SCHEME OF EXAMINATION and SYLLABI FOR B.E. (Information Technology)

3rd – 8th semester for Academic Session 2015-16

Vision

To produce information technology engineers who work passionately, creatively and effectively for the betterment of technology and society at large.

Mission

- The mission of Information Technology branch is to educate students in technology and provide advanced knowledge in related areas in order to enable them to create and consume information products for a dynamic information society.
- The aim is to create a culture that fosters excellence and combines rigorous academic study with the support of a diverse campus community.
- The endeavour is to have up-to-date curricula and pedagogy in the information technology discipline so that students have a solid foundation in the core concepts and develop problem solving skills.
- The mission is to offer internship opportunities to the students and to foster their personal and professional growth.

Programme Educational Objectives (PEOs)

PEO 1: Graduates are prepared to be employable in industry and possess knowledge or engineering & IT concepts, practices and tools to support design, development, application and maintenance of IT enabled products and projects.

PEO 2: Graduates are prepared to pursue higher education in their area of interest.

PEO 3: Graduates are prepared to possess professional skills like team work, ethics, competence in written & oral communication.

Program Outcomes of IT Department

- a. An ability to apply knowledge of mathematics, computing, science and engineering.
- **b.** An ability to design and conduct experiments to analyze and solve engineering problems.
- **c.** An ability to design and construct a hardware and software system, component or process to meet desired needs, within realistic constraints.
- d. An ability to identify, formulate and develop solution for complex engineering problems.
- e. An ability to use the engineering techniques, skills and modern engineering tools for solving engineering problems.
- f. An understanding of proper use of professional skills for the benefit of society.
- **g.** The broad education necessary to understand the impact of engineering solutions in a global economic, environmental, and societal context.
- h. An ability to apply ethical principles and commit to professional skills and responsibility.
- i. An ability to work with multidisciplinary teams to design, develop and maintain the projec by developing professional interaction with each other.
- j. An ability to communicate effectively in both verbal and written forms.
- k. Project management techniques and teamwork necessary for successful information engineering technologies, system designs and implementations, and the effective use or communication skills to prepare technical reports, and presentations.
- I. Recognition of the need for, and an ability to engage in life-long learning.

Note: The examiner shall set seven questions of equal marks. First question is compulsory and shall cover the whole syllabus by including questions of conceptual nature. Rest of the syllabus will be divided into A and B parts having three questions each. Candidate is required to attempt at least two questions from each part.

<u>SCHEME OF EXAMINATION AND SYLLABIFOR B.E. (Information Technological Schemester for AS 2015-16</u>

Teaching Scheme for B.E. Second Year

Second	Year- Third Semester	•											
Sub	Sub Name		Sch	nem	e of Tea	aching	Scheme of Examination						
Code						-	Theory		Practical				
		L	Т	Р	Hrs.	Credits	Sess	Univ Exam	Marks*	Т			
HSS-301	Elective- I [#]	3	0	0	3	3	50	50	-	1			
MATHS- 302	Linear Algebra and Operations Research	3	1	0	4	4	50	50	-	1			
ITE301	Analog & Digital Communication (Theory)	3	1	0	4	4	50	50	-	1			
ITE351	Analog & Digital Communication (Practical)	0	0	3	3	2	-	-	50	5			
ITE302	Data Structures and Algorithms (Theory)	3	1	0	4	4	50	50	-	1			
ITE352	Data Structures and Algorithms (Practical)	0	0	3	3	2	-	-	50	5			
ITE303	Digital Electronics (Theory)	3	1	0	4	4	50	50	-	1			
ITE353	Digital Electronics (Practical)	0	0	3	3	2	-	-	50	5			
	Total:	15	4	9	28	25	250	250	150	6			

*- Note: Marks refer to mid semester evaluation and end semester evaluation

Elective-I[#]

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Choose any one from the following:

- HSS-301a Economics
 - HSS-301b Introduction to Psychology
- HSS-301c Sociology
- HSS-301d French Language

Seco	nd Year- Fourth Seme	ster								
Sub	Sub Name		Sch	eme	e of Tea	ching	1	Scheme of	Examinatio	n
Code							T	neory	Pract	ica
		L	Т	Р	Hrs.	Credits	Sess	Univ Exam	Marks*]
ITE401	Analysis and Design of Algorithms	3	0	0	3	3	50	50	-	
ITE402	Discrete Mathematics	3	1	0	4	4	50	50	-	
ITE403	Cyber laws & IPR	3	0	0	3	3	50	50	-	
ITE404	Microprocessor (Theory)	3	1	0	4	4	50	50	-	
ITE454	Microprocessor (Practical)	0	0	3	3	2	-	-	50	
ITE405	Computer Networks (Theory)	3	0	0	3	3	50	50	-	
ITE455	Computer Networks (Practical)	0	0	3	3	2	-	-	50	
ITE406	Computer Architecture & Organisation	3	1	0	4	4	50	50	-	
ITE407	Educational Tour	-	-	-	-	Non- Credit	-	-	50	
	Total:	18	3	6	27	25	300	300	150	

Second Year- Fourth Semester

*- Note: Marks refer to mid semester evaluation and end semester evaluation.

Teaching Scheme for B.E. Third Year

Thi	rd Year - Fifth Semester	r									
Sub	Sub Name		Sch	eme	e of Tea	ching	Scheme of Examination				
Code							Theory		Practica		
		L	Т	Р	Hrs.	Credits	Sess	Univ Exam	Marks*]	
IT531	Data Base Management Systems	3	0	0	3	3	50	50	-		
IT581	Data Base Management Systems(Prac)	0	0	3	3	2	-	-	50		
IT532	Computer Graphics	3	1	0	4	4	50	50	-		
IT582	Computer Graphics (Prac)	0	0	3	3	2	-	-	50		
IT533	Operating System	3	1	0	4	4	50	50	-		
IT583	Operating System (Prac)	0	0	3	3	2	-	-	50		
IT534	System Software	3	0	0	3	3	50	50	-		
IT535	Multimedia Systems	3	0	0	3	3	50	50	-		
IT536	Industrial Training(after 4 th semester)	0	0	0	0	2	-	-	50		
	Total	15	2	9	26	25	250	250	200		
4 N	T. 4 N.T I				1			1			

*- Note: Marks refer to mid semester evaluation and end semester evaluation

Sub	Sub Name		Sc	heme	of Teac	hing	5	Scheme of	Examinatio	J
Code						0	Tł	neory	Pract	ic
		L	Т	Р	Hrs.	Credits	Sess	Univ Exam	Marks*	
IT631	Wireless Communication	3	1	0	4	4	50	50	-	
IT681	Wireless Communication (Prac)	0	0	3	3	2	-	-	50	
IT632	Software Engineering	3	1	0	4	4	50	50	-	
IT633	Internet & Web Technology	3	0	0	3	3	50	50	-	
IT683	Internet & Web Technology (Prac)	0	0	3	3	2	-	-	50	
IT634	Network Security & Cryptography	3	1	0	4	4	50	50	-	
IT635	Business Intelligence	3	1	0	4	4	50	50	-	
IT685	Business Intelligence & Software Engineering (Prac)	0	0	3	3	2	-	-	50	
	Total	15	4	09	28	25	250	250	150	

*- Note: Marks refer to mid semester evaluation and end semester evaluation

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Third Year - Sixth Semester

Teaching Scheme for B.E. Fourth Year

Sub	Sub Name		Sc	heme	of Teac	hing	Scheme of Examination			
Code						-	T	neory	Pract	i
		L	Т	Р	Hrs.	Credits	Sess	Univ Exam	Marks*	I
IT731	Digital Signal Processing	3	1	0	4	4	50	50	-	
IT781	Digital Signal Processing(Prac)	0	0	3	3	2	-	-	50	
IT732	Java Technologies	3	0	0	3	3	50	50	-	T
IT782	Java Technologies (Prac)	0	0	3	3	2	-	-	50	I
IT733	Compiler Design	3	0	0	3	3	50	50	-	T
IT734	Cloud Computing	3	0	0	3	3	50	50	-	T
IT735	Elective-II [#]	3	0	0	3	3	50	50	-	T
IT785	Project-I	0	0	6	6	3	-	-	100	T
IT786	Industrial Training (after 6 th Semester)	0	0	0	0	2	-	-	50	
	Total	15	1	12	28	25	250	250	250	T
*_	Note: Marks refer to m	id sem	este	r eval	uation a	and end ser	nester e	valuation.		

Fourth Year - Seventh Semester

Elective-II[#]

Choose any one from the following: • Artificial Intelligence

• Mobile Computing

• Building Enterprise Applications

F	'ourth Year - Eighth Sem	nester								
Sub	Sub Name		Sc	heme	of Teac	hing	Scheme of Examination			
Code							Т	heory	Prac	ctic
		L	Т	Р	Hrs.	Credits	Sess	Univ	Marks*	
								Exan	1	
IT831	Digital Image	3	1	0	4	4	50	50	-	
	Processing									
IT881	Digital Image	0	0	3	3	2	-	-	50	
	Processing(Prac)									
IT832	Embedded System	3	1	0	4	4	50	50	-	
	Design									
IT882	Embedded System	0	0	3	3	2	-	-	50	
	Design(Prac)									
IT833	Elective-III [#]	3	1	0	4	4	50	50	-	
IT834	Elective-IV [#]	3	1	0	4	4	50	50	-	
IT885	Seminar	0	0	3	3	2	-	-	50	
IT886	Project II	0	0	6	6	3	-	-	100	
	Total	12	4	15	31	25	200	200	250	
				OR	OPTIC	DN – 2				
Sub	Sub Name		D	urati	on	Credits	Int. A	Ass.	Marks*	•
Code										
IT887	Industrial Training		6	mont	hs	25	30	0	350	
*	Note: Marks rafer to m	id con	nost	or ou	aluation	and and a	mostar	ovaluat	ion	

te: Marks refer to mid semester evaluation and end semester evaluation.

Elective III[#]

Choose any one from the following:

- Software Testing and Quality Assurance
- System Simulation and Modeling •
- Object Oriented Analysis & Design

Elective IV[#]

Choose any one from the following:

- Theory of Computation
- Soft Computing
- Mobile Apps Development

Student can exercise option 1 or option 2 according to the following:

A student may opt for one semester training in lieu of subjects of 8th Semester. The marks for six months training will be equal to the total marks of 8th Semester study. A student can opt for six month semester training under following conditions:-

a. The student got selected for job in campus placement and the employer is willing to take that student for the training.

b. The student got offer of pursuing training from reputed government research organization/govt. sponsored projects/govt. research institution provided that Student should no be paying any money to get trained. For pursuing this training student needs the prior approva from the Chairperson/Coordinator of the Respective department/ branch.

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SYLLABUS FOR B.E. (I.T.) THIRD SEMESTER

COURSE INFORMATION SHEET

Course Code	HSS-301a				
Course Title	Economics (Theory)				
Type of Course	Elective				
LTP	300				
Credits	03				
Total Lectures	45				
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50				
Course Prerequisites	Nil				
Course Objectives	 To make students understand he society manages its scarce resource for achieving maximum satisfaction. To make students learn about economic aspects related to consumer, firm, market and economy 				
Course Outcomes	 I. The students are expected to appendimenting knowledge to maximize profit, satisfaction and welfare. II. The students are able to identify the forces that affect the economy. 				
SYLL	ABUS				

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction to Economics	(06)
Nature of Economics, Economic Thoughts, Economic Activities, Relationship of	
Economics with other Social Sciences and Engineering	
Theory of Consumer Behaviour	(12)
Demand: Types, Law of Demand, Determinants of Demand and Change in Demand	
Elasticity of Demand: Nature, Degrees, Types, Measurement and Factors Affecting	
Elasticity of Demand and its Application	
Laws of Consumption: Concept and Applicability of Law of Diminishing Marginal	

Utility a	and Law of Equi-Marginal Utility		
Theory	of Production and Cost		(06)
Cost: T	ypes of Costs, Production: Law of Variab	le Proportion, Returns to Fac	tor and
Returns	to Scale, Economies and Diseconomies of	Scale	
	SECTI	ON-B	
Theory	of Market		(08)
Nature	and Relevance of Perfect Competiti	ion, Monopoly and Mono	polistic
Compet	ition		
Basic C	concepts of Macro Economics		(09)
Nationa	l Income: Concept and Measurement, Dete	rmination of Equilibrium of Ir	ncome
Inflation	n: Concept, Causes and Effect of Inflation,	Measures to Control Inflation	
Project	Presentations		(04)
RECO	MMENDED BOOKS		
S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	Modern Economics	H. L. Ahuja	S. Chand & C
			Ltd
2.	Economics For Engineers	M.L. Gupta. & S.P. Gupta	ESS PEE
	.		Publications
3.	Business Economics	H.L. Ahuja	S. Chand & Co
			Ltd
4.	Macro Economic Theory	M.L. Jhingan	Konark
			Publisher Pvt.
5	Drin sigles of Misses as a surjes	L Stiglitz & Carl E Walsh	LIQ WW Norton
э.	Principles of Microeconomics	J. Sugniz & Carl E waish	W.W. Norton
6	Principles of Feenomies	Mankiw N Gragory	Congago
0.	r finciples of Economics	Malikiw N Olegoly	Loorning
7	Course in Micro Economics Theory	1 Krans	Drantice Hall
/•		A. Kieps	
8.	Economics	Samuelson A. Paul &	Tata McGraw
		Nordhaus D William	Hill
9	Microeconomics	H.Gravelle & R. Reiss	Pearson
			Education
10	Macro Economics: Theory and Practice	H. L. Ahuja	S. Chand & C
			Ltd.

COURSE INFORMATION SHEET

Course Code	HSS-301b						
Course Title	Introduction to Psychology (Theory)						
Type of Course	Elective						
LT P	300						
Credits	03						
Total Lectures	45						
Course Assessment Methods:							
End Semester Assessment (University Exam.)	50						
Continuous Assessment (Sessional)	50						
Course Prerequisites	Nil						
Course Objectives	 To provide knowledge and understandi about important concepts in Psychology To make students learn the application principles of psychology in working life 						
Course Outcomes	 I. The students will learn the causes a dynamics of human behavior. II. The students will be able to app psychological principles to enhance th personal and professional life. 						
SYLL	ABUS						

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

	SECTION-A		Ho	our			
Underst psychol	anding Human Behaviour: Definition, met ogy for engineers	thods, branches and application	ion of ((05)			
Measuri	Measuring Human abilities: Intelligence, theories and assessment						
The ind	ividual working life: Personality, approache	es and trait theories	((<u>06)</u>			
Psychol	ogical problems of everyday life: Stress an	d coping	((06)			
	SECTIO	DN-B	······································				
Work and mental health, workplace spirituality							
Motivation : the concept and theoretical framework, motivating people at work							
Group c	Group dynamics, Intergroup relations, conflict and negotiation						
Leaders	hip and Management		((05)			
RECO	MMENDED BOOKS						
S. No.	NAME	AUTHOR(S)	PUBLISH	ER			
1.	G.E. Psychology 2007 Edition	Ciccarelli, S.K., & Meyer	Pearson				
2.	Organisational Behaviour 2010 Edition	M. Parikh & R. Gupta	Tata McGra	aw			
			Hill Educat	tior			
3.	Introduction to Psychology 1986 Edition	C.T. Morgan, R.A. King,	McGraw-H	ill			
		J.R.Weiss & J. Schopler					

4.	Organizational Behavior 2003 Edition	S.P. Robbins	Prentice Hall o India
5.	Organizational Behavior 2010 Edition	F. Luthans	McGraw Hill

COURSE INFORMATION SHEET

Course Code	HSS-301c					
Course Title	Sociology (Theory)					
Type of Course	Elective					
LT P	300					
Credits	03					
Total Lectures	45					
Course Assessment Methods:						
End Semester Assessment (University Exam.)	50					
Continuous Assessment (Sessional)	50					
Course Prerequisites	Nil					
Course Objectives	 To make the students understand the ro of theory in social sciences. To explain students how social problen interact and react with the larger society To make students learn whether t problem is evaluated on the macro micro perspective and their cause a effect patterns. 					
Course Outcomes	 I. The students will be able to identify t function and application of sociolo theory in social sciences. II. The students will be able to understa how social class affects individual li chances. III. The students will learn about soc structure and how it shapes and influence social interactions. 					
SYLL	ABUS					
Note: The examiner shall set seven question	s of 10 marks each. First question has to					

