search constrained	Construction Sector Const	R 2019	Semes		M
Course Code	Course Name		lours /	Week P	Credit C	Total Hours	Maxin Mar	
19MC301	INDIAN CONSTITUTION	2	0	0	-	30	10	0
<ul> <li>To Under perspect</li> <li>To addread and entity years of</li> <li>To addread 1917 and</li> </ul>	ective (s): The purpose of lea rstand the premises informing ive. ess the growth of Indian opinio lement to civil and economic r Indian nationalism. ess the role of socialism in Indi d its impact on the initial draftin comes: At the end of this cour	the twi n regar ights as ia after ig of the	in then ding m s well a the co e India	nes of libe nodern Inc as the em mmencer nConstitu	lian intellect lergence of nent of the I tion.	uals' con nationhoc	stitutiona od in the	al rol earl
<ul> <li>Gandhi ii</li> <li>Discuss i social rei</li> <li>Discuss i the leader through a</li> </ul>	the growth of the demand for ci in Indian politics. The intellectual origins of the fra forms leading to revolution in In the circumstances surrounding ership of Jawaharlal Nehru an adult suffrage in the Indian Con the passage of the Hindu Code	mework ndia. the found nd the e	k of arg ndation eventu n.	gument than of the Co	at informed t	he conce ialist Part	ptualizat y [CSP] ı	ion c unde
	tory of making of Indian Cor	And the second second				T		5
istory of Indi	an Constitution - Drafting Com	mittee,	(Comp	osition &	Working)			
	losophy of the Indian Consti	itution						5
reamble - Sa	lient Features	al.	0.2.5	1.00				
undamental	ONTOURS OF CONSTITUTIC Rights - Right to Equality - Righ ultural and Educational Rights Fundamental Duties.	nt to Fre	edom	- Right ag	ainst Exploit	tation -Rig Directive	ght to Fre Principl	eedo es of
	GANS OF GOVERNANCE				131-1-1	1 N -1		5
President - Go Qualifications	omposition - Qualifications and vernor - Council of Ministers - J - Powers and Functions. CAL ADMINISTRATION	S						
District's Adm Elected Repre Elected officia Hierarchy (Dif grass root der	inistration head: Role and Imp sentative, CEO of Municipal Co Ils and their roles, CEO ZilaF ferent departments) -Village lev nocracy.	orporatio Pachaya	on - Pa at: Pos	achayati ra sition and	i: Introductio role- Block	on, PRI: Z level: O	ilaPacha rganizat	ayat - ional
Jnit VI ELI	ECTION COMMISSION			5	S			5
	nission: Role and Functioning,						11	
	s, State Election Commission: ST/OBC and women	Role ar	nd Fun	ctioning, I	nstitute and	Bodies fo	r the	
XT BOOK(S				2				
	tution of India", 1950 (Bare Act	t), Gove	ernmer	nt Publica	tion			
	isi, "Dr. B. R. Ambedkar Frami	ng of In	dian C	constitutio	n", 1st Editio	on, 2016.	Ava	
2. Dr. S. N. Bu Publishers								
Jublishers	, "Indian Constitution Law", 7th	n Edn.,	Lexis I	Vexis, 201	4.			
ublishers		n Edn.,	Lexis I	Nexis, 201	4.			-

1 Chairman - BoS Dept. of CSE - ESEC



Departr	ment	COMPUTER SCIENCE AND EN	NGINI	EER	ING		R 2019	Semester	Ш
Cour		Course Name	1743	lours Wee	22532	Credit	Total Hours	Maximur Marks	n
Cod	e		L	Т	Ρ	С	Hours	Ivial K5	
19CS3	302	COMPUTER ARCHITECTURE	3	0	0	3	45	100	
To unde To unde and floa To know To know To know <b>Course</b> At the er Des At the er Des Sche Des Des Des Unit I	pose of erstand ting-po / in deta / the hid / the dif Outco nd of th ign of a lyse an ign the eduled ign a co ign a co ign a co	f learning this course is the basic structure and operation of a the operation of the arithmetic unit inc int addition, subtraction, multiplication ail the different types of control and the erarchical memory system including c fferent ways of communicating with I/C	ache by per ling is s mic	g the risior cept men ices form ssue	algo of pi nory a and nance s af rence chite	pelining. and virtua standard fecting s and syn ctural fea	al memory I/O interfa uperscala chronizat itures.	/. aces. ar and dynar ion etrics - Instru	mical
and inst modes –	ruction - RISC	sequencing - Hardware - Software I - CISC	Interfa	ace -	- Inst	ruction s	et archite	cture - Addre	-
and inst modes – <b>Unit II</b> Arithmet of positiv and fixed	ruction - RISC ARIT tic Oper ve num d point	sequencing - Hardware - Software I - CISC - CISC - HMETIC OPERATIONS rations - Addition and subtraction of sig bers - Signed operand multiplication and operations	Interfa gned nd fas	num st mu	bers	- Design	of fast ad	ders -Multipli	9 cation poin
and inst modes – <b>Unit II</b> Arithmet of positiv and fixed <b>Unit III</b> Fundame control – Data pat	ruction - RISC <b>ARIT</b> tic Oper ve num d point <b>BAS</b> ental c Micro th and c	sequencing - Hardware - Software I - CISC -	gned nd fas INING instru	num st mu st ction	bers Iltiplio 1 - M pts -	- Design cation - In ultiple bu Data haz	of fast ad teger divi us organia zards - In	lders -Multipli sion- Floating zation - Harc struction haz	9 cation poin 9 lwired ards
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV	ARIT ARIT COPEN	sequencing - Hardware - Software I - CISC - C	gned nd fas INING instru sic cc consic	num st mu ction once lerat	bers Iltiplio 1 - M pts - ions	- Design cation - In ultiple bu Data haz - Exceptio	of fast ad teger divi us organia cards - In on handlin	lders -Multipli sion- Floating zation - Harc struction haz ng - ILP –Harc	9 cation poin 9 wired ards dward 9
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV Basic co cache pe	ruction - RISC ARIT tic Oper ye num d point BAS ental c Micro th and c ware a MEM oncepts erforma	sequencing - Hardware - Software I - CISC - CISC - THMETIC OPERATIONS rations - Addition and subtraction of sig bers - Signed operand multiplication and operations SIC PROCESSING UNIT AND PIPELI oncepts - Execution of a complete in programmed control - Pipelining :Bas control considerations - Performance of pproaches. IORY SYSTEM s - Semiconductor RAM - ROM - Spee ance - Virtual memory - Memory mana	gned nd fas INING instru sic co consic	num st mu ction erat	bers Iltiplie o - M ots - ions	- Design cation - In ultiple bu Data haz - Exception	of fast ad teger divi us organia cards - In on handlin he memo	Iders -Multipli sion- Floating zation - Harc struction haz ng - ILP –Harc ries -Improvir	9 cation poin 9 lwired ards dward dward 9 g
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV Basic co cache pe Seconda	ruction - RISC ARIT tic Oper ye num d point BAS ental c Micro th and c ware a MEM oncepts erforma ary stor	sequencing - Hardware - Software I - CISC - CISC - THMETIC OPERATIONS rations - Addition and subtraction of sig bers - Signed operand multiplication and operations SIC PROCESSING UNIT AND PIPELI oncepts - Execution of a complete is programmed control - Pipelining :Bas control considerations - Performance of pproaches. IORY SYSTEM s - Semiconductor RAM - ROM - Spee ance - Virtual memory - Memory mana age devices	gned nd fas INING instru sic co consic	num st mu ction erat	bers Iltiplie o - M ots - ions	- Design cation - In ultiple bu Data haz - Exception	of fast ad teger divi us organia cards - In on handlin he memo	Iders -Multipli sion- Floating zation - Harc struction haz ng - ILP –Harc ries -Improvir	9 cation poin 9 wired ards dware dware 9 g
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV Basic co cache pe Seconda Unit V Accessi circuits –	ruction - RISC ARIT ic Oper /e numid point BAS ental c Micro th and c ware a MEM oncepts erforma ary stor I/O ( Standa	sequencing - Hardware - Software I - CISC - CISC - CISC - MMETIC OPERATIONS rations - Addition and subtraction of signed bers - Signed operand multiplication and operations SIC PROCESSING UNIT AND PIPELI oncepts - Execution of a complete in programmed control - Pipelining :Base control considerations - Performance of pproaches. IORY SYSTEM S - Semiconductor RAM - ROM - Speet ance - Virtual memory - Memory mana age devices DRGANIZATION devices - Programmed Input/output Ir ard I/O Interfaces (PCI, SCSI, and US	gned nd fas INING instru sic cc consic ed - S ageme	num num st mu ction phonce ize a ize a pts -	bers Iltiplio pts - ions and co equire Dire	- Design cation - In Ultiple bu Data haz - Exceptio exception cst - Cacle ements -	of fast ad teger divi us organia cards - In on handlin he memo Associati	Iders -Multipli sion- Floating zation - Harc struction haz ng - ILP –Harc ries -Improvir ve memories	9 cation poin 9 lwired ards dward dward 9 g - 9
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundame control – Data pat and Soft Unit IV Basic co cache pe Seconda Unit V Accessi	ruction - RISC ARIT tic Oper ye num d point BAS ental c Micro th and c ware a MEM oncepts ary stor ary stor Standa OOK(S Willia	sequencing - Hardware - Software I - CISC - CISC - CISC - MMETIC OPERATIONS rations - Addition and subtraction of signed bers - Signed operand multiplication and operations SIC PROCESSING UNIT AND PIPELI oncepts - Execution of a complete in programmed control - Pipelining :Base control considerations - Performance of pproaches. IORY SYSTEM S - Semiconductor RAM - ROM - Speet ance - Virtual memory - Memory mana age devices DRGANIZATION devices - Programmed Input/output Ir ard I/O Interfaces (PCI, SCSI, and US	gned nd fas INING instru sic co consic consic ed - S ageme ageme	num st mu st mu ction nce lerat ize a ent re	bers Itiplio pts - M pts - ions and co equire Dire CPU	- Design cation - In ultiple bu Data haz - Exception ost - Cacl ements - ct Memon Commur	of fast ad teger divi us organi: cards - In on handlin he memo Associati ry Access nication.	Iders -Multiplie sion- Floating zation - Harc struction haz ng - ILP –Harc ries -Improvir ve memories - Buses - Inte	9 cation poin 9 lwired ards dward dward 9 9 - 9 erface
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundame control – Data pat and Soft Unit IV Basic co cache pe Seconda Unit V Accessi circuits –	ruction - RISC ARIT ic Oper / ARIT ic Oper / BAS ental c Micro th and c ware a MEM oncepts erforma ary storn I/O ( Standa OOK(S Willia Edition	sequencing - Hardware - Software I - CISC - CISC - CISC - THMETIC OPERATIONS rations - Addition and subtraction of sig- bers - Signed operand multiplication and operations SIC PROCESSING UNIT AND PIPELI oncepts - Execution of a complete in programmed control - Pipelining :Base control considerations - Performance of pproaches. IORY SYSTEM s - Semiconductor RAM - ROM - Spee ance - Virtual memory - Memory mana age devices DRGANIZATION devices - Programmed Input/output Ir ard I/O Interfaces (PCI, SCSI, and US ) am Stallings, —Computer Organization	Interfa gned nd fas instru sic co consic consic ed - S ageme nterru B), IC	num st mu st mu ction nce lerat ize a ent re pts - DP -	bers Itiplia of - M pts - ions and c equire Dire CPU	- Design cation - In ultiple bu Data haz - Exception ost - Cacl ements - ct Memon Commur ure – Des	of fast ad teger divi us organi: cards - In on handlin he memo Associati ry Access nication.	Iders -Multiplie sion- Floating zation - Harc struction haza ng - ILP –Harc ries -Improvir ve memories s- Buses - Inte r Performanc	9 catio poin 9 wire ards dward 9 9 9 9 9 9 9 9 9 9 9 9
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV Basic co cache pe Seconda Unit V Accessi circuits – TEXT BC 1.	ruction - RISC ARIT tic Oper ye num d point BAS ental c Micro th and c ware a MEM oncepts erforma ary store Standa OOK(S Villia Editic	sequencing - Hardware - Software I - CISC - COPERATIONS - Signed operand subtraction of signed - Signed operand multiplication and operations - Second operand multiplication and operations - Second operand multiplication and - Operations - Computer Architecture and - Computer Architecture and	Interfa gned nd fas instru sic co consic consic ed - S ageme nterru B), IC	num st mu st mu ction nce lerat ize a ent re pts - DP -	bers Itiplia of - M pts - ions and c equire Dire CPU	- Design cation - In ultiple bu Data haz - Exception ost - Cacl ements - ct Memon Commur ure – Des	of fast ad teger divi us organi: cards - In on handlin he memo Associati ry Access nication.	Iders -Multiplie sion- Floating zation - Harc struction haza ng - ILP –Harc ries -Improvir ve memories s- Buses - Inte r Performanc	9 cation poin 9 wired ards dward 9 9 - 9 erface ell, 8t
and inst modes – Unit II Arithmet of positiv and fixed Unit III Fundam control – Data pat and Soft Unit IV Basic cc cache pe Seconda Unit V Accessi circuits – TEXT BC 1. 2. REFERE 1.	ruction - RISC ARIT iic Oper ye num d point BAS ental c Micro th and c ware a MEM oncepts erforma ary stor Standa OOK(S Willia Editic John ENCE(S	sequencing - Hardware - Software I - CISC <b>THMETIC OPERATIONS</b> rations - Addition and subtraction of sig- bers - Signed operand multiplication and operations <b>SIC PROCESSING UNIT AND PIPELI</b> oncepts - Execution of a complete in programmed control - Pipelining :Base control considerations - Performance of pproaches. <b>IORY SYSTEM</b> s - Semiconductor RAM - ROM - Spee ance - Virtual memory - Memory mana- age devices <b>DRGANIZATION</b> devices - Programmed Input/output In- ard I/O Interfaces (PCI, SCSI, and US ) am Stallings, —Computer Organization on, Pearson Education, 2009. P. Hayes, —Computer Architecture and <b>S</b> ) Hamacher, Zvonko Vranesic and Safe ems, 6th Edition, Tata McGraw Hill, 2000	Interfa gned nd fas instru sic co consic consic ed - S ageme nterru B), IC n and or nd Or wat Z	num st mu st mu ction nce lerat ize a ent re pts - DP - Arch gani: aky,	bers Iltiplic of - M pts - ions and ca equin Dire CPU nitect zatio	- Design cation - In ultiple bu Data haz - Exception ost - Cacl ements - ct Memon Commur ure – Des n, 3rd Edi	of fast ad teger divi us organiz cards - In on handlin he memo Associati ry Access nication. signing fo tion, Tata	Iders -Multiplie sion- Floating zation - Harc struction haz ng - ILP –Harc ries -Improvir ve memories - Buses - Inte r Performanc McGraw Hill, tion and Emb	9 cation poin 9 wired ards dward 9 9 - 9 erface ell, 8t
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4 Chairman - BoS Dept. of CSE - ESEC

Departin	ent	COMPUTER SCIENCE AND E					R 2019	Semester	1
Cours	6-1-1-	Course Name		lour: Wee		Credit	Total	Maximum	
Code		oourse nume	L	Т	Р	С	Hours	Marks	
19CS30	03	OBJECT ORIENTED PROGRAMMING USING JAVA	3	0	0	3	45	100	
<ul> <li>Gair cond</li> <li>Und</li> <li>Obje</li> <li>Und</li> <li>Und</li> <li>Und</li> <li>Und</li> <li>Und</li> <li>Und</li> <li>Kno</li> <li>Course O</li> <li>At the end</li> <li>Writ</li> <li>Devide</li> <li>Mit II</li> <li>Basics of ooping, and the optimization of the optimizati</li></ul>	be of lead cepts sur- lerstand erstand erstand erstand erstand erstand erstand whow to putcome d of this of e Java pr lead e Java pr lava med Java pr Java pr Java pr Java pr Java pr Java med OBJI objects sses like in jav rogramm il packag THRE Thread li handling mdling in Flow La	arning this course is to dge about basic Java language sy ch as variables, conditional and ite the fundamentals of object-oriente king methods etc and exception h the principles of inheritance, packa the basics of Exception Handling & bandle events <b>s:</b> course, learners will be able to: pplication programs using OOP pr the concepts of Packages and in rograms to implement error handli lication using multi threading t based java program <b>DUCTION TO JAVA</b> ogramming, Data types, Variables chods, Overloading, Math class, Ar <b>ECT AND CLASSES</b> and classes in java, Constructors, String, Character, StringBuffer, Fi <b>RITANCE AND PACKAGES</b> a, Super and sub class, Overridin ing, Casting objects, Instance of	rative ed pro andlin ages a Multi inciple heritar ng tec s, Ope rays in Final le, this operat <b>IG</b> interfa -catch key e GUI o	exer grann g me and in i three es ar hnice chniq erato hniq izer, s refe bject tor, / uce, I i – U vent comp	cution nming echar nterfa eadin nd pro ues u rs, C a Visib erenc clas Abstra Ser d s, Gl poner	n method g in Java nisms. aces. g oper prog using exc ontrol str oility mod e. s, Polym act class threading efined Ex UI Basics	ram structures in ifiers, Mel iorphism, Interface g - Thread s, Panels uttons, Ch	defining clas eturing ndling ncluding select thods and obje Dynamic bind e in java, Pack d synchronizat , Frames, Lay neck Boxes, Ra	9 ing agr 9 ion 9 /ou
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and the manager		nplete Reference, Java 2 (11 <sup>TH</sup> Ed	ition	Editi	on), I	Herbert S	child, TM	Н	Ť.
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1.	E. Balag	urusamy, Java Programming with	premi	ier, s	econ	d edition	, Tata Mc	graw Hill, 2016	5.
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Departme	nt (	COMPUTER SCIENCE AN	ID ENG	NEER	ING		R 2019	Semester	Ш
Course Co	de	Course Name	Но	ours / \	Neek	Credit	Total Hours	Maximu Marks	m
			L	Т	Р	С			
19CS304		DATA STRUCTURES	3	0	0	3	45	100	
The purpo To To To	learn about th learn basic so design and in	this course is to the implementation of list us orting and searching algorit nplement stack and queue olement the nonlinear data	thms						
<ul> <li>App</li> <li>nplementir</li> <li>Imp</li> <li>Wri</li> </ul>	of this course oly the fundar ng real time p lement basic te programs t	e, learners will be able to: nental knowledge of variou roblems. sorting and searching algo to implement list, linked Lis ots of trees and graphs in r	orithms. it, stack	and qu	ieue.	designing	and		
Unit I	INTRODUC	TION					and the second		9
Represent managem Unit II Linked Lis	tation - Searc ent Record s LINKED LI	ation – Singly, Doubly - Tr	arch and	d Binar	y Searc	ch Pointer	arrays – D	ynamic Men	9
List Circula Unit III	ar Linked List	t – Two way List.		_	mente		- Anni		9
Unit III			applicati	on of s			- tower o	of Hanoi Que	10000
Stack: rep representa	ation – ADT –	- ADT Polish notations – a circular queue – Dequeue			ue-App	ncation			
Stack: rep representa of Queues	ation – ADT –				ue-App		K. was		9
Stack: rep representa of Queues <b>Unit IV</b> Binary Tre	ation – ADT – TREES es: represen	circular queue – Dequeue tation – traversing Travers	e – priori al algori	ty Que	ising st		ry search t	tree – searc	1
Stack: rep representa of Queues <b>Unit IV</b> Binary Tre – inserting	ation – ADT – TREES es: represen	circular queue – Dequeue	e – priori al algori	ty Que	ising st		ry search t	tree – searc	1
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Stack: rep representa of Queues Unit IV Binary Tre – inserting Unit V Introductio first searc Prim's and TEXT BOO	ation – ADT – TREES ees: represen – deleting A GRAPHS on – Terminol h – Topologi Kruskal's al OK(S)	circular queue – Dequeue tation – traversing Travers VL Trees – searching – ins ogy – representation Opera cal sort - Shortest-path alg gorithms	al algori serting – ations o gorithms	ty Que thms u deletir n Grap s (Dijsk	ng hs Trav tra Alg	acks Bina versing : E orithm) -	Breadth firs Minimum	st search- De spanning tre	hing 9 epth
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Department	COMPUTER SCIENCE AND EN				T	R 2019	Semester III	LL
Course Code	Course Name		Hour Wee		Credit	Total	Maximum	
Course Code	Course Name	L	Т	Ρ	С	Hours	Marks	
19TPS03	QUANTITATIVE APTITUDE AND LOGICAL REASONING - I	2	0	0	0	30	100	Ē
Course Obje	ctive (s): The purpose of learning this c	ourse	e is t	0				
<ul> <li>Crack apti</li> </ul>	tude assessment by using speed math co	once	pts.					
Solve prob	olems using fast track method by learning	g sim	plific	atior	and nur	nbers.		
Learn the	basic of ratio and proportion and mixture	cond	cepts	s				_
Calculate	different ways of solving problems on ave	erage	e and	age	S.			
Learn the	logical skills by analyzing the objects.							
Course Outc	omes: At the end of this course, learners	s will	be a	ble t	o:		<u></u>	
. Solve the	question with speed and accuracy.							
2. Crack the	quantitative aptitude questions by using	simp	lifica	tion	and num	bers syst	em.	
. Solve mos	st of the aptitude topics by knowing ratio	and j	orop	ortio	n topics v	with allega	ation.	
. Solve the	problems on average and ages by using	logic	cal w	ay of	fapproad	ch.		
. Develop ti	heir logical thinking.							
	EED MATHS AND NUMBER SYSTEMS			L.				
	EED MATHS AND NUMBER SYSTEMS IS: Square and square roots – Square		num	bers	from 31	to 50. F	inding square	
PEED MATH			num	bers	from 31	to 50. F	inding square	6 s of
Umbers between	IS: Square and square roots – Square	for						s of
PEED MATH umbers between UMBER SYS	<b>IS:</b> Square and square roots – Square een 81 to 100. Cubes and cubes roots.	for	ope	rties	of Numb			s o
SPEED MATH numbers betwe NUMBER SYS alue - Divisibi	IS: Square and square roots – Square een 81 to 100. Cubes and cubes roots. STEMS: Numbers and types of Numbers	for – Pr nainc	ope der ti	rties	of Numb			s of
SPEED MATH numbers between IUMBER SYS alue - Divisibi UNIT 2 SIM SIMPLIFICATI	IS: Square and square roots – Square een 81 to 100. Cubes and cubes roots. STEMS: Numbers and types of Numbers ility rules – Concept on unit digit and ren	for – Pr nainc <b>MBE</b> jebra ion –	rope der ti <b>RS</b> ic fo Rec	rties heore rmul	of Numb em. ae –Simj g decima	oers –Fac	e value and pl	ace
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SPEED MATH numbers between NUMBER SYS alue - Divisibit UNIT 2 SIM SIMPLIFICATI Mixed fraction PROBLEMS CO UNIT 3 RA RATIO AND F	IS: Square and square roots – Square een 81 to 100. Cubes and cubes roots. <b>TEMS:</b> Numbers and types of Numbers ility rules – Concept on unit digit and ren <b>MPLIFICATIONS &amp; PROBLEMS ON NU</b> <b>ONS:</b> BODMAS rule – Application of alg on – Continued fraction and its simplification <b>N NUMBERS:</b> Set of numbers – Assume <b>TIO &amp; PROPORTION ,ALLIGATIONS 8</b> <b>PROPORTION:</b> Ratio between two or mo	for maine <b>MBE</b> jebra jebra e the <b>MIX</b> pre pe	ic fo RS ic fo Rec unk	rties heore rmul currin nowi <b>RE</b> ns –	of Numb em. ae –Sim g decima n numbe Miscellar	olification als. rs and for	of decimal fra m equations	s o ace ctio
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SPEED MATH         numbers between         NUMBER SYS         value - Divisibility         UNIT 2       SIMPLIFICATION         SIMPLIFICATIONS         COBLEMS CO         UNIT 3       RA         RATIO AND F         LLIGATIONS         Six golden rule         UNIT 4       AV         AVERAGES:         PROBLEMS CO         UNIT 5       AN         NALOGY: St         Vork and wo         neasurement	IS: Square and square roots – Square een 81 to 100. Cubes and cubes roots. TEMS: Numbers and types of Numbers ility rules – Concept on unit digit and ren MPLIFICATIONS & PROBLEMS ON NU ONS: BODMAS rule – Application of alg on – Continued fraction and its simplification NUMBERS: Set of numbers – Assume TIO & PROPORTION ,ALLIGATIONS & PROPORTION: Ratio between two or mo S ANS MIXTURES: Definition – Allegation is to solve problems on mixture – Remov ERAGES & PROBLEM ON AGES Average from total –Total from the avera ON AGES: Ages - Persons in Past - Pres ALOGY & MIRROR & WATER IMAGES udy and topic relationship – Worker and rking place – Worker and product – – Quantity and unit – Animals and young	for maine maine maine maine ebra ebra ebra ebra ebra ebra ebra ebr	rope der ti RS ic fo Rec unk <b>CTUF</b> ersor e – M mong - Mis Futu relat duct es –	rties heore rmul currin nown RE Mean the cella ure. I tions and Male	of Numb em. ae –Sim g decima n numbe Miscellar value (o quantitie neous p Miscellar Miscellar	pers –Fac plification als. rs and for neous pro r cost prices more the roblems. neous pro ol and act aterials – nale.	e value and pl of decimal fra m equations oblems. ce) of the mixtu nan two. blem.	s o ace ctic d e e f e anc

# **TOTAL : 30 HOURS**

### **REFERENCES:**

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- 3. R.V.Praveen,"Quantitative Aptitude and Reasoning"Third Edition, PHI Learning ,2016.
- Dr.R S Aggarwal, Quantitative Aptitude, Revised and Enlarged Edition, S.Chand Publishing Company Ltd, 2017.
- 5. Arun Sharma "How to Prepare for Quantitative Aptitude" Eight Edition, McGraw Hill Education, 2018.
- 6. "Reasoning and Aptitude" for GATE and ESE Prelims, Made Easy Publication, 2020.

Chairman - BoS Dept. of CSE - ESEC

	ent	COMPUTER SCIENCE AND E	NGIN	EERI	NG		R 2019	Semester	111
Course Co	ode	Course Name		lours Wee		Credit	Total Maxim		
			L	Т	P	С	Hours	Marks	
19CS305	5	DIGITAL ELECTRONICS LABORATORY	0	0	4	2	60	100	6,1
• To • To	ose of le familiar	e (s): arning this course is ize students with digital ICs, the b students the opportunity to set u	~~~ 영양 문화 문화 표			에 같은 전 것 같은 것이 같이 했다.		and study their	
<ul> <li>Stu</li> <li>Imp</li> <li>Des</li> <li>Des</li> </ul>	d of this udy and plement sign and sign and	es: course, learners will be able to Test Logic Gates Logic Circuits I Implement Adder and Subtracto I Implement Combinational Circu I Implement Sequential Logic Circ	ts						
		of Logic Circuits.							
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Department	COMPUTER SCIENCE AND END	SINE	EERI	NG		R 2019	Semester	Semester III	
Course Code	Course Name	1.100	ours Wee		Credit	Total	Maximum		
		L	Т	Р	С	Hours	Marks		
19CS306	DATA STRUCTURES LABORATORY	0	0	4	2	60	100		

### Course Objective (s):

The purpose of learning this course is to

 Familiarize students in the implementation of searching algorithms, sorting algorithms, linear & non linear data structures.

#### **Course Outcomes:**

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

 Implement searching algorithms and sorting algorithms Implement Linear data structures (list, stack & queue) and non linear data structures (trees and graphs).

#### List of Experiments

- 1. Implementation of Searching Algorithms
- 2. Implementation of sorting algorithms
- 3. Implementation of LIST ADT using Array and Linked Representation
- 4. Implementation of Queue ADT
- 5. Implementation of Singly, Doubly and Circularly Linked Lists
- 6. Implementation of Stack ADT using Arrays and Linked list
- 7. Implementation of Binary Trees
- 8. Implementation of Graph Algorithms

#### **TEXT BOOK(S)**

1.	Reema Thareja, "Data Structures Using C", Second Edition, Oxford University Press, 2011
2.	Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education, 1983.
REFER	ENCE(S)
1.	Stephen G. Kochan, "Programming in C", 3rd edition, Pearson Education.
2.	Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, 1997.
3.	Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, "Fundamentals of Data Structures in C", Second Edition, University Press, 2008

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Departme	ent	COMPUTER SCIENCE AND	ENGIN	EER	ING		R 2019	Semester	Ш
Course Co	ode	Course Name		lour: Wee		Credit	Total		
			L	Т	Р	С	Hours		
19CS30	7	JAVA PROGRAMMING LABORATORY	0	0	4	2	60	100	
<ul> <li>Un</li> <li>cla</li> <li>Un</li> <li>Un</li> </ul>	ose of le derstan sses, ol derstan derstan	e (s): arning this course is to d the fundamentals of object- ojects, invoking methods etc and d the principles of inheritance, p d the basics of Exception Handli to handle events	l excepti ackages	on h and	andli inte	ing mecha rfaces.		ncluding def	ining
• Kn Course C							1.00		
<ul> <li>To</li> <li>Ap</li> <li>Ab</li> <li>De</li> <li>To</li> </ul> List of E	write pr ply inhe le to har velop m develop <b>xperim</b>		ogram						
	-	using class and methods							
		implementation							
		via Interface and Abstract class	3						
	and the second	on Package implementations			R.				
		s using Generic collections							
	•	sing IO Streaming							
7. Cre	eate use	r defined exception							
8. Dev	velop ap	oplication to demonstrate multi th	reading				<i></i>	1	
9. Pro	gram us	sing Applet with event handling							
10. Pro	gram to	demonstrate event handing usi	ng AWT	/ Sw	ing				
11. Pro	gram to	demonstrate Layout Managers							
12. Pro	gram to	demonstrate file handling							
ТЕХТ ВО	OK(S)				1-	e e			
1.	Herbert	Schildt, Java: The Complete Re	eference	e, 11 <sup>.</sup>	th Ed	lition, Mc	Graw Hill	Education	
2.	Cay S I Hall, 20	Horstmann, Gary Cornell, Core 13.	Java Vo	lume	e - I f	Fundame	ntals,9th	Edition, Prer	ntice
REFEREN	ICE(S)								
1.	Bert Ba	tes, Kathy Sierra, Head First Ja	va, 2nd I	Editi	on, C	Reilly Me	edia, 2008	5.	1
2.		Sierra, Bert Bates, OCA/OCP J McGraw Hill Education, 2014.	ava SE	7 P	rogra	ammer I	and II St	udy Guide, I	First

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	COMPUTER SCIENCE AND	<b>ENGI</b>	NE	ERIN	G	R 2019	Semester	·   I\
Course Code	Course Name	V	our: Vee	k	Credit	Total Hours	Maximur Marks	
19BS401	PROBABILITY AND STOCHASTIC	L 3	T 2	P	C 4	60	100	
	MODELS			0	4	60	100	
	tive (s): The purpose of learning this course			o to	undorstor	d the herie	concente of	
	lling and studying this course the students ility and the distributions with characteristic							
	rize and apply the methodologies of the rai							
	enough confidence to identify and model						2320	
	ate solutions, using the skills learned in the							-
	mes: At the end of this course, learners wi				ia cappoi	ang on non		
<ul> <li>The stud</li> </ul>	dents will be able to demonstrate and apply	y the ba	asic	prot	bability ax	ioms and co	oncepts in	
	re areas. of random phenomena in their co			Ċ				
<ul> <li>The stud</li> </ul>	ents will be able to apply the concepts of	probab	ility	distr	ibutions i	n an approp	riate place	
	ce and Engineering.							
	lents will be able to calculate the relations							
	tion techniques and to study the properties							
	lents will be able to apply the concepts of i	random	n pr	oces	ses and s	tationary ra	ndom	
	es in their core areas.			- 41				
	lents will be able to identify and apply the o	queuing	g m	etno	ablogies t	o optimize t	ne result	
	aiting line. BABILITY AND RANDOM VARIABLE					- Aline - Aline		12
	oms of probability - Conditional probability -	Total	nro	hahil	ity Bayo	's theorom	A State of the second	12
	<ul> <li>Probability mass function - Probability d</li> </ul>						nt	
enerating functi		onony	- carrie	, and the	riopora	ee memor		
Jnit II PROE	BABILITY DISTRIBUTIONS			Ξĥ			the se	12
	ing functions of probability distributions- Co							1
	utions: Binomial- Poisson- Uniform -Expor	nential	-No	orma	I- Weibull	distribution	S.	
Jnit III TWO	DIMENSIONAL RANDOM VARIABLES							12
oint Distribution	- Discrete and continuous distributions - M	Aaraina	al ar	nd Co	1111			
		nargine			onditional	Distribution	s -	
ovariance Auto		nargine			onditional	Distribution	S -	-
ovariance Auto	HASTIC PROCESS						1.2.5	12
ovariance Auto Jnit IV STOC lassification- St	HASTIC PROCESS ationary process- Markov process- Markov						1.2.5	12
ovariance Auto Jnit IV STOC lassification- St stributions- Poi	HASTIC PROCESS ationary process- Markov process- Markov sson process- Birth and death Processes						1.2.5	
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Chairman - BoS Dept. of CSE - ESEC

	COMPUTER SCIENCE AND EN	GIN	EER	ING		R 2019	Semester	IV
Course Code	course Name		lours Wee		Credit	Total Hours	Maximur Marks	n
		L	Т	Р	С	Hours	Warks	
19CS401	DESIGN AND ANALYSIS OF ALGORITHMS	3	0	0	3	45	100	
<ul><li>To inf</li><li>To lease</li></ul>	of learning this course is roduce general techniques for analyzing arn different algorithm design technique	s	npute	er alg	orithms			
<ul> <li>To un Course Out</li> </ul>	derstand the limitations of Algorithm po	wer		145				
<ul> <li>Reconnection</li> <li>algori</li> <li>Estim</li> <li>Apply</li> <li>Write</li> </ul>	ate the time and space complexities of a mathematical preliminaries to the analy efficient algorithms	algori vsis al	thms nd de	s esigr	n stages o	of different		
	are the time and space complexities of <b>_GORITHM ANALYSIS</b>	differ	ent t	ypes	of algorit	thms.		9
	- role of algorithms in computing - Algo	orithm	effi	cienc	y - Math	ematical a	analysis for Re	1.1.1
and Non-red	cursive algorithms - Empirical analysis	of al	aorit	hm	Brute Fo	rce Appro	ach. Selection	Sort -
			3		Didto i o			
<b>Bubble Sort</b>	- Sequential Search - String Matching.		9					
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Bubble Sort         Unit II       I         Insertion sor         Strassen's M         Unit III       I         Knapsack       F         Algorithms.       C         and Codes       I         Unit IV       So         Lower Bound       Algorithms:         Algorithms:       N         Unit IV       E         n - Queens I       Assignment         TEXT BOOK       1.         2.       Alt	Sequential Search - String Matching.     DECREASE AND CONQUER TECHNIC t - Topological sort. Divide And Conque Matrix Multiplication     OYNAMIC PROGRAMMING     Problem and Memory functions - Opt     Greedy Technique: Prims Algorithms - Ke     OLVABILITY     d Arguments - Decision Trees - P, NP     /ertex-cover problem - Travelling Salese     ACKTRACKING     Problem - Hamiltonian Circuit Problem     Problem - Knapsack Problem - Travellir     K(S)     many Levitin, "Introduction to the Design     lition, 2017     fred V Aho, Design And Analysis Of Cor	QUE er Tec imal ruska and N man I - Suba ng Sal and A	Bina I's Al Prob set S lesm	que: ary S Igorit Comp Iem Sum nan	Merge sc Gearch T hm - Dijks lete Prob Problem.	ort - Quick rees - Wastra's Algo olems., Pro Branch a ms", Pear	sort - Binary s arshall's and rithm - Huffma oblem. Approx nd Bound Tec son Publicatic	9 search - 9 Floyd's n Trees 9 imation 9 hnique:
Bubble Sort       Unit II       Insertion sor       Strassen's M       Unit III       Knapsack       Algorithms.       Algorithms.       Onit IV       Solution       Algorithms.       Unit IV       Solution       Algorithms.       Unit V       Bassignment       TEXT BOOK       1.       2.       Alter       1.       There       1.       There       1.	Sequential Search - String Matching.     DECREASE AND CONQUER TECHNIC t - Topological sort. Divide And Conque Matrix Multiplication     OYNAMIC PROGRAMMING     Problem and Memory functions - Opt     Greedy Technique: Prims Algorithms - Ke     OLVABILITY     d Arguments - Decision Trees - P, NP     /ertex-cover problem - Travelling Salese     ACKTRACKING     Problem - Hamiltonian Circuit Problem     - Knapsack Problem - Travellin     K(S)     many Levitin, "Introduction to the Design     lition, 2017     fred V Aho, Design And Analysis Of Cor     E(S)     omas H. Cormen, Charles E. Leiserson     India Publications, 3rd Edition, 2009	and M and A and A and A and A mpute	Bina Bina I's Al NP-C Prob set S lesm Analy er Al	que: ary S Igorit Comp lem Sum nan /sis c gorith	Merge sc Gearch T hm - Dijks lete Prob Problem. of Algorith	ort - Quick rees - Wastra's Algo olems., Pro Branch a ms", Pear ison Wese	sort - Binary s arshall's and rithm - Huffma oblem. Approx nd Bound Tec son Publicatio ely, 2001 rithms", Prent	9 Floyd's n Trees 9 imation 9 hnique: ons, 3rd
Bubble Sort       Unit II       Insertion sor       Strassen's M       Unit III       Knapsack       Algorithms.       and Codes       Unit IV       Strassignment       Algorithms.       Unit V       Bin - Queens I       Assignment       1.       2.       Alt       Code       1.       2.       1.       2.       1.       1.       2.	Sequential Search - String Matching.     DECREASE AND CONQUER TECHNIC t - Topological sort. Divide And Conque Matrix Multiplication     OYNAMIC PROGRAMMING     Problem and Memory functions - Opt     Greedy Technique: Prims Algorithms - Ke     OLVABILITY     d Arguments - Decision Trees - P, NP     /ertex-cover problem - Travelling Salese     ACKTRACKING     Problem - Hamiltonian Circuit Problem     - Knapsack Problem - Travelling     K(S)     many Levitin, "Introduction to the Design     lition, 2017     fred V Aho, Design And Analysis Of Cor     E(S)     omas H. Cormen, Charles E. Leiserson	and M and A and A and A and A mpute	Bina Bina I's Al NP-C Prob set S lesm Analy er Al	que: ary S Igorit Comp lem Sum nan /sis c gorith	Merge sc Gearch T hm - Dijks lete Prob Problem. of Algorith	ort - Quick rees - Wastra's Algo olems., Pro Branch a ms", Pear ison Wese	sort - Binary s arshall's and rithm - Huffma oblem. Approx nd Bound Tec son Publicatio ely, 2001 rithms", Prent	9 Floyd's n Trees 9 imation 9 hnique: ons, 3rd

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	ARTIFICIAL INTELLIGENCE AND Course Name	H	our Vee	's/	Credit		Maximum Marks
Course Code	Course Name	L	T	P	С	Hours	
19HS402	UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY	2	1	0	3	60	100
Course Obje	ctive (s): The purpose of learning t	his	COL	irse	is to	1.16.1	
<ul> <li>To help 'SKILL' of all h</li> <li>To faci profess unders perspe based</li> <li>To high human interac</li> <li>Salient Featu</li> <li>It pres unders self-exp</li> <li>The wh about v self-exp within c</li> <li>The pri in the li</li> <li>While i</li> </ul>	b the students appreciate the essent S' to ensure sustained happiness at uman beings. itate the development of a Holistic p sion as well as towards happine tanding of the Human reality an ctive forms the basis of Universal Hu- iving in a natural way. hight plausible implications of such conduct, trustful and mutually fulfill tion with Nature <b>ures of the Course:</b> The salient fea- ents a universal approach to v tanding of reality (i.e. a worldview of bloration. hole course is presented in the form arious aspects of the reality are pre- blore the proposals by verifying the oneself and validate experientially in the focus throughout the course is the fe of the student rather than just a to htroducing the holistic worldview ar- ng notions is also made to enable to	tial nd perse ess d 1 um a H ing ntur ralu f th n o see see see see see see see see se s tur tur ralu f th n o see set s s s a h ing nd ing s a h ing nd ing s a h ing nd ing ing nd ing nd ing nd ing ing nd ing nd ing nd ing ing nd ing nd ing ing nd ing ing nd ing ing ing ing ing ing ing ing ing ing	con pros arcs he an \ Holis hu hu es t e re e re f a c on t ing. ard sfer ts in	nple sper ctive nd res /alu stic mar his educ eality dialo 1 an the affe of i	e among prosper t of ex es and underst behavi course i cation y "as it is basis of ecting a informal cations,	h are the student ity base istence. moveme anding i for and n is to by deve s") throu hereby a udents a f their na qualitation. a critica	e core aspirations s towards life and ed on a correct Such a holistic ont towards value- in terms of ethical nutually enriching eloping the right gh the process of set of proposals re encouraged to atural acceptance we transformation al appraisal of the
<ul> <li>To exp study o</li> <li>The color</li> <li>It is free</li> <li>It is free</li> <li>It is a</li> <li>Whatever facilitate</li> <li>Subseq</li> <li>is a souther</li> <li>This provide the studies</li> <li>This sepresent</li> <li>Module 1 – In</li> <li>Generations - Unite</li> </ul>	odology: The methodology of this lorational and thus universally adapt of the human being vis-à-vis the rest urse is in the form of 28 lectures (dis e from any dogma or value prescript process of self-investigation and se ver is found as truth or reality is s ed to verify it in their own right, uent Experiential Validation – the w urce of reflection. Decess of self-exploration takes the f dents to begin with, and then to co to continuous self evolution. If-exploration also enables them to co beliefs. Introduction to Value Education -3 nderstanding Value Education - S ontinuous Happiness and Prosperi	otal of scu tior elf- tate ba hol orn onti critic	ble. exis ssic expled a secce e n of nue cally	It ir sten ons) lora as a l or exist a d wit v eva	ation as	practice d not of sal and Natural the lab a between student neir pre-o	e sessions. giving sermons. the students are Acceptance and and every activity the teacher and in every activity, conditionings and

	Iule 2 – Harmony in the Human Being 6+3
Lecti Distin the S Progr	<b>ures</b> - Understanding Human being as the Co-existence of the Self and the Body - nguishing between the Needs of the Self and the Body – The Body as an Instrument of Self - Understanding Harmony in the Self - Harmony of the Self with the Body - ramme to ensure self-regulation and Health <b>rials</b> [ <i>Practice Session</i> ] - <i>Exploring the difference of Needs of Self and Body</i> - <i>Exploring</i>
Sourd	ces of Imagination in the Self - Exploring Harmony of Self with the Body
Mod	lule 3 – Harmony in the Family and Society 6+3
o-Hu	<b>ures</b> - Harmony in the Family – the Basic Unit of Human Interaction - Values in Human- man Relationship – 'Trust' – the Foundational Value in Relationship - 'Respect' – as the Evaluation - Understanding Harmony in the Society - Vision for the Universal Human
	r <b>ials</b> [Practice Session] - Exploring the Feeling of Trust - Exploring the Feeling of ect - Exploring Systems to fulfil Human Goal
	lule 4 – Harmony in the Nature/Existence 4+2
Lectu Mutua at All <b>Tutor</b>	<b>Ires</b> - Understanding Harmony in the Nature - Interconnectedness, self-regulation and al Fulfilment among the Four Orders of Nature – Realizing Existence as Co-existence Levels - The Holistic Perception of Harmony in Existence <b>rials</b> [Practice Session] - Exploring the Four Orders of Nature - Exploring Co- ence in Existence
	ule 5 – Implications of the Holistic Understanding 6+3
Conde Drder Mana Life a <b>Futor</b> Mode	<b>Ires</b> - Natural Acceptance of Human Values - Definitiveness of (Ethical) Human uct - A Basis for Humanistic Education, Humanistic Constitution and Universal Human - Competence in Professional Ethics - Holistic Technologies, Production Systems and gement Models-Typical Case Studies - Strategies for Transition towards Value-based nd Profession <b>Tials</b> [Practice Session] - Exploring Ethical Human Conduct - Exploring Humanistic Is in Education - Exploring Steps of Transition towards Universal Human Order
	rse 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, human 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 .
EXT	BOOK(S):
1.	A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93- 87034-47-1
2.	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978- 93-87034-53-2
REFE	RENCE 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
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Department	B.E. COMPUTER SCIENCE A	-			1.1.2	R 2019	Semester	·   I\
Course Code	Course Name		Houi Wee T		Credit C	Total Hours	Maximu Marks	
19TPS04	QUANTITATIVE APTITUDE AND LOGICAL REASONING - II	2	0	0	0	30	100	
Course Objec	tive (s): The purpose of learning this co	urse	is to					
<ul> <li>Solve pr</li> <li>Teach th</li> <li>Know the</li> <li>Know ab</li> <li>Course Outco</li> <li>1. Solve pro</li> <li>2. Know the</li> <li>3. Understa</li> <li>4. Evaluate issues ar</li> <li>5. Enhance</li> <li>JNIT 1 PAR</li> </ul>	e basic of partnership and chain rule in soblems using fast track method by learning e angle of elevation and depression. The relationship, direction concepts in easy out coding and decoding through logical mes: At the end of this course, learners oblems by using shortcut in partnership at tips and tricks of profit and loss with perind the concepts of angles. The logical way of thinking by solving proting for the logical way of thinking by solving proting the logical way of thinking by solving proting the real life situations.	ng pr way. way. will b nd ch centa ng an	ofit a e ab nain n age t nd an s co	le to: rule. hrou alyzi	gh fast tra ing analyt and rankir	ack method ical reason	ls. ing of key ots.	
INIT 2 PRO ROFIT AND L	Definition – Direct proportion and Indirec FIT & LOSS, PERCENTAGE .OSS: Basic definition and types of profi ue v/s false value – Application in data i	t and	loss	- C			and marked	6 price
	: Percentage – Percentage using shortc	uts.						
JNIT 3 HEIG	HT AND DISTANCE							6
IEIGHT AND D	DISTANCES: Line of sight – Angle of ele	vatior	n – A	ngle	of depres	ssion.		
JNIT 4 BLO	OD RELATIONSHIP & DIRECTION SEN	ISE 1	EST	F				6
	TIONSHIP: Analysis the gender relations INSE TEST: Distance between the startin CAL SEQUENCE OF WORD, CODING SEQUENCE TEST	ng an	den	ding	points - S	ense the d	irection corre	ectly.
	UENCE OF WORDS: Sequence of occu ience of increasing/decreasing size, valu DECODING: Introduction – Description o	e, int f cod	ensil ing r	ty, et neth	с.			
oding & decodi	ng – Problems involving coding & decod				nking test		quence test. AL : 30 HOU	

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8.	Bharat Mein Angreji Raj – PanditSunderlal
9.	Rediscovering India - by Dharampal
10.	Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
SUGG	ESTED ASSESSMENT:
This	is a compulsory credit course. The assessment is to provide a fair state of development
of the	e student, so participation in classroom discussions, self-assessment, peer assessment
etc. v	will be used in evaluation. <i>Example</i> :
Asse	ssment by faculty mentor. 10 marks
Self-	assessment: 10 marks & Assessment by peers: 10 marks
Socia	ally relevant project/Group Activities/Assignments: 20 marks
Sem	ester End Examination: 50 marks
The	overall pass percentage is 40%. In case the student fails, he/she must repeat the
	se

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Chainese + Book

	ent	COMPUTER SCIENCE AND	ENGINI	EER	ING		R 2019	Semester	IV
Course Co	ode	Course Name		lours Wee		Credit	Total	Maxim	
			L	Т	Р	С	Hours	Marks	5
19CS403	3	COMPUTER NETWORKS	3	0	0	3	45	100	
<ul> <li>To</li> <li>refe</li> <li>To</li> </ul>	ose of lear study the erence ar understa	(s): rning this course is concepts of data communicati chitecture nd the error detection and corre concepts of sub netting and ro	ection m	netho	ods a	nd types		s of ISO/OS	I
• To	understa	nd the different types of protoco	ols and	netw	ork o		nts.		
<ul> <li>Pratect</li> <li>Ananet</li> <li>Uno</li> <li>Uno</li> <li>Uno</li> <li>Uno</li> </ul>	actice the hnologies alyse the working a derstand derstand DATA ( on, history	the fundamentals of data comme e error detection and correction requirements for a given organ architecture and routing technol the transport layer principles are the application layer protocols and <b>COMMUNICATIONS AND PHY</b> y and development of computed t types of transmission media, or	on met nization logies nd reliat and also <b>/SICAL</b> er netwo	hods al st ble d the LAY	tructu ata tr use <b>(ER</b> netw	d unders ure and s ransfer of cryptog	tand the elect the graphy ar	e different n most appr nd network s SO/OSI moo	ropriate security 9 del anc
	(NRZ, NF	RZI, Manchester, 4B/5B). MAC							
Error dete specificati	ction (Pa ons of po	rity, CRC, Hamming code), Sli						cols, LAN: [	Desian
sidelooth.		opular technologies, switching, /i-Max, FDDI, PPP, bridging an		ət, G	igab	it Etherne	et, Token	i Ring, Toke	
		opular technologies, switching, /i-Max, FDDI, PPP, bridging an DRK LAYER		ət, G	igao		et, Token	ı Ring, Toke	
<b>Jnit III</b> Internet P	rotocol, I	/i-Max, FDDI, PPP, bridging an DRK LAYER Pv6, ARP, DHCP, ICMP, Dista	d SDN.	tor r	outin	ig, Link st	ate routir		en Bus 9
<b>Unit III</b> Internet P domain ro	rotocol, I uting, RIF	/i-Max, FDDI, PPP, bridging an DRK LAYER	d SDN.	tor r	outin	ig, Link st	ate routir		en Bus 9
Unit III Internet P domain ro Unit IV UDP, TCF control, tin	Protocol, I uting, RIF TRANS P, Connec ners, retr	/i-Max, FDDI, PPP, bridging an DRK LAYER Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N	d SDN. Ince veo letwork	tor r Addı	outin ress	ig, Link st Translatio	ate routir on isited, flo	ng, Classles	9 9 s Inter- 9 gestion
Unit III Internet P domain ro Unit IV UDP, TCF	Protocol, I uting, RIF <b>TRANS</b> P, Connec ners, retraing	/i-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termir	d SDN. Ince veo letwork	tor r Addı	outin ress	ig, Link st Translatio	ate routir on isited, flo	ng, Classles	9 9 s Inter- 9 gestion
Unit III Internet P domain ro Unit IV JDP, TCF control, tim Programm Jnit V DNS, E-N cryptograp Public Key	Protocol, I uting, RIF <b>TRANS</b> P, Connec ners, retraing <b>APPLI</b> Mail -SMT ohy, Shar Authenti	Vi-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termin ansmission, TCP extensions, I	d SDN. Ince veo letwork nation, s Design i P, HTT	tor r Addi slidin issue	outin ress g wii es in	ig, Link st Translatio ndow rev protocols V, symm	ate routir on isited, flo s at differ etric and	ng, Classles ow and cong rent layers, d asymmetr	9 9 s Inter- 9 gestior Socke 9 ic key
Unit III Internet P domain ro Unit IV UDP, TCF control, tim Programm Unit V DNS, E-M cryptograp Public Key FEXT BOO	Protocol, I uting, RIF TRANS P, Connec ners, retr ning Appli Mail -SMT ohy, Shar / Authenti OK(S)	Vi-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termin ansmission, TCP extensions, I <b>CATION LAYER</b> TP, MIME, POP3, IMAP, FT ring of symmetric keys – Diffic ication Protocols, Firewalls.	d SDN. Ince veo letwork nation, s Design i P, HTT e-Hellma	issue P, V an k	outin ress g win es in WWW ey E	ig, Link si Translatio ndow rev protocols V, symm xchange	ate routir on isited, flo s at differ etric and , Public	ng, Classles ow and cong rent layers, d asymmetr Key Infrastr	9 9 s Inter- 9 gestion Socket 9 ic key
Unit III Internet P domain ro Unit IV UDP, TCF control, tim Programm Unit V DNS, E-M Cryptograp Public Key TEXT BOO 1.	Protocol, I uting, RIF TRANS P, Connec ners, retraing APPLI Mail -SMT ohy, Shar v Authenti OK(S) AS Tane Behrouz	Vi-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termir ansmission, TCP extensions, I <b>CATION LAYER</b> TP, MIME, POP3, IMAP, FT ring of symmetric keys – Diffie	d SDN. Ince veo letwork nation, s Design i P, HTT e-Hellma ter Netw	tor r Addi slidin issue P, V P, V vorks	outin ress g wii es in WWW ey E	ig, Link st Translation ndow rev protocols V, symm xchange	ate routir on isited, flo s at differ etric and Public I Prentice	bw and congrent layers, d asymmetr Key Infrastro	en Bus 9 s Inter- 9 gestion Socket 9 ic key ucture,
Unit III Internet P domain ro Unit IV JDP, TCF control, tim Programm Jnit V DNS, E-N Cryptograp Public Key <b>FEXT BOO</b> 1.	Protocol, I uting, RIF TRANS P, Connec ners, retraing APPLI Mail -SMT Mail -SMT Mail -SMT OHY, Shar Authenti OK(S) AS Tane Behrouz 2007	Vi-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termin ansmission, TCP extensions, I <b>CATION LAYER</b> TP, MIME, POP3, IMAP, FT ring of symmetric keys – Diffic ication Protocols, Firewalls. nbaum, DJ Wetherall, "Comput	d SDN. Ince veo letwork nation, s Design i P, HTT e-Hellma ter Netw	tor r Addi slidin issue P, V P, V vorks	outin ress g wii es in WWW ey E	ig, Link st Translation ndow rev protocols V, symm xchange	ate routir on isited, flo s at differ etric and Public I Prentice	bw and congrent layers, d asymmetr Key Infrastro	n Bus 9 s Inter 9 gestior Socke 9 ic key ucture
Unit III Internet P domain ro Unit IV UDP, TCF control, tim Programm Unit V DNS, E-M cryptograp Public Key TEXT BOO 1. 2. REFEREN	Protocol, I uting, RIF TRANS P, Connee ners, retra- ning APPLI Mail -SMT ohy, Shar Authenti OK(S) AS Tane Behrouz 2007 ICE(S)	Vi-Max, FDDI, PPP, bridging an <b>DRK LAYER</b> Pv6, ARP, DHCP, ICMP, Dista P, OSPF, BGP, Subnetting, , N <b>SPORT LAYER</b> ction establishment and termin ansmission, TCP extensions, I <b>CATION LAYER</b> TP, MIME, POP3, IMAP, FT ring of symmetric keys – Diffic ication Protocols, Firewalls. nbaum, DJ Wetherall, "Comput	d SDN. Ince veo letwork nation, s Design i P, HTT e-Hellma ter Netw ation an	slidin slidin P, V an k vorks	outin ress g will es in AVVV ey E s", 5th etwor	ng, Link st Translation ndow rev protocols V, symm xchange n Edition, rking", 4t	isited, flo s at differ etric and Public I Prentice	bw and congrent layers, d asymmetr Key Infrastro -Hall, 2010. , Tata McGr	en Bus 9 s Inter- 9 gestion Socket 9 ic key ucture, awHill,

Y I

- 2. Arun Sharma, How to prepare for Data Interpretation for the CAT, First Edition, Tata McGraw-Hill Publishing Company Ltd, 2012.
- 3. R.V.Praveen,"Quantitative Aptitude and Reasoning"Third Edition, PHI Learning ,2016.
- 4. Dr.R S Aggarwal, Quantitative Aptitude, Revised and Enlarged Edition, S.Chand Publishing Company Ltd, 2017.
- 5. Arun Sharma "How to Prepare for Quantitative Aptitude" Eight Edition, McGraw Hill Education, 2018
- 6. "Reasoning and Aptitude" for GATE and ESE Prelims, Made Easy Publication, 2020.

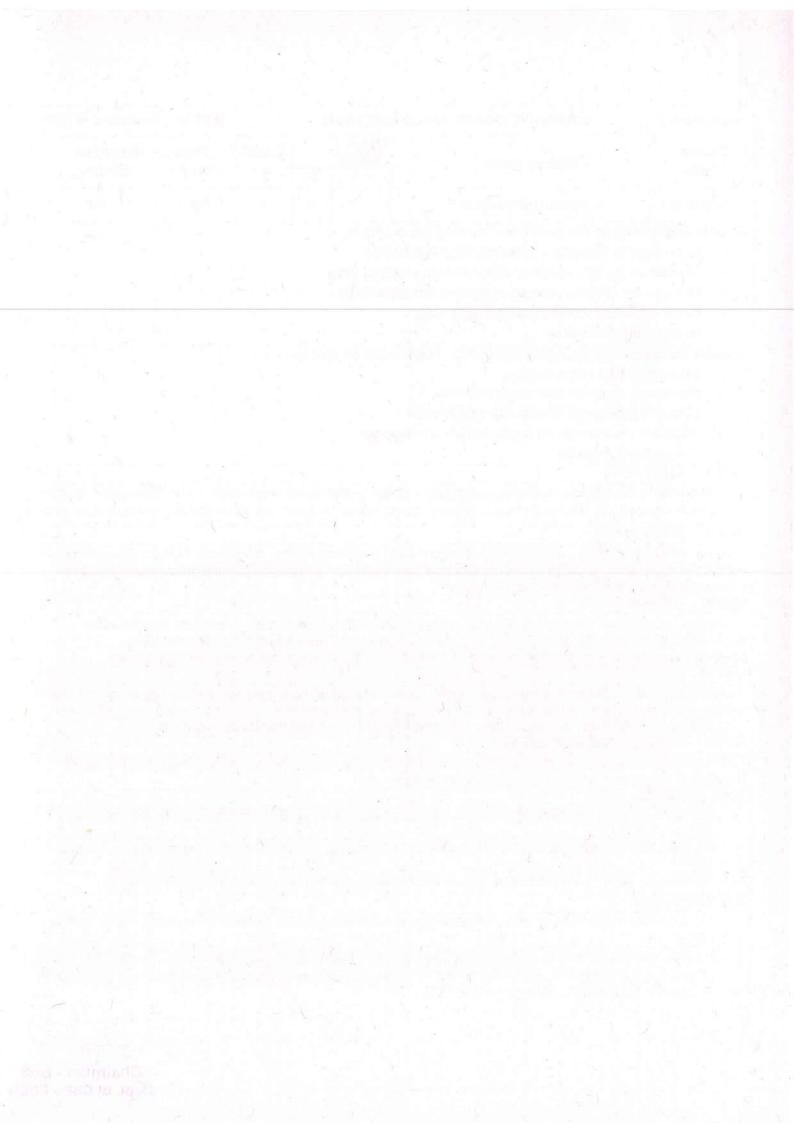
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Continuentaria See - State - See

	COMPUTER SCIENCE AN	D ENGIN	EERIN	IG	12.27	R 2019	Semester IV	EEC	
Course Code	Course Name	те Week		Credit	Total	Maximum			
Code		L	Т	Р	C	Hours	Marks		
19HS401	LANGUAGE SKILLS	0	0	2	0	30	100		
<ul> <li>To involve</li> <li>To improve</li> <li>To focus th</li> <li>To enhance</li> </ul>	e (s): The purpose of learning to the students in effective listenin the oral communication skills in e effective reading of general and e and comprehend the writtente e LSRWskills.	gactivitie n properr nd techn	es. manne						
<ul> <li>Understan</li> <li>Communic</li> <li>Comprehe</li> <li>Write the rest</li> </ul>	es: At the end of this course, lead d the technicaltalks. tate to his peer groupproperly. nd the general and technicaltex eports and job application in cle _SRWskills.	t.		ible to				6	
	nportance –Listening strategies ation - Being an active listener:								
Jnit II SPEAK	ING							6	
Give personal info	rmation - ask for personal inforr	nation - (	expres	ss abil	ity - ask fo	or clarificat	tion - pronuncia	ation	
Give personal info pasics - pronuncia	rmation - ask for personal inforr tion practice - conversation star	nation - ( ters: Pe	expres p talk	ss abil - stres	ity - ask fo sing sylla	or clarificat bles and s	tion - pronuncia peaking clearly	ation	
Give personal info pasics - pronuncia summarizing acad	rmation - ask for personal inforr tion practice - conversation star emic readings and lectures	nation - ters: Pej	expres o talk	ss abil - stres	ity - ask fo sing sylla	or clarificat bles and s	tion - pronuncia peaking clearly	ation / -	
Give personal info pasics - pronuncia summarizing acad Jnit III READIN	rmation - ask for personal inforr tion practice - conversation star emic readings and lectures NG	ters: Pe	o talk	- stres	sing sylla	bles and s	peaking clearly	ation	
Give personal info pasics - pronuncia summarizing acad Jnit III READIN Strategies for effect	rmation - ask for personal inforr tion practice - conversation star emic readings and lectures <b>IG</b> ctive reading - Read and recogr	ters: Per	o talk rent ty	- stres	sing sylla f texts - P	bles and s	peaking clearly	ation / -	
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Give personal info pasics - pronuncia summarizing acad <b>Jnit III READIN</b> Strategies for effect bhotos and title - F Jnderstanding pro <b>Jnit IV WRITIN</b>	rmation - ask for personal inforr tion practice - conversation star emic readings and lectures <b>NG</b> ctive reading - Read and recogr Read for details - Use of graphic moun reference and use of com <b>G</b>	ters: Pep nize diffe organize nectors i	o talk rent ty ers to n a pa	- stres pes o reviev ssage	f texts - P v and aid - speed r	bles and s redicting c comprehe eading tec	peaking clearly ontent using nsion - hniques	ation / - 6	
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Course Cod	e Course Name		Hours / Week		Credit		Total	Construction of the second s	
	100 March 100 Ma	L	Т	Р	С	Hours	Marks		
19CS407	DATABASE MANAGEMENT SYSTEM LABORATORY	0	0	4	2	60	100		
<ul> <li>To let ER d</li> <li>To ut desig</li> <li>To kr recover the end of t</li></ul>	e of learning this course is arn the fundamentals of data models to co- iagram. Inderstand the relational database implanta in concepts now the fundamental concepts of transaction very procedure. Inderstand the internal storage structures of elp in physical DB design along with Query <b>comes:</b> If this course, learners will be able to: the Relational model, ER diagrams. liarize to use SQL commands to manage to concurrency control and recovery mecha in effective Databases for enterprise applied	he constant	g dif timiz datat ns fc ons d TC strai	ng S ssing feren zatior base or pra	QL with a	effective rency con l indexing ues.	relational da trol techniqu g techniques	tabase es anc	
TEXT BOOK	((S)						2 months		
	Silberschatz, H. F. Korth & S. Sudersha dition 2010.	an, I	Data	base	system	concepts	, McGraw H	ill, 6th	
2. C	J. Date, An introduction to database systemeters	ems	s, Ad	disor	n Wesley	,8 th Edit	ion, 2003.		
REFERENC	E(S)								
		-				1.2.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1			
1 R	Elmasri & S. B. Navathe, Fundamentals o	f da	taba	se sy	vstems, A	ddison V	Vesley, 6th E	dition,	

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Department	COMPUTER SCIENCE AND EI	NGINI	EERI	NG		R 2019	Semester	IN
Course Code	Course Name		lours Wee		Credit	Total	Maximur	n
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19IT304	DATABASE MANAGEMENT SYSTEMS	3	0	0	3	45	100	
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Course Outco			_					
<ul> <li>Explain t design, r</li> <li>Design E</li> <li>Convert queries of</li> </ul>		nodel, ase a popul	entit pplic late	ty-rel ation relati	ationship scenario ional dat	o model, re os abase an	elational data	
<ul> <li>Familiar</li> </ul>	with basic database storage structur	es an	d acc	2000				
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Unit I     INTF       History and m     database archi       Unit II     DAT       Data modeling     nor       languages: Ove     ove       embedding nor     nor       Unit III     REL       Mapping conce     and relational of       forms; multi val     Transactions; fa       Unit IV     TRA       Transactions; fa     HY       Storage and fille     filles       filles with variab     TEXT BOOK(S       1.     A. Si       2.     C. J.       REFERENCE(S       1     R. E	RODUCTION         notivation for database systems; contecture and data independence.         A MODELING         ; conceptual models; object -orienteerview of database languages; SQL;         procedural queries in a procedural la         ATIONAL DATABASES         eptual schema to a relational schema         calculus; Relational database design         ued dependency; join dependency; r         NSACTION PROCESSING         ailure and recovery; concurrency contect         SICAL DATABASE DESIGN         e structure; indexed files; hashed file         ple length records; database efficience         plate, An introduction to database sy	mpone ed mo ; quer angua a; enti : Data epres itrol es; sig y and han, D	ents del; y opi ge; ii ty ar base entat unatu tunir	of da relat timiz ntrod nd re e des tion t ng.	atabase ional dat ation; 4th luction to ferential sign; func heory. es; b -tre system o n Wesley	systems; a model. n-generati Object Q integrity; ctional dep ees; files y concepts, 7,8 th Editi	Database of on environm uery Langua relational algo bendency; no with dense in McGraw Hill on, 2003.	9 query ents ge. 9 gebra orma 9 gebra orma 9 gebra orma

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Department	COMPUTER SCIENCE AND E	NGINI	EERI	NG		R 2019	Semester	IV
Course Cod	e Course Name		lours Wee		Credit	Total	Maximu	
		L	Т	Р	С	Hours	Marks	5
19CS404	OPERATING SYSTEMS	3	0	0	3	45	100	
To un     To fa     To fa     To fa     To fa     Scher     To le     Course Out     At the end o     Deter     Deter     Imple     Simu     Ident torage Mana Unit I	e of learning this course is inderstand the basic concepts of operati miliarise the OS services that assist sys- copose several aspects of OS design in duling and Process synchronization, arn the memory management, Seconda <b>comes:</b> If this course, learners will be able to: mine the efficiency of CPU Scheduling of and model Deadlock ment Process Synchronization technique late disk scheduling and Memory mana fy File and Disk Storage Management	stem uncludin ary Ma algorit ues. agemen with re SS aracte	sers g: pr nage thms nt teo spec	chniq chniq ct to c	ues. different	e System	Implementa	9 cepts
Concepts	- process states -Concurrent processes			s cor	ntrol bloc	k -Proce:	ss context T	hread
lob and pro processes – consumer pr	cessor scheduling – scheduling algori critical sections – mutual exclusion – s ocesses – Critical section problem So to implement mutex, process synchron	thms - ynchro emaph	-Proc nizat	tion - 5 — ir	- Proces: nit, wait,	s coopera	ation, produc	curren er and
Unit III	PC AND DEADLOCK					32	1	9
System mo	s Communication (IPC) - Message Pas del – Deadlock characteristics – Meth roidance - Deadlock detection - Deadloc	ods fo	or ha	ndlin				
Unit IV	MEMORY MANAGEMENT							9
- Segmenta	nagement: Background - Swapping -Co tion with paging Virtual Memory: Bac -Allocation of frames –Thrashing						1.22.1	
opideemen								
	FILE AND SECONDARY STORAGE M	ANAG	EMI	ENT				9

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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)
REFEF	Harvey M.Deitel, Paul J. Deitel, David R. Choffnes, "Operating systems", Third edition, Pearson Prentice Hall(2007).