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Sociology – The Discipline	(03)
Sociology as a Science, Impact of Industrial and French Revolution on the Emergence	
of Sociology, Relevance of Sociology for Engineering	
Basic Concepts	(04)
Society, Association, Institution, Culture Relativism, Social Structure, Social System,	
Socialisation, Competition, Conflict, Accommodation, Social Mobility	
Pioneering Contributions to Sociology	(04)
Seminal Views of Karl Marx, Emile Durkheim, Max Weber, Alwin Toeffler	
Evolution of Society	(05)
Primitive, Agrarian, Industrial and Post-Industrial, Features of Industrial and Post-	

Industrial Society, Impact of Automation and Industrialization on Society								
Economy and Society	(05)							
Economic Systems of Simple and Complex Societies, Sociological Dimensions of								
Economic Life, Market (free) Economy and Controlled (planned) Economy								
SECTION-B	l							
Industrial Sociology	(04)							
Nature and Scope of Industrial Sociology, Pre-Conditions and Co	sequences of							
Industrialization								
Science and Technology	(04)							
Ethos of Science and Social Responsibility of Science								
Social Change	(05)							
Theories of Change, Factors of Change, Directed Social Change, Soc	al Policy and							
Social Development, Social Cost Benefit Analysis, Kole of Engineers in .	evelopment (07)							
Traditional Hindu Social Organization Casta System Agrarian Society	India Social							
Consequences of L and Reforms and Green Revolution Working of t	e Democratic							
Political System in a Traditional Society Problem of Education in	ndia Gender							
Discrimination, Economic Reforms: Liberalization, Privatization and	Globalization.							
Strategies for Development in India	· · · · · ,							
Social Problems	(04)							
AIDS, Alcoholism, Drug Addiction, Corruption	` ´							
RECOMMENDED BOOKS								
S. No. NAME AUTHOR(S)	PUBLISHER							
1. Sociology Ranjay Vardhan and	s. New Academi							
Kapila Kapila Seciele and Themese and Democratica M. Hemisuchese	Publishing							
2. Sociology. Themes and Perspective IVI. Haralamoos	Educational							
	Publications							
3. Sociology of Indian Society C N Rao Shankar	Sultan Chand							
	and Co.							
4. Introduction to Sociology Vidya Bhushan and	D.R. Kitab Mahal							
Sachdeva	Publications							
5. Sociological Thought Francis Abraham and	J.H. Macmillan							
Morgan	India Ltd.							
6. Social Problems Etzioni Amitai	Prentice Hall							
7. Industrial Sociology Scheneider	Tata McGraw							
	Hill							
8. Society in India David Mandilbaum	Popular							
	Publications							
9. Sociology L. Broom, P. Selzni	k and Harper							
D. Dorrock	International							
	Publishing							
	11							

COURSE INFORMATION SHEET

Course Code	MATHS-302
Course Title	Linear Algebra and Operations Research
T. 40	(Theory)
Type of Course	
Credits	04
Local Lectures	45
End Semester Assessment (University Evam)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Engineering Mathematics-I
Course Objectives	 Engineering Mathematics-II This course is designed to provide introduction to Sequences and Series, Lina algebra and Complex functions. Particular this course will: Present basic concepts of sequences a series, namely limit of sequen convergence and divergence of an infir series, error estimates. Present an introduction to fundamental concepts of Linear algeb namely linear dependence a independence of vectors, rank of math solution of a system of linear equations Gauss elimination method and inverse a matrix by Gauss-Jordan eliminatimethod, eigen value problem, Cayle Hamilton theorem, similarity of matrietc. Present an introduction to the baa concepts of complex functions, nam continuity, differentiability of comp functions, analytic function, Cauce Riemann equations, Taylor and Laur series, concept of residue, conforr mappings and linear fractio transformations etc.
Course Outcomes	After completing the course, students show be able to: IV. Apply the fundamental concepts Sequences and Series and Linear Algel and the basic numerical methods for the resolution.
	V. Solve the problems choosing the m

	formulate the basic concepts of course.
IX	Use an adequate scientific language
	Organization Engineering.
VIII.	Formulate and solve differential equat
	Functions.
VII.	Use computational tools to so
	problems analytically and the need to numerical approximations for th resolution.
VI.	suitable method. Understand the difficulty of solv
	VI. VII. VIII. IX.

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Linear Algebra: Concept of linear independence and dependence, Rank of a matrix:	(07)
Row – Echelon form, Vector space, Dimension, Basis, System of linear equations:	
Condition for consistency of system of linear equations, Solution by Gauss elimination	
method. Inverse of a matrix: Gauss – Jordan elimination method. (Scope as in Chapter	
6, Sections 6.3 – 6.5, 6.7 of Reference 1).	
Eigen values, eigen vectors, Cayley – Hamilton theorem (statement only). Similarity of	(07)
matrices, Basis of eigenvectors, diagonalization (Scope as in Chapter 7, Sections 7.1,	
7.5 of Reference 1).	
Optimization Problems. Linear Programming: Graphical Method (Scope as in	(12)
Chapter 1 of Reference 4).	
Solution of simultaneous linear equations: An overview (Scope as in Chapter 2,	
Sections $2.15 - 2.16$ of Reference 4).	
Basic solutions, lines and hyperplanes, convex sets, extreme points, convex sets and	
hyperplanes (Scope as in Chapter 2, Sections 2.19 – 2.21 of Reference 4).	
Reduction of any feasible solution to a system of equations to a basic feasible solution.	
Simplex Method: The simplex algorithm (Scope as in Chapter 3, 4 of Reference 4).	
Tableau format for simplex computations, Charne's M-method, Two phase method	
(Scope as in Chapter 5 of Reference 4).	
The revised simplex method (Scope as in Chapter 7 of Reference 4).	
SECTION-B	
Duality theory: Formulation of the dual problem, Theorems on duality: Weak Duality	(06)
Theorem, Strong Duality Theorem, Complementary Slackness Theorem, Dual Simplex	
Algorithm (Scope as in Chapter 8, Sections $8.1 - 8.12$ of Reference 4).	
Integer Linear Programming: Branch and Bound Algorithm, Cutting Plane	(04)
Algorithm (Scope as in Chapter 9, Section 9.1 – 9.2 of Reference 5).	
The Assignment Problem: Hungarian Method (Scope as in Chapter 5, Section 5.4 of	(03)
Reference 5).	
Traveling Salesman Problem (Scope as in Chapter 9, Section 9.3 of Reference 5).	(03)

CPM and PERT: Network representation, Critical path computations, Construction of time schedule, Linear programming formulation of CPM, PERT networks (Scope as in Chapter 6, Section 6.6 of Reference 5).

S No	NAME	AUTHOP(S)	DUDI ISUED
5. INO. 1.	Advanced Engineering Mathematics, Eighth Edition	E. Kreyszig	John Wiley
2.	Advanced Engineering Mathematics, Second Edition	Michael D. Greenberg	Pearson Education
3.	Linear Algebra	Vivek Sahai, Vikas Bist	Narosa Publishing House, New Delhi
4.	Linear Programming	G. Hadley	Narosa Publishing House, New Delhi
5.	Operations Research, An Introduction, Seventh Edition	Hamdy A. Taha	Pearson Education, Delhi
6.	Operations Research, Twelfth Edition	Kanti Swaroop, P. K. Gupta, Man Mohan.	Sultan Chand and Sons, New Delhi
7.	Operations Research, 2005	A. M. Natarajan, P. Balasubramani, A. Tamilarasi	Pearson Education, Delhi

PO CO	a	b	c	d	e	F	g	h	i	j	k	1
CO1	2											
CO2	2			2								
CO3	1	2		2								
CO4	1			2	2							
C05	1			2								

CO6 1 2 1

COURSE INFORMATION SHEET

Course Code	ITE301				
Course Title	Analog and Digital Communication				
	(Theory)				
Type of Course	Core				
L T P	310				
Credits	04				
Total Lectures	45				
Course Assessment Methods:					
End Semester Assessment (University Exam.)	50				
Continuous Assessment (Sessional)	50				
Course Prerequisites	Basic Electronics				
Course Objectives	 To understand about the modulative techniques used for digital distransmission. To have knowledge about the digicommunication, spread spectrum a multiple access techniques. 				
Course Outcomes	 At the end of the subject, student will be all to: I. Apply the principles of analog and digit communication in related fields. II. Compute the bandwidth and transmissis power by analysing time and frequer domain spectra of signal required una various modulation schemes III. Apply suitable modulation schemes a coding for various applications. IV. Differentiate between analog and digit communication. V. Capability to communicate effectively. VI. Identify, formulate and model proble and find engineering solutions based on system approach. 				
0.1/1 T	ADUC				
SYLL	ADUS				

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION A	Hour
Amplitude Modulation & Demodulation and Systems	(08)
Data Transmission concepts; transmission impairments; Channel capacity, Sampling	
theorem, Concept of Modulation its merits & demerits, Principle and generation of	
AM, DSB/SC, SSB signal, Balanced modulator, Detection of AM, DSB/SC, and SSB	
signals, Super heterodyne Radio Receivers.	
Frequency Modulation & Demodulation and Systems	(07)
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various s	stages	eneration	n of FM	I and Pr	VI signa	is, Fi	M Transm	utter and	d FM re	eceive	er with	
Pulse M Principle pulse mo systems.	Ise Modulation & Demodulation nciples, generation and detection of PAM, PWM, PPM & PCM signals, noise in se modulation system, companding, delta modulation ,adaptive delta modulation tems. SECTION-B											
					SEC	CTIC	N-B					(A -)
Digital PSK, FS limit. Sig	modulat K, MSK gnal to N	, QAM loise Ra	hnique Error o tio.	s calculat	ions for	PSK	, FSK, M	SK, QA	M, Sha	nnon	's	(07)
Jultiplexing and Multiple Access Allocation of communication Resources, FDM/FDMA, TDM/TDMA, CDMA, SDMA, Jultiple Access Communications and Architecture Access Algorithms												(07)
Spread Spread S Hopped	Spectrum Spectrum Systems	m Tech Overvi , Synch	niques ew, Pse ronizati	eudonoi on of D	se Sequ S and F	ience FH sy	s, Direct S stems, Ja	Sequence	te and F Conside	reque eratio	ency ns,	(08)
RECON	MEND	ED BO	OKS									
S. No.			NAM	E				AUTHO	R(S)		PUBI	ISHER
1.	Principles of Communication Systems, Taub and Schilling Tata 2 nd Edition											
2.	Communication Signals and Systems, 1 st S. Haykins											'iley
3.	Principles of Digital Communication, 1 st J. Das, S.K. Mullick, P.K. New Edition Chatterjee Interna											
4.	Digit	al Com	municat	tions, 4 ^t	^h Editio	n	J	.G. Pro	akis		Tata N H	McGrav Hill
5.	I	Electror	ic Com	imunica	ition		George	e Kenne	dy and	B.	McGı	aw Hil
P() a	b	с	d	e	f	g	h	i	j	k	1
<u>co ></u>												
CO1	2			2								
CO2	2	2										
СО3	2				1							

CO4	1							
C05					2	2		
CO6		2			1		1	

51
g and Digital Communication ical)
Electronics
Build an understanding of the fundamental concepts of Modulation techniques. Familiarize the student with the basis terminology of the communication system.
successful completion of the cours ts are able to: Measure signal-to-noise ratio wi various equipment.
Design and measure AM, FM, QPS and spread spectrum communicati systems.
Identify and measure factors whi hamper communication systems.
Understand the basic concept bandwidth and filtering.
Distinguish between analog a digital communications.
di

- 1. To measure the modulation Index of AM signals using Trapezoidal Method.
- 2. To study the voltages and waveforms of various stages of an AM Superheterodyne Receiver.
- 3. To measure the sensitivity and selectivity of a Superheterodyne Radio Receiver.
- 4.
- To measure the fidelity of an AM Superhetrodyne radio Receiver. To study DSB/SC AM signal and its demodulation using Product Detector 5. Circuit
 - (i) with dedicated wire
 - with antenna (ii)
- 6. To study the Frequency modulation and Demodulation circuits.
- To study the Pulse Code Modulation (PCM) and de-modulation circuits. 7.
- 8. To study the Time Division Multiplexing (TDM) and De-multiplexing circuits.
- 9. To study delta and Sigma Delta modulation, demodulation circuits.

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2			1								
CO2	2	2	1	1								
CO3		1			1							
CO4		1										
CO5	1								1	1		

COURSE INFORMATION SHEET

Course Code	ITE302
Course Title	Data Structures and Algorithms (Theory)
Type of Course	Core
LT P	310
Credits	4
Total Lectures	45
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50
Course Prerequisites	Programming Fundamentals
Course Objectives	 To provide a knowledge regarding efficient storage of data for an ea access, how to represent the inherer relationship of the data in the real wor an efficient processing of data and hel in data protection and management. To teach students various data structur and to explain them algorithms in performing various operations on the data structures. To introduce the fundamentals of Da Structures, abstract concepts and he these concepts are useful in proble solving.
Course Outcomes	After completion of this course, the studen are able to:
	 Understand and calculate the complex of algorithms to analyse the time a space usage. Design and implement abstract data typ such as arrays, linked list, stack and que using static or dynamic memo allocation. Understand and implement binary tre binary tree traversals, binary search tre and related analysis to solve problems. IM. Implement graphs and graph algorithm and associated traversals to solve real 1 problems likes shortest path a Minimum Spanning Tree. Develop comparison-based sean algorithms like sequential search ordered lists, and binary searches as w as to implement various types of sorti algorithms including selection, insertio
	merge, and heap to solve problems

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro

Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

	SECTION-A		Hour					
Introdu	ction:		(01)					
Introduc	ction to data structures; Introduction to Algo	orithms Complexity						
Arrays, Concept data in t	Concepts; Basic operations & their algorithms: Transverse, Insert, Delete, Sorting of lata in these data structures; Prefix, Infix, Postfix Notations;							
Lists:			(10)					
Concepts of Link List and their representation; Two way lists; Circular link list; Basic pperations & their algorithms: Transverse, Insert, Delete, Searching and Sorting of data n List; Storage Allocation & Garbage Collection; Linked stack and queues; Generalized List; sparse matrix representation using generalized list structure;								
	SECTIO)N-R						
Trees: Binary applicat Heap & Tree	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr	and linked lists; Trees and their eting and searching in binary tr ee; Height balance Tree (AVL	(08) r ees; .); B-					
Trees: Binary T applicat Heap & Tree. Graphs Graphs; first sea	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch: Breadth first search	and linked lists; Trees and their eting and searching in binary tr ee; Height balance Tree (AVL	r ees; .); B- Depth (08)					
Trees: Binary 7 applicat Heap & Tree. Graphs Graphs; first sea Sorting	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching:	and linked lists; Trees and thein eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests;	r rees; .); B- Depth (10)					
Trees: Binary 7 applicat Heap & Tree. Graphs Graphs; first sea Sorting Insertion Search	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching: n sort; Selection sort; Merging; Merge sort; Indexed Search: Hashing schemes: Binary	and linked lists; Trees and their eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests; Radix sort; Sequential & Bina	r ees; .); B- Depth (08) (08) (08) (08) (10) (10)					
Trees: Binary 7 applicat Heap & Tree. Graphs Graphs; first sea Sorting Insertion Search; BECCO	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching: n sort; Selection sort; Merging; Merge sort; Indexed Search; Hashing schemes; Binary MMENDED POOKS	and linked lists; Trees and their eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests; Radix sort; Sequential & Bina search Tree.	r ees; .); B- Depth (08) (08) (08) (08) (10) (10)					
Trees: Binary f applicat Heap & Tree. Graphs; first sea Sorting Insertion Search; RECOM	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching: n sort; Selection sort; Merging; Merge sort; Indexed Search; Hashing schemes; Binary MMENDED BOOKS	and linked lists; Trees and their eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests; Radix sort; Sequential & Bina search Tree.	r ees; .); B- Depth (08) (08) (08) (08) (10) (10) (10) (10)					
Trees: Binary applicat Heap & Tree. Graphs Graphs; first sea Sorting Insertion Search; <u>S. No.</u> 1	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching: n sort; Selection sort; Merging; Merge sort; Indexed Search; Hashing schemes; Binary MMENDED BOOKS NAME Data Structure Using C and C++	and linked lists; Trees and their eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests; Radix sort; Sequential & Bina search Tree. AUTHOR(S) A. Tanenbaum, Y. Langsam M. L. Augenstein	r (08) r ees; .); B- Depth (08) ury (10) PUBLISHER Prentice Hall of India					
Trees: Binary applicat Heap & Tree. Graphs Graphs; first sea Sorting Insertion Search; RECON S. No. 1	Trees and their representation using arrays a ions; Binary tree transversal; Inserting, dele Heap Sort; General Trees; Thread binary tr and their applications: Linked Representation of Graphs; Graph T rch; Breadth first search. & Searching: n sort; Selection sort; Merging; Merge sort; Indexed Search; Hashing schemes; Binary MMENDED BOOKS NAME Data Structure Using C and C++ Theory and problems of Data Structures	and linked lists; Trees and their eting and searching in binary tr ree; Height balance Tree (AVL Traversal and spanning forests; Radix sort; Sequential & Bina search Tree. AUTHOR(S) A. Tanenbaum, Y. Langsam, M. J. Augenstein Seymour Lipschutz	r ees; .); B- Depth (08) (08) (08) (08) (10) (10) (10) PUBLISHER Prentice Hall of India McGraw Hill					