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Department	COMPUTER SCIENCE AND	ENGIN	NGINEERING R 2019 Semeste		Semester	V		
Course Code	Course Name	1.000	our Wee		Credit	10101	Maximur Marks	n
		L	Т	Ρ	С	Hours	Warks	7
19CS501	WEB TECHNOLOGY	3	0	0	3	45	100	

# Course Objective (s):

The purpose of learning this course is To understand the basics of WWW and Web design Develop website using HTML, CSS and java scripts To develop web application using PHP & MySQL

To send and receive data using XML &AJAX

# Course Outcomes:

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

- Describe the concepts of WWW including browser and HTTP protocol.
- Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications.
- Use the JavaScript to develop the dynamic web pages.
- Use server side scripting with PHP to generate the web pages dynamically using the database connectivity.
- Develop the modern Web applications using the XML and AJAX

# Unit I Introduction to WWW & WEB DESIGN

Concept of WWW, Internet and WWW, HTTP Protocol : Request and Response, Web browser and Web servers, Features of Web 2.0. Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation

# Unit II HTML & STYLE SHEETS

Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Website structure. Overview and features of HTML5. Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS

# Unit III JAVA SCRIPT

Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: Javascript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations, DHTML : Combining HTML, CSS and Javascript, Events and buttons

Unit IV PHP

PHP : Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files,

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Advance Features: Cookies and Sessions, Object Oriented Programming with PHP., Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin

# Unit V XML AND AJAX

9

Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. Transforming XML using XSL and XSLT. AJAX Architecture-Dynamic web page Creation using AJAX.

TEXT	T 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

# REFERENCE(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.
3.	Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India, 2014

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Course	COMPUTER SCIENCE AND EN	Н	our	s /	Credit	R 2019 Total	Semester Maximu	
Code	Course Name	-	Wee			Hours	Marks	
		F	Т	Ρ	С	- 24		
19CS502	THEORY OF COMPUTATION 3 0 0 3 45		100					
Course Object								2
	f learning this course is	• 100 million						
	an understanding of Computational	areas a	-					
	a knowledge of regular languages a	and the second						
	<i>i</i> the relation between regular langua	ige,	cont	ext fi	ree langi	lage and	correspor	aing
<ul> <li>recogniz</li> <li>To study</li> </ul>						¥		
<ul> <li>To study</li> <li>Course Outco</li> </ul>	/ the concept of Turing machines.	-			-		1	
	his course, learners will be able to:							
	and the concepts of Finite Automata	Re	aula	r and	d Contex	t free I a	nquages	
	he Context free grammar and Push	•	-					ade
and the second second	e pumping lemma properties to Reg						and the second	age
	he Turing machine for a Language.	aiai	and	0011	loxer roc	Langue	gee	
and the second se	and the various classes of problems							
		jar -					ana antisea	9
								-
minimization o	tion, equivalence between NFA a f FSM ,equivalence between two FS							
minimization o Unit II RI	f FSM ,equivalence between two FS	βM's,	Mo	ore a	and Mala	iy machii	nes	DFA, 9
minimization o Unit II RI Regular sets equivalence b regular sets(p	f FSM ,equivalence between two FS	SM's, lles, on, ars,	Mo ma Pum rigł	ore a nipu nping nt lir	and Mala lation of lemma near and	f regula Closure left lin	nes r expressi e propertie lear gramr	OFA, 9 ons, s of mars
minimization o Unit II RI Regular sets equivalence b regular sets(p equivalence be	f FSM ,equivalence between two FS EGULAR EXPRESSIONS , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm	SM's, lles, on, ars,	Mo ma Pum rigł	ore a nipu nping nt lir	and Mala lation of lemma near and	f regula Closure left lin	nes r expressi e propertie lear gramr	OFA, 9 ons, es of mars
minimization o Unit II RI Regular sets equivalence b regular sets(p equivalence be Unit III C	f FSM ,equivalence between two FS EGULAR EXPRESSIONS , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F ONTEXT FREE GRAMMARS	SM's, on, ars, FA, i	Mo ma Pum rigł nter	nipu nipu nping nt lir conv	and Mala lation of lemma near and version b	y machin f regula , Closure d left lin etween l	nes r expressi e propertie lear gramr RE and RC	OFA, 9 ons, es of mars 3 9
minimization o Unit II RI Regular sets equivalence b regular sets(p equivalence be Unit III C Context free	f FSM ,equivalence between two FS EGULAR EXPRESSIONS , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F ONTEXT FREE GRAMMARS Grammars, Derivation trees, Left	SM's, on, ars, A, i	Mo ma Pum righ nter	ore a nipu nping nt lir conv	and Mala lation or l lemma near and version b	y machin f regula , Closure d left lin etween l	nes r expressi e propertie ear gramr RE and RC st Derivati	9 ons, s of mars 9 9 ons,
minimization o Unit II RI Regular sets equivalence b regular sets(p equivalence be Unit III C Context free Ambiguity in Co	f FSM ,equivalence between two FS EGULAR EXPRESSIONS , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F ONTEXT FREE GRAMMARS Grammars, Derivation trees, Left ontext-Free Grammars, Specification	M's, on, ars, A, in Mos	Mo ma Pum righ nter st D Con	nipu nipu nping nt lir conv eriva	and Mala lation of lemma version b version b tions, R Free Gra	y machin f regula , Closure d left lin etween l light Mo ammars,	r expressi e propertie lear gramr RE and RC st Derivati Normal Fo	OFA, 9 ons, es of mars 3 9 ons, rms,
minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal	M's, on, ars, A, i Mos s of Forn	Mo ma Pum righ nter st D Con n (G	nipu nipu nping nt lir conv eriva	and Mala lation of lemma version b version b tions, R Free Gra	y machin f regula , Closure d left lin etween l light Mo ammars,	r expressi e propertie lear gramr RE and RC st Derivati Normal Fo	OFA, 9 ons, es of mars 3 9 ons, rms,
minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr Languages of a	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C	M's, on, ars, A, i Mos s of Forn	Mo ma Pum righ nter st D Con n (G	nipu nipu nping nt lir conv eriva	and Mala lation of lemma version b version b tions, R Free Gra	y machin f regula , Closure d left lin etween l light Mo ammars,	r expressi e propertie lear gramr RE and RC st Derivati Normal Fo	OFA, 9 ons, s of mars 9 ons, rms, A) –
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minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr Languages of a Unit IV TU	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C <b>JRING MACHINE</b> d Examples- Computing Partial Fur	M's, on, ars, A, in Mos Sof Form CFG	Mo ma Pum righ nter Con n (G s.	ore a nipu nping nt lir conv eriva ntext NF) vith	and Mala lation or lemma near and version b tions, R Free Gra , Pushd	y machin f regula , Closurd d left lin etween l tight Mo ammars, own auto	nes r expressi e propertie lear gramr RE and RC st Derivati Normal Fo omata (PD s – Combi	OFA, 9 ons, es of mars 9 ons, rms, A) – 9 ning
minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr Languages of a Unit IV TU Definitions and Turing Machine	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C <b>JRING MACHINE</b> d Examples- Computing Partial Fur es-Variations of Turing Machines w	M's, on, ars, A, in Mos Sof Forn CFG	Mo ma Pum righ nter Con n (G s. Mul	ore a nipu nping nt lir conv eriva etext NF) vith	and Mala lation or lemma hear and version b ditions, R Free Gra , Pushd Turing I e TMs-N	y machin f regula , Closure d left lin etween l light Mo ammars, own auto Machine	r expressi e propertie lear grammer RE and RC st Derivati Normal Fo comata (PD s – Combi ministic Tu	9 ons, es of mars 9 ons, rms, A) – 9 ning uring
minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr Languages of a Unit IV TU Definitions and Turing Machine	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C <b>JRING MACHINE</b> d Examples- Computing Partial Fur es-Variations of Turing Machines w versal Turing Machines-Models of	M's, on, ars, A, in Mos Sof Forn CFG	Mo ma Pum righ nter Con n (G s. Mul	ore a nipu nping nt lir conv eriva etext NF) vith	and Mala lation of lemma hear and version b ditions, R Free Gra , Pushd Turing I e TMs-N	y machin f regula , Closure d left lin etween l light Mo ammars, own auto Machine	r expressi e propertie lear grammer RE and RC st Derivati Normal Fo comata (PD s – Combi ministic Tu	9 ons, es of mars 9 ons, rms, A) – 9 ning uring
minimization o Unit II RI Regular sets equivalence be regular sets(p equivalence be Unit III C Context free Ambiguity in Co Chomsky Norr Languages of a Unit IV TU Definitions and Turing Machine Church Turing	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C <b>JRING MACHINE</b> d Examples- Computing Partial Fur es-Variations of Turing Machines w rersal Turing Machines-Models of Thesis.	M's, on, ars, A, in Mos Sof Forn CFG	Mo ma Pum righ nter Con n (G s. Mul	ore a nipu nping nt lir conv eriva etext NF) vith	and Mala lation of lemma hear and version b ditions, R Free Gra , Pushd Turing I e TMs-N	y machin f regula , Closure d left lin etween l light Mo ammars, own auto Machine	r expressi e propertie lear grammer RE and RC st Derivati Normal Fo comata (PD s – Combi ministic Tu	9 ons, s of mars 9 ons, rms, A) – 9 ning uring the
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minimization o         Unit II       RI         Regular sets       equivalence be         regular sets(pequivalence be         equivalence be         Unit III       C         Context free         Ambiguity in Co         Chomsky Norr         Languages of a         Unit IV       TU         Definitions and         Turing Machine         Machines-Univ         Church Turing         Unit V       C         Chomsky hier	f FSM ,equivalence between two FS <b>EGULAR EXPRESSIONS</b> , regular expressions, identity ru etween RE and FA, inter conversi roofs not required),regular gramm etween regular linear grammar and F <b>ONTEXT FREE GRAMMARS</b> Grammars, Derivation trees, Left ontext-Free Grammars, Specification nal Form (CNF), Greibach Normal a PDA - Equivalence of PDA's and C <b>JRING MACHINE</b> d Examples- Computing Partial Fur es-Variations of Turing Machines w rersal Turing Machines-Models of Thesis. <b>ELASSES OF PROBLEMS</b>	M's, on, ars, A, ii Mos Sof Forn CFG <sup>0</sup> nctio vith Cor	Mo ma Pum righ nter Con con con con s. Mul mput	ore a nipu nping nt lir conv eriva itext NF) vith tation	and Mala lation or lemma near and version b version b tions, R Free Gra , Pushd Turing I e TMs-N ns, Coul	y machin f regula , Closure d left lin between l tight Mo ammars, own auto Machine Nondeter nter machine ext sens	r expressi e propertie lear gramm RE and RC st Derivati Normal Fo omata (PD s – Combi ministic Tu chine and itive langu	OFA, 9 ons, es of mars 9 ons, rms, A) – 9 ning uring the 9 age,
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	hine, undecidability of post's correspondence problem. Turing reducibility, definition of P NP problems, NP complete and NP hard.
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.
REF	ERENCE(S)
3.	H.R.Lewis and C.H.Papadimitriou, —Elements of the theory of Computation, 2nd Edition, Pearson Education/PHI, 2003
4.	Micheal Sipser, —Theory and Computation, 7th Edition, Thomson Course Technology, 2008

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N. O	COMPUTER SCIENCE AND EN	IGINE	ER	NG		R 2019	Semeste	r IV
Course Code	Course Name	1	ours Wee		Credit	Total		num
	a second a second as a second	L	т	Р	С	Hours	Mar	ks
19CS503	SOFTWARE ENGINEERING	3	0	0	3	45	100	
<ul> <li>To know</li> <li>To desig</li> <li>To gathe</li> <li>To deve</li> <li>To verif</li> </ul> Course Outcoor At the end of th <ul> <li>Analyze</li> <li>Design,</li> <li>program</li> <li>Apply design</li> <li>Apply test</li> <li>improve</li> </ul>	f learning this course is y the fundamentals of project manage on software using models. er knowledge on various software tes lop an efficient software system throu y the quality of software products	ting, m igh go mputir / com ne con cts f the s	naint od g ng re pute sstru	tenar group equire er bas ction	ements sed syst	eness. appropria em proco are syste	ess, comp	
Process assest specifications: nonfunctional i software requir	neering Fundamentals; Software pros sment models; Overview of Project I Requirements elicitation; Requirements requirements; User requirements, S rement specification document. Pro	Manag nts ar System	geme halys h re	ent a sis m quire	are life- ctivities; nodeling ments,	cycle and Software technique requirem	e requireme es; Function ent validation	models ents and onal and tion and
Process asses specifications: nonfunctional i software requir techniques	neering Fundamentals; Software pro sment models; Overview of Project I Requirements elicitation; Requirements requirements; User requirements, S	Manag nts ar System	geme halys h re	ent a sis m quire	are life- ctivities; nodeling ments,	cycle and Software technique requirem	e requireme es; Function ent validation	models ents and onal and tion and
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2.	Ian Sommerville, "Software Engineering", 9th Edition, Addison- Wesley, 2011
REFER	ENCE(S)
1.	Pankaj Jalote, "Software Engineering, A Precise Approach", Wiley India, 2010.
	Kalkar C.A. "Cathuara Engineering" Drantica Hall of India But Ltd. 2007
2.	Kelkar S.A., "Software Engineering", Prentice Hall of India Pvt Ltd, 2007.

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Course		1.1	lEEF lour	s/	Credit	R 2019 Total	Semester V Maximu	
Code	Course Name	-	Wee	-	C	Hours	Marks	
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	help people make sense of numerical d							
	the calendars and series in simplified w							
	nd the concept of the interest amount in		nd Cl					
	procedure to deal with a situation and s				ermine th	ne answer		
	ating arrangements in rows or in small g			o uci				
	comes: At the end of this course, learne			ahle	to:			-
	ate various principles involved in solving					s and there	aby roducing	the
	to solve Aptitude Questions.	jinat	nem	alica	i probleti	is and there	eby reducing	line
	question based on calendar, odd man o	ut ar	dso	rios	by using	shortcut	athode	
	the interest by using shortcut methods in						ethous.	
	ir critical thinking by solving the syllogis							
	e conditions and do interpretation.	in an	u co	uise	of action	•		
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	A INTERPRETATION & CLOCKS PRETATION: Tabulation – Bar graphs –	Die	<u>ala a m</u>			h e		6
LOCKS: Def	inition – important points – Angular diffe						rent timings-	
correct clock								
	ENDARS, ODDMAN OUT & SERIES							6
JNIT 2 CALI		r – C	ount	ing o	of odd da	ys – Day o	f the week.	6
JNIT 2 CALI	ENDARS, ODDMAN OUT & SERIES			0.53		-200 (200)		
JNIT 2 CALI ALENDARS DDMAN OU	ENDARS, ODDMAN OUT & SERIES : Odd days – Leap year – Ordinary yea			0.53		-200 (200)		6
UNIT 2 CALI ALENDARS	ENDARS, ODDMAN OUT & SERIES : Odd days – Leap year – Ordinary yea T & SERIES: Odd man out – Power ser			0.53		-200 (200)		
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## TOTAL: 30 HOURS

#### **REFERENCES:**

- 1. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Fourth Edition, Tata McGraw-Hill Publishing Company Ltd, 2012
- 2. Arun Sharma, How to prepare for Data Interpretation for the CAT, First Edition, Tata McGraw-Hill Publishing Company Ltd, 2012.
- 3. R.V.Praveen,"Quantitative Aptitude and Reasoning"Third Edition, PHI Learning ,2016.
- 4. Dr.R S Aggarwal, Quantitative Aptitude, Revised and Enlarged Edition, S.Chand Publishing Company Ltd, 2017.
- 5. Arun Sharma "How to Prepare for Quantitative Aptitude" Eight Edition, McGraw Hill Education, 2018.
- 6. "Reasoning and Aptitude" for GATE and ESE Prelims, Made Easy Publication, 2020.

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	COMPUTER SCIENCE AND ENG	SIN	EEF	RING		R 2019	Semester	۷	
Course Code	Course Name	0.00	our: Wee		Credit	Total Hours	Maximur Marks	n	
Code		L	Т	Ρ	С	Hours	Warks	KS	
	MOBILE APPS DEVELOPMENT – SUPPORTED BY INFOSYS LIMITED	2	0	4	2	60	100		
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<ul> <li>Underst</li> </ul>	and Mobile apps deployment		Ċ.	_				d'	
<ul> <li>Familiar</li> <li>Design a user exp</li> </ul>	ate the Mobility landscape ize with Mobile apps development asp and develop mobile apps, using Androi perience design, native data handling a ation of nuances such as native hardw dia.	d a and	s de bac	kgro	ound task	s and not	tifications.		
Perform	testing, signing, packaging and distrib	utio	on of	f mo	bile apps	Gale 1			
Jnit I G	etting started with Mobility							6	
etting up the	mobile app development environment a						ndroid platf		
pp developm Jnit II Bi	uilding blocks of mobile apps	alor	ng w	ith a	n emulat	or, a case	study on Mo	15	
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	<ul> <li>Using emulator to deploy and run mobile apps</li> <li>Testing mobile app - unit testing, black box testing and test automation</li> </ul>
TEX	T BOOK(S)
1.	Anubhav Pradhan, Anil V Deshpande, Mobile Apps Development, Edition 1
2.	Barry Burd, Android Application Development All in one for Dummies, Edition: I
REF	ERENCE(S)
1	Teach Yourself Android Application Development In 24 Hours , SAMS Publications

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Department	COMPUTER SCIENCE AND ENG	R 2019	Semester	V				
Course	Course Name Week	Cre			Total	Maximum		
Code		L	Т	Р	С	Hours	Marks	
19CS505	WEB TECHNOLOGY LABORATORY	0	0	4	2	60	100	

#### Course Objective (s):

- The purpose of learning this course is to
- Understand various Scripts like HTML, XML and JavaScript
- Study the various rich internet applications using Ajax
- Learn the server side programming using PHP

#### **Course Outcomes:**

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

- Build interactive web applications using HTML, DHTML and CSS
- Design dynamic web pages using AJAX, PHP and XML
- Implement the web authoring tools with the database design for web development

#### List of Experiments

- 1. Write HTML/Java scripts to display your CV in navigator, your Institute website, Department Website and Tutorial website for specific subject
- 2. Design HTML form for keeping student record and validate it using Java script.
- 3. Write an HTML program to design an entry form of student details and send it to store at database server like SQL, Oracle or MS Access.
- 4. Write programs using Java script for Web Page to display browsers information.
- 5. Write a Java applet to display the Application Program screen i.e. calculator and other.
- 6. Writing program in XML for creation of DTD, which specifies set of rules. Create a style sheet in CSS/ XSL & display the document in internet explorer.
- Program to illustrate JDBC connectivity. Program for maintaining database by sending queries. Design and implement a simple servlet book query with the help of JDBC & SQL. Create MS Access Database,.
- 8. Assume four users user1, user2, user3 and user4 having the passwords pwd1, pwd2, pwd3 and pwd4 respectively. Write a servlet for doing the following. Create a Cookie and add these four user id's and passwords to this Cookie. 2. Read the user id and passwords entered in the Login form and authenticate with the values available in the cookies.
- 9. Install a database (MySQL or Oracle). Create a table which should contain at least the following fields: name, password, email-id, phone number Write a PHP to connect to that database and extract data from the tables and display them. Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

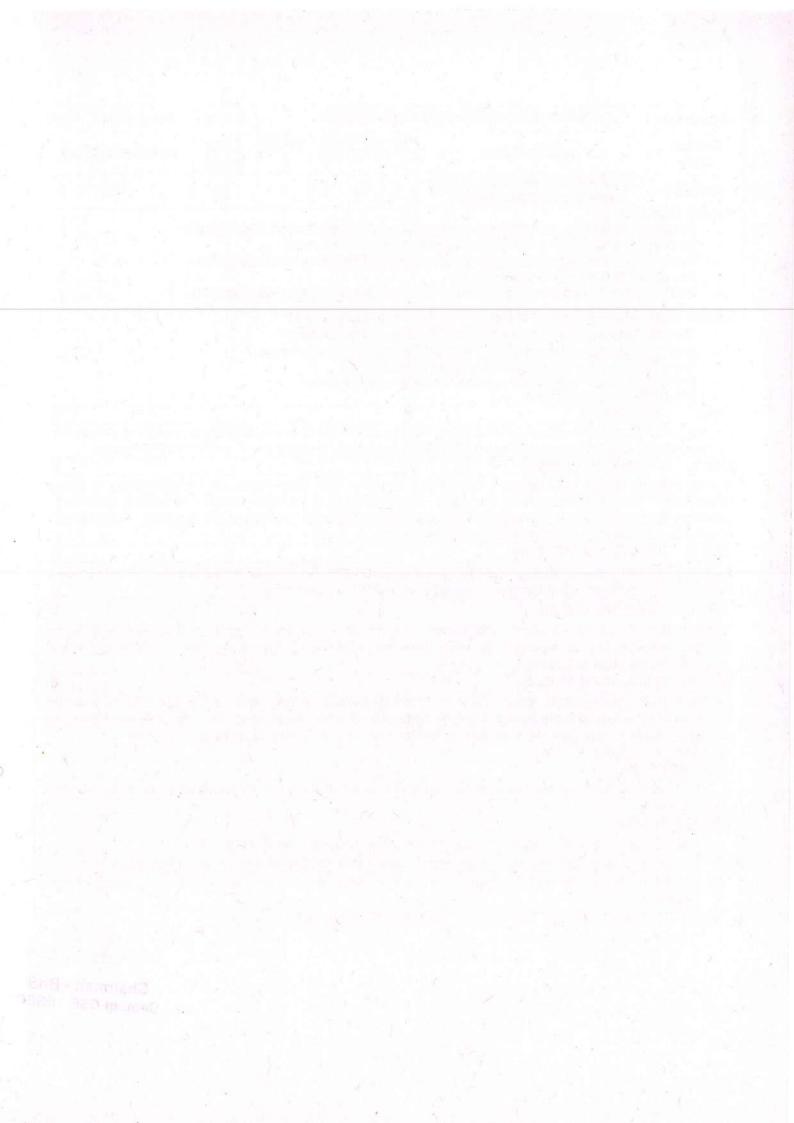
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ι	Write a PHP which insert the details of the 3 or 4 users who register with the web site by using registration form. Authenticate the user when he submits the login form using the user mame and password from the database
11. [	Design and implement a simple shopping cart example with session tracking API.
TEX	T BOOK(S)
1.	HTML 5, Black Book, dreamtech Press, 2017
2.	Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson, 2017
3.	Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill 2015
REF	ERENCE(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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Depar	rtment	COMPUTER SCIENCE AND	ENGI	NEER	ING		R 2019	Semester V	EEC
	urse	Course Name	Hou	rs/W	eek	Credit	Total	Maximum Ma	irks
Co	ode		L	Т	Ρ	C	Hours		
	S504	PROFESSIONAL SKILLS FOR SOFTWARE ENGINEER	0	0	2	0	30	100	
•	To deve To impro To enab To prepa	ctive (s): lop students' communicative compe ove their ability to communicate effe ole the learners to fine-tune their con are the error-freedocuments. Igthen their thinking level and updat	npreh	y in in ending	tervie g lev	ews. el of diffe	erenttexts.		
•	Develop Make ef Underst Enhance Strength	omes: At the end of this course, lea o listening skills to comprehend gene ffective presentations in group/pair a tand various concepts by reading dit e the writing skills to express the ide nen their softskills. STENING	eral / and at fferen	techni ttend j ttexts.	calta obint	lks. erviews			6
		nformal conversation - Practicing Gr s, News, documentaries - Listening t							views
Unit II		JBLIC SPEAKING	and second		1		11110-00-00-00-00-00-00-00-00-00-00-00-0		-
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Department	COMPUTER SCIENCE AND E	NGIN	EER	ING		R 2019	Semester	V
Course	Course Name Hours / Week		Credit	Total	Maximu	m		
Code		L	Т	Р	С	Hours	Marks	
19CS601	CRYPTOGRAPHY AND NETWORK SECRUITY	3	0	0	3	45	100	
To know	<b>tive (s):</b> f learning this course is the methods of conventional encry rstand the concepts of public key er	· .		and r	number t	heory		
<ul> <li>To know</li> </ul>	rstand authentication and Hash fun the network security tools and app rstand the system level security use	licatio						
<ul> <li>To use Control</li> <li>To analyze</li> <li>To use the</li> </ul>	n and conduct experiments to analy ryptography in different fields of Eng te and select a suitable Cipher for a e best solution for a threat. ficient algorithms for obtaining optim	gineer in app	ring a	and I ion.	Mathema			
Unit I IN	TRODUCTION TO CRYPTOGRAP	HY				em.		9
Basic concept assurance -Ba Introduction to	s: confidentiality, integrity, availal sic cryptography Historical backgro Symmetric crypto primitives, Asym	bility, bund T	Frans	spos	policies, ition/Sub	security stitution,		sms ohe
Basic concept assurance -Ba Introduction to Unit II SY Traditional Sy ciphers. Model Standard - DE Transformation issues	s: confidentiality, integrity, availab sic cryptography Historical backgro Symmetric crypto primitives, Asym <b>MMETRIC CIPHERS</b> mmetric ciphers - Substitution ciph rn Symmetric key ciphers - Modern S analysis - Structure - Multiple n - Key Expansion – Analysis - Mo	bility, bund 1 metric ers - 1 n bloc DES	Trans Tran Cran A ar	spos pto p spos nd Si dvan	policies, ition/Sub primitives sition cipl tream cip ced data	security stitution, ners - str ohers - E Encryp	Caesar Cip ream and b Data Encryp tion Standa	sms ohe 9 lock otior ard the
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TE)	(T BOOK(S)
1.	William Stallings, —Cryptography and Network security, Pearson Education, New Delhi 2007.
2.	Cryptography and Network security, Atul Kahate, Tata McGraw-Hill Pub company Ltd., 2nd Edition, New Delhi 2009
REF	ERENCE(S) Behrouz A.Forouzan —Cryptography and Network Secuity, The McGraw-Hill Companies,

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Course			BINEERING		ours /		3	R 2019	Semester	V
Code	Course Name		Hours / Week Credit Total Hours		Maximu Marks	m				
Code		L	Т	Р	С	Hours	Warks			
19CS602	<b>COMPILER DESIGN</b>	3	0	0	3	45	100			
<ul> <li>To unde</li> <li>To desig</li> <li>To imple</li> <li>To perfo</li> </ul>	f learning this course is rstand, design and implement a le n DFA & NFA with different conve ment code generation schemes. rm optimization of codes and gain rstand Lex and YACC tools.	ersion f	ech	niqu	es.		onments.			
Construct     Understa     Design a     Analyze  Init I CC	t lexical analyzer to identify the tole and intermediate code generation compiler for a small language with various code optimization techniq <b>OMPILATION AND LEXICAL AN</b> o programming language translation	of gra and sy th code ues ALYSI	mm mbo e ge <b>S</b>	ar. ol tal nera	ble organ ition.			9		
ootstrap arrar analysis phase	ious programming language trans gement, logical phases of compile e: - Design issues, patterns, lexen ssions-Overview of automata, Tho	er, pas nes, To	s Vs oker	s pha ns-at	ise-cousi tributes-	ns of cor specifica	mpilers, Lex ation of toke	ica		
	ex									
Role of parse	NTAX ANALYSIS				. N. F	5.01.0 P				
Elimination of predictive pars precedence pars of SLR parser to <b>Jnit III SEM</b>		Recu Jp par nce ta LALR   <b>MENT</b>	sing ble, pars <b>S</b>	e-De :- S par sing-	escent pa hift-Redu sing –LR Syntax	arsing, I ice pars parsers errors-Y/	Non- recurs ers, Opera :- Construc ACC	FA 9 uity sive ting tior 9		

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Unit V	CODE GENERATION & OTHER TRANSLATIONS ISSUES	9
times b vs. rec	in the design of a code generator, the target machine, Reducing the memory ac y exploiting addressing modes- peephole optimizations, basic blocks, DAG's- Iter ursive interpretation; Elements of Assembly language- assemblers- Passes o ler-Macros- design of macro processors- passes of a macro processor	ative
ГЕХТ В	OOK(S)	- L
1.	A. V. Aho et al, Compilers: Principles, techniques, & tools, Second Edition, Pea Education, 2007	rson
2.	K. D. Cooper and L. Torczon, Engineering a compiler, Morgan Kaufmann, 2004	
REFER	ENCE(S)	
3.	Steven S.Muchnick "Advanced Compiler design implementation" Elsevier Sci India.	ence
4.	D.M. Dhamdhere "Systems programming and operating systems" Tata McGraw Pub.	- Hill