PO CO	a	b	c	d	e	f	g	h	i	j	k	
C01	2				1							
CO2			2	1								

CO3			1	2				
CO4	1	2	1	1				
CO5			2	1	1			

Course Code	ITE352
Course Title	Data Structures and Algorithms (Practica
Type of Course	Core
LT P	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Programming Fundamentals
Course Objectives	 To impart knowledge about developing recursive as well as non-recursive algorithms and to gain the knowledge different data structures. To be able to Choose the appropriate distructure and algorithm design method a specified application and to devel skills to design and analyze simple liming and non linear data structures, To strengthen the ability to identify a apply the suitable data structure for given real world problem and to gak knowledge in practical applications data structures.
Course Outcomes	 After completion of this course, the student are able to: Calculate the complexity of algorithms implementing different data structures. II. Implement traversal, insertion, deleted and searching operations on basic d structures such as arrays, lists, tree stacks, queues, binary search trees, a hash tables. III. Incorporate data structures into applications they write. IV. Implement various searching and sortialgorithms. V. Understand and apply fundament algorithmic problems including Traversals, Graph traversals, and short

							p	aths.			
					SJ	LLAB	US				
List of	Progra	ams:									
1.	Implei from a	mentation given lo	on of A	rray O Sparse	peratio Matrice	n: Trav s: Multi	ersal, Ir plicatio	nsertion n. additio	& Dele on.	tion at	and
2.	Stacks Postfix	E Imple	mentati ation of	on of Postfix	Push, F Express	Pop; Co ions.	onversio	n of Ir	ıfix exp	pression	n to
3.	Queue elemer	s: Addints.	ng, De	leting E	lements	s; Circu	lar Que	eue: Ad	ding an	d Dele	ting
4.	Impler Impler	mentation nentation	on of L	inked icks and	Lists: In queues	nserting s using	, deletii linked	ng, inve lists; Po	rting a lynomia	linked al addit	list. ion,
5	Polync	mial mu	iltiplica	tion.		D:	Jaamah 7	Faces D			Tan
Э.	Decure	Implen		n ol Bli Traca	$ary \alpha$	Binary 3	Search	rees, K	ecursive	e and r	von-
6	Cronk	DES		TTess.							
0. 7	Impler	nontatio	a Dro n of sor	ting and	saarahi	ng algor	ithms				
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0.	sorting	technia	nes	CIItatio	n. Scar	uning, n	iscitting	and der	cung, s	carciiii	gæ
	sorting	, teening	ues.								
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PO											
	a	b	c	d	e	f	g	h	i	j	k
									-		
01	2										
								1	1		

CO3

CO4

CO5

COURSE INFORMATION SHEET

Jourse Code	ITE303
Course Title	Digital Electronics (Theory)
Гуре of Course	Core
СТР	310
Credits	04
Fotal Lectures	45
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50
Course Prerequisites	Basic Electronics
Course Objectives	The objective of this course is to provi students in-depth theoretical base of digi- electronics.
Course Outcomes	 After completion of this course, the studer are able to: Explain the basic concepts of digitelectronics like number systems, log gates, Boolean algebra, K-maps etc. Elaborate the concepts of combination and sequential circuits, their types a designing. Identify the need of various type counters & converters and elaborate the designing & functioning. IV. Outline and compare various types logic families, their characteristics a comparison. V. Explain, design and analyze fundamen concepts of memory organization a their different types.
SYLL	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hours
Introduction	(10)
Representation of Logic, Logic Variables, Boolean Algebra, Boolean Expressions and minimization of Boolean expression using K-Map, Review of Logic Gates & Flip- flops, design & Implementation of Adder, Subtractor, Multiplexer, DeMultiplexer, Encoder, Decoder, ROM, Digital Comparators, Code Converters	
Number Systems and Codes Decimal, Binary, Hexadecimal, Octal's complement, 2's complement, addition and subtraction, weighted binary codes, Error detecting codes, Error correcting codes, Alphanumeric codes.	(07)
Counters & Shift Registers	(07)
	29

	1			
	esign of registers	unter, Up-Down counter, de conditions, design of shift r Universal shift Registers.	Counters, Design of Modulo-N ripple co ous counters with and without lockout t-left, shift-right & parallel load facilities.	Ripple (synchro with shi
	I	ON-B	SECTI	
(07)	pe; A/D on type,	ted type, R-2R Ladder type, Successive approximation	nverters & Hold switch, D/A converters: weighters: Counter-Ramp type, Dual Slope Ty e; Specifications of ADC & DAC	Data Co Sample Convert flash typ
(06)	on delay, pull up, eteristics	ower dissipation, propagatio TL NAND Gate with active AOS. Comparison of Charac	Logic families ristics of digital circuits: fan in, fan-out, p rgin; Transistor-transistor Logic(TTL), T and output Characteristics, MOS and CM ECL, MOS & CMOS logic circuits	Digital Character noise m its input of TTL,
(04)	nisation,	g ic atic RAM, Memory Orgar & FPGA.	ductor Memories & Programmable Lo ROM, EPROM, EEPROM; RAM: St & Writing Operation in RAM, PLA, PAI	Semicon ROM, Reading
(04)		nt, Design Procedure.	nous sequential logic al circuits, State Reduction and Assignme IMENDED BOOKS	Synchro Sequent RECO
SHER	PUBLIS	AUTHOR(S)	NAME	S. No.
ce Hall ndia	Prentic	William H. Gothmann	Digital Electronics – An introduction to theory and practice, 2^{nd} Edition	1.
lcGraw	Tata M Hill	R.P.Jain	Modern Digital Electronics	2.
1cGraw	Tata M Hill	Herbert Taub& Donald Schilling	Digital Integrated Electronics	3.
1cGraw-	Tata M	Millman&Halkias	Integrated Electronics	4.
	Hill			
e Hall	Hill Prentic India	R J Tocci	Digital System Principles & Applications	5.

РО СО <	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2	2	2	1								
CO2	2	2		2	2							
СО3	2		2	1	2							

CO4	2	2	1	1				
C05	2	2	2	1	2			

Course Code	ITE353
Course Title	Digital Electronics (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Basic Electronics
Course Objectives	 The aim of this course is to provide understanding of the fundamentals of digit logic design to the students through practic training. The student is given hands-o experience on the usage of ICs and design circuits using gates, flip-flops, multiplexers as to enhance the theoretical study of t subject. The objective of this course is: To practically experiment the working of basic logic gates. To have knowledge of working an application of flip-flops. To appreciate the difference betwee combinational and sequential circuand be able to design, minimize an build both. To understand the need and use multiplexers, demultiplexers, encode and decoders. To learn to convert data from analyto digital form and vice-versa.
Course Outcomes	 After completion of this course, the studer are able to: Know how to make use of hardware kinds in ICs for testing and debugging circuits. II. Know how to design building block digital circuits i.e. gates, flip-flops. III. Design, testing and analyzing of media complexity combinational and sequent digital logic circuits using gates and flops. IV. Design, testing and analyzing different types of converters.
SYLL	ABUS
Note: Do any eight experiments. List of Experiments: 1. To Study data sheets and truth tables of AND	, OR, NOR, NAND, NOT and XOR

Gates.

- To verify the truth tables of RS, D, JK and T Flip Flops
 To fabricate and test the truth table of half/full adder.
- 4. To design and implement a Modulo-N Counter
- To Design and implement a Universal shift register
 Design & fabrication of synchronous counter.
- 7. Design & fabrication of Combinational circuits using Multiplexers.
- 8. To convert 8 bit Digital data to Analog value using DAC
- 9. To convert Analog value into 8 bit Digital data using ADC

10. To design and fabricate the given sequential circuits using Flip-flops as memory elements.

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
CO1		2			1							
CO2		2	1		1							
CO3		2	1	2	2							
CO4		2	1	2	2							

SYLLABUS FOR B.E. (I.T.) FOURTH SEMESTER

COURSE INFORMATION SHEET

Course Code	ITE401					
Course Title	Analysis and Design of Algorithms (Theory)					
Type of Course	Core					
LTP	300					
Credits	03					
Total Lectures	45					
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50					
Course Prerequisites	Programming fundamentals Mathematics					
Course Objectives						
Course Outcomes	I.					
SYLLABUS						

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Analysis of algorithm	10
Role of Algorithms in Computing; Growth of functions: Asymptotic Notation, Standard	
notation, Performance measurements Introduction to Recurrences: substitution method,	
recursion-tree method, master method; Algorithms;	
Divide and Conquer Method	8
General Method, Binary Search, Matrix Multiplication, Merge Sort, Quick Sort and	
their performance analysis	
Greedy Approach	8
Elements of Greedy strategy, Knapsack problem, Single source Shortest paths problem,	
Minimum Spanning tree problem and analysis of these problems.	
SECTION-B	
Dynamic Programming	10
General Method, Multistage Graph, All Pairs Shortest Path Algorithm, 0/1 Knapsack	
Problem, Traveling Salesman Problem	
Backtracking	8
The General Method , 8-Queens Problem- Sum of Subsets ,Knapsack	
P and NP Problems	6
Polynomial time, Nondeterministic Algorithms and NP, Reducibility and NP	
completeness, NP complete Problems	
RECOMMENDED BOOKS	

S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	Fundamentals of Computer Algorithms	Ellis Horowitz, Sartaj Sahni	Galgotia
2.	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest	Prentice Hall
3.	The Design and Analysis of Computer Algorithms	Aho A.V., Hopcroft J.E., Ullman J.D.	Pearson Education
4.	Fundamentals of Algorithmics	Gilles Brassard & Paul Bratley,	Prentice Hall
Course Code	ITE402		
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Course Title	Discrete Mathematics (Theory)		
Type of Course	Core		
LT P	310		
Credits	04		
Total Lectures	45		
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50		
Course Prerequisites	Mathematics		
Course Objectives	 To provide the knowledge of computational foundation of computation computations. To make them familiar with some ba foundation of Artificial Intelligence. 		
Course Outcomes	 I. Understand the notion mathematical thinking, mathematical thinking, mathematic proofs, and algorithmic thinking, a be able to apply them in proble solving. II. Understand the basics of discreprobability and number theory, and able to apply the methods from the subjects in problem solving. III. Use effectively algebraic techniques analyse basic discrete structures a algorithms. IV. Understand asymptotic notation, significance, and be able to use it analyse asymptotic performance some basic algorithmic examples. V. Understand some basic properties graphs and related discrete structur and be able to relate these to practic examples. 		
SYLL	ABUS		

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Principles of Counting - I: Rule of Sum and Product, Permutations, Combinations,	(05)
Combinations with repetition (Scope as in Chapter 1, Sections 1.1 - 1.4 of Reference	
1).	

AUTHOR(S)	PUBLISHE
napter 15, sections 15.1 –	15.4 01
port networks: The Max-Flo	w Min-
Path Algorithm, Minimal Sp	panning
l.	*
ed trees, Trees and Sorting (S	cope as
eference 1).	Ionnais
ouring and Chromatic poly	, Planar
ions and examples, Sub	graphs, (11)
. 1 1 01	1 (14)
unctions (Scope as in Chap	oter 10,
coefficients, The non homog	geneous
nce relation. The second orde	er linear
ne summation operator (Scoj	pe as m
Calculational Techniques, Pa	irtitions
of Reference 1).	
als, Arrangements with for	rbidden
le of Inclusion and Exe	clusion, (11)
)N-B	
······································	
cope as in Chapter 7 Section	18 7 1 –
irected Graphs Partial orders	· Hasse
note principle. Function components $5.1 - 5.6$ of Paferance 1)	position
d Relations, Functions, One	-to-one (09)
ctions $2.1 - 2.5$ of Reference	1).
ence, Use of Quantifiers, Def	initions
	ence, Use of Quantifiers, Def ctions 2.1 – 2.5 of Reference id Relations, Functions, One hole principle. Function comp ons 5.1 – 5.6 of Reference 1). irrected Graphs, Partial orders cope as in Chapter 7, Section DN-B ble of Inclusion and Exc ials, Arrangements with fo of Reference 1). Calculational Techniques, Pa The summation operator (Scop nce relation, The second order coefficients, The non homog functions (Scope as in Chap ions and examples, Sub gree: Euler trails and circuits, ouring and Chromatic polyne efference 1). ed trees, Trees and Sorting (S). Path Algorithm, Minimal Sp port networks: The Max-Flo hapter 13, Sections 13.1 – AUTHOR(S)

S. No.	NAME	AUTHOR(S)	PUBLISHE
1	Discrete and Combinatorial Mathematics, Fourth Edition,2002	Ralph P. Grimaldi	Pearson Education
2	Discrete Mathematical Structures, Fifth Edition, 2004	B. Kolman, R. C. Busby, S. C. Ross, Nadeem-ur- Rehman	Narosa Publishing House
3	Discrete Mathematics for Computer Scientists and Mathematicians, Second Edition, 2003	J. L. Mott, A. Kandel, T. P. Baker.	Prentice-Hall India
4	Elements of Discrete Mathematics, Second Edition, 2000	C. L. Liu.	Tata McGra Hill
5	Discrete Mathematics, Second Edition, Schaum's Outlines	S. Lipschutz, M. Lipson	Tata McGra Hill

ро Со _	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2			2	1							
CO2	2			2	1							
CO3	2				2							
CO4	1			2	2							
CO5	2				2							

Course Code	ITE403
Course Title	Cyber Laws & IPR (Theory)
Type of Course	Core
LTP	300
Credits	03
Course Assessment Methods End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50
Course Prerequisites	Computer Networks
Course Objectives	 To familiarize students with the dynami of Cyber Law with a focus on new forr of cybercrime, To establish a basic knowledge on t technical side of Cyber Law, To give an update of recent Cyber Law developments and case law make studer conversant with the social and intellectu property issues emerging fro 'Cyberspace; Explore the legal and policy development in various countries to regula Cyberspace; Develop the understanding of relationsh between commerce and cyberspace; a give students in depth knowledge Information Technology Act and leg frame work of Right to Privacy, Da Security and Data Protection.
Course Outcomes	 The students should be able to: Describe the need for cyber law Get familiarize with the dynamics Cyber Law with a focus on new forms cyber crime. III. Get established a basic knowledge on t technical side of Cyber Law IV. Have an update of recent Cyber La developments and case law V. Get engaged with today's Cyber Lar reality and debates VI. Work on tools for further study of Cyb Law
SYLI	ABUS
Notes The succession shall set server succession	and the mention and First succession has to

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt 39

least ty paper.	wo questions from each part. All the cou	rse outcomes must be covere	d by the qu	esti	
	SECTI	ON-A			
Basics	of Computer & Internet Technology		8		
Interne Algorit	t, ISP & domain name; Network Security; hms; Digital Signatures	Encryption Techniques and			
Introd	uction to Cyber World		3		
Introdu Cyber	action to Cyberspace and Cyber Law; Diffe Law and Netizens	rent Components of cyber Law	/s;		
Cyber Law and Netizens E-Commerce Introduction to E-Commerce; Different E-Commerce Models; E-Commerce Trends and Prospects; E-Commerce and Taxation; Legal Aspects of E-Commerce.					
- -	SECTI	ON-B			
Intelle IPR, C Patents	ctual Property Rights opyright and Patents, International Treaties s, Domain Name Disputes and Resolution.	and Conventions, Business So	oftware 11		
IT Act Reason Certify Crimes	, 2000 Is, Aims, Objectives and Applications, Reging Authority, Digital Signature Certificates -Offences and Contraventions, Grey Areas	ulators under IT Act, Role of s, Duties of the Subscribers, C of IT Act.	yber		
Projec Candid make a	t Work lates will be required to work on a project. presentation and submit the project report.	At the end of the course, studen	4 nts will		
RECO	MMENDED BOOKS				
S. No.	NAME	AUTHOR(S)	PUBLISHE	R	
1	A Guide to Cyber Laws & IT Act 2000	NandanKamath	Universal La	aw	

S. No.	NAME					A	UTHOI	R(S)		PU	JBLISI	HEF	
1	A Guide with Ru	A Guide to Cyber Laws & IT Act 2000 with Rules & Notification						amath	Uı Pu	Universal Law Publishing			
2	Cyber C Internet	Cyber Cops, Cyber Criminals & Internet					Keith Merill&Deepti Chopra				I K International		
3	Informa	Information Technology Law					Diane Row Land, Routledge-Cavendish						
4	Handbo	Handbook of Cyber Laws				Va	Vakul Sharma				McMillian		
CO I	PO a	b	c	d	e	f	g	h	i	j	k		

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CO1	1				2	2		
CO2	1				2	2		
CO3	2				1			
CO4					2	1		1
C05				2		1		
CO6			2		2			

Course Code	ITE404
Course Title	Microprocessor (Theory)
Type of Course	Core
LT P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Digital Electronics
Course Objectives	 To familiarize students w Microprocessor 8085 and interfacing 8085 with various peripheral devices. To write programs in assembly languag
Course Outcomes	 After completion of this course, the studen are able to: Understand architecture microprocessor. Understand interfacing input devic output displays and memory. Understand concept of counters and the delays. Understand the concept of stac subroutine, vectored and non vector external interrupts. Understand the basic assembly langua programming. This is initial step
SYLL	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Microprocessor Architecture and Microcomputer Systems:	(06)
Adress/Data Buses, Concept of demultiplexing of Buses, Control and status signals,	
Registers, Ports, Flags, Instruction Decoding and Execution, memory Interfacing	
Interfacing I/O Devices Basic Interfacing Concents Interfacing Output Displays Interfacing Input Devices	(06)
Memory- Mapped I/O	

Progra Introdu Model, Arithm Langua	Instruction for the second sec	ning the 8085: on to 8085 Assembly Language Programming, The 8085 Programming struction Classification, Instruction Format. Data Transfer (Copy) Operations, c Operations, Logic Operations, Branch Operations, Writing Assembly Programs.									g s, y	(07)	
Progra Progra and 16 Operat	Programming Techniques with Additional Instructions: Programming Techniques Looping, Counting and Indexing, Additional Data Transfer and 16-Bit Arithmetic Instructions, Arithmetic Operations Related to Memory, Logic Operations.										er c	(06)	
					SE	СТІО	N-B						
Counte Counte Pulse V	Counters and Time Delays: Counters and Time Delays, Hexadecimal Counter, Modulo Ten, Counter, Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs									g ((06)		
Stack :	and Su	broutin	ies:	101	1.0. (T (((04)	
Stack,	Subrou	tine, Co	ndition	al Call a	nd Retu	rn Insti	uctions					(03)	
The 80	85 Inter	rrupt, 80	085 Vec	ctored in	terrupts.	•					`		
Genera Block Interfac commu	General –Purpose Programmable Peripheral Devices: Block Diagram, Working and Control word of: The 8255A Programmable Peripheral Interface, The 8259 A Programmable Interrupt Controller, Programmable communications interface 8251.									ıl e	(07)		
RECU S No	KECOMMENDED BOOKS S. No. NAME AUTHOD(S)									PI	BLISHER		
1	Prog	Microp grammir	processong and A	or Archit Applicati	ecture, ons with	h the	Ran	esh S.G	aonkar	ionkar PHI			
2	A	8085 Advanced Microproce Advanced Microprocessors & Interfacing ssors& Interfacing							Badri Ram Tata				
3		Microp	orocesso	r Princip	oles and		Cha	rles M.C	Gilmore	Ta	a McC	a McGrav	
4	1	Micropr progra	ocessor amming	s and Int	terfacing dware	3	Do	ouglas V	. Hall	Ta	ta McC Hill	Grav	
PO CO	a	b	c	d	e	f	g	h	i	j	k	I	
C01	2		1										
CO2	CO2 1 2 1												
CO3	1		1										

CO4		1	2				
CO5		1	1				

Course Code	ITE454							
Course Title	Microprocessor (Practical)							
Type of Course	Core							
LT P	003							
Credits	02							
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical) Course Prerequisites Course Objectives	00 50 Digital Electronics 1. To develop, key-in, test and troublesh the assembly language program a machine level program on 8085 kits.							
Course Outcomes	 After completion of this course, the studer are able to: Implement basic programs in assemble language of 8085 microprocessor. Implement programs for counters at time delays in assembly language. Implement programs for stack subroutines. IV. Implement programs for vectored and memory with 8085 microprocessor. 							
1 List of Experiments:	2							
2 Eamiliarization of 8085 kits								
 Painmarization of avithmetic and logic ope programs) 	rations using above kits.(At least 5							
 Development of interfacing circuits of v 8085. 	arious control applications based on							
 Application of assembly language using 80 programs. 	085 instructions set to develop various							
6. Applications of data movement instruction	s to develop relevant programs.							

ро со _	a	b	c	d	e	f	g	h	i	j	k	
CO1	2		1									
CO2	1	2	1									
СО3	1		1									
CO4			1		2							
CO5			1		1							

Course Code	ITE405
Course Title	Computer Networks (Theory)
Type of Course	Core
LTP	300
Credits	03
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Computer Fundamentals
Course Objectives	 This course is to provide students with overview of the concepts and fundamentals data communication and computer networl the main course objectives are: Build an understanding of the fundamental concepts of computer networking. Familiarize the student with the basis taxonomy and terminology of the computer networking area. Introduce the student to advanced networking concepts, preparing the student for Entry Advanced courses in computer networking.
Course Outcomes	Students are expected to accomplish the

	follow	ring objectives through this course:
	I.	Understand basic concepts of computer network including switching and multiplexing and identify the different types of network topologies, protocols and various propagation medias.
	II.	Enumerate the layers of the OSI model and TCP/IP and explain the functions of each layer.
	III.	Apply knowledge of different technique of flow control and error control during data transmission and illustrate various protocols of data link layer and MAC sublayer.
	IV.	Identify the design and implementation issues of network layer and compare various routing protocols.
	V.	Implement various congestion control mechanism at network layer and transpo- layer.
	VI.	Understand the functioning of transport layer and compare the IP, UDP and TCF
	VII.	Discover the different application layer protocols for communication.
SVI I AI	BUS	
SILLA		

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction: Basic concepts of computer networks, switching; multiplexing; Network Hardware: LAN, MAN, WAN, Wireless networks, Internet; Network Software: Layer, Protocols, interfaces and services; Reference Model: OSI/TCP/IP and their comparison.	(08)
Physical Layer: Transmission media: Magnetic, Twisted pair, coaxial cable, fiber optics, wireless transmission (radio, microwave, infrared, light wave). Circuit Switching & Packet Switching. Introduction to ATM, ISDN (Narrowband & Broadband), Cellular radio and communication satellites.	(08)
Data Link Layer: Framing; Error control; Error correction & Detection; sliding window protocols (one bit, Go back n, selective repeat); Examples of DLL Protocols-HDLC, SLIP; Medium Access Sub layer: Channel Allocation, MAC protocols -ALOHA, CSMA protocols, Collision free protocols, Limited Contention Protocols, Wireless LAN protocols, IEEE 802.3, 802.4, 802.5 standards and their comparison. Bridges: Transparent, source routing, remote.	(09)

SECTION-B						
Network Layer:	(09)					
Design issues, routing algorithms (shortest path, flooding, flow based, distance vector, hierarchical, broadcast, multicast, for mobile hosts).Congestion control algorithms (Leaky bucket, Token bucket, Choke, Packet, Load shedding).						
Transport Layer:	(06)					
Addressing, establishing and releasing connection, flow control & buffering, multiplexing, crash recovery, Internet Transport protocol (TCP and UDP).						
Application Layer:	(05)					
Network Security; Domain Name System; Simple Network Management Protocol; Electronic Mail.						
RECOMMENDED BOOKS						

S. No.	NAME	AUTHOR(S)	PUBLISHER
1	. Computer Networks, 4 th Edition	Andrew S. Tanenbaum	Prentice Hall India
2	Data and Computer Communications	William Stallings	Prentice Hall India
3	Internet working with TCP/IP	Douglas E. Coomer	Prentice Hall India
4	Design & Analysis of Computer Communication Networks	Vijay Ahuja	McGraw Hil
5	Data & Computer Communication	Douglas E. Coomer	Addition Wessley

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
C01	2		1	2	2	1	2		1		1	
CO2			2	1	2							
СО3	1	1		2	1		1					
CO4	1	2	2		1	1	1				1	
C05		1	2		2						1	

CO6	1	2		2			1	
CO7	1	2	2	2			1	

Course Code	ITE455					
Course Title	Computer Networks (Practical)					
Type of Course	Core					
LTP	003					
Credits	02					
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical) Course Prerequisites	00 50 Computer Fundamentals					
Course Objectives	 This course is to provide practical knowled of networking concepts and components. T course is efficient to gaining networki vocabulary and awareness. The aims of course are: To provide students with a practic base in computer network issues. To learn about transmissi media(wireless and wired media) a internetworking devices(bridges, hull switches, routers, etc.) To learn about various troubleshooti commands 					
Course Outcomes	 After completion of this course, the studen are able to: Understand practically how compute network are designed and their working Know the procedure how to form cab with crimping tools and RJ-45 connecte How and when to use troubleshooti commands like ping, ipconfig, etc. IV. Various internetworking tools and the working. 					
SYLI	LABUS					
List of Practicals: 1. To familiarize with the various basic to LAN.	ools (crimping, krone etc.) used in establishing					

2. To familiarize with switch (manageable & unmanageable), hub, connecters, cables (cablin

standards) used in networks.

- 3. To familiarize with routers & bridges.
- 4. To use some basic commands like ping, trace-root, ipconfig for trouble shooting netwo related problems.
- 5. To use various utilities for logging in to remote computer and to transfer files from / remote computer.
- 6. To develop a program to compute the Hamming Distance between any two code words.
- 7. To develop a program to compute checksum for an 'm' bit frame using a generat polynomial.
- 8. To develop a program for implementing / simulating the sliding window protocol.
- 9. To develop a program for implementing / simulating a routing algorithm.
- 10. To study various IEEE standards (802.3, 802.4, 802.5, 802.11)
- 11. To develop a program for implementing/simulation the ALOHA protocol

ро со _	a	b	c	d	e	f	g	h	i	j	k	1
CO1		2	2		1	2	1					
CO2			2	1	1							
СО3				2	1		1					
CO4			2	2	2		1				1	

Course Code	ITE406
Course Title	Computer Architecture & Organisation
	(Theory)
Type of Course	Core
LT P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Digital Electronics (IT335)
Course Objectives	 To understand instruction executivity through instruction cycles, basic concurst and implementation of interrupts, and control and data transfers, functioning ALU and control unit. To understand instruction set designing, RISC architecture as superscalar architecture as well different mechanisms used for read/we operations in the memory design.
Course Outcomes	 Upon successful completion of the cour students are able to: Have knowledge of the major compone of a computer including CPU, memo I/O, and storage. Made to design of high speed adders a multipliers. Design effectively assembly langua programming techniques. Have a detailed knowledge of I organisation, CPU instruction set a addressing modes. Compute cost estimation of effici computer architecture. Work effectively as an individual and a team
SYLL	ABUS
Note: The examiner shall set seven question	s of 10 marks each First question has to

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

	SECTION-A	Hour
	Design Methodology	(04)
	System design, Design levels- Gate level, Register level, Processor level.	
	Basic Computer Organization & Design	(08)
	Instruction codes, common bus system, computer instruction, Design of basic	
Ì		

Control Design	
Basic concepts, Hardwired control, Micro programmed control, Design of control unit.	
Central Processing Unit	
Introduction, General reg. Organization, Inst. Formats Addressing modes, Data transfer & manipulation, RISC & CISC Characteristics.	
SECTION-B	
Input-Output Organization	
I/O interface, Modes of transfer, Priority interrupts, DMA, I/O processor.	
Memory Organization	
Memory hierarchy, Main memory, Auxiliary memory, Associative memory. Cache memory, virtual memory, Memory management H/W.	
Parallel Processing	
Introduction, Multiprocessors, Interconnection structure.	
RECOMMENDED BOOKS	
C NA NAME AUTIOD(C) DUDI	ГT

S. No.	NAME	AUTHOR(S)	PUBLISHER
1	Computer Architecture & Organization	J.P Hayes	Tata McGrav
			Hill
2	Computer System Architecture	Morris Mano	PHI
3	Advanced Computer Architecture	Kai Hwang	Tata McGrav Hill
4	Computer Organization and Architecture	William Stallings	PHI

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
CO1	1											
CO2	1		1									
CO3	1		1									
CO4			1									
C05		1	1							1		

	CO6	2		2	2	2							
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Course Code		ITE407						
Course Title		Educa	tional To	our				
Type of Course		Core						
LTP		000						
Credits		Non- C	redit					
Course Assessment Methods:								
End Semester Assessment (University	Exam.)	00						
Continuous Assessment		50						
Course Prerequisites		Nil						
Course Objectives		1.	To enal regarding environm functiona To pro opportun through and emp	ole stu g the nent ality of ovide iity to interact loymen	dents of compar studen o lea tion, we	to get rnal a comp ny. nts w rn pr orking ces.	insig workin any any ith actical metho	
		Upon s able to:	uccessfu	l compl	letion, 1	the stud	lents a	
		I. II. III.	Motivate advantag presented Bring a c cannot b Make different experien	e and ge of all d. dimensi e gained connec aspect ce.	help learnir on to ea d in the ctions s of th	to ta ng oppo ducation classro betwee neir edu	ke fu rtuniti n, which om. en the acation	
				1	1	1	1	
PO b c d			h			1.	, I	
	ет	9	I N			I K		

<u>со</u>	a	b	c	d	e	f	g	h	i	j	k	1
CO1	1		2	2	2	1	1					1
CO2		2	2	2	2	1	1					

SYLLABUS FOR B.E. (I.T.) FIFTH SEMESTER

Course Code Course Title Type of Course L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	IT531 Data Base Management Systems (Theor Core 3 0 0 03 45 50 50 50 50 50 50 50
Course Title Type of Course L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	Data Base Management Systems (Theor Core 3 0 0 03 45 50 50 50 Computer Fundamentals
Type of Course L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	Core 3 0 0 03 45 50 50 Computer Fundamentals 50
L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	300 03 45 50 50 Computer Fundamentals
Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	03 45 50 50 Computer Fundamentals
Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	45 50 50 Computer Fundamentals
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	50 50 Computer Fundamentals
End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	50 50 Computer Fundamentals
Continuous Assessment (Sessional) Course Prerequisites Course Objectives	50 Computer Fundamentals
Course Prerequisites Course Objectives	Computer Fundamentals
Course Objectives	e e inpater i anaantentais
	 To expose the student to the b concepts involved in designing building a database management sys and to make them learn how to use Structured Query Language (SQL). To understand the relational model relational database management sys detailed knowledge of transact concurrency and recovery strategies DBMS and knowing the importance normalization for DBMS and differ normalization techniques.
Course Outcomes	 Upon successful completion of the coustudents are able to: II. Understand the basic concepts of database management system and components. III. Understand the relational data more entity-relationship model and process relational database design. Design en relationship diagrams to represent sin database application scenarios. IV. Improve a database design normalization. V. Understand the concept of a transac and different techniques for concurre control. VI. Construct a relational database
	formulate SQL and PL/SQL querie manipulate and access the data. VII. Learn how to write basic queries
SYLL	formulate SQL and PL/SQL querie manipulate and access the data. VII. Learn how to write basic queries relational algebra.