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	COMPUTER SCIENCE AND EN	GIN	IEEI	RINC	3	R 2019	Semester	V
Course	Course Name	1.	our Wee		Credit	Total	Maximu	n
Code		L	Т	Р	С	Hours	Marks	
19CS603	FOUNDATIONS OF INTERNET OF THINGS	2	0	2	3	45	100	
The purpos To u	<b>ojective (s):</b> se of learning this course is nderstand what Internet of Things is. lentify the various elements of an IoT Sy	yste	m					
Platf • To u • To id	nderstand the various means of commu orms nderstand Cloud Computing & its releva lentify types of data analytics and data v nake students aware of security concern ions	ance /isu	e in aliza	IoT ation	tools			т
<ul> <li>Desc</li> <li>Desc</li> <li>Desc</li> <li>Desc</li> </ul>	of this course, learners will be able to: cribe components of IoT Architecture an cribe and choose Sensors and Actuators cribe and implement edge network cribe Big Data Analytics, transform data	5						
proto	ify the DIY (Do it yourself) open sou types				-			
proto Unit I	ify the DIY (Do it yourself) open sou types Introduction to IoT	irce	ele	ectro	nics plat	forms fo		107 7
proto Unit I Definition o	ify the DIY (Do it yourself) open sou types Introduction to IoT of IoT - Evolution of IoT - IoT and related	irce	ele	ectro	nics plat	forms fo		7
proto Unit I Definition c Unit II Introduction	ify the DIY (Do it yourself) open sou types Introduction to IoT	ter d ter	rms an I	- Bu	nics plat siness S	cope	or building	7
proto Unit I Definition c Unit II Introduction - Edge Net	ify the DIY (Do it yourself) open sou types Introduction to IoT of IoT - Evolution of IoT - IoT and related Elements of IoT n to Elements of IoT - Basic Architecture	d ter of nun	rms an l icati	- Bu oT A	nics plat siness S Applicatic Aodel – V	cope	or building	7
proto Unit I Definition o Unit II Introduction - Edge Net	ify the DIY (Do it yourself) open sou types Introduction to IoT of IoT - Evolution of IoT - IoT and related Elements of IoT n to Elements of IoT - Basic Architecture working (WSN) – Gateways - IoT Comm	ter of nun	ele rms an l icati	- Bu oT A on N gies	nics plat siness S Applicatic Iodel – V	forms fo cope on Sensc VPAN &	or building	7 7 tors
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KEFEF	RENCE(S)	
4.	Internet of Things and Data Analytics, Wiley Publications	
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Sector Contraction

Department	COMPUTER SCIENCE AND	ENGIN	IEEF	RING	3	R 2019	Semester	
Course Code	Course Name		lour: Wee	k	Credit	Total Hours		
		L	Т	P	С			
19CS604	CLOUD COMUTING	3	0	0	3	45	100	
Course Objec	tive (s):				1. S. N.			
The purpose of	f learning this course is							
To under	rstand the concept of cloud comp	outing.						
	about the cloud services .				1.1.1			1
<ul> <li>To have</li> </ul>	knowledge on the various issues	in clou	nd co	omp	uting.			
	miliar with the lead players in clo							
	eciate the emergence of cloud as ed communication.	the ne	xt ge	ener	ation con	nputing p	paradigm ar	nd
Course Outco	mes:			1				
At the end of th	his course, learners will be able to	<b>)</b> :			2			
Articulate	e the main concepts, key technol	ogies,	strer	ngths	s and lim	itations o	of cloud	
omputing.								
	e key and enabling technologies							
<ul> <li>Develop</li> </ul>	the ability to understand and use	the ar	chite	ectur	e of com	pute and	l storage cl	oud
	and delivery models.							
<ul> <li>Evaluate</li> </ul>	and choose the appropriate tech	nnologi	es, a	algor	ithms an	d approa	aches for	
nplementation	and use of cloud.				e d'ul			
	DERSTANDING CLOUD COMP							9
Cloud Comput	ing – History of Cloud Computin	g – Clo	bud	Arch	nitecture -	- Cloud	Storage -	Why
	ting Matters – Advantages of					isadvant	ages of C	loud
	Companies in the Cloud Today –		Serv	ices				-
	VELOPING CLOUD SERVICES		-		<b>B</b> 1		F	9
Web-Based A	pplication - Pros and Cons of	Cloud	Serv.	/ice	Develop	ment –	Types of C	loud
	opment – Software as a Service							
	outing - Discovering Cloud Servi	ces De	velo	pme	nt Servic	es and I	00IS - AIIIa	3201
	App Engine – IBM Clouds		č					9
	OUD COMPUTING FOR EVERY		0			U - L 4		- E.
	mail Communications – Collabora							
	rating Contact Lists – Cloud Con					ity – Coll	aborating c	m
	and Events – Cloud Computing	for the	Cor	pora	ation.			9
A SACIDATION AND AND AND AND AND AND AND AND AND AN	ING CLOUD SERVICES						l'an Onland	-
Collaborating of	on Calendars, Schedules and Ta	isk Mai	nage	emer	nt – Explo	oring On	line Schedi	uling
Applications –	Exploring Online Planning and	llask	Mar	hage	ement –	Collabor	ating on E	ven
Management -	- Collaborating on Contact Mana	gemen	ι – C	olla	borating	on Proje	d Shoring L	ilee
and and the second s	on Word Processing - Collabora				ises – St	oring and	a Sharing F	
	VANCED WAY TO COLLABOR				-lu-t!	Mah M	ail Convice	9
	via Mah Basad Communicatio	n Ioo	ls –	Ev		vveb iv	iall Service	es -
Evaluating We	via Web-Based Communicatio eb Conference Tools – Collabo via Blogs and Wikis				ial Netwo	orks and		

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<ul> <li>Anthony T.Velte, Cloud Computing, 12<sup>th</sup> Edition, Tata Mcgraw Hill, 2013</li> <li>REFERENCE(S)         <ul> <li>Haley Beard, Cloud Computing Best Practices for Managing and Me Processes for On-demand Computing,</li> </ul> </li> </ul>	
Haley Beard, Cloud Computing Best Practices for Managing and Me	14 - C
Processes for On-demand Computing,	Measuring
2. Applications and Data Centers in the Cloud with SLAs, Emereo Pvt Limited, Ju	d, July 2008

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Department	COMPUTER SCIENCE AND E	NGIN	VEEP	RING	,	R 2019	Semester	V
Course Code	Course Name		Hour Wee		Credit	Total Hours	Maximur Marks	n
Darmine I		L	Т	Ρ	С	nours	Warks	
19TPS06	QUANTITATIVE APTITUDE AND LOGICAL REASONING - IV		0	0	0	30	100	
Course Objec	tive (s): The purpose of learning this c	ourse	e is t	0		1		*
Ascertains t	the occurrence of an event on the basis	of al	lread	ly pro	esent info	rmation.		
Use area m	odels to represent the distributive prope	erty ir	n ma	then	natical rea	asoning.		
Calculate th	e work capacity by chocolate based me	ethod	l. –					
Work with ti	me, speed and distance by relative spe	ed co	once	pts.			Section 2.	
Determine h	now various phenomena are related.							
Course Outco	mes: At the end of this course, learners	s will	be a	ble t	0		the second	8
Know the ou	utcome of an event developed the conc	ept o	f pro	babi	lity.			
	e area and surface volume in real time							
	the concepts of Times and Work and F	62.			ern and C	orrelating	the Concepts	_
Understand		ipes	anu	CISU	en anu c	onelating	the Concepta	
both	the concepts of times and work and t	í.					£	0
both.		, nd or		nto o	f Pooto o	nd Stroom		0
Know the co	oncepts of Time, Speed and Distance a		507-250 C	19. 27. 19.19.19.1		nd Streams	5.	0
Know the co Analyze the	oncepts of Time, Speed and Distance a cause and effect of problems by using	critic	al th	inkin		nd Streams	5.	
Know the co Analyze the JNIT 1 PROE	oncepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b>	critic BINAT	al thi	inkin S	g.	-		(
Know the co Analyze the JNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements o	oncepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a <b>IS:</b> Numbers with digits - Words with of books on a shelf.	critic BINAT a fain a bag th let	r coi con tters	inkin S n – tain - A	g. Drawing ing balls o rrangeme	a card from of different ents of pe	n a pack of colors. rson in a ro	e We
Know the co Analyze the UNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements co OMBINATION	oncepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a <b>IS:</b> Numbers with digits - Words with of books on a shelf. <b>S:</b> Formation of committee – Selection	critic BINAT a fain a bag th let	r coi con tters	inkin S n – tain - A	g. Drawing ing balls o rrangeme	a card from of different ents of pe	n a pack of colors. rson in a ro	e We
Know the co Analyze the UNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements o OMBINATION JNIT 2 AREA REA: Area – F OLUME: Cubo	oncepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a <b>IS:</b> Numbers with digits - Words with of books on a shelf. <b>S:</b> Formation of committee – Selection	critic BINAT a fain a bag th let n of q gle –	al thi TION r coi g con tters uesti	inkin S n – ntaini - A ions	g. Drawing ing balls rrangeme from que teral – Fa	a card from of different ents of pe stion pape	m a pack of colors. rson in a ro rs. chniques.	we we
Know the co Analyze the UNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements o OMBINATION JNIT 2 AREA REA: Area – F OLUME: Cubo neir formulas.	ancepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a <b>IS:</b> Numbers with digits - Words with of books on a shelf. <b>S:</b> Formation of committee – Selection <b>&amp; VOLUME</b> Perimeter – Important points about trians	critic BINAT a fain a bag th let n of q gle –	al thi <b>FION</b> r coi g con tters uesti	inkin S n – ntaini - A ions	g. Drawing ing balls rrangeme from que teral – Fa	a card from of different ents of pe stion pape	m a pack of colors. rson in a ro rs. chniques.	we we ow
Know the co Analyze the UNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements of OMBINATION JNIT 2 AREA REA: Area – F OLUME: Cubo heir formulas. JNIT 3 TIME IME AND WOI ays the works s	Ancepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a IS: Numbers with digits - Words with of books on a shelf. S: Formation of committee – Selection & VOLUME Perimeter – Important points about trians oids – Cube – Cylinder – Cone – Frustu & WORK, PIPE & CISTERNS RK: Introduction – Basic concepts – Les starting and ending.	critic BINAT a fain a bag th let n of q gle – um of	al thi TION r coi g con tters uesti Qua f a co	inkin S n – ntaini - A ions idrila one -	g. Drawing ing balls rrangeme from que teral – Fa – Sphere	a card from of different ents of pe stion pape st track teo – Hemisph ernative da	m a pack of colors. rson in a ro rs. chniques. here – Pyram	ee
Know the co Analyze the JNIT 1 PROE ROBABILITY: huffled cards – ERMUTATION rrangements o OMBINATION JNIT 2 AREA REA: Area – F OLUME: Cubo eir formulas. JNIT 3 TIME ME AND WOR ays the works s IPES AND CIS	A cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a IS: Numbers with digits - Words with of books on a shelf. S: Formation of committee – Selection A VOLUME Perimeter – Important points about triangoids – Cube – Cylinder – Cone – Frusta WORK, PIPE & CISTERNS RK: Introduction – Basic concepts – Less starting and ending. TERNS: Introduction - Basic concepts -	critic BINAT a fain a bag th lef n of q gle – um of eaving – Cap	al thi <b>FION</b> r coin tters uesti Qua f a co g and pacit	inkin S n – ntaini - A ions one d join	g. Drawing ing balls rrangeme from que teral – Fa – Sphere	a card from of different ents of pe stion pape st track teo – Hemisph ernative da	m a pack of colors. rson in a ro rs. chniques. here – Pyram	we we iid
Analyze the Analyze the UNIT 1 PROE PROBABILITY: huffled cards – PERMUTATION Trangements of OMBINATION UNIT 2 AREA NREA: Area – F OLUME: Cubo heir formulas. UNIT 3 TIME IME AND WOR ays the works as PIPES AND CIS UNIT 4 TIME& IME AND DIST ifferent – Stopp istance betwee ROBLEMS ON rossing each of	Ancepts of Time, Speed and Distance a cause and effect of problems by using <b>BABILITY , PERMUTATIONS &amp; COMB</b> Rolling an unbiased dice – Tossing Picking up balls of certain color from a IS: Numbers with digits - Words with of books on a shelf. S: Formation of committee – Selection & VOLUME Perimeter – Important points about trians oids – Cube – Cylinder – Cone – Frustu & WORK, PIPE & CISTERNS RK: Introduction – Basic concepts – Les starting and ending.	critic BINAT a fain a bag th let n of q gle – um of eaving – Cap BTRE Dista en wit	al thi <b>FION</b> r coir g cont tters uesti Qua f a co g and pacity <b>AMS</b> ance th two lae -	inkin S n – ntaini - A ions ions drila one d join y of t S cov ro dif – Dif	g. Drawing ing balls of rrangeme from que teral – Fa – Sphere ning – Alt the total li vered is s ferent mo ferent typ	a card from of different ents of pe stion pape est track teo – Hemisph ernative da ters – Wate ame – Dis des of tran	m a pack of colors. rson in a ro rs. chniques. here – Pyram ays – In betw r flow in the t tance covere sport – Time ects –Two tr	iic iic an ai

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# UNIT 5 STATEMENT - CONCLUSION , ARGUMENTS, CAUSE & EFFECT, ASSERTION & REASON

**STATEMENT AND CONCLUSION: Statement** to be true - Two conclusions together - Logically follows. **STATEMENT AND ARGUMENTS: Arguments** strong with respect to the statement.

CAUSE AND EFFECT: Cause and effect relationship between the two statements.

**ASSERTION AND REASON:** Assertion(A) and Reason(R) – Both (A) and (R) are individually true and (R) - (A) is true but (R) is false – (A) is false but (R) is true.

# TOTAL: 30 HOURS

6

## REFERENCES:

- 1. Abhijit Guha, Quantitative Aptitude for Competitive Examinations, Fourth Edition, Tata McGraw-Hill Publishing Company Ltd, 2012
- 2. Arun Sharma, How to prepare for Data Interpretation for the CAT, First Edition, Tata McGraw-Hill Publishing Company Ltd, 2012.
- 3. R.V.Praveen,"Quantitative Aptitude and Reasoning"Third Edition, PHI Learning ,2016.
- 4. Dr.R S Aggarwal, Quantitative Aptitude, Revised and Enlarged Edition, S.Chand Publishing Company Ltd, 2017.
- 5. Arun Sharma "How to Prepare for Quantitative Aptitude" Eight Edition, McGraw Hill Education, 2018.
- 6. "Reasoning and Aptitude" for GATE and ESE Prelims, Made Easy Publication, 2020.

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Department	COMPUTER SCIENCE AND	ENGIN	IEEI	RING	6	R 2019	Semester	VI
Course	Course Name	Hours / Week			Credit	1 otal	A server that the server that the server server is	
Code		L	T	Ρ	С	Hours	Marks	
19CS605	NETWORK SECURITY LABORATORY	0	0	4	2	60	100	

# Course Objective (s):

The purpose of learning this course is

- To know the methods of conventional encryption.
- To understand the concepts of public key encryption and number theory
- To understand authentication and Hash functions.
- To know the network security tools and applications.

## **Course Outcomes:**

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

- Develop code for classical Encryption Techniques to solve the problems.
- Build cryptosystems by applying symmetric and public key encryption algorithms
- Construct code for authentication algorithms.
- Develop a signature scheme using Digital signature standard.
- Demonstrate the network security system using open source tools

## List of Experiments

1. Perform encryption, decryption using the following substitution techniques

- (i) Ceaser cipher, (ii) playfair cipher iii) Hill Cipher iv) Vigenere cipher
- 2. Perform encryption and decryption using following transposition techniques

i) Rail fence ii) row & Column Transformation

- 3. Apply DES algorithm for practical applications.
- 4. Apply AES algorithm for practical applications.
- 5. Implement RSA Algorithm using HTML and JavaScript
- 6. Implement the Diffie-Hellman Key Exchange algorithm for a given problem.
- 7. Implement the SIGNATURE SCHEME Digital Signature Standard.
- 8. Demonstrate intrusion detection system (ids) using any tool eg. Snort or any other s/w.
- 9. Automated Attack and Penetration Tools

Exploring N-Stalker, a Vulnerability Assessment Tool

- 10. Defeating Malware
- i) Building Trojans ii) Rootkit Hunter

## REFERENCE(S)

1.

Build Your Own Security Lab, Michael Gregg, Wiley India, 2015

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Department	COMPUTER SCIENCE AND E	ENGINEERING				R 2019	Semester	VI
Course Code	Course Name	Hours / Week		Crodit		Total	Maximun Marks	
4000000	COMPREHENSIVE REVIEW	L	T	Ρ	C	Hours	Warks	
19CS606		0	0	2	0	30	-	

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

• To encourage the students to comprehend the knowledge acquired from the first Semester to fifth Semester of B.E Degree Course through periodic exercise.

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

• Ability to review, prepare and present technological developments

# METHOD OF EVALUATION:

• The students will be assessed 100% internally through weekly test with objective type questions on all the subject related topics

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Department	COMPUTER SCIENCE A	ND EN	IGINE	EERI	NG	R 2019	Semester VII	PC
Course Code	Course Name		Hours Week	(	Credit C	Total Hours	Maximum Ma	arks
19CS701	BIGDATA ANALYTICS	L 3	Т 0	P 0	3	45	100	
	e (s): The purpose of learning t				3	45	100	
<ul> <li>Learn abou</li> <li>Understance</li> <li>To explore Hage</li> </ul>	I the basics of Bigdata It the basic Principles of Hadoo I features of NOSQL databases doop Eco system tools and practices f ic R Programming	s	ing wi	th big	data		en llan	
<ul> <li>Understand</li> <li>Develop Ma</li> <li>Work with No.</li> <li>Use Hadoo</li> </ul>	es: At the end of this course, le I basic of Big Data and its Envir ap-Reduce application using Ha NoSQL Database Management p Eco System Tools for Big Da ta using R Programming	ronme adoop t Syste	nt ms		ble to:			
	TION TO BIGDATA							6
ntroduction to Ha ladoop distributio lDFS – Map Re	TION TO HADOOP adoop: Features – Advantages ns – Hadoop vs. SQL – RDBM educe: Mapper – Reducer – loop 2 (YARN): Architecture –	S vs. H Com	Hadoo biner	op – – F	Hadoop Partitione	Compone r – Sea	ents – Architect rching – Sorti	ure
Init NOSOL DA		interac	ung v	WICH I	ladoop	_00 0yote		9
CRUD operations Cursors – Indexes	es: Mongo DB: Introduction – F – Arrays – Functions: Count	- Sor	t – L	imit	– Skip –		ate – Map Red	ge -
and Export – Que	s – Mongo Import – Mongo Exp paces – CRUD operations – Co rying System tables.	ollectio	ns – (	Cour	nter – TT	tion – Fe L – Alter d	commands – Im	uce. /pes
and Export – Que Jnit V HADOOP E	s – Mongo Import – Mongo Exp paces – CRUD operations – Co rying System tables. CO SYSTEMS	ollectio	ns — (	Cour	nter – TTI	L – Alter o	commands – Im	uce /pes ipor
And Export – Que Jnit HADOOP E Hadoop Eco syste unctions – Pig: Fe ypes – Running Functions – Comp	s – Mongo Import – Mongo Exp paces – CRUD operations – Co rying System tables. CO SYSTEMS ems: Hive – Architecture – dat eatures – Anatomy – Pig on H pig – Execution modes of Pig olex data type – Piggy Bank – or. Jasper Report: Introduction –	a type ladoop – HE - User	ns – ( – Fi – Pi DFS d	Cour le fo g Ph comr ned I	rmat – H ilosophy nands – Functions	L – Alter d IQL – Se – Pig La Relation s – Para	erDe – User de tin overview – al operators – meter substituti	uce /pes ipor 9 fine Data Eva on

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	nd Export – Manipulation data with dplyr – Vectorizing Functions – Apply Family – Infix operator Replacement Functions – Function with arguments r& return – Filter, Map and Reduce
Т	EXT BOOK(S):
1	Seema Acharya, Subhashini Chellappan, "Big Data and Analytics", Wiley Publication, 2015.
2	Garrett Grolemund, "Hands-On Programming with R", O'Reilly Media, Inc, 2014.
R	EFERENCES
1	Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, "Big Data for Dummies", John Wiley & Sons, Inc., 2013
2	Tom White, "Hadoop: The Definitive Guide", O'Reilly Publications, 2011.
3	Kyle Banker, "Mongo DB in Action", Manning Publications Company, 2012.
4	Russell Bradberry, Eric Blow, "Practical Cassandra A developers Approach", Pearson Education, 2014.

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Department	COMPUTER SCIENCE AND	) ENG	INEE	RINC	3	R 2019	Semester VII	PC	
Course Code	Course Name		Hours/ Week Credit		Total Hours				
ooue		L	T	Ρ	С	nours	warks		
19CS702	ARTIFICIAL INTELLIGENCE	3	0	0	3	45	100		
<ul> <li>Understand</li> <li>Study searce</li> <li>Understand</li> <li>Introduce n</li> <li>To know ab</li> </ul> Course Outcor <ul> <li>Understand</li> <li>Use appro</li> <li>Represent</li> <li>Utilize the I</li> <li>Design app</li> </ul>	<b>The purpose of learning this</b> I fundamental concepts in Artificial Intelliger thing techniques to solve real world problem I the knowledge representation and reasonin machine learning models yout the various applications of AI. <b>Thes:</b> At the end of this course, learn ad the basics of AI & Intelligent Agents priate search algorithms for any AI prob a problem using first order and predicate earning model to model machines lications that use Artificial Intelligence <b>DUCTION TO AI</b>	nce. ng mech ners wi	nanism II be a	IS	to:			9	
<b>Jnit II PROBI</b> Problem solving Algorithms and Satisfaction Probl	Optimization Problems - Sea	ninform arching	ed -	Inf	formed - Partial earch -	- Heuristi Observati Game	ons - Con	<b>9</b> Search strain ptima	
	LEDGE REPRESENTATION		_					9	
First Order Pro Chaining – R Objects – Even Reasoning with Defa <b>Unit IV LEARN</b>	edicate Logic – Prolog Program Resolution – Knowledge Represe ts - Mental Events and Mental Jult Information.	ntation Obje	- ects	Or - F	cation – ntological Reasoning	Enginee Systems	ring-Categories for Categorie	kwarc anc es -	
	Supervised Learning – Learning Decision Tre cial Neural Networks – Support Vector Ma								
	CATIONS							14	
AI applications anguage Proces Perception – Plannin <b>TEXT BOOK(S)</b>	g – Moving.	ation Spee		eval- Recog	Informa Inition -	ation Ex - Robot		latura e -	
				_					
1. S. Russell and	P. Norvig, Artificial Intelligence: A Modern A	Approa	:h∥, Pre	entice	Hall, Third	Edition, 20	09.		
2 Rajendra Aker	rkar, "Introduction to Artificial Intelligence", I	PHI Lea	rning F	Private	e Limited, 2	2012.			
REFERENCES			15			1			
1. Richard E		LOUSS 1							

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2. Nils J. Nilsson, —The Quest for Artificial Intelligence||, Cambridge University Press, 2009. Vinod Chandra S.S., Anand Hareendran S., "Artificial Intelligence And Machine Learning", PHI Learning Private 3 Limited, 2014 Chairman - Bog Dept. of CSE - ESEC

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	t COM	PUTER SCIENCE AND				ING	R 2019	Semester	VII	ES
Course Code		Course Name		ours leek T		Credit C	Total Hours	Maxi Ma	mun rks	n
19ES701	RESEAR	RCH METHODOLOGY	3	0	P 0	3	45	10	0	_
<ul> <li>Know</li> <li>Analy:</li> <li>Learn</li> <li>Know</li> <li>Know</li> <li>Course Out</li> <li>At the end o</li> <li>Under</li> </ul>	e of learning the basics o ze data Soft Compu- edge on Eth edge on Pre comes: f this course,	pare reports learners will be able to: of research formulation								
<ul> <li>Impler</li> <li>Under</li> <li>Prepa</li> </ul>	ment soft cor stand ethics re reports	nputing algorithm and IPR							t	-
Unit I RE	SEARCH FO	ORMULATION AND DE	SIGN	1						9
rom literatur		as a source, searching	the w	veb,	criti	cal literat	ure review,	identifying g	jap a	ents, reas
Jnit II DA Accepts of m nethods, dat	e and resear TA COLLEC nethod valida a processing	ch database, developme CTION AND ANALYSIS Ition, observation and co and analysis strategies	ent of ollecti and t	ion c	criti king of da	cal literat g hypothe ata, meth ta analys	ure review, esis. ods of data	identifying g	jap a samj	reas
Jnit II DA Accepts of m nethods, dat STAT,SPSS	e and resear TA COLLEC nethod valida a processing for student t	ch database, developme <b>TION AND ANALYSIS</b> Ition, observation and co and analysis strategies test, ANOVA, etc.), hyp	ollecti and t	ion c	criti king of da	cal literat g hypothe ata, meth ta analys	ure review, esis. ods of data	identifying g	ap a samp e (Si	reas Ding gma
Jnit IIDAAccepts of mnethods, datSTAT,SPSSJnit IIIThit IIIComputer ano evolutiona	e and resear TA COLLEC nethod valida a processing for student t- REE PHASE d its role in re ry algorithms	ch database, developme <b>TION AND ANALYSIS</b> attion, observation and co and analysis strategies test, ANOVA, etc.), hyp <b>INDUCTION MACHIN</b> esearch, Use of statistic a - Fundamentals of Ger	ent of ollecti and t othes ES al sof netic a	f wor ion c tools sis te twar	of da s,da estin	cal literat g hypothe ata, meth ta analys g. PSS, GR	ure review, esis. ods of data is with station ETL etcin r	identifying g collection, cally packag esearch. Int	jap a samp e (Sig 9 roduc	pling gma
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Chairman - BoS Dept. of CSE - ESEC

4	Trochim, W.M.K., 2005. Research Methods: the concise knowledge base, Atomic Dog Publishing. 270p.
REFE	RENCES:
1	Anthony, M., Graziano, A.M. and Raulin, M.L., 2009. Research Methods: A Process of Inquiry, Allyn and Bacon.
2	Fink, A., 2009. Conducting Research Literature Reviews: From the Internet to Paper. Sage

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	C	ode	course Name	L	T	P	С	Hours	Mar	ks
19	90	CS704	DATA ANALYTICS LABORATORY	0	0	4	2	60	10	0
	•	Understa Understa Learn th Understa	ve (s): The purpose of learning the and the basics of Hadoop and Ma and Installation of Hive and Query e basics of Pig Scripts and the basic data analytics using nes: At the end of this course, lea	ap Redu y Proces y R	ce Pro ssing t	ograr using	g Hive			
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	1.	Installation	and configuration of Hadoop	T OF EXP	ERIME	NTS				
	2.		e Programming							
	3.	957/A	various HDFS commands	÷						
	4.		red data into NoSQL data and do	all one	ration	5 5110	ch as No	aun 102	ry with API	
	5.		juery processing on data warehou							
	6.		nd data pipeline using Pig Interac					nation of	TINC	
	7.		ata Analysis using MongoDB			mna	nus			182
	8.		ulations using R							
	9.		plore the Data				1.2			
			Test for Independence R							
		and the second second	gistic Regression using R							
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2.		States in the second	"Hadoop: The Definitive Guide",	O'Reilly	Publi	icatio	ons, 2011	;		
3	K	Kyle Banke	r, "Mongo DB in Action", Manning	Publica	ations	Con	npany, 20	)12.		
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Course Code	Course Name	Hours / Week	Credit	Total Hours	Maximun Marks	n

Chairman - BoS

Course Code         Course Name         Hours/ Week/ L         Credit T         Total Hours         Maximum Marks           19CS703         CLOUD COMPUTING LABORATORY         0         4         2         60         100           Course Objective (s): The purpose of learning this course is to         -         -         60         4         2         60         100           Course Objective (s): The purpose of learning this course is to         -         -         -         60         100           Course Outcomes: At the end of this course, learners will be able to:         -         -         -         -           Configure various virtualization tools such as Virtual Box, VMware workstation.         -         -         Design and deploy a web application in a PaaS environment.         -           - Learn how to simulate a cloud environment that can be used as a private cloud.         -         Use AWS and Yahoo Pipes           1         Install and use a generic cloud environment that can be used as a private cloud.         -         Use AWS and Yahoo Pipes           1.         Install Google App Engine. Create hello world app and other simple web applications us python/java.         -         Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim.           6. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim.	Department	COMPUTER SCIENCE AN	are la company	S States of the		3	R 2019	Semester VII P
Laboratory       L       I       P       C         19CS703       CLOUD COMPUTING LABORATORY       0       0       4       2       60       100         Course Objective (s): The purpose of learning this course is to         •       Develop web applications in cloud       •       Learn the design and development process involved in creating a cloud-based application         •       Learn to implement and use Yahoo Pipes and AWS         Course Outcomes: At the end of this course, learners will be able to:         •       Configure various virtualization tools such as Virtual Box, VMware workstation.         •       Design and deploy a web application in a PaaS environment.         •       Learn how to simulate a cloud environment to implement new schedulers.         •       Install and use a generic cloud environment that can be used as a private cloud.         •       Use AWS and Yahoo Pipes         LIST OF EXPERIMENTS         1       Install S Compiler in the virtual machine created using virtual box and execute Simple Programs         4       Install Codel App Engine. Create hello world app and other simple web applications us python/java.         5.       Use GAE launcher to launch the web applications.         6.       Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim.         <	and the second	Course Name		Week	<	00-94.00040.00040.0	100000000000000000000000000000000000000	
19CS703       LABORATORY       0       0       4       2       60       100         Course Objective (s): The purpose of learning this course is to         •       Develop web applications in cloud       •       Learn the design and development process involved in creating a cloud-based application         •       Learn to implement and use Yahoo Pipes and AWS         Gourse Outcomes: At the end of this course, learners will be able to:         •       Configure various virtualization tools such as Virtual Box, VMware workstation.         •       Design and deploy a web application in a PaaS environment.         •       Learn how to simulate a cloud environment to implement new schedulers.         •       Install and use a generic cloud environment that can be used as a private cloud.         •       Use AWS and Yahoo Pipes         LIST OF EXPERIMENTS         1       Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top         2       of windows7 or 8.         3       Install Coogle App Engine. Create hello world app and other simple web applications us python/java.         5.       Use GAE launcher to launch the web applications.         6.       Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim.         7.       Find a procedure to transfer the files fro	Code		L	Т	P	C	nours	Marks
<ul> <li>Develop web applications in cloud</li> <li>Learn the design and development process involved in creating a cloud-based application</li> <li>Learn to implement and use Yahoo Pipes and AWS</li> </ul> <b>Course Outcomes:</b> At the end of this course, learners will be able to: <ul> <li>Configure various virtualization tools such as Virtual Box, VMware workstation.</li> <li>Design and deploy a web application in a PaaS environment.</li> <li>Learn how to simulate a cloud environment to implement new schedulers.</li> <li>Install and use a generic cloud environment that can be used as a private cloud.</li> <li>Use AWS and Yahoo Pipes</li> </ul> <b>LIST OF EXPERIMENTS</b> Install Compiler in the virtual machine created using virtual box and execute Simple Programs 4. Install Google App Engine. Create hello world app and other simple web applications us python/java. Use GAE launcher to launch the web applications. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim. Find a procedure to transfer the files from one virtual machine to another virtual machine. Find a procedure to taunch virtual machine using trystack (Openstack) Establish an AWS account. Use the AWS Management Console to launch an instance and connect to it. Create a Mashup using Yahool Pipes. <b>EXT BOOKS:</b> 1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Para Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012. 2. Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Managen and Securityil, CRC Press, 2017. <b>EFERENCES:</b> 1. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, —Mastering Cloud Computing, IT Megraw Hill, 2003. 2. Gove Reese, "Cloud Application Architectures: Building Applications and Infrastructure in Negraw Hill, 2003.	19CS703		0	0	4	2	60	100
<ul> <li>Configure various virtualization tools such as Virtual Box, VMware workstation.</li> <li>Design and deploy a web application in a PaaS environment.</li> <li>Learn how to simulate a cloud environment to implement new schedulers.</li> <li>Install and use a generic cloud environment that can be used as a private cloud.</li> <li>Use AWS and Yahoo Pipes</li> </ul> LIST OF EXPERIMENTS 1. Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top 2. of windows7 or 8. 3. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs 4. Install Google App Engine. Create hello world app and other simple web applications us python/java. 5. Use GAE launcher to launch the web applications. 5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim. 7. Find a procedure to transfer the files from one virtual machine to another virtual machine. 8. Find a procedure to launch virtual machine using trystack (Openstack) 9. Establish an AWS account. Use the AWS Management Console to launch an instance and connect to it. 10. Create a Mashup using Yahool Pipes. EXT BOOKS: 11. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Para Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012. 2. Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Managen and SecurityII, CRC Press, 2017. REFERENCES: 11. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, —Mastering Cloud ComputingII, T Mcgraw Hill, 2013. 2. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical ApproachII, T Mcgraw Hill, 2009. 3. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in The State of the Internet of Cloue Acomputing - A Practical ApproachII, T Mcgraw Hill, 2009.	<ul><li>Develop we</li><li>Learn the d</li></ul>	b applications in cloud esign and development process	involved	d in cr		ng a clou	d-based a	application
<ul> <li>Use AWS and Yahoo Pipes</li> <li>LIST OF EXPERIMENTS</li> <li>Install Virtualbox/VMware Workstation with different flavours of linux or windows OS on top</li> <li>of windows7 or 8.</li> <li>Install a C compiler in the virtual machine created using virtual box and execute Simple Programs</li> <li>Install Google App Engine. Create hello world app and other simple web applications us python/java.</li> <li>Use GAE launcher to launch the web applications.</li> <li>Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not presen CloudSim.</li> <li>Find a procedure to transfer the files from one virtual machine to another virtual machine.</li> <li>Find a procedure to transfer the files from one virtual machine to another virtual machine.</li> <li>Establish an AWS account. Use the AWS Management Console to launch an instance and connect to it.</li> <li>Create a Mashup using Yahoo! Pipes.</li> </ul> EXT BOOKS: <ol> <li>Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Para Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.</li> <li>Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Managen and SecurityII, CRC Press, 2017.</li> </ol> EFERENCES: <ol> <li>Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, —Mastering Cloud ComputingII, T Mograw Hill, 2013.</li> <li>Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical ApproachII, T Mograw Hill, 2009.</li></ol>	<ul> <li>Configure</li> <li>Design and</li> <li>Learn how</li> </ul>	various virtualization tools such a d deploy a web application in a P to simulate a cloud environment	as Virtua aaS en to imple	al Box vironn	, VM nent. t nev	lware wo v schedu	lers.	
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<ol> <li>Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Para Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.</li> <li>Rittinghouse, John W., and James F. Ransome, —Cloud Computing: Implementation, Managen and Securityll, CRC Press, 2017.</li> <li>Rejkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, —Mastering Cloud Computingll, T Mcgraw Hill, 2013.</li> <li>Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing - A Practical Approachil, T Mcgraw Hill, 2009.</li> <li>George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in</li> </ol>	<ol> <li>Install a C cod</li> <li>Install Googl python/java.</li> <li>Use GAE laud</li> <li>Simulate a c CloudSim.</li> <li>Find a procect</li> <li>Find a procect</li> <li>Establish an instance and cor</li> </ol>	mpiler in the virtual machine crea e App Engine. Create hello w ncher to launch the web applicati loud scenario using CloudSim a lure to transfer the files from one lure to launch virtual machine us AWS account. Use the nnect to it.	vorld ap ions. and run virtual ing tryst	a sc machi	hedu ine to Oper	ther sim uling algo o anothe nstack)	ple web orithm tha r virtual n ole to	applications usin at is not present i nachine. launch an EC
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Department

COMPUTER SCIENCE AND ENGINEERING

R 2019 Semester VII PC

Chatman - BoS Dept. of CSE - ESEC

Department	COMPUTER SCIENCE AND ENGINEERING						Semester	VII
Course Code	Course Name	Hours / Week		Credit	Total	Maximum		
		L	Т	Р	С	Hours	Marks	
19CS802	PROJECT WORK PHASE - II 0 0 1		18	6		100		

#### Course Objective (s):

The purpose of learning this course is to

- To identify and learn new tools, algorithms and techniques.
- To understand the various procedures for validation of the product and analysis the cost effectiveness.
- To understand the guideline to Prepare report for oral demonstrations.