COURSE INFORMATION SHEET

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt

	SECTION-A		Hou
Data Ba Data Ba General	se Concept: se Vs file oriented approach, Basic DBM Architecture of a Data Base Management S	S terminology, Data independenc oftware, Components of DBMS.	e, (04)
Data Ba Introduc Diagram	se Design: tion to Data Models, Entity Relationshi s, Conceptual Design of a relational data ba	o Model, Entities, Attributes, E- ase model	(05) R
Data No Introduc Boyce C	ormalization: tion, Keys, First Normal Form, Second odd Normal form, Denormalization, case s	Normal form, Third Normal forr rudies of Data Normalization	n, (06)
Transac Schedule granular	tion Processing Concepts: es and recoverability, serializability, locki ity, multiversion concurrency control.	ng techniques, timestamp orderin	(06) g,
	SECTIO	N-B	
Structur Introduc rows, W of a Qu Update & Equi Jo Minus; I Group F	red Query Language (SQL):. tion to SQL, Data types, Querying datab orking with Null Values, Matching a patte ery, Aggregate Functions, Grouping the F & Delete statement, Alter & Drop statemen ins, Inner Joins, Outer Joins, Self Joins; NestedQueries. Functions: Arithmetic, Cha unctions	ase tables, Conditional retrieval or rn from a table, Ordering the Resu tesult of a Query, Insert statemer ts, Querying Multiple Tables: Join SET Operators: Union, Intersec racter, Date and General Function	(08) of ilt it, s, et, s;
Data Ma Data De Another Row(s) Base tab VIEW, I	anipulation and Control: finition Language (DDL), Creating Table table, Inserting Values into a Table, Upda From a Table, Dropping a Column, Introd ole(s) through VIEWs, Rules of DML Stat Inline Views, Materialized Views. Databas of REVOKE Command, COMMIT and RC	s, Creating a Table with data fro ting Column(s) of a Table, Deletir uction to VIEWs, Manipulating the ements on Join Views, Dropping se Security and Privileges, GRAN DUBACK	(08) m ng ne a T
PL/SQL Introduc of PL/SQ Variable PL/SQL PL/SQL Pl/SQL;	tion to PL/SQL, PL/SQL Block Structure, J QL, PL/SQL Data Types, Variables and C Assignments and Expressions, Operat Variables, Built-in-Functions, Conditional Writing PL/SQL Code, Composite E Cursor Manipulation, Implicit Cursor Predefined Exceptions, User Defined Exce	PL/SQL Architecture, Fundamenta constants, Scope and Visibility of or Precedence, Referencing Nor and Iterative Control, SQL With batatypes. Cursor Management Attributes, Exception Handling ptions.	(06) ls a n- in in in in
Relation Relation Calculus	al Queries: al Algebra and Calculus, Preliminarie , Expressive Power of Algebra and Calculu	s, Relational Algebra, Relation s, Points to review.	al (02)
RECON	IMENDED BOOKS		
S. No.	NAME	AUTHOR(S) P	UBLISHER
1	An Introduction to Database Systems, 8 th Edition	C.J. Date	Pearson

2	Schaum's Outlines Fundamentals of Relational Databases, 3 rd Edition	Toledo	Tata McGrav Hill
3	Database Management Systems, 2 nd Edition	James Martin	PHI
4	Data Base Management Systems, 3 rd Edition	Raghu Ramakrishnan and Johannes Gehrke	McGraw Hil
5	Introduction to Data Base Systems, 3 rd Edition	Bipin C Desai	Galgotia Publications

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	1			1								
CO2		1	1	2	1							
CO3	1	1	1	2								
CO4	1	1	1	2								
CO5		2	2	1	2							
CO6	2	1	1	1								

Course Code	IT 581
Course Title	Data Base Management Systems (Practical)
Type of Course	Core
LT P	003
Credits	02
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	00 50 Computer Fundamentals 1. To use the Oracle and SQL databa systems along with hands on experier on DDL, DML as well as DO Commands. 2. To make students able to implement nested queries and various function based on programming assignments.

Course Outcomes	Upon successful completion of this cours
	students will be able to:
	I. To use the Oracle 10g RDBMS f creating a simple relational databa using DDL commands.
	II. To create and execute queries using
	basic and advanced SELEC statements.
	III. To perform join operations relational tables
	IV. To apply set operators, write nest subqueries and create views of t database.
	V. To use cursors for row wi processing of data
	SYLLABUS

Practical based on Theory.

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
CO1		2										
CO2		2	1	1								
CO3	1	1	1	1								
CO4	1	1	1	1								
C05		2	2	1								

Computer Graphics (Theory) Core 3 1 0 44 55 60 60 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
Core 3 1 0 14 15 50 60 60 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 310 4 5 60 60 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 4 5 60 60 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 5 60 60 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 i0 i0 Analog and Digital Communication(IT332) 1. To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 Analog and Digital Communication(IT332) To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 Analog and Digital Communication(IT332) To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 To study the introduction of compu graphics and its algorithms, segmer geometric transformations, windowing.
 To understand clipping, 3D geometry a transformations, hidden Line methods.
 After completion of this course, the student of the course of the course, the student of the course, the course, the student of the
VI. Describe the role of hidden surfa

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction to computer graphics Applications of computer graphics, Picture representation, color table ,Video Display Devices- Raster Scan Systems, Random Scan Systems, Input Devices, Output primitives	(07)
Raster Scan Graphics: Scan conversion, Frame buffer, Bresenham's line and circle drawing algorithms, Scan- Line Polygon Fill Algorithm, Inside-Outside Tests, Boundary-Fill Algorithm, Flood- Fill Algorithm, Antialiasing and Halftoning, Character Generation, Attributes of lines	(07)
Segments: Segments table, creating deleting and renaming segments, visibility, image	(06)

transfor	matior	1S.											
Transfo	ormati	ions:										(07)	
Geomet	ric Tr	ansform	nations:	Matrice	es, Tran	slation	, Scaling	, Rotat	ion, Ho	mogenee	ous		
Coordin	, ates	Compos	site Trar	nsformat	ion Ma	trix, C	oordinate	e Transf	ormatio	n, Rotat	ion		
about ar	ı arbitı	rary poi	nt, Inve	rse Tran	sformat	ions, C	ther trans	sformati	ons.				
					SE	CTIO	N-B						
Window	ving a	nd clip	ping:									(08)	
Viewing	g trans	formati	on and c	clipping,	The Co	ohen-S	utherland	algoritl	ım, The	Sutherla	ind		
– Hodgi	nan A	lgorithn	n, The c	lipping	of polyg	gons.							
Three I	imension:												
3D geor	netry, 3D primitives, 3D transformations, rotation about arbitrary axis, parallel												
projecti	on, pe	erspectiv	ve proj	ection,	viewing	, parai	neters, c	onversi	on to v	view pla	ane		
coordin	ates												
Hidder	ı Line	and su	rface:									(05)	
Back fa	Line and surface: e removal algorithms, hidden line methods												
RECO	MME	NDED	BOOKS	5									
S. No.			NA	ME			1	AUTHO	R(S)		PUBLI	SHER	
1	P	Principle	e of inter	ractive C	Compute	er	New	man and	1 Sproul	N	AcGra	w Hil	
		Gr	aphics,	2 nd Editi	ion								
2	Grap	hics, A	prograr	nming A	pproac	h, 2^{nd}	Stev	ven Har	rington	Г	ata M	cGrav	
			Edi	tion	~ ~						Hi	11	
3	Ma	athemat	ical Elei	mants of	Compu	ıter	Rog	gar and	Adams	1	Mcgrav	v Hil	
		Gr	aphics,	2 nd Editi	ion			-			e		
4	Intr	Introduction to Computer Graphics. 1 st N.Krishnamurthy Tata Mc											
		Edition Hi											
PO								_			_		
	a	b	c	d	e	f	g	h	i	j	k		
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CO1						1	2			
CO2	2	1			1					
CO3	1	2		2						
CO4	2		1		2					

CO5	2	1		2				
CO6			1	2				

Course Code	IT 582
Course Title	Computer Graphics (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 50
Course Prerequisites	Programming Fundamentals
Course Objectives	 To understand how the various eleme that underlie computer graphics (algeb geometry, algorithms and data structur optics, and photometry) interact in design of graphics software systems.
Course Outcomes	 After completion of this course, the studer are able to: Define and apply various Graph function. II. Create the geometric shapes based underlying algorithms and mathemati approach. III. Produce the transformations in tw dimensional and three-dimension world coordinate space. IV. Use line and polygon clipping algorithm V. Develop parallel and perspect projections.

SYLLABUS

Practical based on theory.

PO CQ	a	b	c	d	e	f	g	h	i	j	k	1
C01	2				1							
CO2	2	1			1							
CO3	1	2		2								

CO4	2	1	2				
CO5	2	1	2				

Course Code	IT533
Course Title	Operating Systems (Theory)
Type of Course	Core
L T P	310
Credits	04
Total Lectures	45
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50
Course Prerequisites	Computer Fundamentals
Course Objectives	 To study and understand ma components of operating system, the working, and operations performed operating system. To provide students knowledge of resource management provided operating systems, concepts and theori of operating systems, implementati issues of operating systems. To be able to understand description multiprocessor and distributed operati system and different operating system a compare their features.
Course Outcomes	Students are able to accomplish the following
	through this course:
	 I. Grasp a fundamental understanding design of an operating systems a understand the services provided by it. II. Learn the concepts of process, scheduling and synchronization. III. Illustrate different approaches to memor management and the concept of virtumemory in modern Operating systems. IV. Understand the concepts of da input/output, file management and lea how to use the disc space efficiently f data storage. V. Analyze the services provided distributed operating systems. VI. Compare various Operating systems li UNIX, WINDOWS, and SOLARIS etc.
1 T/XO	ADUC
SYLL	

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

S	SECTION-A	Hour
Basic Functions and Concepts of Op Concept of an operating systems, b Personal Computer System, Paralle	perating Systems: batch system, Multi-programmed, Time sha el system, Real time system, General sy	(05) aring, /stem
Architecture.		
Features and Objectives of Operatin System components, operating syst System Structure, System design ar states, process state transition, pr concurrent processes, deadlocks, scl Synchronization.	ng Systems: tem services, System calls, System Prog ad implementation. Concept of process, pro ocess control block, operations of proce neduling algorithms, scheduling criteria, Pro	(11) rams, ocess esses, ocess
Memory Management: Logical and physical address space, st swapping, concepts of multi program management strategies, Demand Pagi	torage allocation and management techniques ning, paging, segmentation, virtual storage ng, Page Replacement Algorithms, Thrashing	(06) g.
	SECTION-B	(0.0)
Information Management: File concept, Access method, Director Allocation methods, Free space mana Disk Scheduling, Disk management, S	ry structure, Protection File system structure, gement, Directory implementation, Disk struc Swap space management.	(06) cture,
Distributed-System Structures: Network operating system, Distribute Robustness, Design Issues.	d operating systems, Remote services,	(06)
Distributed file systems and Distrib Naming and Transparency, Remote fi eplication, Event ordering, Mutual E Deadlock Handling, Election Algorith	uted Coordination: le Access, Stateful versus stateless service, Fi xclusion, Atomicity, Concurrency control, ums, Reaching Agreement.	(06) ile
Case Studies: Unix O.S. Architecture, Operating sys iles in Unix system processes and the nanagement, Unix shell, history and	stem services, user perspective, representation ir structure, Input-output system, Memory evolution of Unix system.	(05)
RECOMMENDED BOOKS		
S. No. NAME	AUTHOR(S)	PUBLISHER

S. No.	NAME	AUTHOR(S)	PUBLISHER
1	Operating Systems, 5 th Edition	Galvin &Silberschatz	Addison
			Wesley
			Publishing Ltc
2	An Introduction to Operating System,	Harvey M. Deitel	Narosa
	3 rd Edition	-	Publishing
			House
3	Operating Systems: Design and implementation, 3 rd Edition	Andrew S. Tanenbaum	PHI
4	Operating system, 5 th Edition	MillanMilankovic	McGraw Hill

CO V) a	b	c	d	e	f	g	h	i	j	k	l

CO1	2		2			1			
CO2			2		1				
СО3			2	1	2				
CO4			2	1	1				
CO5			2	2	1	1			
CO6		1	2	2	1				

Course Code	IT 583
Course Title	Operating Systems (Practical)
Type of Course	Core
	003
Credits	02
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 50
Course Prerequisites	Computer Fundamentals
Course Objectives	 To teach students about various operati systems including Windows, and UNIX To be able to students learn about system configuration and administration Students learn, explore and practitechnologies related to UNIX.
Course Outcomes	Upon successful completion of this court the students will be able to: I. Understand internal structure of UN operating system and its installation. II. Study and implementation of vario

		I	II. I c s s	comman introduct operating shell pro statement	ds runn ion of c system grammi s and lo	ing on lifferent s and in ng with ops.	UNIX. Shells i nplemen various	in UN tation s conti
	SY	LLABUS						
List o	f Practicals:							
1.	Installation of the Linux operating	g system						
2.	Working with text editor 'vi'							
3.	Using basic commands-man, who rm.	o, more, pipe,	finger	, cat, red	lirect, ls	s, cp, m	v,	
4.	Working with directory and plain sort, diff, uniq and grep command	files-pwd, cc ls.	l, mkdi	r, rmdir	, lp, wc	, date, c	cal,	
5.	Using miscellaneous commands-l	head, tail, cut	, copy,	paste, s	pell, fir	nd and b	oc.	
6.	Working with shell scripts under chmod and calendar commands	Korn Shell ar	nd usin	g shell v	ariable	s, print,	•	
7.	Additional features of Korn shell command line editing commands, command	such as profi , aliases and s	le, kshi special	rc file, h characte	istory, ers in p	read and rint	d	
8.	Using quotes, relational operators shell control statements such as for script.	s, command stor-in, if-then-	ubstitu elseif-e	tion, ari else, whi	thmetic ile,case	functio date an	ons, id	
9.	Working under the Bourne shell-s for, for in, if-then-else-fi, -if-then and expressions.	shell scripts, o -elif-fi, while	control ,until,	stateme case, rel	nts suc ational	h as tes operato	t, ors	
						1	1	
	PO							

РО СО	a	b	c	d	e	f	g	h	i	j	k	1
CO1		1	2		1							
CO2		2	2	1	2							
CO3		2	2	2	2							

Course Code	IT534
Course Title	System Software (Theory)
Type of Course	Core
LTP	300
Credits	03
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Microprocessor(IT433)
Course Objectives	 To infroduce the major concepts areas language translation and compiler desi and to develop an awareness of function and complexity of mode compilers, linkers, loaders a assemblers. To gain knowledge and skills necessary develop system software covering a bro range of engineering and scienti applications and will learn context f grammars, compiler parsing techniqu construction of abstract syntax tre symbol tables, and actual code generat and provided with a thorough coverage the basic issues in programs interact directly with operating systems.
Course Outcomes	 After completion of this course, the stude are able to: I. Identify the functions of mode compilers, linkers, loaders, assemblers macros w.r.t. machine architecture. II. Define the machine dependent a machine independent features of varies system softwares. III. Apply knowledge of data structures algorithms needed for the processing assemblers, compilers, linkers, load and macros. IV. Design system software for real machine by using implementation examples. V. Integrate algorithms together to des object programs from source programs. VI. Evaluate which system software is need for different stages of implementation or system

				SI	ECTIO	N-A						Hour
Introduc System s Tradition	e tion: oftware al CISC	and m	achine ISC Ma	archite	cture. S	Simplif	ied Inst	ructiona	ıl Comj	puter (S	SIC),	(06)
Assemble Basic a Independ AIX Asso	ers: ssemble ent asse embler.	er fun embler	ctions, features	Machi s, Assen	ne-depo nbler D	endent esign c	assem	bler fø Implerr	eatures, ientatio	Mac n exam	hine- ples:	(08)
Macro P B features,	rocesso asic M Design	ors: lacro p options	orocesso	or func	tions,	Machir	ne-Indep	oendent	Macro	o proc	essor	(08)
					SEC	CTION	- B					
Loader a Basic loa	and Lin ader fu eatures	kers: nctions Loader	, Mach Design	ine dep	pendent	Loade	er featu	res, Ma mples	achine-1	Indeper	ndent	(07)
Compile Basic Co Analysis, Independ	rs: ompiler Code ent com	functio Gene piler fe	ons, Pha cration, catures,	ases of Mach and Co	Compi ine de mpiler l	ler, Gr penden Design	ammar, t com options	Lexica piler f	l Analy eatures,	ysis, Sy , Mac	yntax hine-	(10)
Operatin Basic op Machine	ng Syste perating indeper	systen systen dent op	n funct perating	tions, N system	Aachine feature	e depei es, Op	ndent o erating	perating System	g syste Design	m feat option	ures, s	(06)
RECOM	IMEND	DED BO	OKS									
S. No.	C		NAM	E	1		/	AUTHO	R(S)		PUBL	ISHER
1	Syste	m Sonv	vare, A	n Introc	Luction	το	Le	eland L.	веск		Add	lison
2	Syste	m Prog	rammir tem. 2 nd	ng and (difference of the difference of the dif	Dperatir	ng	D.	M.Dhar	ndere		TN	MH
3	Sys	tem Pro	ogramm	ing, 1 st	Edition		Med	nick& I	Donova	n	TN	МН
4	Comp	ilers [.] Pi	incinle	s Tech	niques a	nd	AVA	Aho R S	Sethi I	D	Add	lison
			Tool	ls		und	11	Ullma	in		We	sley
РО	, ,					6						
<u>co</u> ⁄	a	b	c	d	e	1	g	h	1	J	K	1
CO1	2											

CO2

СО3	2	1							
CO4		1	2						
CO5				2					
CO6					2				1

Course Title Type of Course L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Objectives	Multimedia Systems (Theory) Core 300 03 45 50 50 50 50 1. To understand the basics of multime
Type of Course L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Objectives	Core 300 03 45 50 50 50 Computer Fundamentals 1. To understand the basics of multimentals
L T P Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Objectives	300 03 45 50 50 Computer Fundamentals 1. To understand the basics of multimentals
Credits Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Objectives	03 45 50 50 Computer Fundamentals 1. To understand the basics of multimentals
Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Outcomes	45 50 50 Computer Fundamentals 1. To understand the basics of multimed
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives	50 50 Computer Fundamentals 1. To understand the basics of multimed
Course Objectives Course Objectives Course Outcomes	Computer Fundamentals 1. To understand the basics of multimental
Course Objectives Course Outcomes	1. To understand the basics of multimed
Course Outcomes	 technologies and introduction to varied image formats and their featur fundamentals of digital image and vid compression technique. 2. To understand the basics of Virtu Reality and its importance along w familiarization with various multimed applications in various environments.
	 After completion of this course, the studen are able to: Explain multimedia concepts such characteristics, challenges, desiral features, components, applications a trends in Multimedia. Explain Multimedia Softwa Development Tools, Authoring Too Multimedia Standards for Docume Architecture and Document Interchange Distinguish between storage media su as Magnetic Disk, Optical Disk, C DVD, and RAID. Explain the basics of audio, imag videos and graphics such as file forma color models, video signals, T Standards, MIDI and apply sampling a quantization for audio digitization. Apply standard image, audio and vid compression techniques such as Huffma MPEG in a real environment and desi new compression algorithms.
	and distributed multimedia systems.
SYLL	

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question

paper.	SECTION A		T	TT								
T . 4 J	SECTION-A			Hour								
Introduction: Multimedia and its types, Introduction to Hypermedia, Hyper Text, Multimedia Systems and their Characteristics, Challenges, Desirable Features, Components and Applications, Trends in Multimedia.				(05)								
Multimedia Technology: Multimedia Systems Technology, Multimedia Hardware devices, Multimedia software development tools, Multimedia Authoring Tools, Multimedia Standards for Document Architecture, SGML, ODA, Multimedia Standards for Document interchange, MHEG, Multimedia Software for different media.				(06)								
Storage Media : Magnetic and Optical Media, RAID and its levels, Compact Disc and its standards, DVD and its standards, Multimedia Servers.				(05)								
Audio: Basics of Digital Audio, Application of Digital Audio, Digitization of Sound, Sample Rates and Bit Size, Nyquist's Sampling Theorem Typical Audio Formats Delivering Audio over a Network, Introduction to MIDI (Musical Instrument Digital Interface), Components of a MIDI System Hardware Aspects of MIDI, MIDI Messages			(05)									
	SECTIO	DN-B										
Image, Graphics and Video: Graphic/Image File Formats, Graphic/Image Data, Colour in Image and Video, Colour Image and Video Representations, Basics of Video ,Types of Colour Video Signals, Analog Video, Digital Video, TV standards.				(06)								
Video au Classify Encodin Huffmar Coding, Coding, JPEG C Inter-fra Bitstreau Compre	nd Audio Compression: ing Compression Algorithms, Lossless g, Run-length Encoding, Pattern Substitu n Coding, Huffman Coding of Images, Ad Lempel-Ziv-Welch (LZW) Algorithm, Sou Frequency Domain Methods, Differenti ompression, Video Compression, H. 261 me (P-frame) Coding, MPEG Compression n, Decoding MPEG Video in Software, ssion Methods, Psychoacoustics, MPEG Au	Compression Algorithms, E tion, Basics of Information t aptive Huffman Coding, Arit Irce Coding Techniques, Tran al Encoding, Vector Quanti Compression, Intra Frame C n, MPEG Video, The MPEG Audio Compression, Simple Idio Compression	ntropy heory, hmetic nsform sation, oding, Video Audio	(12)								
Multime Building	edia Communication: g Communication network, Application	Subsystem, Transport Subs	ystem,	(06)								
RECON	AMENDED BOOKS											
S. No.	NAME	AUTHOR(S)	PUB	LISHER								
1	Multimedia Computing	Ralf, Steinmetz and	Pe	arson								
	Communications and Applications	KlaraNahrsted	Education									
2	Multimedia System Design	Prabhat K. Andleigh, KranThakkar	PHI									
3	Multimedia Computing	Li, Drew	Pearson Education									
4	Multimedia Communications	Fred Halsall	Pe Edu	arson								
ро со _	a	b	c	d	e	f	g	h	i	j	k	1
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CO1			2	1								1
CO2			2	1								
CO3			2	1								
CO4			2		1							
C05			2	2	1							
CO6				2	1							

Course Code	IT536
Course Title	Industrial Training (After 4 th Semester)
Type of Course	Core
LTP	002
Credits	2
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Nil
Course Objectives	 To enable students to integrate theo with practice. To introduce students to work culture a industrial practices. To provide opportunity for students work with industrial practitioners.
Course Outcomes	 Upon successful completion of training, the students are able to: Apply knowledge related to curratechnologies. II. Demonstrate interpersonal skills a ability for team work. III. Compile a proper report on their work experience.

РО СО	a	b	c	d	e	f	g	h	i	j	k	
C01	1		2	2	2	1	1					
CO2								1	2			
CO3										2	2	

SYLLABUS FOR B.E. (I.T.) SIXTH SEMESTER COURSE INFORMATION SHEET

Course Code	IT631
Course Title	Wireless Communication (Theory)
Type of Course	Core
L T P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Analog and Digital Communication(IT332)
Course Objectives	 To provide basic knowledge about concepts, problems and desi approaches in wireless communicati systems. To make students will familiarize w channel impairment, mitigati techniques, and multiple accu techniques. Migration to 3G technolog is also covered in the course.
Course Outcomes	After completion of this course, the stude are able to:
	 Learn the basics of various mob communication systems and understa their differences. Learn, understand and apply the conce of system design fundamentals. Understand the GSM and CDMA wirel- systems. Remember and understand the cham- impairment mitigation techniques. Learn about the various multiple acc- techniques, also understand and analy the difference between them. VI. Understand the 3G wireless techniques.
SVLL	ABUS
SILL	

Note: The examiner shall set seven questions of equal marks. First question is compulso and shall cover the whole syllabus by including questions of conceptual nature. Rest of the syllabus will be divided into A and B parts having three questions each. Candidate required to attempt at least two questions from each part.

SECTION-A	Hour				
Introduction Evolution of Mobile Communication Systems, Paging systems, cordless telephone					
systems, cellular telephone systems, comparison of common wireless communication systems.					
System Design Fundamentals	(10)				
Frequency reuse, Channel assignment strategies, handoff strategies, interference,					
improving coverage and capacity in cellular systems, mechanism for capacity					

imp tecl	prove hniqu	ment-cell splitting, cell sectoring and mes.	nicrocell zone concept, modu	ulation	
Wi GS cel	reles M, C lular	s Systems GSM reference architecture and GSM se standard, IS-95 system.	ecurity architecture, CDMA	digital	(08)
		SECTIO	DN-B		
Ch Inti Div Cha	anne roduc versit annel	Humpairment Mitigation Techniques tion, Power control, Diversity Technic y, Space Diversity, Path Diversity, Cha coding and interleaving.	ques: Frequency Diversity, annel Equalization, Rake rec	Time ceiver,	(09)
Mu Sin CD	ultiple nplex MA.	e Access Techniques , Duplex, Time Division Duplex, Frequenc SDMA, OFDM, Hybrid Multiple Access.	y Division Duplex, FDMA, T	DMA,	(08)
Mi	grati	on to 3G technologies:			(05)
Wi	Ĕi, W	iMax, EDGE, Bluetooth, CDMA-2000.			<u> </u>
RE	CON	AMENDED BOOKS			
S.	No.	NAME	AUTHOR(S)	PUBI	LISHER
	1.	Wireless Communications Principles and practice, 2 nd Edition	Theodore S. Rappaport	Prent Iı	ice Hal 1dia
	2.	Wireless and Cellular Communication, 2009 Edition	Sanjay Sharma	SK I Pub	Kataria olisher
	3.	Mobile and Personal Communication Systems and services, 1 st Edition	Raj Pandya	IEEI	E Press

PO CO	a	b	c	d	e	f	g	h	i	j	k	
CO1	1											
CO2	1	1										
СО3	1	2			2							
CO4	1											

CO5	1						
CO6	1		2				

Course Code	IT 681
Course Title	Wireless Communication (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Analog and Digital Communication (IT332
Course Objectives	 To familiarize students with the TCP/II Suite, understand the Wireless Communication Technology (Satellite, Cellular and Bluetooth networking).
Course Outcomes	 Upon successful completion of this course, the students will be able to: Use Wireless communication tools. Analyze behavior of components and signals of GSM mobile phone trainer k it. Understand and apply AT commands mobile phone trainer kit. Develop programs in an integra development environment using μVision3 V3.60 and ECEFlash performing different operations on GS call.

SYLLABUS

Wireless Communication lab course includes the following:➢ Exposure to advanced wireless tools.

- > Pertinent lab exercises related to wireless communication.
- > A project that allows the students to apply technical concepts learnt in the course by:
 - Executing projects based on the applications of wireless communication concepts i. Working together in teams ii.

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	1	2			1							
CO2		2										
CO3		2										
CO4		2										

11002
Software Engineering (Theory)
Core
310
04
45
50 50
System Analysis and Design
 To help students to develop skills that we nable them to construct software of hig quality software that is reliable and that reasonably easy to understand, modify and maintain.
 After completion of this course, the studen are able to: Classify various software process mode Identify appropriate project metrics in proper project management. III. Compare various project estimating methods for good s/w project planning. IV. Illustrate various types of risk and the management strategies. V. Explain various s/w quality assurant activities and s/w configurating management process. VI. Explain and compare various s/w design and testing process and methods. VII. Use of CASE tools which will provisignificant help in design a development activities of Software Development Life Cycles.

compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Software Evolution	(06)
Software products, Evolving role of Software, Software crisis, S/w Engineering - a	
layered Technology, Software process Models.	
Project Management Concepts	(04)
People, The problem, The Process, S/w Measurement, Project Metrics.	
S/W Project Planning	(04)
Project estimation, Empirical Estimation Models, COCOMO Model.	
Risk Management	(04)
•	78

Reactive Vs Proactive risk strategies, s/w Risks, Risk Identification, Projection, Risk Mitigation, Monitoring and Management.	
S/W Quality Assurance	(06)
S/w quality concept, SQA- S/w quality assurance activities, reviews, SQA plan, ISO	
9000 Quality standards, ISO approach to quality assurance systems.	
SECTION-B	
S/W Configuration Management	(05)
Baselines, S/w configuration Items, SCM process, Version control, Change control.	
Design	(06)
Design Concepts and principles, Modular Design, Design Methods.	. ,
S/W Testing Methods	(06)
Testing Fundamentals, test case design, White box testing, Black Box testing, Testing	. ,
Strategies, Verification & validation, Unit, Integration, Validation, System Testing.	
Computer aided S/W Engineering	(04)
CASE, Building blocks For Case, Integrated Case Environment.	. ,

RECOMMENDED BOOKS

S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	S/W Engineering-A Practitioner's Approach, 8 th Edition	Roger S.Pressman	McGRAW- HILL
			Internationa Edition
2.	Software Engineering, 3 rd Edition	Ian Somerville	Pearson Education
3.	Software Engineering	Jalote	Narosa Publisher

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1				2	2							
CO2	2	1		2								
CO3				2								
CO4				2	2							
C05				2	1						1	

CO6			2	1				
C07	1	1		2				

se Code IT63	33
rse Title Inter	rnet & Web Technology (Theory)
of Course Core	e
P 300)
its 03	
Lectures 45	
se Assessment Methods: Semester Assessment (University Exam.) 50 Invous Assessment (Sessional) 50	
ndous Assessment (Sessionar) 50	(\mathbf{T}_{422})
se Prerequisites Com Prog	ramming Fundamentals
se Objectives 1	 To enable the students to get familiar we current technologies used in we development and maintenance. To highlight the features of different technologies involved in web technologies and various scripting languages.
rse Outcomes Afte are a	r completion of this course, the studer ble to:
I.	Apply the fundamental knowledge of Object Oriented Concepts.
П.	Define the networking and security concepts.
III.	Design interactive and static web pages using HTML, CSS and JavaScript.
IV.	Define multithreading and database
V.	Develop and Deploy an Enterprise Application.
SYLLABUS	manla and First martine bar to b
SYLLABUS : The examiner shall set seven questions of 10	mai

compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction	(07)
Objected oriented concepts, object oriented programming (review only), advanced	
concept in OOP relationship, inheritance, abstract classes, polymorphism, Object	
Oriented design methodology approach, best practices, UML class diagrams, interface,	
common base class.	
Networking & Security	(11)
Internetworking, working with TCP/IP, IP address, subnetting, DNS, VPN, proxy	
	01

servers, firewalls, Client/Server concepts, World Wide Web, components of web application, MIME types, browsers and web servers, types of web content, URL, HTML, HTTP protocol, Web applications, performance, application servers, Web security, User Experience Design, basic UX terminology, UXD in SDLC, rapid prototyping in Requirements.