## **Course Outcomes:**

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

- Utilize the new tools, algorithms, techniques that contribute to obtain the solution of the project.
- Test and validate through conformance of the developed prototype and analysis the cost effectiveness.
- Prepare report and present the oral demonstrations.

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•	M. J. Quinn, "Parallel programming in C with MPI and OpenMP", Tata McGraw Hill, 2003.
3	B. Chapman, G. Jost, and Ruud van der Pas, "Using OpenMP", MIT Press, 2008
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	COMPUTER SCIENCE AN				3	R 2019	Semester VIII	P
Course Code	Course Name		Hours Weel T		Credit C	Total Hours	Maximum Marks	1
19CS801	HIGH PERFORMANCE COMPUTING	3	0	0	3	45	100	
<ul> <li>Learn the operation</li> <li>Study the</li> <li>Understand</li> <li>Understand</li> </ul>	tive (s): The purpose of learning th different ways of exploiting Instruction Leve various SIMD architectures. d the different multiprocessor architectures d message passing paradigm using MPI ed memory programming paradigm with Pt	l Parallel and war	ism ehouse	e scale		s.		
<ul> <li>Explore I</li> <li>Analyze</li> <li>Compare</li> <li>Analyze</li> <li>Write par</li> </ul>	mes: At the end of this course, lear nstruction Level Parallelism in a code the architecture of Vector, SIMD and G e symmetric and distributed memory mu- the issues in warehouse scale computi- callel programs using MPI framework, F	PU arch ultiproce ng.	nitectu essor s	re. syster	ns.			9
LP: Concepts a cheduling Har	puters - Dependability - Quantitative and challenges - Basic compiler tecl dware based Speculation - Multiple ly: Intel Core i7, ARM Cortex-A53.	nniques	s for e	xpos	ing ILP -	Branch	prediction - Dyn	am
	, SIMD AND GPU ARCHITECTURES cture: Vector Execution Time-M							9
	or Mask Redister-Memory Banks-St		- 11	0 1	. D.	in the second second	Manten Analite	
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19CS705 PROJECT WORK- PHASE - I 0 0 2 1 30 100

The purpose of learning this course is to

- To develop knowledge to formulate a real world problem and project's goals.
- To identify the various tasks of the project to determine standard procedures.

## **Course Outcomes:**

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

- Formulate a real world problem, identify the requirement and develop the design solutions.
- Express the technical ideas, strategies and methodologies

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Department	COMPUTER SCIENCE AND EN	IGI	NEE	RIN	G	R 2019	Semester	IV
Course	Course Name	10121	our Wee		Credit	. otai	Maximu	m
Code		L	LTP		С	Hours	Marks	
19CSPE01	C# AND .NET PROGRAMMING	3	0	0	3	45	100	
<ul> <li>Unde</li> <li>Lear</li> <li>Know</li> <li>Be a</li> <li>Lear</li> <li>Course Outo</li> <li>At the end of</li> <li>List the platform</li> <li>Unders</li> <li>Debug</li> </ul>	of learning this course is to erstand the foundations of CLR exe n the technologies of the .NET fram w the object oriented aspects of C#. ware of application development in n web based applications on .NET comes: this course, learners will be able to e major elements of the .NET frame m. stand Object based concept of C# , compile, and run a simple application	.NE (ASI ): wor	ork. T. P.NI	nd ex	kplain ho			
Discus     Discus     Unit I     IN     Introducing     Operators, cl     mplicit and	e the basic structure of a C# applic s CLR and security in .NET. TRODUCTION TO C# C#, Understanding .NET, overview hecked and unchecked operators, E explicit casting, Constant, Arrays	v of Expre	C# essio	, Lit ons,	erals, Va Branchi	ariables ng, Loop	, Data Typ ping, Metho	9 bes, bds,
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1.	Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.
2.	Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012
3.	Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
4.	Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010

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Course	COMPUTER SCIENCE AND	Н	our Wee	s /	Credit		Semester Maximur	v n
Code	Course Name	L	T	P	С	Hours	Marks	
19CSPE02	ADVANCED JAVA PROGRAMMING	3	0	0	3	45	100	
Course Obje	ective (s):							
The purpose	of learning this course is							
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	n knowledge to develop standalo	19110101010101010101010						_
	cuss basic principles of HTML, Ja							
-	n knowledge to develop dynamic							
	oduce tools, technologies and f			her	nce Hibe	ernate a	nd Spring	ar
Introdu	iced to enhance web development	nt skill	S.	1.11	- Verali			_
using H Able to applica	e and design web-based informa HTML5, CSS, JavaScript o Design and develop interactiv ations using eclipse.							
otruto	e the features of various platfor		nd f	ram	eworks	like hibe	ernate, Spr	ing
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obje	cts- Action	n Ele	ement	s – Sharing	data	Betw	een	JSP	pages Application	on Develop	ment
using	g eclipse										

#### Unit V JAVA FRAMEWORKS

Hibernate Introduction-features-Architecture-Mapping and Configuration Files in Hibernate - Hibernate O/R Mappings –Hibernate query language-Simple examples using hibernate-Spring Introduction- Architecture-IOC container- Dependency Injection Bean – Getting started with Spring MVC framework- Simple examples using Spring-STRUTS – Introduction, Struts framework core components – Installing and setting 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", Prentice Hall, 5 <sup>th</sup> Edition, 2011.
3.	Gavin King, Christian Bauer, "Java Persistence with Hibernate", Dreamtech press, Kogent Learning Solutions Inc. 2008
4.	Craig Walls, "Spring in Action", Manning, Dreamtech press, 2014
<b>RE</b> 1.	ERENCE(S) Cay S. Horstmann and Gary Cornell, "Core Java™, Volume I – Fundamentals" 9th Edition, Prentice Hall, 2012
2.	Robert W. Sebesta, "Programming the World Wide Web", Addison-Wesley, 7thEdition, 2012.

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COMPUTER SCIENCE AND ENGINEERING					R 2019	Semester
Course Name	Hours / Week		iotai	Maximum		
	L	Т	Р	С	Hours	Marks
OPEN SOURCE SYSTEMS	3	0	0	3	45	100
		Course Name	Course Name Wee	Course Name Week	Course Name Week Credit	Course NameWeekCredit HoursTotal HoursLTPC

- system
- Develop web based applications using open source system

## **Course Outcomes:**

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

- Understand Open Source Software tools and techniques to develop applications
- Analyze the advantages and disadvantages of Open Source tools and languages with respect to proprietary Software
- Apply the Open Source Software in developing web based Applications and Internet of Things

## Unit I INTRODUCTION TO OPEN SOURCE OPERATING SYSTEMS

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Introduction to Open Sources - Need of Open Sources -Advantages of Open Sources Application of Open Sources - Sources LINUX Introduction General Overview Kernel Mode and User Mode Process - Advanced Concepts -Scheduling - Personalities - Cloning -Signals -Development with Linux.

Unit II OPEN SOURCES DATABASE

MySQL: Introduction - Setting up account - Starting, Terminating and Writing your Own SQL programs- Record Selection Technology - Working with Strings - Date and Time - sorting Query Results - Generating Summary - Working with metadata - Using Sequences - MySQL and Web.

## Unit III CONFIGURING SERVERS

Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux /Unix networks); Setting up proxy services -- using squid (http / ftp / https proxy services); Setting up printer services -using CUPS (print spooler), foomatic (printer database).

## Unit IV FIREWALL, BUILD SYSTEM, CVS

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection – GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas); Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

Unit V SERVER TECHNOLOGIES

Web Server: Apache Server - Working with Web Server - Configuring and Using Apache Web Services - MDA - Introduction to MDA - Geneses of MDA - MDA Applications

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TEXT	BOOK(S)
1.	N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005
2.	Peter Wainwright, Professional Apache. Wrox Press, New Delhi, 2010
3.	M. N. RAO, Fundamentals of Open Source Software, PHI Learning Private Limited, 2015
REFE	RENCE(S)
1.	H.S. Lahman Model-Based Development: Applications 1st edition Pearson Education Inc,2011
2.	Stephen J. Mellor, Marc Balces, "Executable UMS: A foundation for MDA", Addison,2002.

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Code       Course Name         I9CSPE04       R PROGRAMMING         Course Objective (s):       The purpose of learning this course is         The purpose of learning this course is       To understand the basics in R p         statements, string functions       To learn to apply R programming for         To understand the use of R Big Data       To able to appreciate and apply the F         Course Outcomes:       At the end of this course, learners will be able         Create artful graphs to visualize comp       Write more efficient code using parall	L 3 orogramn Text pro analytics R program	cess	P 0 in	C 3 terms	Hours 45 of const	Marks 100 tructs, cont	trol
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Init III DATA FRAMES			0				15
reating Data Frames – Matrix-like oper	ations ir	n fra	ame	s – Mer	ging Da	ata Frames	; –
pplying functions to Data frames – Factor	rs and T	able	es –	factors a	and leve	ls – Comm	on
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Control statements – Arithmetic and Bool							
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1.	Norman Matloff, "The Art of R Programming: A Tour of Statistical Software
2.	<ul> <li>Design", No Starch Press, 2011</li> <li>Jared P. Lander, "R for Everyone: Advanced Analytics and Graphics", Addison- Wesley Data &amp; Analytics Series, 2013.</li> </ul>
REFE	RENCE(S)
1.	Mark Gardener, "Beginning R – The Statistical Programming Language", Wiley, 2013
2.	Robert Knell, "Introductory R: A Beginner's Guide to Data Visualisation, Statistical Analysis and Programming in R", Amazon Digital South Asia Services Inc, 2013.

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epartment Course	COMPUTER SCIENCE AND E	Н	our	s /	G Credit	R 2019 Total	Semeste Maxi	
Code	Course Name	L	Wee T	P	С	Hours	Ma	
19CSPE05	XML AND WEB SERVICES	3	0	0	3	45	1	00
	ective (s): the XML Technologies and modeli le an overview of Service Oriented .						nce of Wel	b services
<ul> <li>Impart</li> <li>Famili Servic</li> <li>Under</li> <li>Design</li> </ul>	f this course, learners will be able t knowledge in XML technologies to arize with concepts of SOA ,star	o bui ndarc OAP	ds a	nd	technolo	gies for	building	
evcha	nged among Web Services							
Jnit I X Role of XML	ML TECHNOLOGY - XML and The Web - XML Langu							
Jnit I X Role of XML over HTML - SAX - pres XPATH.	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR	- DTI	D-X	ML	Schema	is - XML	processir	es of XML ng – DOM – XLINK
Unit I X Role of XML over HTML - SAX - pres XPATH. Unit II S Service Orie architectures	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards	- DTI RMS earing	D - X - XI	(ML HTM	Schema IL - Tran with Clie	is - XML sformati ent-Serv	processir on - XSL1 er and D	es of XML ng – DOM – XLINK <b>9</b> vistributed
Unit I X Role of XML over HTML - SAX - pres XPATH. Unit II So Service Orie architectures Service laye	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef	- DTI RMS earing	D - X - XI	(ML HTM	Schema IL - Tran with Clie	is - XML sformati ent-Serv	processir on - XSL1 er and D	es of XML ng – DOM – XLINK <b>9</b> vistributed
Unit I     X       Role of XML       over HTML -       SAX - pres       XPATH.       Unit II       Service Orie       architectures       Service laye       Unit III       Architecting	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemen	- DTI RMS paring its o nt. B - B W - W	D - X - X g S f S 2 C veb s	(ML HTM DA DA DA -	Schema IL - Tran with Clie Principle nitations ices tech	ent-Serves of Se	processir on - XSLT er and D ervice orie RBA and	es of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM -
Unit IXRole of XMLover HTML -SAX - presXPATH.Unit IIService OrieService layeService layeUnit IIIABusiness matchitectingComposition	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemen RCHITECTING WEB SERVICES otivations for web services - B2B web services - Implementation view	- DTI RMS paring its o nt. 8 - B w - w w - p	D - X - X g S f S 2 C veb s	(ML HTM DA DA DA -	Schema IL - Tran with Clie Principle nitations ices tech	ent-Serves of Se	processir on - XSLT er and D ervice orie RBA and	es of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM -
Unit I     X       Role of XML       over HTML -       SAX - pres       XPATH.       Unit II       Service Orie       architectures       Service laye       Unit III       Architecting       composition       Jnit IV       W       Transport pr       describing was       services: UD       abXML).	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemer RCHITECTING WEB SERVICES Divations for web services - B2E web services - Implementation view n of web services - deployment view EB SERVICES BUILDING BLOCH otocols for web services - mess eb services: WSDL - Anatomy - mat DI - Anatomy - Web service inspe	- DTI RMS aring its o nt. B - B w - w w - p <b>(S</b> aging nipul ction	D - X - XH g SC f SC veb s proce g wi ation	CML HTM DA - DA - DA - Iir serv ess v ess v th v	Schema IL - Tran with Clie Principle nitations ices tech view. web servi	ent-Serves of COl of COl nnology	processir on - XSLT er and D ervice orie RBA and stack - log otocols - y - Discove	s of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM - gical view 9 SOAP – ering web (E-com &
Unit I     X       Role of XML       Sover HTML -       SAX - pres       XPATH.       Jnit II       Service Orie       architectures       Service laye       Jnit III       Architecting       composition       Jnit IV       W       Transport pr       services: UD       bXML).       Jnit V       XI	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemen RCHITECTING WEB SERVICES bitvations for web services - B2B web services - Implementation view n of web services - deployment view EB SERVICES BUILDING BLOCH otocols for web services - mess eb services: WSDL - Anatomy - main DI - Anatomy - Web service inspe	- DTI RMS paring its o nt. B - B w - w w - p <b>KS</b> aging nipul ction	D - X - XH g SC f SC veb s proce g wi ation - W	(ML HTM DA DA - lin serv ess v th v r - w /eb	Schema IL - Tran with Clie Principle nitations ices tech view. web servi yeb servi Services	ent-Serves of Se of COI nnology vices pr ce police and E-	processir on - XSLT er and D ervice orie RBA and stack - log otocols - y - Discove business	s of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM - gical view 9 SOAP – ering web (E-com & 9
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Unit I     X       Role of XML       Sover HTML -       SAX - pres       XPATH.       Jnit II       Service Orie       architectures       Service laye       Jnit III       Architectures       Service laye       Jnit III       Architecting       composition       Jnit IV       W       Transport pr       Services: UD       abXML).       Jnit V       XII       Signature - X	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemen RCHITECTING WEB SERVICES otivations for web services - B2B web services - Implementation view n of web services - deployment view EB SERVICES BUILDING BLOCH otocols for web services - mess eb services: WSDL - Anatomy - mai DI - Anatomy - Web service inspe ML AND WEB SERVICES SECUR y Overview - Canonicalization - XM KMS Structure - Web Services Services - ME	- DTI RMS aring its o nt. B - B w - w w - p <b>(S</b> aging nipul ction IL Se	D - X - XH g SC f SC veb s oroce g wi ation - W	(ML HTM DA - DA - DA - Iir serv ess n th v h - w /eb ty F	Schema IL - Tran with Clie Principl nitations ices tech view. web servi Services ramewor	ent-Serves of Se of COI nnology vices pr ce police and E-	processir on - XSLT er and D ervice orie RBA and stack - log otocols - y - Discove business	s of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM - gical view 9 SOAP – ering web (E-com & 9
Unit I     X       Role of XML       over HTML -       SAX - pres       - XPATH.       Unit II       Service Orie       architectures       Service laye       Unit III       Architectures       Service laye       Unit III       Architecting       - composition       Unit IV       W       Transport pr       describing w       services: UD       bXML).       Jnit V       XII       Signature - X       TEXT BOOK	ML TECHNOLOGY - XML and The Web - XML Langu EDI - Databases - XML standards entation technologies - XSL - XFOR DA BASICS ented Architecture (SOA) - Comp s - Characteristics of SOA - Benef rs - Business Process managemen RCHITECTING WEB SERVICES otivations for web services - B2B web services - Implementation view n of web services - deployment view EB SERVICES BUILDING BLOCH otocols for web services - mess eb services: WSDL - Anatomy - mai DI - Anatomy - Web service inspe ML AND WEB SERVICES SECUR y Overview - Canonicalization - XM KMS Structure - Web Services Services - ME	- DTI RMS paring its o nt. - B w - W w - P <b>XS</b> aging nipul ction <b>ITY</b> IL Se curit	D - X - XH g SC f SC 22C veb s vroce g wi ation - W	(ML HTM DA - lin serv ess v th v r - w (eb :	Schema IL - Tran with Clie Principle nitations ices tech view. web servi Services ramewor ML.	ent-Serves of Se of COI nology vices pr ce policy and E-	processir on - XSLT er and D ervice orie RBA and stack - log otocols - y - Discove business	s of XML ng – DOM – XLINK 9 vistributed entation – 9 DCOM - gical view 9 SOAP – ering web (E-com & 9

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	2002.
REFE	RENCE(S)
1.	Thomas Erl, Service Oriented Architecture: Concepts, Technology and Design, Pearson Education, 2005.
2.	Sandeep Chatterjee and James Webber, Developing Enterprise Web Services: An Architects Guide, Prentice Hall, 2004.
3.	Mark O Neill, Web Services Security, Tata McGraw-Hill, 2005.

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Departmen	t COMPUTER SCIENCE AND I	ENGI	NEE	RIN	G	R 2019	Semester	v	
Course	Course Name		our Wee		Credit	Total	Maxim		
Code		L	Т	Ρ	С	Hours	ware	Marks	
19CSPE06	GRAPH THEORY AND ITS APPLICATIONS	3	0	0	3	45	10	0	
The purpos To To To	<b>bjective (s):</b> se of learning this course is to understand the basics of graph data familiarize Tree and its properties understand the Representation of g		cture	e					
	know the various Graph Problems _earn Directed graph and its applic	ations							
<ul><li>Appl</li><li>Able</li><li>Appl</li></ul>	erstand graph fundamentals y tree principles to solve problems to represent Graph y Graph to solve problems yze the properties of Directed Grap	h							
				-		1		9	
	, importance, isomorphism, walk, p on graphs operation on graphs, Eul						onnected g	graphs	
Unit II	TREES			×			L'AL (	9	
spanning separatabi	distance and centers, trees, s tree , Cut sets Properties, func ity, network flows, 1-2 isomorphi tion, planar graphs, kuratowski's gr	lamen sm	ital ,Pla	circ nar	uits and and dua	l cut se al graph	ets, conne is, Combi	ectivity natoria	
Unit III	MATRIX REPRESENTATION OF O	GRAP	HS					9	
	natrix, circuit matrix, cut set matrix	k, fund	dam	enta	al matrice	es, relat	onships ai	mongs	
	ath matrix, and adjacency matrix								
matrices, p	ath matrix, and adjacency matrix COLORING, COVERING AND PAI	RTITIC	ONII	NG				9	
matrices, p <b>Unit IV</b>	COLORING, COVERING AND PAI number, chromatic partitioning, mat	AND	- 100 SA 54	1992-1993	g, four c	olor prol	olem	9	
matrices, p Unit IV   ( Chromatic Unit V   I	COLORING, COVERING AND PAI number, chromatic partitioning, mat DIRECTED GRAPHS	ching,	COV	verin		- · ·		9	
matrices, p Unit IV 0 Chromatic Unit V 1 Different representat – input & vertices, di	COLORING, COVERING AND PAI number, chromatic partitioning, mat DIRECTED GRAPHS types, directed paths and co tion, tournament. Graph theoretic a output, algorithms for connected rected circuits and shortest paths	ching, nnect	cov edne	verin ess, , Co	Euler	digrap represe	hs, trees ntation of	<b>9</b> -matri graph	
matrices, p Unit IV 0 Chromatic Unit V 1 Different representat – input & vertices, dir TEXT BOC	COLORING, COVERING AND PAI number, chromatic partitioning, mat DIRECTED GRAPHS types, directed paths and co tion, tournament. Graph theoretic a output, algorithms for connected rected circuits and shortest paths K(S)	ching, nnect algorith ness,	cov edno nms span	verin ess, , Co nnin	Euler omputer g tree, f	digrap represe undame	hs, trees ntation of ental circu	9 -matri graph its, cu	
Matrices, p Unit IV Chromatic Unit V I Different representat – input & vertices, dir TEXT BOC	COLORING, COVERING AND PAI number, chromatic partitioning, mat DIRECTED GRAPHS types, directed paths and co tion, tournament. Graph theoretic a output, algorithms for connected rected circuits and shortest paths	ching, nnect algorith ness,	cov edno nms span	verin ess, , Co nnin	Euler omputer g tree, f	digrap represe undame	hs, trees ntation of ental circu	9 -matri graph its, cu	

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REF	ERENCE(S)
3.	F.Harary, Graph Theory, Addison Wesley/ Narosa, 1998
4.	E.M.Reingold, J.Nievergelt, N.Deo, Combinatorial Algorithms: Theory and Practice, Prentice Hall, N.J.1977

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3. Turning

	COMPUTER SCIENCE AND	<b>ENGIN</b>	NEE	RIN	G	R 2019	Semester	v
Course Code	Course Name	943	our Wee		Credit	Total	Maximu	
Code		L	Т	Ρ	С	Hours	Marks	
19CSPE07	COMPUTER VISION	3	0	0	3	45	100	
<ul><li>To buil</li><li>To exp</li></ul>	of learning this course is to d an understanding on detailed ose the students to image feat	ure reco	gnit		ge forma	tion.		
To intro	oduce fundamental algorithms t oduce various views ose the students to various seg			tech	niques			
<ul> <li>Apprec</li> <li>Analyse</li> <li>Apply v</li> <li>Examin</li> </ul>	this course, learners will be ab iate the detailed models of ima e the techniques for image feat various algorithms for Linear Fil ne various of image e segmentation algorithms and	ge form ure reco ters	ogni	tion.				
	AGE FORMATION AND IMAG	Carl and a second second	-		lageo			9
Perspective	ments of Analytical Euclidea Projection, Affine Cameras a pration: Least Squares Parame	and Affi	ine	Pro	amera jection E	Parame Equation	ns, Geome	the etric
Perspective Camera Calib Calibration, T Unit II RA Light in space Shading: Qualitative R	Projection, Affine Cameras a pration: Least Squares Parame aking Radial Distortion into Ac <b>DIOMETRY MEASURING LIC</b> ce, Light at Surfaces ,Import adiometry Sources and their	and Affi ter Esti count <b>GHT</b> ant Spe effects	ine mat ecia	Pro ion, I Ca	amera jection E A Linear ses, So Shading	Parame Equation Approa urces, \$	ters and ns, Geome nch to Cam Shadows s, Color:	the etric nera 9 and The
Perspective Camera Calib Calibration, T <b>Unit II RA</b> Light in space Shading: Qualitative R Physics of Co Surface Color	Projection, Affine Cameras a bration: Least Squares Parame aking Radial Distortion into Act <b>DIOMETRY MEASURING LIG</b> ce, Light at Surfaces ,Import adiometry Sources and their blor, Human Color Perception, In from Image Color	and Affi ter Esti count <b>GHT</b> ant Spe effects	ine mat ecia	Pro ion, I Ca	amera jection E A Linear ses, So Shading	Parame Equation Approa urces, \$	ters and ns, Geome nch to Cam Shadows s, Color:	the etric nera 9 and The olor,
Perspective Camera Calib Calibration, T Unit II RA Light in space Shading: Qualitative R Physics of Co Surface Color Unit III LIN Linear Filters Fourier Trans Co-relation an Edges, Textu Synthesizing	Projection, Affine Cameras a pration: Least Squares Parame aking Radial Distortion into Acc <b>DIOMETRY MEASURING LIG</b> ce, Light at Surfaces ,Import adiometry Sources and their olor, Human Color Perception, I from Image Color <b>IEAR FILTERS</b> and Convolution, Shift Invar forms,Sampling and Aliasing, and Finding Pattern, Edge Detection re: Representing Texture, An Textures for Rendering, Shape	and Affi ter Esti count <b>GHT</b> ant Spe effects Represe iant Lin Filters ction:No alysis I From T	ine mat ecia , Lc entir near as <sup>-</sup> bise, Jsin Fext	Pro ion, I Ca ocal ng C Sys Fem Est	amera jection E A Linear Ises, So Shading olor, A M stem, Sp plates, T imating I	Parame Equation Approa urces, S Model fodel for Datial Fr echniqu Derivativ	ters and ns, Geome ich to Cam Shadows s, Color: r Image Co requency ie Normali ves, Detec	the etric nera 9 and The blor, 9 and zes ting
Perspective Camera Calibration, T Unit II RA Light in space Shading: Qualitative R Physics of Co Surface Color Unit III LIN Linear Filters Fourier Trans Co-relation an Edges, Textu Synthesizing Unit IV TH	Projection, Affine Cameras a bration: Least Squares Parame aking Radial Distortion into Act <b>DIOMETRY MEASURING LIG</b> ce, Light at Surfaces ,Import adiometry Sources and their blor, Human Color Perception, I from Image Color <b>NEAR FILTERS</b> and Convolution, Shift Invar forms,Sampling and Aliasing, and Finding Pattern, Edge Deter- ire: Representing Texture, An	and Affi ter Esti count <b>GHT</b> ant Spe effects Represe iant Lir Filters ction:No alysis I From 1 <b>VIEWS</b>	ine mat ecia , Lo near near as Jsin Fext	Pro ion, I Ca ocal ng C Sys Tem Est g C ure	amera jection E A Linear ises, So Shading olor, A M stem, Sp plates, T imating I priented	Parame Equation Approa urces, s Model odel for Derivativ Pyramic	ters and hs, Geome hch to Cam Shadows s, Color: r Image Co requency le Normali ves, Detec Is,Applicat	the etric nera 9 and The blor, 9 and zes ting ion: 9

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Unit	V SEGMENTATION BY CLUSTERING	9
Huma	an Vision Grouping and Gestalt, Applications: short Boundary detection	and
Back	ground subtraction, Image Segmentation by Clustering Pixels, Segmentation	By
Grap	h-Theoretic Clustering, Segmentation By Fitting a Model: The Hough Transfo	orm,
Fitting	g Lines, fitting Curves, Segmentation and Fitting Using Probabilistic Methods: Miss	sing
Data	Problems, Fitting and Segmentation, Tracking with linear dynamic mod	els,
	erence problem, kalman Filtering, Data Association, Application-Vehicle Tracking	
TEXT	r BOOK(S)	
1.	David A.Forsyth, Jean Ponce, "Computer Vision A Modern Approach", Pren Hall, 2003	tice
2.	Linda G. Shapiro, George C. Stockman , "Computer Vision", Published by Pren Hall,2001.	tice
REFE	ERENCE(S)	
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Department	COMPUTER SCIENCE AND EN	GIN	EEF	RING	) – – j	R 2019	Semester	۷
Course	Course Name	1 2000	our: Wee		Credit	Total	Maximu	n
Code		L	Т	Р	С	Hours	Marks	
19CSPE08	HUMAN COMPUTER INTERFACE	3	0	0	3	45	100	
<ul> <li>To lea</li> <li>To uno</li> <li>To beo disabil</li> </ul>	of learning this course is to rn the foundations of Human Compute derstand the GUI concepts come familiar with the design technolog			<u>е</u> е.		nd perso	ns with	
	rn the software tools used in user inter	face						
<ul><li>Desigr</li><li>Desigr</li><li>Explain</li></ul>	stand fundamentals of HCI n effective HCI for graphical user interfa n effective dialog for HCI. n the HCI implications for designing mu op meaningful user interface using soft	ultim	nedia		commerc	e/ e-lean	ning Web si	tes
Unit I IN	NTRODUCTION					1		9
Introduction	NTRODUCTION : Importance of user Interface – defini . A brief history of Screen design	tion,	, im	porta	ance of g	lood des	ign. Benefit	
Introduction good design	: Importance of user Interface - defini	tion,	, im	porta	ance of g	jood des	ign. Benefit	
Introduction good design Unit II G The graphic graphical sys	: Importance of user Interface – defini . A brief history of Screen design <b>GUI</b> al user interface – popularity of gra stem, Characteristics, Web user – Inter	phic	cs, 1	the	concept	of direc	t manipulat	s o 9 ion
Introduction good design Unit II G The graphic graphical sys user interfact	: Importance of user Interface – defini . A brief history of Screen design <b>GUI</b> al user interface – popularity of gra stem, Characteristics, Web user – Inter	phic	cs, 1	the	concept	of direc	t manipulat	s o 9 ion
Introduction good design. Unit II G The graphic graphical sys user interfact Unit III H Design proc	: Importance of user Interface – defini A brief history of Screen design <b>IUI</b> al user interface – popularity of gra stem, Characteristics, Web user – Inter e	phic face	s, f e po	the pula	concept rity, char tance of	of direc acteristic	t manipulat cs- Principle characteris	9 ion 9 9
Introduction good design. Unit II G The graphical graphical sys user interface Unit III H Design proc human consi	: Importance of user Interface – defini A brief history of Screen design <b>IUI</b> al user interface – popularity of gra stem, Characteristics, Web user – Inter e <b>CI DESIGN</b> ess – Human interaction with compu	phic face	s, f e po	the pula	concept rity, char tance of	of direc acteristic	t manipulat cs- Principle characteris	9 ion 9 9
Introduction good design Unit II G The graphic graphical sys user interfact Unit III H Design proc human consi Unit IV C Screen Desig ordering of so – amount of in – information design Unit V S	: Importance of user Interface – defini A brief history of Screen design <b>GUI</b> al user interface – popularity of gra stem, Characteristics, Web user – Inter e <b>CI DESIGN</b> ess – Human interaction with compu- ideration, Human interaction speeds, u	phic face uters nde g an tion senta s –	s, in rsta and p anc ation Tec	the pula npor ndin urpo I flov n info	concept rity, char tance of g busine se, orga v – Visua ormation ogical co	of direc acteristic human ss junction nizing sc lly pleasi simply ar onsiderat	t manipulat cs- Principle characteris ons reen eleme ng composi nd meaningt ion in interf	9 ion s c 9 stic 9 stic 9 nts tion fully iace 9