		•			SEC	TION-	·B					
HTN	AL & Scrip	ting										(07)
Clier	nt Tier using	, HŤML	, basic	HTML	tags, loc	k and f	feel usi	ng CSS	, client s	ide		
scrip	ting using J	ava Scri	pt and v	validatio	ons, Doc	ument	Object	Model	(DOM)			
Frai	neworks &	Multitł	nreadin	g Prog	rammin	g						(10)
Busi	ness tier usi	ng POJO) (Plain	ı Old Ja	va Objeo	cts), int	roducti	on to fr	ameworl	ks,		
intro	duction to P	OJO, m	ultithre	aded pr	ogramm	ing, Ja	va I/O,	Java Da	atabase			
Con	nectivity (JE	DBC).										
Java	ı Servlets &	Progra	mming	5								(10)
Pres	entation tier	using	JSP, R	ole of	Java El	E in E	nterpris	e appli	cations,	Basics	of	
Serv	lets, introdu	cing ser	ver side	e progra	mming	with JS	P, Stan	dard Ta	g Librar	y.		
REC	COMMEND	DED BO	OKS									
. No.		N	AME				AUT	HOR(S)]	PUBLI	SHER
1.	M	ultimed	ia Com	puting		Ra	lf, by S	teinmet	z and		Pear	rson
	Commu	inication	ns and A	Applicat	tions		Klaral	Vahrste	dt		Educ	ation
2.	Internet	Book, T	he: Eve	erything	, You]	Dougla	s E Cor	ner	P	Prentic	e Hall
	Need	to Know	/ About	Compi	iter							
	Networkin	g and H	ow the	Interne	t Works	_						
3.	Web Tech	nologies	: A Co	mputer	Science		leffrey	C. Jack	son	Р	rentic	e Hall
		Pers	spective	2		_						
4.	Java:	The Co	mplete	Referen	ce		Herbe	rt Schil	dt	N	/lcGra	w-Hill
										I	Profes	sional
5.	Java Fra	amewor	ks and (Compoi	nents		Mich	ael Nasl	h		Camb	oridge
										Un	niversi	ity Pres
6	XML	Black I	Book 2r	nd Editi	on		Ted V	Vugofsk	ai	Cert	ificati	on Insi
											Pre	ess
7.	Core Servl	ets and	JavaSei	rver Pag	ges Vol.	M	arty Ha	ll and I	Larry		Sı	ın
	1: Core	Techno	ologies	2nd Edi	tion		B	rown		N	licros	ystems
8.	Hea	d First S	Servlets	and JS	P	Br	yan Ba	sham, k	Cathy	0'	'Reilly	/ Medi
						Sie	erra, an	d Bert I	Bates,			
							S	SPD				
9.	The	Comple	te refer	ence JS	Р		Phil	Hanna		Ta	ata M	cGraw
		Ŷ								Н	ill Ed	ucation
						.3						
P	0											
						c	_					.

PO CQ	a	b	c	d	e	f	g	h	i	j	k	1
C01			1		2							

CO2	1			2				
CO3	2	2	1					
CO4	1			2				
CO5	1	2	2				1	

COURSE INFORMATION SHEET Course Code IT 683 Internet & Web Technology (Practical) **Course Title Type of Course** Core LTP 003 Credits 02 **Course Assessment Methods:** End Semester Assessment (University Exam.) 00 Continuous Assessment (Practical) 50 **Course Prerequisites** Programming Fundamentals **Course Objectives** 1. To expose students to proje development best practices and apply t concepts assimilated during the classroo session. After completion of this course, the studer **Course Outcomes** are able to: Apply various tags available I. HTML/DHTML.. II. Design interactive and static w pages using HTML, CSS a JavaScript. III. Demonstrate Document Obje Model(DOM). IV. Develop and Deploy an Enterprin Application.

SYLLABUS

Practical Exposure:

The assignments for OOC, HTML, JDBCand JSP are to be completed as part of the Hands-On f the subjects.

- OOC using Java
- HTML/JS
- JDBC
- JSP

Project based on developing & deploying web application(s). The Project Development primarily based on the Client tier using HTML/JS, JDBC and Presentation tier using JSP with back end database such as MS-Access or Oracle 9i.

The project is a Group Activity-consisting of 4 members in a team. The project specification hosted on the portal has to be completed. The project has to be evaluated before the fin examination.

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2				1							
CO2	2		2	1								
CO3	1			1	2							
CO4	1		2	2							1	

Course Code	11634
Course Title	Network Security and Cryptography
	(Theory)
Type of Course	Core
LT P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Computer Networks(IT432)
Course Objectives	 To understand the principles of encryption algorithms; conventional and public key cryptography. To have a detailed knowledge about authentication, hash functions and application level security mechanisms.
Course Outcomes	After completion of this course, the studen
	are able to:
	I. Design new algorithms based on ba encryption and decryption algorith such as Caesar cipher, Vigenere Ciph Vernam Cipher, DES, AES.
	II. Apply Modular Arithmetic, Euclide algorithm in algorithms such as RS Diffie Hellman Algorithm.
	III. Explain and solve key distributi problems using Diffie Hellman and Pub Key Cryptosystem.
	IV. Apply basics concepts of public k cryptosystem, digital signatures, and RS Encryption algorithm in their systems
	V. Explain and compare Message Dig Algorithms such as MD4, MD5 a Secure Hash Algorithms such as SHA
	VI. Outline the basics of IP Security, SS TLS and firewall based solution again network and web security threats.
SYLL	ABUS

Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper. Hour

SECTION-A

1.	Principles of Cryptography, 4 th	William Stallings	Pearson
KECOM	MENDED BOOKS NAME	AUTHOR(S)	PUBLISHE
Firewalls Firewall I	: Design principles, trusted systems, Virtual	Private Networks.	(04
Web Secu Web secu Secure El	arity: irity consideration, secure socket Layer ectronic Transaction Protocol	protocol, Transport Layer Sec	urity
Payload	•	, , , , , , , , , , , , , , , , , , , ,	
Kerberos,	IP security: Architecture, Authenticati	on Header, Encapsulating Sec	(04 curity
Hash Alg Hash con MD4 and	orithms: cept, description of Hash Algorithms, MD5, Secure Hash Algorithms such as S	Message Digest Algorithms suc H1 and SHA2	2h as (05
Public Ko Concept Adlman (The Digit	ey Encryption Systems: and Characteristics of Public Key Enc RSA) Encryption, Digital Signature Algo al Signature Standard (DSA).	ryption system, Rivets – Sha rithms and authentication proto	(08 amir- ocols,
	SECTIO	N-B	
Key Man Exchange	agement Protocols: Solving Key Distribution Problem, with Public Key Cryptography.	Diffie-Hellman Algorithm,	(04 Key
Number 1 Modular A	theory and basic Algebra: Arithmetic, Euclidean algorithm, Random	number generation	(04
Stream a Rotor bas operations Introducti	nd Block Ciphers: ed system and shift register based systems s. The Data encryption Standard (DES), A on to Advance Encryption Standard (AES	s. Block cipher: principles, mod nalyzing and Strengthening of b	(07 DES,
Technique the Caesa such as V	and Types of threats, challenges for es, Classical Cryptographic Algorithms: N Ir Cipher, Cryptanalysis of Monoalphabo igenere, Vernam Cipher	Information security, Energy Ionoalphabetic Substitutions su stic ciphers, Polyalphabetic Cij	ption ch as ohers

S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	Principles of Cryptography, 4 th Edition	William Stallings	Pearson Education
2.	Security in Computing, 2 nd Edition	Charles P.Pfleeger	Prentice Hal Internationa
3.	Cryptography & Network Security, 2 nd Edition	AtulKahate	TMH
4.	Applied Cryptography: Protocols, Algorithms, and Source Code in C, 2 nd Edition	Bruce Schneier	John Wiley an Sons
			0

5.	Fire	ewalls a	nd Interr Editic	net Secur	ity, 2 nd	Bill Cheswick and Steve Bellovin					Addison- Wesley			
6.	Security Technologies for the world wide web, 2nd Edition						Rolf Oppliger					Artech House Inc		
<u>РО</u> СО	a	b	c	d	e	f	g	h	i	j	k	1		
CO1	2		2	2		1	1					1		
CO2	2			1										
CO3	2		2	1										
CO4	1		2	2								1		
CO5	1		2	2			1							
CO6			2	2								1		

Course Code	IT635
Course Title	Business Intelligence (Theory)
Type of Course	Core
LTP	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Data Base Management System(IT531)
Course Objectives	 To impart knowledge of data warehousi and data mining for Business Processes To understand the role of Business Intelligence in taking business decisions
Total Lectures Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional) Course Prerequisites Course Objectives Course Outcomes Syll Note: The examiner shall set seven questions	 After studying this course, students are at to: I. Illustrate the concept of busine intelligence with BI framework, applications and BI infrastructur components and be able to differentia between business intelligence, OLAP a data warehousing. II. Explain the general concepts of dat integration and ETL in context of dat warehousing and understand the importance of data profiling and quality III. Compare E-R model w multidimensional model and apply the concept of dimensions, facts, and st snowflake schema to real world problem IV. Demonstrate understanding of enterprine reporting and be able to differentiabetween dashboards and scorecards. V. Understand the concept of data mini and its relevance in business intelliger and make use of various data mini techniques such as association reporting
CVI I	

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction to Business Intelligence:	(08)
Introduction to OLTP and OLAP, BI Definitions & Concepts, Business Applications of	

Basics of Concept ntroductorial o data of	of Data Integration (Extraction Transform ts of data integration, need and advan etion to common data integration approaches quality, data profiling concepts and application	nation Loading) tages of using data integ to introduction to ETL, Intro- tons.	gration, duction	(08)
ntrodu ntroduo Aodelir ttribute	ection to Multi-Dimensional Data Modelin etion to data and dimension modeling, n ng vs. multi dimensional modeling, conc e, hierarchies, star and snowflake schema.	g, nultidimensional data mod epts of dimensions, facts,	el, ER cubes,	(08)
	SECTIO	N-B		
asics of the second sec	of Enterprise Reporting etion to enterprise reporting, concepts of da architecture.	shboards, balanced scorecar	ds, and	(06)
Data M	ining Functionalities:			(15)
Associa ransact lassific	tion rules mining, Mining Association rules mining, Mining Association rules of databases, Classification and prediction ation, k-nearest neighbor classification	les from single level, mu Decision tree induction, B	ıltilevel ayesian	
ansact ansact lassific <u>RECO</u>	tion rules mining, Mining Association rules mining, Mining Association rules of databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS	Ides from single level, mu Decision tree induction, B	iltilevel ayesian	ISHEP
ansact ansact lassific ECOI S. No. 1.	tion rules mining, Mining Association rules mining, Mining Association rules ion databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS NAME Fundamentals of Business Analytics	Iles from single level, mu Decision tree induction, B AUTHOR(S) R N Prasad, SeemaAcharya	Iltilevel ayesian PUBI Wile	JISHER y India
Associa ransact lassific <u>RECON</u> <u>S. No.</u> 1. 2.	tion rules mining, Mining Association rules mining, Mining Association rules in databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS NAME Fundamentals of Business Analytics Data Mining: Concepts and Techniques	Iles from single level, mu Decision tree induction, B AUTHOR(S) R N Prasad, SeemaAcharya J.Han and M. Kamber	Itilevel ayesian Wile Wile Kau publ Harco pv	LISHER y India organ ifman ishers, urt Ind t. Ltd
Associa ransact lassific <u>RECON</u> <u>S. No.</u> <u>1.</u> <u>2.</u> <u>3.</u>	tion rules mining, Mining Association rules mining, Mining Association rules in databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS MME Maximum Fundamentals of Business Analytics Data Mining: Concepts and Techniques Business Intelligence: The Savvy Manager's Guide Maximum	Iles from single level, mu Decision tree induction, B AUTHOR(S) R N Prasad, SeemaAcharya J.Han and M. Kamber David Loshin	Itilevel ayesian PUBI Wile Mac Kau publ Harco pvt Latest By Kn Ente	LISHER y India organ ifman ishers, urt Ind t. Ltd Editio owledg prorise
Associa ransact lassific <u>RECON</u> <u>S. No.</u> <u>1.</u> <u>2.</u> <u>3.</u> <u>4.</u>	tion rules mining, Mining Association rules mining, Mining Association rules in databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS NAME Fundamentals of Business Analytics Data Mining: Concepts and Techniques Business Intelligence: The Savvy Manager's Guide Business Intelligence roadmap	Iles from single level, mu Decision tree induction, B. AUTHOR(S) R N Prasad, SeemaAcharya J.Han and M. Kamber David Loshin Larissa Terpeluk Moss, ShakuAtre	Itilevel ayesian PUBI Wile Wile Marco pvb Harco pvf Latest By Kn Ente Ad We	LISHER y India organ ifman ishers, urt Ind t. Ltd Editio owledg erprise dison seley
Associa ransact lassific <u>ECON</u> <u>S. No.</u> <u>1.</u> <u>2.</u> <u>3.</u> <u>4.</u> <u>5.</u>	tion rules mining, Mining Association rules mining, Mining Association rules in databases, Classification and prediction ation, k-nearest neighbor classification MMENDED BOOKS NAME Fundamentals of Business Analytics Data Mining: Concepts and Techniques Business Intelligence: The Savvy Manager's Guide Business Intelligence roadmap Successful Business Intelligence: Secrets to making Killer BI Applications	Iles from single level, mu Decision tree induction, B. AUTHOR(S) R N Prasad, SeemaAcharya J.Han and M. Kamber David Loshin Larissa Terpeluk Moss, ShakuAtre CindiHowson	Itilevel ayesian Wile Wile Wile Mac Kau publ Harco pvt Latest By Kn Ente Ad We Tata M	LISHER y India organ ifman ishers, urt Ind t. Ltd Editio owledg erprise dison seley McGrav fill

_РО СО	a	b	c	d	e	f	g	h	i	j	k	1
CO1					2	1						
CO2				2	2	1						

CO3		2		2	2	1				
CO4			1					2	2	
CO5	2			2						

Course Code	IT685
Course Title	Business Intelligence & Software Engineering (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Data Base Management System(IT531)
Course Objectives	 To understand the concepts and be able apply these concepts in various business contexts and through hands-on exercise with leading software applications for OLAP, OLTP, data warehouses, data marts and relational database and mode
Course Outcomes	Upon successful completion of this court
	In Make Lies of date mining tools
	 Make Use of data mining tools classify or predict future trends a scenarios.
	II. Build various graphical reports a analyze data using MS Access and M Excel.
	III. Make Use of project management
	tools for software project planning
	IV. Use CASE tools effectively
	software project
CVI I	
SYLLA	ADUS

• Seminars from the topics related to Business Intelligence space

• Relevant lab exercises to get exposure to BI concepts & tool

Practical Exposure: With intent to get some exposure in the business intelligence space, the colleges can arrange for: • A project that allows the students to apply Technical, Betiavioral, Process concep learnt in the 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 2 projects.