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TEXT	BOOK(S)
1.	The essential guide to user "Interface design", Wilbert O Galitz, Wiley Dreama Tech
2.	Designing the user interface, 3rd Edition Ben Shneidermann, Pearson Education Asia
3.	Human – Computer Interaction, Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson, Prentice Hall (2004).
REFE	RENCE(S)
4.	Interaction Design Prec, Rogers, Sharps. Wiley Dreamtech
5.	User Interface Design, Soren Lauesen, Pearson Education

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Department	COMPUTER SCIENCE AND ENGINEERING	IEERING		<b>i</b> 4	R 2019	Semester	V	
Course	Course Name	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	lour Wee		Credit	Total Hours	Maximu Marks	m
Code		L	Т	Ρ	C	Hours	Marks	
19CSPE09	COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS	3	0	0	3	45	100	
ourse Objec	<b>:tive (s):</b> If learning this course is to							
and the second second second second	stand the basic output primitives							
	stand the three dimensional concept	te						
	basics of Multimeida system	15				•		
	stand the design of multimedia system	me						
• To under	stand the design of multimedia syste	21113		5		11 I.	1	
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<ul> <li>Understa</li> </ul>	and the Applications of Multimedia S	yste	m					
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ntroduction -	Line - Curve And Ellipse Drawing					tes – Tv	vo-Dimensi	
ntroduction - Geometric Tra	Line - Curve And Ellipse Drawing Insformations – Two-Dimensional Cl					tes – Tv	wo-Dimensi	ona
ntroduction - Geometric Tra	Line - Curve And Ellipse Drawing					tes – Tv	wo-Dimensi	
ntroduction - Geometric Tra Jnit II TH	Line - Curve And Ellipse Drawing Insformations – Two-Dimensional Cl	ippin Three	g Ar	nd V	iewing sional Ge	eometric		ona 9
Introduction - Geometric Tra Unit II TH Three-Dimens Transformation	Line - Curve And Ellipse Drawing Insformations – Two-Dimensional Cli REE-DIMENSIONAL CONCEPTS ional Object Representations – T	ippin Three	g Ar	nd V	iewing sional Ge	eometric		ona 9
Introduction - Geometric Tra Unit II TH Three-Dimens Transformation Unit III MU An Introductic Architecture – – Multimedia I Compression	Line - Curve And Ellipse Drawing Insformations – Two-Dimensional Cli <b>REE-DIMENSIONAL CONCEPTS</b> ional Object Representations – T ns – Three- Dimensional Viewing – C <b>ILTIMEDIA SYSTEMS DESIGN</b> on – Multimedia Elements – Mult Evolving Technologies for Multimed Data Interface Standards – Need Fo and Decompression: Types of C olor, Gray Scale and Still – Video	ippin Three Color imec lia – r Dat	-Din Mo dia / Defi ta C	nens dels Appli ining omp	iewing ional Ge – Anima ications Objects ression - – Binar	eometric tion. – Multin for Multi Multime y Image	and Mode nedia Syste media Syste dia Databas o Compress	9 9 9 9 9 9 9 9 9 9 8 9 8 9 8 9 8 9 8 9
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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: 81-203-2177-4
REFE	RENCE(S)
3.	Ze-Nain Li, Mark S.Drew, "Fundamentals of Multimedia", PHI. ISBN :81-203-2817-5.
4.	John F. Koegel Buford, " Multimedia Systems", Third Edition, 2000. ISBN: 8177588273

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	COMPUTER SCIENCE AND EN		outro cubro.		G	R 2019	Semester	V
Course Code	Course Name	an area	our Wee	ek	Credit	Total Hours	LITERATION CONTRACTOR AND	
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19CSPE10	DIGITAL IMAGE PROCESSING	3	0	0	3	45	100	
<ul> <li>Funda</li> <li>Perfor</li> <li>To un representation</li> </ul>	e of learning this course is to amentals of digital image processing rming image enhancement and image nderstand the image compression sentation techniques. arn image representation techniques	ge re n pi	esto	ratic	n			and
• To kn	ow about how to interpret the extrac	ted	data	a fro	m the im	lage	-	
<ul> <li>Enhar</li> <li>Apply and se</li> <li>Repre-</li> <li>ble to interp</li> </ul>	ze and apply image transforms like have the quality of images by image s Huffman coding, Shift codes, arith egmentation for digital images sent image using chain codes, linea ret the data and relate with real time	met met	othe ic c gnat	ening odin	g and ima g and p	age shar erform e	pening	
	IGITAL IMAGE FUNDAMENTALS				10/-1-1-		and Diam	
Image forma	IGITAL IMAGE FUNDAMENTALS ation - Image transforms - Fourier t elling transforms	rans	sforr	ns -	Walsh -	Hadam	ard - Discre	( comes
Image forma cosine - Hot	ation - Image transforms - Fourier t	£.		38	Walsh -	Hadam	ard - Discre	ete
Image forma cosine - Hot Unit II III Histogram r Restoration	ation - Image transforms - Fourier t elling transforms	RAT	<b>ION</b> ther	I	- Image	Sharpe	ening - Ima	<b>9</b> ge
Image forma cosine - Hot Unit II III Histogram r Restoration filtering	ation - Image transforms - Fourier t elling transforms <b>IAGE ENHANCEMENT &amp; RESTOF</b> modification techniques - Image sr	RAT noo els	ther	l ning patia	- Image	Sharpe	ening - Ima	ete 9 ge
Image forma cosine - Hot Unit II II Histogram r Restoration filtering Unit III II Runlength, coding, JPE schemes, Fa	ation - Image transforms - Fourier t elling transforms <b>IAGE ENHANCEMENT &amp; RESTOF</b> nodification techniques - Image sr - Degradation Model – Noise mod	RAT noot els ITA meti dictiv -De	TION TIO	l batia N odin echr	- Image Il filtering g, bit pla niques, B of discon	a Sharpe g - Frequ ane codi lock trur tinuities	ening - Ima uency doma ing, transfo ncation codi - Edge linki	ete 9 ge ain 9 rm
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Image forma         cosine - Hot         Unit II       IM         Histogram r         Restoration         filtering         Unit III       IM         Runlength,         coding, JPE         schemes, Fa         and boundar         Unit IV       R         Boundary R         descriptors,         Descriptors         Unit V       O	ation - Image transforms - Fourier t elling transforms <b>MAGE ENHANCEMENT &amp; RESTOF</b> modification techniques - Image sr - Degradation Model – Noise mod <b>MAGE COMPRESSION &amp; SEGMEN</b> Huffman coding, Shift codes, arithm G Standard, wavelet transform, prece acet modeling- Image segmentation ry detection - Thresholding - Region <b>EPRESENTATION AND DESCRIP</b> epresentation using chain codes, I Moments Region representation, <b>BJECT RECOGNITION AND INTE</b>	RAT noo els ITA meti dictiv -De bas TIO Line Reg	TION ther - Sp ic co ve to tect sed N ar S gion	I hing patia odin echr ion ( seg) Bign al d	- Image I filtering g, bit pla niques, B of discon mentatio ature, SI lescripto	ane codi lock trur tinuities n - Morp nape nu r, Textu	ening - Ima uency doma ing, transfo ncation codi - Edge linki ohology. mber, Four re, Relation	9 9 9 9 9 7 m 1 9 9 9 1 ier 1 1 9 9
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2.	Sid Ahmed, Image Processing, McGraw Hill, New York, 1995.
REFE	RENCE(S)
1.	http://poseidon.csd.auth.gr/EN
2.	http://www.olympusmicro.com/primer/resources/imageprocessing.html
3.	http://graphics.cs.cmu.edu/courses/15-463/2004_fall/www/463.html

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Department	COMPUTER SCIENCE AND E	NGI	NEE	RIN	G	R 2019 Semest		VI
Course	Course Name		our Wee		Credit	Total	Maximum Marke	
Code			Т	Ρ	С	Hours	Marks	
19CSPE11	DISTRIBUTED SYSTEMS	3	0	0	3	45	100	
<ul> <li>To und environ</li> <li>To eva validate</li> <li>To gain</li> <li>Gourse Outco</li> <li>At the end of</li> <li>Underse</li> <li>Analyzed system</li> </ul>	of learning this course is derstand the basics of networking ment. luate the impact of memory on part their performance. In knowledge of how to design and comes: this course, learners will be able to the basics of networking and e various issues in the design ar	impl io: d prot d im	/dis eme toco	tribu ent c lls men	ited algo listribute	rithm for d algorit distribu	mulations hms ted compu	anc
Unders Unit I INT Distributed Co	he knowledge of deadlock method tand the significance of distributed RODUCTION omputing Models, Software Conce s in design of a distributed operati	d file epts,	sys Har	tem	with rea			7 rver
		<u> </u>						9
format, Mess Object Invoca <b>Unit III PR</b> Threads, coc algorithms, n System mode	o Message Passing, Advantages sage Buffering, Remote Procedu ation, Message Oriented Commun COCESSES, SYNCHRONIZATION de migration, clock synchronizat nutual exclusion, Distributed tra el, Resources vs. communication of l resolution, Centralized deadlock	ire C lication N AN ion, nsac leadl	all, on. D D logi tion ock:	Ext DIST cal . Di s, de	ended F RIBUTE clocks, stributec adlock p	D DEAD global s Deadlo preventio	DLOCK btate, Elec bock Detec bon, avoidar	11 tion tion nce,
path pushing	and edge chasing algorithm							
	STRIBUTED SHARED MEMORY							9
memory, Des	hared Memory Introduction, Ge sign and implementation, Issues e, consistency models, thrashing,	of D	SM	, Gr	anularity			
Unit V DIS	STRIBUTED FILE SYSTEM					JP2		9
models, file a	le System Introduction, Desirable accessing, sharing, caching meth A(CORBA RMI and Services)						10 A A A A A A A A A A A A A A A A A A A	

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1.	Andrew Tanenbaum, Maarten Van Steen, "Distributed System- Principals Paradigm", Maarten van Steen Publication,2016
2.	Singhal and Shivratri, "Advanced Concept in Operating Systems", McGraw Hill,2015
REF	ERENCE(S)
1.	Sunita Mahajan, Seema Shah, "Distributed Computing", Oxford, 2nd edition, 2013
1. 2.	Sunita Mahajan, Seema Shah, "Distributed Computing", Oxford, 2nd edition,2013 Pradeep K. Sinha "Distributed Operating Systems", Prentice Hall of India Private,2012

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Department	COMPUTER SCIENCE AND E				IG	R 2019	Semester	V
Course Code	Course Name	_	our Wee	ek	Credit	Total Hours	and the second sec	
		L	Т	Ρ	C	nouro	marito	
19CSPE12	INFORMATION RETRIEVAL TECHNIQUES	3	0	0	3	45	100	
<ul> <li>To under operation operation operation.</li> <li>To get a clusterin.</li> <li>To under multime.</li> </ul>	of learning this course is to erstand the basics of information r ons and indexing an understanding of machine lear ng. erstand the various applications of dia IR, web search erstand the concepts of digital libra	rning of in aries o: ng th nts o	g teo forn s ne a	vaila	ques for on retriev able tool	text cla val givin s. Retrieva	ssification a g emphasis	to
<ul> <li>Design a</li> </ul>	an efficient search engine and ana	alvze	e the	e W	eb conte	nt struct	ure	
Unit I INT Basic Concept Retrieval Eva	an efficient search engine and ana RODUCTION: MOTIVATION ts – Practical Issues - Retrieval Pr luation – Open Source IR Sy s– The impact of the web on IR –	oce /ster	ss – ns–	- Arc Hist	hitecture ory of	e - Boole Web Se	an Retrieva earch – W	I – eb
Unit I INT Basic Concept Retrieval Eva Characteristics Search engine	RODUCTION: MOTIVATION s – Practical Issues - Retrieval Pr luation – Open Source IR Sy s – The impact of the web on IR –	oce /ster	ss – ns–	- Arc Hist	hitecture ory of	e - Boole Web Se	an Retrieva earch – W	eb f a
Unit IINTBasic ConceptRetrievalEvaCharacteristicsSearch engineUnit IIMOTaxonomy andWeighting–Probabilistic IVBrowsing	RODUCTION: MOTIVATION is – Practical Issues - Retrieval Pr luation – Open Source IR Sy s– The impact of the web on IR – DELING d Characterization of IR Models Scoring and Ranking –Langua lodels – Algebraic Models – Struc	- Bage	ss – ms– Vers oole Mo	- Arc Hist sus <sup>V</sup> ean dels	hitecture ory of Web Sea Model –	e - Boole Web Se arch–Co Vector Theore	ean Retrieva earch – W mponents o Model - Te etic Models	I – eb f a 9 rm - for
Unit IINTBasic ConceptRetrievalEvaCharacteristicsSearch engineUnit IIMOTaxonomy andWeighting–Probabilistic IVBrowsingUnit IIIIND	RODUCTION: MOTIVATION is – Practical Issues - Retrieval Pri luation – Open Source IR Sy s– The impact of the web on IR – DELING d Characterization of IR Models – Scoring and Ranking –Langua lodels – Algebraic Models – Struct	- Brage	ss – ms– Vers oole Mo ed T	- Arc Hist sus <sup>1</sup> ean dels fext	hitecture ory of Web Sea Model – Set Retrieva	e - Boole Web Se arch–Co Vector Theore I Models	ean Retrieva earch – W mponents o Model - Te etic Models s – Models	I – eb f a 9 rm - for <b>9</b>
Unit I       INT         Basic Concept       Retrieval Eval         Characteristics       Search engine         Unit II       MO         Taxonomy and       Weighting –         Probabilistic M       Browsing         Unit III       IND         Static and Dy       Searching -	RODUCTION: MOTIVATION is – Practical Issues - Retrieval Pr luation – Open Source IR Sy s– The impact of the web on IR – DELING d Characterization of IR Models Scoring and Ranking –Langua lodels – Algebraic Models – Struc	– B age cture x Co ern l edb	ss – ms– Vers oole Mo ed T onst Mat	- Arc Hist sus V ean dels Text	hitecture ory of ' Web Sea Model – a – Set Retrieva ion and g. Quer	e - Boole Web Se arch–Co Vector Theore I Models Index y Opera Expansio	an Retrieva earch – W mponents o Model - Te etic Models s – Models compressio	I – eb f a 9 rm - for 9 on. ery
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Unit IINTBasic ConceptRetrieval EvaCharacteristicsSearch engineUnit IIMOTaxonomy andWeighting -Probabilistic IVBrowsingUnit IIIINDStatic and DySearching - SLanguages - CLocal and GlobUnit IVCLAText Classificamachines andMatrix decompUnit VSEASearching the	RODUCTION: MOTIVATION is – Practical Issues - Retrieval Pri- luation – Open Source IR Sy s– The impact of the web on IR – DELING d Characterization of IR Models – Scoring and Ranking –Langua lodels – Algebraic Models – Struct EXING mamic Inverted Indices – Index Sequential Searching and Patter Query Processing - Relevance Fer bal Analysis – Measuring Effective SSIFICATION AND CLUSTERIN ation and Naïve Bayes – Vector Machine learning on documents. ositions and latent semantic index	- Bage cture cture cture ern l edb enes VG Flat King	ss – ms– Vers Mo ed T onsf Mat ack ss al pace Clu – Fu	- Arc Hist sus V ean dels rext chin and chin and E Cl ster usio	chitecture ory of Web Sea Model – a – Set Retrieva ion and g. Quer Query B fficiency assificat ing – Hie n and Me search -	e - Boole Web Se arch–Co Vector Theore I Models Index y Opera Expansion ion – S erarchica eta learn	an Retrieva earch – W mponents o Model - Te etic Models s – Models compression ations -Que on - Automa upport vect al Clustering ing and Dynam	I - eb fa 9 rm - for 9 on. ery tic 9 or - 9 or - 9 nic

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REFE	RENCE(S)
1.	Christopher D. Manning, Prabhakar Raghavan, Hinrich Schutze, —Introduction to Information Retrievall, Cambridge University Press, First South Asian Edition 2008
2.	Implementing and Evaluating Search Engi1nesll, The MIT Press, Cambridge, Massachusetts London, England, 2010
3.	Ricardo Baeza – Yates, Berthier Ribeiro – Neto, – Modern Information Retrieval The concepts and Technology behind Searchll (ACM Press Books), Second Edition, 2011
4.	Stefan Buttcher, Charles L. A. Clarke, Gordon V. Cormack, —Information Retrieval

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Course	COMPUTER SCIENCE AND EI	H	our	s /	Credit	R 2019 Total		
Code	Course Name	L	T	P	С	Hours	Marks	
19CSPE13	SOCIAL NETWORK ANALYSIS	3			3	45	100	
<ul> <li>To und</li> <li>To mod</li> <li>To min</li> <li>To und</li> </ul>	of learning this course is to erstand the components of the soc del and visualize the social network e the users in the social network erstand the evolution of the social r e the interest of the user							
Work o network     Mine th of the s      Jnit I IN Introduction     Emergence c	this course, learners will be able to n the internals components of the	soci al no he u We	etwo iser b -	ork I - De	Predict ti	ne possi ent of S	ble next out	com 9
Jevelopment	of Social Network Analysis - Key of							-
Discussion ne Jnit II MC /isualizing O Centrality- Cl Representatio	of Social Network Analysis - Key of etworks - Blogs and online commun ODELING AND VISUALIZATION Inline Social Networks - A Taxonom Justering - Node-Edge Diagrams - V ons- Node-Link Diagrams - Hybrid I of data – Random Walks and their A	conc nities ny of /isua Rep	cept s - V Vis alizin rese	s ar Web suali ng S enta	d measi -based r zations - ocial Ne tions - N	ures in n networks Graph I tworks v lodelling	etwork anal Representat vith Matrix-E and aggreg	9 ion - Based gating
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review	mining – Review Classification – Tracking sentiments towards topics over time
REFE	RENCE(S)
1.	Charu C. Aggarwal, "Social Network Data Analytics", Springer; 2011
2.	Peter Mika, "Social Networks and the Semantic Web", Springer, 1st edition, 2007
3.	Borko Furht, "Handbook of Social Network Technologies and Applications", Springer 1 <sup>st</sup> edition, 2010
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Department	COMPUTER SCIENCE AND E				IG	R 2019	Semester	V
Course Code	Course Name		urs lee		Credit	Total Hours	Maximu Marks	n
		L	Т	Ρ	С	nours	WIAIKS	
19CSPE14	DATA WAREHOUSING AND DATA MINING	3	0	0	3	45	100	
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<ul><li> Apply cla</li><li> Analyze</li></ul>	sociation rule mining ssification and prediction techniqu data using cluster techniques aph and multimedia mining	ues						
	RODUCTION TO DATA WAREH		C					9
architecture-	Types of OLAP servers-Data war						ata wareho warehousin	
data mining <b>Unit II I INT</b> Data mining Transformatio and scalable	Types of OLAP servers-Data war <b>RODUCTION TO DATA MINING</b> – functionalities - Major issues n - Data reduction - Discretization frequent item set mining method	AND s - l on an ds-Mir	se A: Dat d c	imp SSC ta c conc g va	Iemental DCIATIO Ileaning ept hiera arious kii	n <b>MININC</b> - Data archy gen	warehousin integration eration-Effic	g to 9 and cient
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2.	William H. Inmon, "Building the data ware house", Wiley Dreamtech (p) Ltd., IV Edition, 2005.
3.	Ian H.Witten, Eibe Frank, "Data Mining: Practical M/c Learning tools and techniques with Java implementation", Third Edition, Morgan Kaufman, 2000
4.	K.P.Soman,Shyam Diwakar,V.Ajay, "Insight into Data Mining, theory and practice", PHI Learning private Limited, 2010.
5.	Ronen Feldman, James Sangee, "The Text Mining Handbook: Advanced Approaches in analyzing unstructured data", Cambridge University Press, 2007
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Department	COMPUTER SCIENCE AND	ENGIN	EER	ING		K 2019	Semester	V
Course	Course Name		lour: Wee		Credit	1 otal i		m
Code		L	Т	Р	С	Hours	Marks	
19CSPE15	SOFTWARE PROJECT MANAGEMENT	3	0	0	3	45	100	-
Course Obje								
	of learning this course is to erstand the Software Project Planni	ng.						
<ul><li>To lear</li><li>To mar</li></ul>	and Evaluation techniques. n about the activity planning and ris age software projects and control s elop skills to manage the various ph	oftware	deli	vera	bles.		nent and pe	ople
manag		<u></u>					NU NU NU NU	
Course Outc								
Unders	this course, learners will be able to: tand Project Management principle stensive knowledge about the basic			18.07	100		framework	and
	cess models.							
<ul> <li>Obtain</li> </ul>	adequate knowledge about softwar	e proce	ess r	node	els and s	oftware e	effort estimation	atio
techniq	100							
100000000000	ues.							
<ul> <li>Estimat</li> </ul>	e the risks involved in various proje							
<ul><li>Estimat</li><li>Define</li></ul>	e the risks involved in various proje the check points, project monite	oring s	truct		project			
<ul> <li>Estimat</li> <li>Define mechar</li> </ul>	e the risks involved in various proje the check points, project monito nisms using project management pri	oring s inciples	truct	ure,		progress		
<ul> <li>Estimat</li> <li>Define mechar</li> <li>Learn s</li> </ul>	e the risks involved in various proje the check points, project moniton nisms using project management pri taff selection process and the issue	oring s inciples s relate	truct ed to	ure, peo	ple mana	progres: gement		king
<ul> <li>Estimat</li> <li>Define mechar</li> <li>Learn s</li> </ul>	e the risks involved in various proje the check points, project monito nisms using project management pri	oring s inciples s relate	truct ed to	ure, peo	ple mana	progres: gement		
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Estimat     Define     mechar     Learn s Unit I IN Project Defini     Overview C	e the risks involved in various proje the check points, project monito nisms using project management pri taff selection process and the issue TRODUCTION TO SOFTWARE PI	oring s inciples s relate <b>ROJEC</b> vities Co	truct d to <b>T M</b>	peo ANA	ple mana GEMEN	progress gement T	s and trac	king 9
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	COMPUTER SCIENCE AND EN	GINE	EER	ING		R 2019	Semester
Course Code	Course Name		our: Wee		Credit	Total	Maximum
		L	Т	Ρ	С	Hours	Marks
19CSPE16	CYBER SECURITY AND ETHICAL HACKING	3	0	0	3	45	100
Course Obje							
and the second se	of learning this course is to						
	tand the fundamental concepts of cyber		curity	-	8		
	arious hacking techniques and attacks.						
	and measure threats to information ass						
	tand the benefits of strategic planning p						
	e where information networks are most			le.			
	students to understand issues in the Int	terne	et				
Course Outc							
	this course, learners will be able to:						
	tand the basics of Cyber Security						
	hacking attacks and protect data assets			1920		-	u anna 11 anna anna
	a computer against a variety of different	ent ty	pes	of se	ecurity at	tacks us	ing a number
	on techniques.			-			
	a LAN against a variety of different typ	es of	fsec	curity	attacks	using a n	number of har
on tooh						0	
	niques.						
Practice	and use safe techniques on the World	Wid	e W	eb			
Practice Unit I	e and use safe techniques on the World TRODUCTION						
Practice Unit I     IN Network and	and use safe techniques on the World TRODUCTION security concepts: Information assuration	nce ·	- Ba	sic c	ryptogra	phy – Dl	NS - Firewall
Practice Unit I IN Network and Virtualization,	e and use safe techniques on the World TRODUCTION security concepts: Information assurate Microsoft windows security principles	nce · s, cr	- Ba eatir	sic c ng a	ryptogra manage	phy – DI ed netwo	NS - Firewalls rk, defining t
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BOOK (S)
McClure, Joel Scambray and Goerge Kurtz, "Hacking Exposed Network Security Secrets & Solutions", Tata Mcgrawhill Publishers, 2010
T Simpson "Ethical Hacking and Network Defense", cengage learning, 2010
EENCE(S)
Brian Komer," Microsoft Windows Security Resource Kit" Prentice Hall of India , 2010.
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Fadia, Manu zacharia "Intrusion alert : An Ethical Hacking Guide to Intrusion Detection",2009

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Department	COMPUTER SCIENCE AND EN	GINE	ERI	NG		R 2019	Semester	· VI
Course Code	Course Name		Hours / Week		Credit	Total	Maximu Marks	
		L	Т	Ρ	С	Hours	Warks	
19CSPE17	WIRELESS SENSOR NETWORKS	3	0	0	3	45	100	
• To stud	<b>ctive (s):</b> ly about Wireless networks, protocol sta ly about fundamentals of 3G Services, i ly about evolution of 4G Networks, its a	its pro	otoc	ols a	and appli			
<ul> <li>Catego</li> <li>Impler</li> <li>and st</li> <li>Impler</li> <li>netword</li> </ul>	omes: this course, learners will be able to: orize the latest 3G / 4G and WiMax net nent wireless network environment for andards. nent different type of applications for rk strategies. the fundamentals of Wireless Wide Are	any a smart	ppli ph	cation one	on using	latest wi		
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Senses of _Engineering Ethics' - variety of moral issued - types of inquiry - moral dilemmate         - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy -         Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories         Unit III       ENGINEERING AS SOCIAL EXPERIMENTATION       9         Engineering as experimentation - engineers as responsible experimenters - codes of ethical abalanced outlook on law - the challenger case study       9         Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the Three Mile Island and Chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime professional rights – employee rights -Intellectual Property Rights (IPR) - discrimination	and the second se	COMPUTER SCIENCE AND EN	NGIN	NEE	RIN	R 2019	Semester	VII	
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1.	Mike Martin and Roland Schinzinger, —Ethics in Engineeringll, McGraw-Hill, New York, 2005
2.	Govindarajan M, Natarajan S, Senthil Kumar V. S, —Engineering Ethicsll, Prentice Hall of India, New Delhi, 2004
3.	Charles D. Fleddermann, —Engineering Ethicsll, Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint).
REFI	ERENCE(S)
1.	Charles E Harris, Michael S. Protchard and Michael J Rabins, —Engineering Ethics – Concepts and CasesII, Wadsworth Thompson Learning, United States, 2000
	- Concepts and Cases , Wadsworth Monpson Learning, Onited States, 2000
2.	John R Boatright, —Ethics and the Conduct of BusinessII, Pearson Education, New Delhi, 2003

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Department	COMPUTER SCIENCE AND EN	IGIN	EER	ING		R 2019	Semester	VI
Course Code	Course Name		our: Wee		Credit	Total	Maximu	m
		L	Т	Ρ	C	Hours	Marks	ć.
19CSPE19	SEMANTIC WEB	3	0	0	3	45	100	
<ul><li>To unde</li><li>To learn</li></ul>	ective (s): of learning this course is to erstand the basics of Ontologies in the Ontologies languages w the Ontology management tools							
	n the applications of Ontology							
<ul> <li>Underst</li> <li>Apply o</li> <li>Apply value</li> <li>Manage</li> </ul>	this course, learners will be able to: and the principles of Ontology ntology tools for web analysis arious ontology algorithms ontology using tools							
<ul> <li>Indoret</li> </ul>	and the applications of ontology							
Unit I II Components Background	ATRODUCTION - Types – Ontological Commitmer - Knowledge Representation Ontol Domain Ontologies – Semantic Web	ogies	s –	Тор	Level	Ontologie	es – Lingu	listic
Unit I II Components Background Ontologies –	TRODUCTION – Types – Ontological Commitme - Knowledge Representation Ontol	ogies – Nee	s – ed –	Top Fou	Level ( Indation -	Ontologie	es – Lingu	hical listic
Unit I II Components Background Ontologies – Unit II L Web Docum Properties – Traditional O	TRODUCTION – Types – Ontological Commitmer - Knowledge Representation Ontol Domain Ontologies – Semantic Web	ogies – Neo AND Veb Synta	ed – ON Res	Top Fou FOL ourc truct	Devel 0 Indation - OGIES I Descri ure – Se	Ontologie - Layers ption us mantics	es – Lingu – Architectr ing RDF- I – Pragmat	hical listic ure <b>9</b> RDF ics -
Unit I II Components Background Ontologies – Unit II L Web Docum Properties – Traditional O – SHOE – O	TRODUCTION  - Types – Ontological Commitmer - Knowledge Representation Ontol Domain Ontologies – Semantic Web ANGUAGES FOR SEMANTIC WEB Ments in XML – RDF - Schema – V Topic Maps and RDF –Overview – Sentology Languages – LOOM- OKBC –	ogies – Neo AND Veb Synta - OCI	ed – ON Res ax S ML -	Top Fou ourc truct - Flo	Devel 0 Indation - OGIES I Descri ure – Se	Ontologie - Layers ption us mantics	es – Lingu – Architectr ing RDF- I – Pragmat	hical listic ure <b>9</b> RDF ics -
Unit I     IN       Components       Background       Ontologies –       Unit II     L       Web Docum       Properties –       Traditional O       – SHOE – O       Unit III     O       Traditional O	TRODUCTION  - Types – Ontological Commitment - Knowledge Representation Ontol Domain Ontologies – Semantic Web ANGUAGES FOR SEMANTIC WEB Ments in XML – RDF - Schema – V Topic Maps and RDF –Overview – S ontology Languages – LOOM- OKBC – IL - DAML + OIL- OWL	ogies – Nec AND Veb Synta - OCI ITIC V	ed – ed – Res ax S ML – WEE	Top Fou ourc truct - Flo	o Level o Indation - OGIES e Descri ure – Se ogic Onto of Ontolo	Ontologie - Layers ption us mantics logy Mar	es – Lingu – Architectr ing RDF- I – Pragmat kup Langua	hical listic ure 9 RDF ics - ages 9
Unit I       IN         Components       Background         Dackground       Ontologies –         Unit II       L         Web Docum       Properties –         Traditional O       –         SHOE – O       O         Unit III       O         Traditional O       –         Traditional O       –         SHOE – O       O         Unit III       O         Taxonomy fo       and Procession	TRODUCTION  - Types – Ontological Commitmer - Knowledge Representation Ontol Domain Ontologies – Semantic Web ANGUAGES FOR SEMANTIC WEB Ments in XML – RDF - Schema – V Topic Maps and RDF –Overview – S ontology Languages – LOOM- OKBC – IL - DAML + OIL- OWL NTOLOGY LEARNING FOR SEMAN r Ontology Learning – Layered Approx	ogies – Nec AND Veb Synta - OCI ITIC V ach – ology	s – ed – ON Res ax S ML - Pha Lea	Top Fou ourc truct - Flo	o Level o Indation - OGIES e Descri ure – Se ogic Onto of Ontolo	Ontologie - Layers ption us mantics logy Mar	es – Lingu – Architectr ing RDF- I – Pragmat kup Langua	hical listic ure 9 RDF ics - ages 9
Unit I       IN         Components       Background         Ontologies –       Imit II         Unit II       L         Web Docum       Properties –         Traditional O       SHOE – O         Unit III       O         Taxonomy for and Procession       O         Unit IV       O         Overview – r       - skills mana	TRODUCTION     – Types – Ontological Commitment     - Knowledge Representation Ontol     Domain Ontologies – Semantic Web     ANGUAGES FOR SEMANTIC WEB     Ments in XML – RDF - Schema – V     Topic Maps and RDF –Overview – S     entology Languages – LOOM- OKBC –     IL - DAML + OIL- OWL     NTOLOGY LEARNING FOR SEMAN     or Ontology Learning – Layered Approa-     ing Ontologies and Documents – Ontology	ogies – Neo AND Veb Synta - OCI ITIC N ach – ology OLS proce	s – ed – <b>ON</b> Res ax S ML - Pha Lea Lea	Top Fou ourc truct - Flo B ses rning - tan	o Level o Indation - OGIES e Descri ure – Se ogic Onto of Ontolo g Algorith get ontol issues. E	Ontologia - Layers ption us mantics logy Mar ogy Learr ms - Eva ogy – on	es – Lingu – Architectr ing RDF- I – Pragmat kup Langua hing – Impo aluation tology map – Developn	hical uistic ure 9 RDF ics - ages 9 rting 9 ping
Unit I       IN         Components       Background         Ontologies –       Imit II         Unit II       L         Web Docum       Properties –         Traditional O       O         SHOE – O       Imit III         Unit III       O         Taxonomy for and Processi       Imit IV         Overview – r       skills mana of Tools and	TRODUCTION     — Types – Ontological Commitmer     - Knowledge Representation Ontol     Domain Ontologies – Semantic Web     ANGUAGES FOR SEMANTIC WEB     ments in XML – RDF - Schema – V     Topic Maps and RDF –Overview – S     ontology Languages – LOOM- OKBC –     IL - DAML + OIL- OWL     NTOLOGY LEARNING FOR SEMAN     or Ontology Learning – Layered Approa-     ing Ontologies and Documents – Ontol     MANAGEMENT AND TO     meed for management – development     gement system – ontological class – o	ogies – Neo AND Veb Synta - OCI ITIC N ach – ology OLS proce	s – ed – <b>ON</b> Res ax S ML - Pha Lea Lea	Top Fou ourc truct - Flo B ses rning - tan	o Level o Indation - OGIES e Descri ure – Se ogic Onto of Ontolo g Algorith get ontol issues. E	Ontologia - Layers ption us mantics logy Mar ogy Learr ms - Eva ogy – on	es – Lingu – Architectr ing RDF- I – Pragmat kup Langua hing – Impo aluation tology map – Developn	hical uistic ure 9 RDF ics - ages 9 rting 9 ping
Unit I       IN         Components       Background         Ontologies       -         Unit II       L         Web       Docum         Properties       -         Traditional O       -         SHOE       -         Unit III       O         Taxonomy for       -         and Procession       -         Unit IV       O         Overview       -         - skills mana       -         of Tools and       -         Unit V       A	TRODUCTION     — Types – Ontological Commitment     Knowledge Representation Ontol     Domain Ontologies – Semantic Web     ANGUAGES FOR SEMANTIC WEB     Ments in XML – RDF - Schema – V     Topic Maps and RDF –Overview – S     entology Languages – LOOM- OKBC –     IL - DAML + OIL- OWL     INTOLOGY LEARNING FOR SEMAN     or Ontology Learning – Layered Approating Ontologies and Documents – Ontology     MANAGEMENT AND TO     meed for management – development     gement system – ontological class – o     Tool Suites – Ontology Merge Tools –	ogies – Nec AND Veb Synta - OCI ITIC V ach – ology OLS proce const	s – ed – ON Res ax S ML - Pha Lea Pha Lea	Top Fou ourc truct - Flo B uses rning - tan ts - y ba	o Level o indation - OGIES e Descri ure – Se ogic Onto of Ontolo g Algorith get ontol issues. E sed Anno	Ontologie - Layers ption us mantics logy Mar ogy Learr ms - Eva ogy – on tvolution	es – Lingu – Architectr ing RDF- I – Pragmat kup Langua hing – Impo aluation tology map – Developn ools	nical nistic ure 9 RDF ics - ages 9 rting 9 ping nent 9

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1.	Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez, "Ontological Engineering: with examples from the areas of Knowledge Management, e-Commerce and the Semantic Web" Springer, 2004
2.	Grigoris Antoniou, Frank van Harmelen, "A Semantic Web Primer (Cooperative Information Systems)", The MIT Press, 2004
REF	ERENCE(S)
	James Hendler, Henry Lieberman and Wolfgang Wahlster, Spinning the Semantic Web:
3.	Bringing the world wide web to its full potential. New Delhi: The MIT Press, 2004.

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Department	COMPUTER SCIENCE AND EN	R 2019	Semester	VI				
Course Code	Course Name		lour: Wee		Credit	Total	Maximu	n
		L	T	P	С	Hours	Marks	
19CSPE20	INFORMATION STORAGE MANAGEMENT	3	0	0	3	45	100	
To under     business	f learning this course is erstand data creation, the amount c s, challenges in data storage and data	a ma	nage	emer	nt,			
	erstand solutions available for data cture, role of each element in suppor						a uala ce	inte
<ul> <li>Understation</li> <li>Know the Analyze</li> <li>Use replaced</li> </ul>	his course, learners will be able to: and the concept of data storage archi e evolution of Storage Technologies the Network Storage Architecture ication technologies in storage mana							
	Secure Storage Management	1	_					•
	<b>TRODUCTION</b> tion, Evolution of storage archited		-			<b>. .</b> .		9
virtualization Implementatio	view: Virtualization - Cloud, Data cent - Connectivity - Disk drive interfa n - Methods - Levels, Intelligent stora	ce -	Sto	orage				
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	OLUTION				0		na Darta	1.000
architecture - 2	DAS and SCSI, SAN: Evolution - C Zoning – FC topologies, SAN based v FCIP components - FCIP topology	/irtua	lizat	ion:	Block lev	el - VSA	N, IP	ts -
	TWORK STORAGE		2		Sec. 1	1.1.1	1. 1. 20 I. I.	9
affecting NAS	<ul> <li>Components - Implementations - F</li> <li>performance - File level virtualizatio</li> <li>and archives - Archive types, CAS:</li> </ul>	n, O	bject	t bas	sed stora	ge: Oper	ration Benef	fits
	ORMATION AVAILABILITY							9
Unit IV INI								
		ology	— F	Plani	ning lifec	ycle - B	lusiness im	pac
Introduction: I analysis - Te Operations - S consistency -	nformation availability - BC termino chnology solutions, Backup and re SCB - Topologies - Targets - Dedup Technologies - Restore and restart - Advanced replication technologies.	estore licatio	e: P on, L	urpo .ocal	ses - M I Replica	ethods - tion: Terr	<ul> <li>Architectu</li> <li>minology - [</li> </ul>	re Data
Introduction: I analysis - Te Operations - S consistency - Technologies	nformation availability - BC termino chnology solutions, Backup and re SCB - Topologies - Targets - Dedup Technologies - Restore and restart	estore licatio con	e: P on, L side	urpo ₋ocal ratio	ses - M I Replica	ethods - tion: Terr	<ul> <li>Architectu</li> <li>minology - [</li> </ul>	re Data

Challenges - Solutions Data Warehousing with Oracle BI

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TEX	T BOOK(S)
1.	Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, New Delhi, 2006.
2.	Somasundaram G, Alok Shrivastava, "ISM – Storing, Managing and Protecting Digital Information", EMC Education Services, Wiley India, New Delhi, 2012.
REF	ERENCE(S)
1.	Gerald J Kowalski, Mark T Maybury, "Information Storage and Retrieval Systems: Theory and Implementation", BS Publications, New Delhi, 2009.
2.	Marc Farley Osborne, "Building Storage Networks", Tata McGraw Hill, New Delhi, 2001
3.	Meeta Gupta, "Storage Area Network Fundamentals", Pearson Education, New Delhi, 2002.

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Departmen	t COMPUTER SCIENCE AND E	IENCE AND ENGINEERING					Semester	VII
Course Coo	e Course Name	10511	lour: Wee		Credit	Total Hours	Maximu Marks	n
		L	Т	Ρ	С	nours	Marks	
19CSPE2	SOFT COMPUTING	3	0	0	3	45	100	
<ul> <li>To in</li> <li>To u</li> <li>Under</li> <li>Apply</li> <li>Use</li> <li>Design</li> </ul>	e of learning this course is to roduce the concepts of neural networks derstand the advanced concepts vector derstand the fundamentals of fuzzy set tablish basic knowledge about optimiza	r quanti s and fu ition tec ecture e to solv ng	ficat uzzy hniq	ion a logic ues i	nd self or : in soft cor	ganizing	maps	
	NEURAL NETWORKS thematical model of neuron, ANN ar network, Backpropagation network, BPA ADVANCED NEURAL NETWORKS							
	Memory: Auto correlation, Hetero Cor Theory: Vector Quantization, ART1, AF FUZZY SETS AND RELATIONS							
	and Imprecision, Chance vs ambig roperties of Membership functions, Fuz						ns, Membei	rship
	FUZZY LOGIC ogic and Fuzzy logic, Fuzzy Rule on, Fuzzy Pattern Recognition, Applicati							9 uzzy
Unit V Derivative	OPTIMIZATION TECHNIQUES ased Optimization – Descent Methods arm Optimization, Case Study - frag	– Gene	etic /	Algor	ithms – A	Ant Color	iy Optimizati	
TEXT BOC	KS					1.18		
1. 1	J. Ross, "Fuzzy Logic with Engineering	g Applic	atio	ns", I	McGraw I	Hill, 3rd E	dition, 2010	
	. Rajasekaran and G.A.V. Pai, "Neura ynthesis and Applications", PHI, 2012	I Netwo	orks,	Fuz	zy Logic	and Ge	netic Algorit	hms:

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REFER	ENCE(S)
<sup>.</sup> 1.	Davis E. Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Pearson Educaton, 2009
2.	Zurada, J.M. "Introduction to Artificial Neural systems", Jaico Publishing House, 2012

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Department	COMPUTER SCIENCE AND EN	R 2019	Semester	VI				
Course Code	Course Name		lour: Wee		Credit	Total	Maximu	n
oouloo oouo		L	Т	Р	С	Hours	Marks	
19CSPE22	NATURAL LANGUAGE PROCESSING	3	0	0	3	45	100	
• The stud	<b>tive (s):</b> of learning this course is to ent should be made to: e techniques in natural language proce	essing	g.					
• Be expos	ar with the natural language generation sed to machine translation. and the information retrieval techniques							
<ul> <li>Analyze</li> <li>Generate</li> <li>Perform</li> <li>Do mach</li> </ul>	his course, learners will be able to: the natural language text. the natural language. Semantic Analysis ine translation.							
	ormation retrieval techniques /ERVIEW AND LANGUAGE MODEL	NG	_	_	<u> </u>			•
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19	2nd Edition, Prentice Hall, 2008.
3.	James Allen, "Natural Language Understanding", 2nd edition, Benjamin /Cummings publishing company, 1995.

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Department	COMPUTER SCIENCE AND EN	GIN	EER	ING		R 2019	Semester	VI	
Course Code	Course Name		our: Wee		Credit	Total	Maximu		
1		L	Т	Ρ	С	Hours	Marks	3	
19CSPE23	MANAGEMENT INFORMATION SYSTEMS	3	0	0	3	45	100		
Course Object	ctive (s):								
The purpose of	of learning this course is to								
Bring a	systematic knowledge of the managem	nent i	infor	matio	on techno	ology.			
	the concepts which are used in inform						duates effec	ctive	
Analyze	the knowledge on effective application	n of ir	nform	natio	n system	is in busi	ness		
Course Outco	omes:				-				
At the end of t	his course, learners will be able to:								
	and the importance of information								
	and organizational and decision making	a in t	ousir	ness					
	the role of the major types of information	-			a busine	ss enviro	onment and	thei	
	ship to each other	,							
	and the various Decision Support Syste	ems							
	the impact of the Internet technology of		sines	ss-el	ectronic o	commerc	e and electr	onic	
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busines	S								
	s FORMATION SYSTEM AND ORGANI	ZAT	ION				2.	9	
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	ge management -Networks - Internet and Web based Information System – Electronic ce - Electronic Business - Commercial applications
TEXT B	DOK(S)
. 1.	George M Marakas, James A O'Brien ,Management Information Systems (English, Mcgraw Hill Education,10th Edition 2013
2.	W S Jawadekar, Management Information Systems, Tata McGraw Hill Publishing Company Limited 2008
REFERE	INCE(S)
1.	Kenneth C Laudon, Jane P Laudon ,Mary E Brabston ,Management Information Systems - Managing the Digital Firm,Fourth Canadian Edition, Pearson Prentice Hall,2008
2.	Applegate, Lynda M et al, Corporate Information Strategy and Management: Text and Cases, McGraw-Hill, 2003

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Department	COMPUTER SCIENCE AND EN	IGINI	EER	ING		R 2019	Semester	VI
Course Code	Course Name	Hours / Week			Credit	Total	Maximur Marks	n
course coue		L	Т	Р	С	Hours	Warks	
19CSPE24	SPEECH PROCESSING	3	0	0	3	45	100	
<ul> <li>To intro</li> <li>To sho</li> <li>predicti</li> </ul>	of learning this course is to oduce speech production and related p w the computation and use of techniq ive coefficients and other coefficients in erstand different speech modeling proc	ues s the a	anal	as s ysis (	hort time of speech	1.		
<ul> <li>Extract</li> <li>Choose</li> <li>Design</li> <li>Use dif</li> </ul>	speech production system and describe and compare different speech parame e an appropriate statistical speech mod a speech recognition system. ferent speech synthesis techniques.	ters. el for	a gi	ven	applicatic	n.		9
Speech Fund	damentals: Articulatory Phonetics – Pi	oduc	tion	and	Classific	ation of S	Speech Sou	inds
Acoustic Pho Short-Time F	damentals: Articulatory Phonetics – Pronetics – Acoustics of speech productio Fourier Transform, Filter-Bank and LPC PEECH ANALYSIS	n; Re	view	of D	Classific Digital Sig	ation of nal Proc	Speech Sou essing conce	epts 9
Acoustic Pho Short-Time F Unit II S Features, Fe mathematica Distances an LPC, PLP ar	netics – Acoustics of speech productio ourier Transform, Filter-Bank and LPC	n; Re Meth ison tance	view nods Tech e, C Disto	v of E nniquepsti	Digital Sig les: Spee ral Distar using a \	ech disto nces, We	essing conc rtion measu eighted Cep Frequency S	9 9 stra
Acoustic Pho Short-Time F Unit II S Features, Fe mathematica Distances an LPC, PLP ar Multiple Time	enetics – Acoustics of speech productio Fourier Transform, Filter-Bank and LPC PEECH ANALYSIS eature Extraction and Pattern Compar I and perceptual – Log–Spectral Dis of Filtering, Likelihood Distortions, Spec and MFCC Coefficients, Time Alignmer	n; Re Meth ison tance	view nods Tech e, C Disto	v of E nniquepsti	Digital Sig les: Spee ral Distar using a \	ech disto nces, We	essing conc rtion measu eighted Cep Frequency S	9 9 stra
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Acoustic Pho Short-Time F Unit II S Features, Fe mathematica Distances an LPC, PLP ar Multiple Time Unit III S Hidden Mark Search, Baur Unit IV S Large Vocab speech recog	enetics – Acoustics of speech productio Fourier Transform, Filter-Bank and LPC PEECH ANALYSIS eature Extraction and Pattern Compar I and perceptual – Log–Spectral Dis of Filtering, Likelihood Distortions, Spectral Dis of MFCC Coefficients, Time Alignmer e – Alignment Paths PEECH MODELING ov Models: Markov Processes, HMMs m-Welch Parameter Re-estimation, Imp	n; Re Meth ison tance tral I at and - Ev oleme	Tech alua alua hiteo	tion, ion is	Digital Sig les: Spee ral Distar using a V ization – Optimal ssues.	ech disto nces, We Varped F Dynamic State Se	essing conc rtion measu eighted Cep Frequency S c Time War quence – V	9 9 strasostra cale ping 9 itert 9
Acoustic Pho Short-Time F Unit II S Features, Fe mathematica Distances an LPC, PLP ar Multiple Time Unit III S Hidden Mark Search, Baur Unit IV S Large Vocab speech recog word units; A	enetics – Acoustics of speech productio Fourier Transform, Filter-Bank and LPC PEECH ANALYSIS eature Extraction and Pattern Compar I and perceptual – Log–Spectral Dis d Filtering, Likelihood Distortions, Spec and MFCC Coefficients, Time Alignmer e – Alignment Paths PEECH MODELING ov Models: Markov Processes, HMMs m-Welch Parameter Re-estimation, Imp PEECH RECOGNITION pulary Continuous Speech Recognition gnition system – acoustics and langua	n; Re Meth ison tance tral E at and - Ev bleme	Tech Tech e, C Disto d No alua entat	v of E 	Optimal ssues. Optimal ssues.	ech disto nces, We Varped F Dynamic State Se ge vocab	essing conce rtion measu eighted Cep frequency S c Time War quence – V quence – V	9 9 stras ostra cale ping 9 iterh 9 uou suk

TEXT BOOK(S)

Chairman - BoS Dept. of CSE - ESEC

1.	Lawrence Rabiner and Biing-Hwang Juang, "Fundamentals of Speech Recognition", Pearson Education, 2003
2.	Daniel Jurafsky and James H Martin, "Speech and Language Processing – An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition", Pearson Education, 2002.
3.	Frederick Jelinek, "Statistical Methods of Speech Recognition", MIT Press, 1997
REFER	ENCE(S)
1.	Steven W. Smith, "The Scientist and Engineer"s Guide to Digital Signal Processing", California Technical Publishing, 1997
2.	Thomas F Quatieri, "Discrete-Time Speech Signal Processing – Principles and Practice", Pearson Education, 2004
3.	Claudio Becchetti and Lucio Prina Ricotti, "Speech Recognition", John Wiley and Sons, 1999

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Department	COMPUTER SCIENCE AND ENGINEERING					R 2019	Semester	VII		
Course	Course Name	Hours / Week			Credit		Credit Total M		Maximur	n
Code		L	Т	Р	С	Hours	urs Marks			
19CSPE25	PARALLEL ALGORITHMS	3	0	0	3	45 100				

# Course Objective (s):

The purpose of learning this course is to

- To provide fundamentals in design, analysis, and implementation, of high performance computational science and engineering applications.
- To gain knowledge on parallel algorithms and their impact in engineering problem

# **Course Outcomes:**

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

- Develop knowledge and skills concerning applications of high-performance computing systems
- Identify parallel computing requirements.
- Use parallel programming concepts in developing real-world applications
- Measure, identify performance bottlenecks

# Unit I INTRODUCTION

Computational Science and Engineering Applications; characteristics and requirements, Review of Computational Complexity, Performance: metrics and measurements, Granularity and Partitioning, Locality: temporal/spatial/stream/kernel, Basic methods for parallel programming, Real-world case studies (drawn from multi-scale, multi-discipline applications)

## Unit II HIGH-END COMPUTER SYSTEMS

Memory Hierarchies, Multi-core Processors: Homogeneous and Heterogeneous, Shared memory Symmetric Multiprocessors, Vector Computers, Distributed Memory Computers, Supercomputers and Pataskala Systems, Application Accelerators / Reconfigurable Computing, Novel computers: Stream, multithreaded, and purpose built

# Unit III PARALLEL ALGORITHMS

Parallel models: ideal and real frameworks, Basic Techniques: Balanced Trees, Pointer Jumping, Divid e and Conquer, Partitioning, Regular Algorithms: Matrix operations and Linear Algebra, Irregular Algorithms: Lists, Trees, Graphs, Randomization: Parallel Pseudo-Random Number Generators, Sorting, Monte Carlo techniques

## Unit IV PARALLEL PROGRAMMING

Revealing concurrency in applications, Task and Functional Parallelism, Task Scheduling, Synchronization Methods, Parallel Primitives (collective operations), SPMD Programming (threads, OpenMP, MPI), I/O and File Systems, Parallel Matlabs (Parallel Matlab, Star-P, Matlab MPI), Partitioning Global Address Space (PGAS) languages (UPC, Titanium, Global Arrays)

# Unit V ACHIEVING PERFORMANCE

Measuring performance, Identifying performance bottlenecks, restructuring applications for deep memory hierarchies, Partitioning applications for heterogeneous resources, Using existing libraries, tools, and frameworks

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REFE	RENCE(S)
1.	Ananth Grama, Anshul Gupta, George Karypis, and ,Vipin Kumar, Introduction to Parallel Computing, 2nd edition, Addison-Welsey,2003
2.	David A. Bader (Ed.), Petascale Computing: Algorithms and Applications, Chapman & Hall/CRC Computational Science Series, 2008

Chairman - BoS Dept. of CSE - ESEC

	ent CO	OMPUTER SCIEN	NCE AND I			-	G	R 2019	Semester	VI
Course Code		Course Nar	me		our Wee		Credit	Total Hours	Maximun Marks	n
Code				L	Т	Р	С	nours	Marks	
19CSPE2	26	SOFTWARE QU ASSURANC		3	0	0	3	45	100	
<ul> <li>To s</li> <li>To l</li> </ul>	ose of le study the learn diffe	arning this course various hierarchi erent types of doo	ical model f	n in sc	oftwa	are o	quality as		9.	
• To s		nd the various as different ISO 900 t.		S				and the second second	ts for softw	are
<ul> <li>De app</li> <li>Use</li> <li>Ana</li> </ul>	sign diffe plication. e six sigr alyze Re	course, learners v erent types of qua ma concepts for s liability growth mo various Quality S	lity measur oftware de odels for sc	res an velopr	nen	t			ed	
Unit I		DUCTION TO SC	STRUGTISTICS AND STRUCTURES	QUAL		'				9
		<ul> <li>Hierarchical moment and analysis</li> </ul>							easuremen	t –
Unit II	SOFTV	VARE QUALITY	ASSURAN	CE				5.74		9
	asks – S0 and Aud	QA plan – Teams its	– Characte	eristics	s — I	mple	ementati	on – Do	cumentatio	n –
Unit III	QUALI	TY CONTROL A	ND RELIA	BILIT	(					9
		- Ishikawa's basic – Rayleigh mode								u —
Unit IV	QUALI	TY MANAGEME	NT SYSTE	м			4			9
		5 – Rayleigh moo s and models – C						th mode	els for QMS	3 –
	QUALI	TY STANDARDS		1		2			1	9
Unit V							wara day			
CMMI — S Requirem	Six Sigma nents into	s – ISO 9000 Ser a concepts. Role o o test cases – Tre s Intelligence Tes	of Statistical nds in the (	l Meth	ods	in S	oftware	Quality -	-Transformi	ng
Need for CMMI – S Requirem	Six Sigma nents into Business	a concepts. Role o o test cases – Tre	of Statistical nds in the (	l Meth	ods	in S	oftware	Quality -	-Transformi	ng

Chairman - BoS Dept. of CSE - ESEC 1/

2.	Stephen H. Kan, —Metrics and Models in Software Quality Engineeringll, Pearson Education (Singapore) Pte Ltd., 2003.
REFE	RENCE(S)
1.	Norman E. Fenton and Shari Lawrence Pfleeger, —Software Metricsll Thomson, 2003
2.	Mordechai Ben – Menachem and Garry S.Marliss, —Software Qualityll, Thomson Asia Pte Ltd, 2003.
3.	Mary Beth Chrissis, Mike Konrad and Sandy Shrum, —CMMII, Pearson Education 2003.

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Department	COMPUTER SCIENCE AND I		0.000		G	R 2019	Semester	VI
Course	Course Name		our Wee		Credit	. otai	Maximu	
Code		L	Т	Ρ	С	Hours	Marks	
19CSPE27	ROBOTICS	3	0	0	3	45	100	3
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Course Outc		_						
<ul> <li>Unders</li> <li>Know u</li> <li>Design</li> <li>Write R</li> </ul>	this course, learners will be able tand the basic functions of Comp ise of Robot Drive Systems and Robot systems using Sensors a cobot Programming	ponent Effecto Ind Ma	ors					
	ne applications of Robot in Indus	stries	4					-
	NDAMENTALS OF ROBOT							9
	nition - Robot Anatomy - Co ord	dinate	Sys	stem	ns, Work	Envelo	pe Types	1.122
Robot - Defir Classification Robot Parts a <b>Unit II RC</b>	nition - Robot Anatomy - Co ord - Specifications-Pitch, Yaw, Roll, and their Functions-Need for Rob DBOT DRIVE SYSTEMS AND E	, Joint oots-D <b>ND EF</b>	Not iffer	ation ent /	ns, Spee Applicati <b>DRS</b>	d of Mo ons	tion, Pay L	and oad
Robot - Defir Classification Robot Parts a <b>Unit II RC</b> Pneumatic I Motors, Step Comparison o and Hydraulic Fingered Gri	nition - Robot Anatomy - Co ord - Specifications-Pitch, Yaw, Roll, and their Functions-Need for Rob <b>DBOT DRIVE SYSTEMS AND E</b> Drives-Hydraulic Drives-Mechan oper Motors, A.C. Servo Mo of all these Drives, End Effectors c- Grippers, Magnetic Grippers, M ppers; Internal Grippers and	, Joint bots-Di <b>ND EF</b> nical otors-S s-Grip Vacuu	Not iffer FE Driv Salie pers	ation ent / CTC ves-l ent s-Me Gripp	ns, Spee Applicati <b>DRS</b> Electrica Feature echanica pers; Tw	d of Mo ons I Drive s, App I Grippe o Fingel	tion, Pay L s-D.C. Se lications rs, Pneum red and Th	anc oac 9 ervo and atic
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Robot - Defir Classification Robot Parts a Unit II RC Pneumatic I Motors, Step Comparison o and Hydraulio Fingered Gri Consideration Unit III SE Requirements Position sens Position sens Position Ser Approach, Tir Sensors., Ana Frame Grabb Lighting Tech Feature Extra	nition - Robot Anatomy - Co ord - Specifications-Pitch, Yaw, Roll, and their Functions-Need for Rob <b>BOT DRIVE SYSTEMS AND El</b> Drives-Hydraulic Drives-Mechar oper Motors, A.C. Servo Me of all these Drives, End Effectors C- Grippers, Magnetic Grippers, M ppers; Internal Grippers and ns. <b>NSORS AND MACHINE VISION</b> of a sensor, Principles and Ap ors - Piezo Electric Sensor, LVD nsors, Range Sensors Triang me of Flight, Range Finders, La alog Sensors, Wrist Sensors, Co er, Sensing and Digitizing Image antiques, Image Processing and action, Object Recognition, Of	, Joint bots-D <b>ND EF</b> nical otors-S s-Grip Vacuu Exterr Vacuu Exterr N plicatio DT, Re gulatio aser R omplia e Data d Ana	Not iffer FEC Driv Salie pers um C nal ons esolv ons Cang ance a- S	ation ent / cTC /es-l ent - Me - Se - Me - Se - Me - Se - Se - Se - Se - Se - Se	ns, Spee Applicati DRS Electrica Feature echanica bers; Two opers; S he follow , Optical nciples, leters, T nsors, S al Conve ata Redu	d of Mor ons I Drive s, App I Grippe o Finger selection ving type Encode Structu ouch Se lip Sens rsion, In uction, S	tion, Pay L s-D.C. Se lications ers, Pneum red and Th a and De es of sens ers, pneum red, Ligh ensors ,bir sors, Cam nage Stora Segmentat	and oad oad oatic antic antic sign <b>9</b> ors- natic ting nary era, age, ion,
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Unit V	IMPLEMENTATION AND ROBOT ECONOMICS	9
	AGV; Implementation of Robots in Industries-Various Steps; Safety Considerations - Economic Analysis of Robots.	itions
TEXT	BOOK(S)	
1.	Klafter R.D., Chmielewski T.A and Negin M., "Robotic Engineering - An Integ Approach", Prentice Hall, 2003.	rated
2.	Groover M.P., "Industrial Robotics -Technology Programming and Applicati McGraw Hill, 2001.	ons",
REFEI	RENCE(S)	
1.	Craig J.J., "Introduction to Robotics Mechanics and Control", Pearson Educa 2008	ation,
2.	Deb S.R., "Robotics Technology and Flexible Automation" Tata McGraw Hill Co., 1994.	Book
3.	Koren Y., "Robotics for Engineers", Mc Graw Hill Book Co., 1992.	

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Department	COMPUTER SCIENCE AND EN			and the second second		R 2019	Semester	VI
Course Code	Course Name	0.02.0	lour Wee		Credit	Total Hours	Maximu	n
Code		L	Т	Ρ	С	Hours	Marks	
19CSPE28	VIRTUAL AND AUGUMENTED REALITY	3	0	0	3	45	100	
<ul> <li>To make</li> <li>To teach</li> <li>To teach</li> <li>particula</li> <li>To teach</li> <li>To teach</li> <li>To porvio tools.</li> </ul>	his course, learners will be able to:	ciplin odal ce ar ng lai	ary use nd be rge s	featu r inte ehav scale	ires of vi eraction a ior. e VR env	tual reali and perce ironment	eption in VF in real time	
<ul> <li>Underst</li> <li>Model V</li> <li>Develop</li> </ul>	and the basics of Virtual Reality and the architecture of Computer Gra /irtual Reality System 9 3D virtual environments and to deve	0		ntera	action tec	hniques.		
	immersive virtual reality applications		-	а. с.		•		1.0
Unit I IN	TRODUCTION OF VIRTUAL REALIT	ΓY	Pea	lity				-
Unit I IN Fundamental Development Input Track 3DScanner et	TRODUCTION OF VIRTUAL REALIT Concept and Components of Virtu on Virtual Reality. Multiple Modals of ter, Sensor, Digital Glove, Movemen c. Output Visual /Auditory / Haptic I	TY ual I f Inp nt Ca Devie	ut ai aptu ces.	nd O re, N	Primary Putput Int	Features erface in	s and Pres Virtual Rea	ality: s &
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100	Application, and Design" Morgan Kaufmann Publishers.
2	Garey and Gavin Bell, "The Annotated VRML 2.0 Reference Manual", Addison-Wesley.
2.	John Vince, "Virtual Reality Systems", Pearson Education.

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	COMPUTER SCIENCE AND	ENGIN	EEF	RING	6	R 2019	Semester	VI
Course	Course Name		our Wee		Credit	Total	Maximu	
Code	E	L	Т	Ρ	С	Hours	Marks	
19CSPE29	<b>BIO INFORMATICS</b>	3	0	0	3	45	100	
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<ul> <li>Study at</li> </ul>	bout the Micro array Analysis.							
<ul> <li>Unders</li> <li>Evaluat</li> <li>Apply h</li> <li>Design</li> </ul>	nis course, learners will be able to tand the concepts of genomics, p te bioinformatics algorithms such idden markov models and monte various bioinformatics tools for p flicroarray Analysis for Gene clas	oroteom as dyn e carlo attern r	amio nato	c pro	ogrammir and visu	ng ualization	1	S
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2.	Gautam B. Singh, Fundamentals of Bioinformatics and Computational Biology: methods and exercises in Matlab, Springer, 2014
REFE	RENCE(S)
1.	Yi-Ping Phoebe Chen, BioInformatics Technologies, Springer Verlag, 2010
2.	M. Abhilash, Introduction to Bioinformatics and Microarray Technology, CBS Publishers & Distributors, 2010

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Department Course		H	~	- 1	1		
	COMPUTER SCIENCE AND E		ours Nee		Credit	Total	Maximum
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19CSPE30 BI	LOCK CHAIN TECHNOLOGY	3	0	0	3	45	100

- part of the block chain Thoroughly explain private and public keys as well as addresses and how exactly they are constructed and used
  Expose the students to the Bitcoin Script language including developing different type of
- Expose the students to the Bitcoin Script language including developing different type of scripts using the provided API.
- Explain to students both fundamental and implied differences between Ethereum and Bitcoin protocol by covering historical, conceptual and architectural distinctions
- Provide a detailed covering of the most prominent smart contract platform Ethereum and expose students to its main programming language Solidity

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

- Discover the secure and efficient transactions with crypto-currencies
- Experiment with crypto currency trading and crypto exchanges
- Understand the fundamentals of Bitcoin
- Develop private block chain environment and develop a smart contract on ethereum
- Build the hyper ledger architecture and the consensus mechanism applied in the hyper ledger

## Unit I CRYPTOCURRENCY AND BLOCKCHAIN-INTRODUCTION

Blockchain-An Introduction, Distinction between databases and blockchain, Distributed ledger. Blockchain ecosystem -Consensus Algorithms & Types, Blockchain structure, Distributed networks-Distributed Applications (DApps) –Web 3.0 -DApps Ecosystems.Working -Permissioned and permission-less Blockchain –Cross Chain Technologies. –IOT & Blockchain -Digital Disruption in Industries –Banking, Insurance, Supply Chain, Governments, IP rights, Creationof trustless Ecosystems –Block chain as a Service –Open Source Block chains

## Unit II CRYPTO CURRENCIES

Crypto Currencies -Anonymity and Pseudonymity in Cryptocurrencies -Digital Signatures -Cryptocurrency Hash Codes -Need for CryptoCurrencies –Crypto Markets –Explore Crypto Currency Ecosystems -ICOs –Crypto Tokens -Atomic Swaps –CryptoCurrency Exchanges – Centralised and Decentralized Crypto exchanges –Regulations on Crypto Currencies & exchanges –Downside of non-regulated currencies –crypto Scams –Exchange hacks

## Unit III BITCOIN

Bitcoin –history-Bitcoin-usage, storage, selling, transactions, working-Invalid Transactions-Parameters that invalidate the transactions-Scripting language in Bitcoin-Applications of Bitcoin script-Nodes and network of Bitcoin-Bitcoin ecosystem

## Unit IV ETHEREUM

The Ethereum ecosystem, DApps and DAOs -Ethereum working-Solidity-Contract classes, functions, and conditionals-Inheritance & abstract contracts-Libraries-Types & optimization of Ether-Global variables-Debugging-Future of Ethereum-Smart Contracts on Ethereum-different stages of a contract deployment-Viewing Information about blocks in Blockchain-Developing smart contract on private Blockchain-Deploying contract from web and console

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Unit V	HYPERLEDGER 9
Applicat Fabric - a busin	dger Architecture-Consensus-Consensus & its interaction with architectural layers- tion programming interface-Application model -Hyperledger frameworks-Hyperledger Various ways to create Hyperledger Fabric Blockchain network-Creating and Deploying ess network on Hyperledger Composer Playground-Testing the business network n-Transferring the commodity between the participants
TEXT B	OOK(S)
1.	Mastering Bitcoin: Unlocking Digital Cryptocurrencies, by Andreas M Antonopoulos 20182.
2.	Ethereum: Blockchains, Digital Assets, Smart Contracts, Decentralized Autonomous Organizations-2016
REFER	ENCE BOOK(S)
1.	Melanie Swan, Blockchain: Blueprint for a New Economy, First Edition 2018

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Courtering - 1005

Departm	ent	COMPUTER SCIEN	CE AND E					R 2019		_
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19CSPE	31	DATA VISUALIZAT TECHNIQUES	ΓΟΝ	3	0	0	3	45	100	
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- analytic crosstabs	abstract al navig s – mult	data visible – building bl ation – optimal quantitat iple concurrent views – f	ocks of info ive scales - focus and c	orma – ref	tion erer	nce l	alizatior ines and	n – analyt d regions	- trellises a	and
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	siness intelligence beyond reporting", Wiley, 2010.
01	than Yau, "Data Points: Visualization that means something", Wiley, 2013.
	ephen Few, "Information dashboard design: Displaying data for at-a-glance onitoring", second edition, Analytics Press, 2013

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Department	COMPUTER SCIENCE AND ENGINEERING					R 2019	Semester VIII
Course	Course Name	Hours / Week			Credit	Total	Maximum
Code		L	Т	P	С	Hours	Marks
19CSPE32	<b>REAL TIME SYSTEMS</b>	3	0	0	3	45	100

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

• Familiarize with various performance measure and scheduling algorithms

Characterize a good real-time programming language

- Understand real time databases
- Provide an effective communication between various devices of a real time system
- Be familiarize with real time reliability techniques

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

- Apply different scheduling algorithm
- Analyze suitable programming constructs according to the specification
- Use real time databases for efficient storage
- Apply real time communication techniques and Fault tolerance techniques in networks
- Exploit reliability in real time applications

## Unit I INTRODUCTION

Introduction – Issues in Real Time Computing – Structure of a Real Time System – Task Classes – Performance Measures for Real Time Systems – Estimating Program Runtimes – Task Assignment and Scheduling – Classical Uniprocessor Scheduling Algorithms – Uni-processor Scheduling of IRIS Tasks – Task Assignment - Mode Changes – Fault Tolerant Scheduling

### Unit II PROGRAMMING LANGUAGES AND TOOLS

Desired Language characteristics- Data Typing- Control structures- Facilitating Hierarchical Decomposition Packages- Run-time Exception- Error handling- Overloading and Generics-Multitasking- Low Level Programming Task scheduling- Timing Specifications- Programming Environments- Run-time Support.

# UNIT III REAL TIME DATABASES

Basic Definition- Real time Vs General Purpose Databases- Main Memory Databases-Transaction priorities Transaction Aborts- Concurrency Control Issues- Disk Scheduling Algorithms- Two-Phase Approach to improve Predictability- Maintaining Serialization Consistency- Databases for Hard Real Time systems

## Unit IV COMMUNICATION

Real-Time Communication – Communications Media- Network Topologies Protocols- Fault Tolerant Routing. Fault Tolerance Techniques – Fault Types- Fault Detection – Fault Error containment - Redundancy- Data Diversity Reversal Checks- Integrated Failure handling

## Unit V EVALUATION TECHNIQUES

Reliability Evaluation Techniques: Obtaining Parameter Values- Reliability Models for Hardware Redundancy Software Error Models – Clock Synchronization: Clocks - Impact of Faults- Fault Tolerant Synchronization in Hardware- Fault Tolerant Synchronization in Software

## TEXT BOOK(S)

1.	C.M. Krishna, Kang G. Shin, "Real-Time Systems", McGraw-Hill International Editions, Third Reprint, 2010.
2.	Philip.A.Laplante "Real Time System Design and Analysis" PHI, Third Edition, April 2011.

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REFE	RENCE(S)
1.	Phillip A. Laplante, Seppo J. Ovaska, "Real-Time Systems Design and Analysis: Tools for the Practitioner", John Wiley & Sons, Third Edition, 2011.
2.	Rajib Mall, "Real time systems: theory and practice", Pearson Education, 2009
3.	Jane W. S. Liu, "Real - time Systems", Prentice Hall, 2000

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Departn	nent	COMPUTER SCIENCE ANI			_	G	R 2019	Semester	VI
Cours		Course Name		ours Nee		Credit C	Total Hours	Maximur Marks	
19CSP	E33	DESIGN PATTERN	3	0	0	3	45	100	-
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• De • Se	esign Softw elect and a	using creational Patterns. vare by following standard prin pply suitable behavioral patter tectural Patterns while deciding	ns in sp	ecif	ic co	ntexts.		patterns.	
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Unit IV	a contraction of the second second	<b>/IORAL DESIGN PATTERNS</b>			54		de sil	Salah Sala	9
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State - St		bility - Command - Interpreter - emplate Method - Visitor - Cas	se Studi	es a	P.P.J		aviorari		0
	ARCH	emplate Method - Visitor - Cas	se Studi	es a		3			9
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Department	COMPUTER SCIENCE AND E	ENGINI	EER	ING		R 2019	Semester	VII
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19CSPE34	QUANTUM COMPUTING	3	0	0	3	45	100	
<ul> <li>Underst formaliz</li> </ul>	and the building blocks of a quantun and the principles, quantum info	rmation	n ar	nd li	i en iza	of quan	tum operat	ions
<ul><li>Explain</li><li>Explain</li><li>Describe</li><li>Explore</li></ul>	omes: his course, learners will be able to: the basic concepts of quantum comp the quantum model of computation e quantum mechanics the quantum computing algorithms a e the quantum computational comple	and ope			al realiza	tion		
		exity an	iu pi	lysic	arrealiza	lion		9
Unit II QU State of a qua - mixed states	mposition theorem JBITS AND QUANTUM MODEL OF ntum system - time evolution of a clo and general quantum operations - c m gates – unitary transformations –	osed sy quantur	vster m cir	n - co cuit i	omposite model -qı			
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		roach	to or		-			
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Order-finding p finding - findir amplitude amp knowing the su <b>Unit V QL</b>	ng discrete logarithms - hidden sub plification - quantum amplitude esti	ogroups mation PLEXIT	- q <b>Y A</b>	uant ND E		ting - se	arching with	nout 9

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TEXT	BOOK(S)
1.	P. Kaye, R. Laflamme, and M. Mosca, "An introduction to Quantum Computing", Oxford University Press, 1999
REFE	RENCE(S)
1.	V. Sahni, "Quantum Computing", Tata McGraw-Hill Publishing Company, 2007
2.	M. A. Nielsen & I.Chuang, "Quantum Computation and Quantum Information", Cambridge University Press (2000)

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Code No	Course		ojectives Outcome						M	aximı Mark		Category
Code No	course	PEO	РО	PSO	L	Т	P	С	СА	ES	Tot.	Category
19CSOE01	Web Development using .NET		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE02	Fundamentals of Open Source Software		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE03	Machine Learning using R		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE04	Fundamentals of Cloud Computing		1,2,3,4, 5,12	1.	3	0	0	3	40	60	100	OE
19CSOE05	BigData		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE06	Principles of User Interface Design		1,2,3,4, 5,12		3	0	0	3	40	60	100	OE
19CSOE07	Fundamentals of Database Management Systems		1,2,3,4, 12		3	0	0	3	40	60	100	OE
19CSOE08	Operating Systems Fundamentals	15	1,2,3,4, 12		3	0	0	3	40	60	100	OE
19CSOE09	Java Programming		1,2,3,4, 12	•	3	0	0	3	40	60	100	OE

# OPEN ELECTIVES OFFERED BY CSE

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Department	COMPUTER SCIENCE AND EN	0.111			G	H	R 2019
Course Code	Course Name	12000	our Wee	k	Credit	Total Hours	Maximum Marks
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9CSOE01	WEB DEVELOPMENT USING .NET	3	0	0	3	45	100
<ul> <li>Unde</li> <li>Lear</li> <li>Know</li> <li>Be a</li> <li>Lear</li> <li>Course Outo</li> <li>At the end of</li> <li>List the platform</li> <li>Unders</li> <li>Debug</li> </ul>	of learning this course is to erstand the foundations of CLR exe in the technologies of the .NET fram w the object oriented aspects of C#. ware of application development in in web based applications on .NET comes: this course, learners will be able to e major elements of the .NET frame m. stand Object based concept of C# , compile, and run a simple application	.NE (ASI wor	ork. T. P.NI k ar	nd e>	xplain hov		
	e the basic structure of a C# applic	atio	n ar		eb basec	l develop	oment of C#
Discus     Discus     Unit I     IN Introducing Operators, cl	s CLR and security in .NET. <b>TRODUCTION TO C#</b> C#, Understanding .NET, overview hecked and unchecked operators, E	v of xpre	C#	, Lit ons,	erals, Va Branchir	ariables, ng, Loopi	9 Data Types ng, Methods
Discus     Jnit I     IN     Introducing (     Dperators, cl     mplicit and     Builder, Strue     Jnit II     OI	s CLR and security in .NET. <b>TRODUCTION TO C#</b> C#, Understanding .NET, overview	v of xpre s, A nbox <b>C#</b>	C# ession array xing	, Lit ons, ⁄ Cla	erals, Va Branchir ass, Arra	ariables, ng, Loopi ay List, S	9 Data Types ng, Methods String, String 9
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1.	Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.
2.	Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012
3.	Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.
4.	Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition, O'Reilly, 2010

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Department	COMPUTER SCIENCE AND E	NGIN	NEE	RIN	G	R	2019
Course	Course Name		our: Wee		Credit	Total	Maximum
Code		L	Т	Ρ	С	Hours	Marks
19CSPE02	FUNDAMENTALS OF OPEN SOURCE SOFTWARE	3	0	0	3	45	100

## Course Objective (s):

- Impart knowledge on Opensource system and its benefits in application development
- learn different open source system such as Language, Database and operation system
- Develop web based applications using open source system

## **Course Outcomes:**

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

- Understand Open Source Software tools and techniques to develop applications
- Analyze the advantages and disadvantages of Open Source tools and languages with respect to proprietary Software
- Apply the Open Source Software in developing web based Applications and Internet of Things

## Unit I INTRODUCTION TO OPEN SOURCE OPERATING SYSTEMS

Introduction to Open Sources - Need of Open Sources -Advantages of Open Sources Application of Open Sources - Sources LINUX Introduction General Overview Kernel Mode and User Mode Process - Advanced Concepts -Scheduling - Personalities - Cloning -Signals -Development with Linux.

Unit II OPEN SOURCES DATABASE

MySQL: Introduction - Setting up account - Starting, Terminating and Writing your Own SQL programs- Record Selection Technology - Working with Strings - Date and Time - sorting Query Results - Generating Summary - Working with metadata - Using Sequences - MySQL and Web.

## Unit III CONFIGURING SERVERS

Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux /Unix networks); Setting up proxy services -- using squid (http / ftp / https proxy services); Setting up printer services -using CUPS (print spooler), foomatic (printer database).

## Unit IV FIREWALL, BUILD SYSTEM, CVS

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection – GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas); Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

## Unit V SERVER TECHNOLOGIES

Web Server: Apache Server - Working with Web Server - Configuring and Using Apache Web Services - MDA - Introduction to MDA - Geneses of MDA - MDA Applications

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	BOOK(S)
1.	N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, S Publishers; 2005
2.	Peter Wainwright, Professional Apache. Wrox Press, New Delhi, 2010
3.	M. N. RAO, Fundamentals of Open Source Software, PHI Learning Private Limited, 2015
REFE	RENCE(S)
1.	H.S. Lahman Model-Based Development: Applications 1st edition Pearson Education Inc,2011
2.	Stephen J. Mellor, Marc Balces, "Executable UMS: A foundation for MDA", Addison,2002.

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Department	COMPUTER SCIENCE AND EN	GIN	IEE	RIN	G		R 2019
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	gnize various machine learning tecr cross several use cases	niq	ues	suc	in as cla	ssificatio	on, regression
Course Out		-					
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	n why, where, how and what Machir		ear	ning	is.		
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<ul> <li>Apply</li> </ul>	Machine Learning techniques such	as c	lass	sifica	ation, reg	ression	
<ul> <li>Explor</li> </ul>	e advanced Machine Learning tech	niqu	es l	ike \$	Support '	Vector N	lachines
<ul> <li>Apply</li> </ul>	Deep Learning Algorithms						
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HAND	S-ON PROJECTS USING R 20
	Description, Data Visualization, Correlation analysis, Clustering, Regression, fication, Neural networks.
техт	BOOK(S)
1.	Practical Data Science with R. Author(s): Nina Zumel, John Mount, Manning
	Shelter Island
2.	Shelter Island           Introduction to Statistical Learning using R. Author(s): Trevor Hastie, Tibshirani
2. 3.	Introduction to Statistical Learning using R. Author(s): Trevor Hastie, Tibshirani
2. 3.	Introduction to Statistical Learning using R. Author(s): Trevor Hastie, Tibshirani Applied Predictive Modeling. Author(s): by Max Kuhn, Kjell Johnson

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Department	COMPUTER SCIENCE AND EN	IGIN	IEE	RIN	G	1202	R 2019	
Course	Course Name		our Wee		Credit		Maxim	
Code		L	Т	Ρ	С	Hours	Mark	5
19CSOE04	FUNDAMENTALS OF CLOUD COMUTING	3	0	0	3	45	100	
Course Obje								
	of learning this course is							
	derstand the concept of cloud comp	outin	g.					
	w about the cloud services .			_		_		_
<ul> <li>To have</li> </ul>	e knowledge on the various issues	in c	cloud	d co	mputing.			
	familiar with the lead players in clou							
- POLAT	preciate the emergence of cloud as	the	nex	t ge	neration	computi	ng paradi	gm
the second s	eb based communication.					12.53		
Course Outo								
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	the key and enabling technologies t							
	p the ability to understand and use	the	arc	hited	cture of c	compute	and stora	age
cloud,								
	and delivery models.						24.1	
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<ul> <li>Evalua mplementatio</li> </ul>	te and choose the appropriate tech n and use of cloud.			s, al	gorithms	and app	oroaches	_
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TEXT	BOOK(S)
1.	Michael Miller, Cloud Computing, 9th Edition Pearson Education, 2014
2.	Anthony T.Velte, Cloud Computing, 12th Edition, Tata Mcgraw Hill, 2013
REFE	RENCE(S)
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, July 2008

+ Chairman - BoS Dept. of CSE - ESEC

Department	COMPUTER SCIENCE AN	ND ENGIN	IEE	RIN	G		R 2019	
Course	Course Name		our Wee		Credit	Total	Maxim	
Code		L	Т	Р	С	Hours	Mark	s
19CSOE05	BIGDATA	2	0	2	3	60	100	)
Course Obje	ctive (s):		1	W				
The purpose	of learning this course is to							
<ul> <li>Introdu</li> </ul>	ce big data technology lands	scape						
<ul> <li>Unders</li> </ul>	stand Hadoop and its ecosys	tem						
<ul> <li>Work w</li> </ul>	vith NoSQL databases such a	as Mongol	DB a	and	Cassand	Ira		
	tand pig and Hive							
Unders	tand the basics of enterprise	e reporting	usi	ng o	pen sour	ce tools		
Course Outc			_	0	-			
At the end of	this course, learners will be a	able to:						
	tand the basics of Big Data a		and	the	Hadoop	eco svst	tem	
	lap Reduce Program							
	and Use NoSQL databases							
	ig Scripts and Hive Query to	access N	050	b IC	ata			
	te Report using Open Sourc		000		ata			
	TRODUCTION TO BIG DAT					-	-	3
STATE STATE STATE	of Digital Data, Introduction		a- C	har	actoristic	s of Date	a Evoluti	1.000
	finition of Big Data, Introduction							
	assification, Challenges, Terr				and the second second second second			Date
The second s	E BIG DATA TECHNOLOG				i Dig Dui			4
	es of NoSQL Databases - Wh			16. C723	antages o	of NoSQ	L SQL	1
and the second second second	L, NewSQL, Hadoop- Featur			adoc	•		antages	0
	view of Hadoop Ecosystem				1. 1. I.	•	•	
	adoop Systems Offered by L							
solutions								1001
Unit III HA								1001
	DOOP		_	1				7
RDBMS vers		nputing Ch		nge			view, Had	7
	DOOP us Hadoop, Distributed Con ile System, Processing Da		nalle	100 million 100	s, Hadoo	op Over	ENGELSER CONTRACTOR	<b>7</b>
Distributed F	us Hadoop, Distributed Con	ata with	nalle Hac	100 million 100	s, Hadoo	op Over	ENGELSER CONTRACTOR	<b>7</b>
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(User Defined Function), Parameter Substitution, Diagnostic Operator Jasper Report - Introduction to JasperReports, Jaspersoft Studio, Connecting to MongoDB NoSQL database, Connecting to Cassandra NoSQL Databases

## HANDS ON (30 Hours)

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 of 4 members)
- Experiencing expectations from different roles

There will be 1 projects (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 the report s is to be pulled from the data-warehouse built in the earlier project.

FEXT	BOOK(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	RENCE(S)
1.	Hadoop in action – Chuck Lam.
2.	Hadoop for dummies - Dirk Deroos, Paul C. Zikopoulos, Roman B. Melnyk,Bruce Brown
	6

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Department	COMPUTER SCIENCE AND E				IG		R 2019
Course Code	Course Name	22942	our Wee	ek	Credit	Total Hours	Maximum Marks
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19CSOE06	PRINCIPLES OF USER INTERFACE DESIGN	3	0	0	3	45	100
Course Objec	and the second						
	f learning this course is to						
	stand the concepts and architect			ie W	orld Wid	e Web.	
	stand and practice Markup Lang						
<ul> <li>To unders</li> </ul>	stand and practice Embedded D	ynan	nic S	Scrip	oting on (	Client-sid	de Internet
Programm	-						1.00
To unders	stand and practice Web Develop	omen	t Te	echn	iques on	client-si	ide.
Course Outco	mes:						
	nis course, learners will be able t						
	knowledge about functionalities						
Explore	markup languages features and	crea	te ir	ntera	active we	b pages	using them
<ul> <li>Learn an</li> </ul>	nd design Client-side validation u	using	scr	iptin	g langua	ges	
Acquire	knowledge about Open source J	Javas	Scrip	ot lib	raries		
Able to c	lesign Front-end web page.						
Unit I INTI	RODUCTION TO WWW	1	1.25				6
Introduction to	Computer networks - Internet S	24	1				
introduction to	Computer networks - internet c	Stand	ard	s –	Introduc	tion to V	vvvv – vvvv
	SMTP – POP3 – File Transfer F						
Architecture -	SMTP – POP3 – File Transfer F	Proto					
Architecture – – response —		Proto					
Architecture – – response – Unit II   UI D	SMTP – POP3 – File Transfer F Generation of dynamic web pag DESIGN	Protoges.	col -	- Ov	erview o	f HTTP,	HTTP reques
Architecture – – response – <b>Unit II</b> UI D HTML5: What	SMTP – POP3 – File Transfer F Generation of dynamic web pag DESIGN is HTML5 - Features of HTML5 -	Proto ges. – Ser	col - man	- Ov	erview o ags – Ne	f HTTP, ew Input	HTTP reques
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• 3	Student should develop User Interface for Real time applications
TEXT	BOOK(S)
1.	Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011.
2	Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013
3.	Bear Bibeault and Yehuda Katz, "jQuery in Action", January 2008
4.	Web link for Responsive Web Design - https://bradfrost.github.io/this-is- responsive/
REFEF	RENCE(S)
1.	Achyut S Godbole and Atul Kahate, "Web Technologies", Second Edition, Tata McGraw Hill, 2012.
2.	David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media, 2011
3.	Ebook link for JavaScript https://github.com/jasonzhuang/tech_books/tree/master/js

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	COMPUTER SCIENCE AND EN	GIN	IEEI	RING	G	R 2019	Semester	IV
Course	Course Name		ours Nee		Credit	Total	Maximun	n
Code		L	Т	Ρ	С	Hours	Marks	
19CSOE07	FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS	3	0	0	3.	45	100	
<ul> <li>Learn</li> <li>Under</li> <li>Apply</li> <li>Under</li> </ul>	e of learning this course is to data modeling using the entity-relati rstand the use of Structured Query La normalization techniques to normaliz rstand the needs of database proces	ang e th	uage ne d	e (S0 atab	QL) and ase	learn SC	QL syntax.	
conse Course Out	quences of concurrent data access.	_				( and the		
datab • Desig • Conve SQL c	in the basic concepts of relational dat ase design, relational algebra and SC n ER-models to represent simple dat ert the ER-model to relational tables, queries on data. ar with basic database storage struct	QL. aba po	se a pula	ippli te re	cation so elational	cenarios databas	e and formu	
	TRODUCTION TO DBMS							9
	d motivation for database systems;				ts of da	tabase	systems; DB	BMS
unctions; d	atabase architecture and data indepe	nde	ence					
				-	1	1		Q
Unit II BA	ASICS OF DATA MODELING	ted			relationa	al data m	odel.: Datat	<b>9</b>
Unit II BA			mo	del;				base
Unit II BA Data model query langu environmen	ASICS OF DATA MODELING ing; conceptual models; object -orien ages: Overview of database languag ts; embedding nonprocedural queries	es;	moo SQ	del; L; qı	uery opti	imization		ation
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Jnit II BA Data model query langu environmen Jnit III RE Mapping co algebra and dependency	ASICS OF DATA MODELING ing; conceptual models; object -orien ages: Overview of database languag ts; embedding nonprocedural queries ELATIONAL DATABASES nceptual schema to a relational sche	es; in ma aba	moo SQ a pr ; ent	del; L; qı ocec ity a	uery opti dural lan and refer gn: Data	imization guage; rential inf abase de	a; 4th-genera tegrity; relati esign; functi	oase atior 9 ona ona
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Unit II     BA       Data model     query languery languery languery languery langu       environmen     Unit III     RE       Unit III     RE       Mapping coalgebra and dependency       Unit IV     TF       Transaction       Unit V     PH       Storage and ndex; files v       TEXT BOOI       1.     A. Hill	ASICS OF DATA MODELING ing; conceptual models; object -orien ages: Overview of database languag ts; embedding nonprocedural queries <b>ELATIONAL DATABASES</b> inceptual schema to a relational sche d relational calculus; Relational data r; normal forms; multi valued depende <b>CANSACTION PROCESSING</b> s; failure and recovery; concurrency of <b>ANSACTION PROCESSING</b> s; failure and recovery; concurrency of <b>ANSACTION PROCESSING</b> I file structure; indexed files; hashed f with variable length records; database <b>K(S)</b> Silberschatz, H. F. Korth & S. Sude I, 6th Edition 2010.	es; s in ma aba ncy cont illes eff	moo SQ a pr ; ent se c ; join trol ; sig ficien	del; qı L; qı ity a desiq n de natu ncy i	uery opti dural lan and refer gn: Data pendence ure files; and tunin base sy	imization guage; ential int abase de cy; repres b -trees; ng. stem co	a; 4th-genera tegrity; relati esign; functi sentation the files with de	9 ona ona ona oory 9 9 9 9 9
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Unit IIBAData modelquery langueenvironmenUnit IIIREMapping coalgebra anddependencyUnit IVTFTransactionUnit VPHStorage andndex; files vTEXT BOOI1.A.Hill2.C.	ASICS OF DATA MODELING ing; conceptual models; object -orien ages: Overview of database languag ts; embedding nonprocedural queries <b>ELATIONAL DATABASES</b> inceptual schema to a relational sche d relational calculus; Relational data r; normal forms; multi valued depende <b>CANSACTION PROCESSING</b> is; failure and recovery; concurrency of <b>ANSACTION PROCESSING</b> if lie structure; indexed files; hashed f with variable length records; database <b>K(S)</b> Silberschatz, H. F. Korth & S. Sude I, 6th Edition 2010. J. Date, An introduction to database s	es; s in ma aba ncy cont illes eff	moo SQ a pr ; ent se c ; join trol ; sig ficien	del; qı L; qı ity a desiq n de natu ncy i	uery opti dural lan and refer gn: Data pendence ure files; and tunin base sy	imization guage; ential int abase de cy; repres b -trees; ng. stem co	a; 4th-genera tegrity; relati esign; functi sentation the files with de	9 ona ona ona oory 9 9 9 9 9
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<ul><li>To underst</li><li>To familiar</li><li>To expose</li></ul>	Course Name OPERATING SYSTEMS FUNDAMENTALS	L	Wee T	-		Total Hours	Maximum
Course Objectiv The purpose of le • To underst • To familiar • To expose		L			0	nouis	Marks
Course Objectiv The purpose of le • To underst • To familiar • To expose			· ·	Ρ	С		
The purpose of le To undersi To familiar To expose		3	0	0	3	45	100
• To learn th Course Outcome At the end of this	earning this course is tand the basic concepts of operati- rize the OS services that assist sy- e several aspects of OS design in duling and Process synchronization in ememory management es: course, learners will be able to:	stem ncludi	user	s	ess, deac	llocks an	d File systems
<ul><li>Determine</li><li>Detect and</li><li>Implement</li></ul>	d the basic OS principles the efficiency of CPU Scheduling I model Deadlock Process Synchronization techniq Memory management techniques.		ithm	s			
distributed sys programs, oper Unit 2 PRO Process con queues, proce	memory management, storagestems. Operating system rating system structure, opera CESS MANAGEMENT cepts, process state, ess scheduling, multithread UNIX and windows	serv ting proc	ices syst ess	ems c	nd syst genera ontrol	tems c tions. block,	alls, system
Unit 3 PRO	CESS SYNCHRONIZATION &	DEA	DL		<		12
Process Peterson's solution synchronization synchronization windows. dea avoidance, reco		critica vare, n, dir tran dead	al se ning sac lock	map phil tions p	secti hores, osopher	classic s proble arison	problem, problems of em, monitors,
table, segmenta	ntiguous memory allocatio ation, virtual memory, demar	nd pa	aging		struct age-repl		the page nt algorithms,
allocation of fra	mes, thrashing, case study -	UNIX	ζ.				
Unit 5 FILE	SYSTEMS						9
	file, access methods, direct	orv o	struc	ture	filo o	intom n	nounting file

12/21012	nagement, efficiency and performance, comparison of UNIX and windows.
TE	XT BOOKS
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).
1221	
TE	XT BOOKS
TE 1.	XT BOOKS Harvey M.Deitel, Paul J. Deitel, David R. Choffnes, "Operating systems", Third edition, Pearson Prentice Hall(2007).

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Department	COMPUTER SCIENCE AND I	ENGIN	IEE	RIN	G		R2019
Course	Course Name		our Wee		Credit	. otal	Maximum
Code		L	Т	Р	С	Hours	Marks
19CSOE09	JAVA PROGRAMMING	3	0	0	3	45	100

## Course Objective (s):

The purpose of learning this course is to

- Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
- Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
- Understand the principles of inheritance, packages and interfaces.
- Understand the basics of Exception Handling & Multi threading
- Know how to handle events

## Course Outcomes:

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

- Write Java application programs using OOP principles and proper program structuring
- Demonstrate the concepts of Packages and inheritance
- Write Java programs to implement error handling techniques using exception handling
- Develop application using multi threading
- Write a program using IO Streaming

#### Unit 1 **Java Basics**

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History of Java – Difference between C++ and Java = Byte Code – JVM – Java Environment - The Java Buzz Words - Data Types - Variables - Type Conversion and Casting Arrays : One Dimensional - Multi Dimensional - Alternate Array Declaration -Operators - Control Statements : Selection (if, switch), Iteration Statements(while, do-while, for , nested loops)-Jump Statements(break, continue, return – Oracle Java Certifications Questions Unit 2 **Object Oriented Programming Basics** 9

OOP Principles - Class Fundamentals - Declaring Objects -Methods - Constructors-Constructor Overloading this - Garbage Collection - finalize()- Method Overloading - Object as Parameters - Returning Objects - Access Control - Understanding static(variable, method, block) - Command line Arguments - Oracle Java Certification Questions

### Unit 3 Inheritance and Packages

Inheritance basics - extends - using super - Multi level inheritance - Method Overriding -Constructors in Multilevel Inheritance- Dynamic Method dispatch - Abstract class - final -Packages : Understanding CIASSPATH - Creating and Accessing Packages - Access Protection in Packages – Oracle Java Certification Questions

### Unit 4 Interfaces, Exception Handling and Threads

Interface : Defining Interface - Implementing Interfaces - extending Interface - Exception Handling : Exception fundamentals - uncaught exception - exception types - exception hierarchy- using try and catch- throw, throws, finally - user defined exception- Java Thread Model - Main Thread - Creating Thread - Thread Methods - Thread priorities - Creating multiple threads – isAlive() and join() – Oracle Java Certification Questions 9

### Unit 5 String Handling and IO Streaming

String Constructors - Creating String object- String concatenation with other data types -Character Extraction Methods - String Comparison - Modifying a String - Searching String -StringBuffer IOStreaming : Character Streams and Byte Streams - Reading and Writing Characters and Strings - Reading and Writing Files - Oracle Java Certification Questions

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TE	KT BOOKS
1.	The Complete Reference, Java 2 (11 <sup>TH</sup> Edition Edition), Herbert Schild, TMH
2.	Core Java Volume-I Fundamentals, Eight Edition, Horstmann & Cornell, Pearson Education
RE	FERENCE(S)
1.	E. Balagurusamy, Java Programming with premier, second edition, Tata Mcgraw Hill, 2016.
1. 2.	E. Balagurusamy, Java Programming with premier, second edition, Tata Mcgraw Hill,

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