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

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1					2	2						
CO2		2							1	2		
CO3										1	2	
CO4					1				2	2		

SYLLABUS FOR B.E. (I.T.) SEVENTH SEMESTER COURSE INFORMATION SHEET

Course Code	IT731
Course Title	Digital Signal Processing (Theory)
Type of Course	Core
LT P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Analog & Digital Communication(IT332)
Course Objectives	 To understand how to analyze a manipulate digital signals and have a fundamental MATLAB programmi knowledge to do so. To provide the student with the necessa background for taking advanced le courses in signal and image processing.
Course Outcomes	After studying this course, students are al
	I. Understand type of signals such as mu channel, multi-dimensions, determinist random etc and their processing.
	II. Understand importance of filters for no removal and visualize using MATLAB.
	III. Understand the concept of both anal and digital filters.
	IV. Understand the concept of Z-transfo and its difference with laplace and four transform.
	V. Understand discrete fourier transform a fast fourier transform how to visual these using MATLAB.
SYLL	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction to Digital Signal Processing Applications and advantages of DSP. Sampling theorem, concept of frequency in discrete time signals.	(04)
Discrete Time Signals and Systems Classification of signals, standard signals and classification of discrete time systems. Linear Time Invariant systems and their representation by difference equations and structures.	(08)
	(04)

Z- Tran Definiti system.	nsform on of direct, inverse z-transform and its p Inverse z-transform by power series expans	roperties. System function of ion and partial fraction expans	a LTI ion.	
Freque	ncy Analysis			(08)
Fourier Fourier time and	series and transform of discrete time signa Transform and its properties. Fast Fourier decimation in frequency algorithms (radio	als and properties (DTFT). De Transform algorithms, decimate (2).	iscrete	
	SECTIO	DN-B		
Realiza Direct f phase F	tion of FIR & IIR Systems: orms, cascade and parallel form IIR structu IR structures.	ires. Direct form, cascade and	linear	(04)
Design Compar and line and the Finite w	of Digital Filters: ison of Analog and Digital filters, Comparis ar phase requirement. FIR filters design usin ir design using the impulse invariance tec ord length effects.	son of IIR and FIR filters.FIR ng the window technique. IIR hnique and bilinear transform	Filters Filters nation.	(12)
DSP Pr Introduc	ocessors ction to DSP Processors, architecture of TM	S 320CXX and ADSP 21XX		(05)
S No	NAME NAME	AUTHOR(S)	PURI	ISHER
1.	Digital Signal Processing: Principles, Algorithms and Applications, 3 rd Edition	Proakis&Manolakis	Pe	arson
2.	Digital Signal Processing	E C Ifeacher and B W Jervis	Prent	ice Hal
3.	Digital Signal Processing, 1st Edition	S Salivaharan, A Vallavraj, C Granapriya	Т	MH
4.	Digital Signal Processing	Sanjay Sharma	S.K. F S	Kataria&

РО СО \	a	b	c	d	e	f	g	h	i	j	k	
CO1	2											
CO2	2											
CO3	1	2										
CO4	1	2										

CO5		2			1							
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Course Code	IT781
Course Title	Digital Signal Processing (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 50
Course Prerequisites	Analog And Digital Communication(IT332)
Course Objectives	 To develop skills for analyzing a synthesizing algorithms and systems the process discrete time signals, digital a analog filters with emphasis on realizati and simulation in MATLAB.
Course Outcomes	After completion of this course, the studen are able to:
	 I. Design signals such as multichann multi-dimensions, determinist random etc and using MATLAB. II. Design and visualize filters for noi removal using MATLAB.
	III. Design both analog and digital filters
	IV. Perform Z-transform, Laplace a Fourier transform.
	V. Perform discrete fourier transform a fast fourier transform usi MATLAB
SVI I	ARUS

Practical based on theory.

РО СО	a	b	c	d	e	f	g	h	i	j	k	
CO1	2											

CO2	2							
CO3	1	2						
CO4	1	2						
CO5		2		1				

COURSE INFORMATION SHEET							
Course Code	IT732						
Course Title	Java Technologies (Theory)						
Type of Course	Core						
L T P	300						
Credits	3						
Total Lectures	45						
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50						
Course Prerequisites	Object Oriented Programming(IT334)						
Course Objectives	 To provide students with the principles object orientation from the perspective Java implementation and UML. To be able to learn the concepts of practical approaches to object-orien analysis, design and programming us UML and Java. 						
Course Outcomes	 Upon successful completion of the counstudents are able to: Understand Java programm fundamentals through object-orien features of the Java language, such encapsulation, inheritance. II. Identify and Understand graph user interface using standard j libraries to implement event dri applications. III. Understand and implement concertion. 						
	9						

VI.	Understand and combine Servlets JSPs into a common application. In depth overview of the J2
	platform technologies that incl EJB.

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set free Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hou
Java Methods, Classes and Inheritance: Introduction; classes; methods; constructors; overloading methods; arrays; recursion; passing arrays and objects to methods; Inheritance; method overriding; abstract classes; using final; packages; interfaces.	(8)
I/O, Applets and Graphics: I/O basics; stream classes; byte and character streams; reading and writing files; Applet fundamentals; Applet class; Applet initialization and termination; event handling; keyboard and mouse events; AWT class; Layout managers; panels; canvases; Frame windows; drawing lines, rectangles, ellipses.	(8)
Exceptional Handling and Multithreaded Programming: Exception handling fundamentals; exception types; uncaught exceptions; try and catch; creating exception classes; throwing exceptions; Java thread model; thread priorities; creating a thread; interthread communication; thread synchronization; suspending, resuming and stopping threads;	(8)
SECTION-B	
Overview of J2EE and working with JDBC: What is J2EE, component based architecture of J2EE: Web, Business and Application component, commonly used classes and interfaces of java.sql package, connecting java application to a database, prepared statements.	(7)
Servlets and JSP: Java Servlets, compilation, deployment, and testing a servlet, session management, request dispatching, Java Server Pages, deploying and testing a JSP, using java beans in JSP.	(7)
Enterprise Java Beans(EJB): Architecture of EJB, creating a stateless-session EJB, statefull-session bean, Life Cycle of session beans, Entity beans, life cycle of entity beans.	(7)

RECON	RECOMMENDED BOOKS								
S. No.	NAME	AUTHOR(S)	PUBLISHER						
1.	Java: How to Program, 6 th Edition	Deitel and Deitel	Pearson Education						
2.	The Complete Reference Java2	Herbert Schildt	ТМН						
3.	J2EE: The Complete Reference	James Edward Keogh, Jim Keogh	McGraw-Hil						

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
C01	2											
CO2		2										
CO3	1			2								
CO4					2				1			
C05				2								
CO6	1			2								

Course Code	IT782
Course Title	Java Technologies (Practical)
Type of Course	Core
LT P	003
Credits	0 2
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 50
Course Prerequisites	Object Oriented Programming(IT334)
Course Objectives	1. To be able to learn the concepts of a practical approaches to object-orient
	98

	analysis, design and programming using UM and Java.
Course Outcomes	Upon successful completion of the cours students are able to:
	I. Analyze and Formulate and devel- solutions for programming probler using object oriented features of ja
	II. Implement Java standard libraries a classes.
	III. To install, configure, and use a J2I application server.
	IV. To create and use connection implementing JDBC API.
	V. Develop java applications and ja applets.
	SYLLABUS

Practical based on theory.

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2	1										
CO2					2							
СО3					2							
CO4	1				2							
CO5				1					2			

Course Code	IT733
Course Title	Compiler Design (Theory)
Type of Course	Core
LTP	300
Credits	03
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	System Software(IT534)
Course Objectives	 To provide the in-depth knowledge of different concepts involved while designing a compiler.
Course Outcomes	 After studying this course, students are ab to: Explain the working of complier a translators. Develop in-depth knowledge of mag stages of compiling. III. Relate and analyze concepts learn earlier in their study like higher lev programming, assemblers, automa theory and formal languages, da structure and algorithms, operati systems. IV. Apply the ideas, the techniques, and the knowledge acquired for the purpose
SYLLA	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

Hour
(05)
(05)
(12)

	SECTION	J-B				
Syntax of Syntax d trees.	directed translation lirected definitions, Synthesized and inherited	d attributes, Construction of syntax	(04)			
Run tim Source 1 of names Storage a	e environments anguage issues (Activation trees, Control sta s), Storage organization (Subdivision of run- allocation strategies, Symbol tables: storage,	ack, scope of declaration, Binding time memory, Activation records) data structures used.	(06)			
Intermed Intermed of three	diate code generation liate languages, Graphical representation, Th address statements (Quadruples, Triples, Indi	nree-address code, Implementatior irect triples).	(03)			
Code optimization and code generation Introduction, Basic blocks & flow graphs, DAG, principle sources of optimization: loop optimization, eliminating induction variable, eliminating common sub-expression, loop unrolling, loop jamming etc. Peephole optimization, Issues in the design of code generator, a simple code generator, Register allocation & assignment.						
S No	IMENDED BOOKS	AUTHOR(S) PU	RLISHER			
1.	Principles of Compiler Design	Aho, Ullman Pu	Varosa blication			
2.	Compiler Construction- Principles and Practice	Dhamdhere Ma	cmillan, India			
3. Compiler Design in C Holub F						

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	1		2									
CO2			2		2							
CO3	1	1		2	2							
CO4		2	2	1	2							

101

Course Code	IT734
Course Title	Cloud Computing (Theory)
Type of Course	Core
LT P	300
Credits	03
Total Lectures	45
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50 Operating System(IT522)
Course Prerequisites	1 To understand about computing concern
Course Objectives	 To understand cloud computing concep To prepare students to be in a position design cloud based applications distributed systems.
	 are able to: Have a sound foundation of different deployment and servicing cloud models use and adopt these services in real 1 scenarios. Understand the basic concepts and methods of distributed computing a develops the concepts and skills necessar to build applications in both Grid a Cloud environments. Understand the concept of resourd virtualization and load balancing. Demonstrate how the cloud may impute storage and security model of organization. Make use of cloud collaborati applications such as calendars, schedul and event management to build project real life. Explore some important cloud computing driven commercial systems such GoogleApps.
	Amazon Web Services and othe businesses cloud application
SYLL	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Cloud Computing Basics	(06)
Introduction- Shift from distributed computing to cloud computing; Cloud Computing	
Overview; Characteristics; Applications; Internet and Cloud; Benefits; Limitations;	

Challeng									
¥	es; Cloud Computing Services and Deple	oyment Models							
Cloud C	omputing Services and Deployment M	odels	(06)						
Infrastructure as a Service; Platform as a Service; Software as a Service; Private Cloud;									
Public Cl	loud; Community Cloud; Hybrid Cloud .								
Cloud Computing vs Other Computing Technologies									
Overview	w of Grid, Peer-to-Peer, Pervasive and Ut	tility Computing technologies; th	neir						
character	ristics and comparison with Cloud Comp	uting. Accessing the Cloud: Har	dware						
and Infra	structure requirements; Access Mechanis	sms: Web Applications, Web AI	PIs,						
Web Bro	owsers.								
Understa	anding Abstraction and Virtualization	····	(05)						
Virtualiz	ation Technologies, Load Balancing and	Virtualization, Hypervisors, Ma	chine						
Imaging.									
Class J 64	SECT	ION-B	(0.4)						
Cloud St	torage and Cloud Standards	suga: Challongos: Standarda	(04)						
Overview	v, Storage as a Service, Cloud Storage is	sues, Chanenges, Standards.							
Using Cl	land Services		(06)						
Cloud co	Ilaborative applications and services – ca	ase studies with calendars sched	ulers						
and even	t management: cloud applications in proj	iect management.							
Cloud Se	ecurity		(05)						
Securing	the Cloud, Securing Data, Establishing i	dentity and presence.	()						
Case stu	dies	X	(05)						
Microsof	ft Azure, Google App Engine and Open s	ource clouds-Open-Nebula and	()						
Eucalypt	ft Azure, Google App Engine and Open s us.	ource clouds-Open-Nebula and							
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Eucalypt RECOM	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME	ource clouds-Open-Nebula and AUTHOR(S)	PUBLISHER						
Eucalypt RECOM S. No.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical	AUTHOR(S) Anthony T. Velte, Toby J.	PUBLISHER McGraw Hill						
RECOM S. No.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical	AUTHOR(S) Anthony T. Velte, Toby J.	PUBLISHER McGraw Hill 2010						
Eucalypt RECOM S. No. 1. 2.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James	PUBLISHER McGraw Hill 2010 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski	PUBLISHER McGraw Hill 2010 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors)	PUBLISHER McGraw Hill 2010 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2. 3.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Eleonpeter	PUBLISHER McGraw Hill 2010 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2. 3.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barria Sociaslay	PUBLISHER McGraw Hill 2010 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2. 3. 4.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach Cloud Computing Bible	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barrie Sosinsky	PUBLISHER McGraw Hill 2010 Wiley, 2011 Wiley, 2011						
Microsof Eucalypt RECOM S. No. 1. 2. 3. 4. 5.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach Cloud Computing Bible Cloud Computing for Dummies	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barrie Sosinsky Judith Hurwitz, Robin	PUBLISHER McGraw Hill 2010 Wiley, 2011 Wiley, 2011 Wiley, 2010						
Microsof Eucalypt RECOM S. No. 1. 2. 3. 4. 5.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach Cloud Computing Bible Cloud Computing for Dummies	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barrie Sosinsky Judith Hurwitz, Robin Bloor,	PUBLISHER McGraw Hill 2010 Wiley, 2011 Wiley, 2011 Wiley, 2010						
Microsof Eucalypt RECOM S. No. 1. 2. 3. 4. 5.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach Cloud Computing Bible Cloud Computing for Dummies	AUTHOR(S) Anthony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barrie Sosinsky Judith Hurwitz, Robin Bloor, MarciaKaufman,FernHalpe	PUBLISHER McGraw Hill 2010 Wiley, 2011 Wiley, 2011 Wiley, 2010						
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Microsof Eucalypt RECOM S. No. 1. 2. 3. 4. 5. 6.	ft Azure, Google App Engine and Open s us. IMENDED BOOKS NAME Cloud Computing: A Practical Cloud Computing: Principles and Paradigms Approach Cloud Computing Bible Cloud Computing for Dummies Handbook of Cloud Computing	AUTHOR(S) Authony T. Velte, Toby J. RajkumarBuyys, James Broberg, AndrzejGoscinski (Editors) Velte, and Robert Elsenpeter Barrie Sosinsky Judith Hurwitz, Robin Bloor, MarciaKaufman,FernHalpe r BorkoFurht, Armando	PUBLISHER McGraw Hill 2010 Wiley, 2011 Wiley, 2011 Wiley, 2010 Springer, 201						

РО СО	a	b	c	d	e	f	g	h	i	j	k	
C01	1				1							

CO2	1			1	1				
СО3	1			1					
CO4			1			2			
C05		1	2						
CO6				2	2				1

Course Code	IT735
Course Title	Artificial Intelligence (Theory)
Type of Course	Elective
	300
Credits	03
Total Lectures	45
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50
Course Prerequisites	Knowledge of basic computer science principles and skills
Course Objectives	 To introduce the main concepts, ideas a techniques of artificial intelligence (AI) the students so that they could know various aspects of AI. To understand some essential princip and are able to implement some basic techniques in their projects or oth related work.
Course Outcomes	After completion of this course, the stude are able to: I. Explain what is AI and intelligent ager
	II. Explain how problems can be solv through searching.
	III. Describe the representation and use knowledge in inference-based probl solving by knowledge based agents.
	IV. Explain various Planning problem algorithms and approaches.
	V. Describe learning form observatio neural networks and expert system.

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A						
Introduction:	(06)					
Artificial Intelligence and its applications, Artificial Intelligence Techniques, criteria of						

		<u></u>			
		f Agents, Learning Agents	e and structure of	, Intelligent Agents, Natu	success, I
(09				m solving techniques:	Problem
	eristics,	ristic search, problem charact	l strategies, heur	State space search, contr	St
	search,	test, Hill climbing, best first	., Generate and t	tion system characteristic	productio
	Search,	ean-end analysis, Min-Max	on problem, Me	rch, Constraint satisfact	A* searc
		tive Deepening	efinements, Iterat	Beta Pruning, Additional	Alpha-Be
(08				edge representation:	Knowled
	wledge	ations, Approaches to kno	and representa	Mapping between fact	М
	soning,	ge, Forward vs. Backward rea	arative knowledg	ntation, procedural vs dec	representa
	atistical	soning, Default reasoning, sta	n-monotonic reas	ng, conflict resolution, N	Matching
	frame,	r structures, semantic nets,	nd Strong filler	ng, fuzzy logic Weak	reasoning
			-	tual dependency, scripts	conceptua
		ON-B	SECTIO		•
(06				ng:	Planning
	anning,	ace search, partial order pl	g with state spa	anning problem, planni	The Plan
	oaches,	ic, Analysis of planning appr	propositional logi	g graphs, planning with	planning
	ng	nuous and Multi Agent planni	l planning, Contir	hical planning, condition	Hierarchi
(10				ng:	Learning
	theory,	trees, Computational learning	rning, Decision t	of Learning, inductive le	Forms of
	e based	planation based and relevance	in learning, Exp	formulation, knowledge	Logical f
		ammilate data and hiddan va	earning with co		learning
	riables,	omplete data and modell va	cuming with co	g, statistical learning,	ieurinig,
	riables,	omplete data and model va	etworks	g, statistical learning, e based learning, Neural N	instance b
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C01						2							
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CO2	2			2		1							
CO3	1			2					1				
CO4		1	1	2		1							
CO5		1	1	2	1								

Course Code	IT735
Course Title	Mobile Computing (Theory)
Type of Course	Elective
LTP	300
Credits	03
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Wireless Communication(IT631)
Course Objectives	 At the end of this course the student should able to: Understand the concept of mobic computing andarchitecture of mobic communication. Be familiar with use of mobile IP and cellular IP in mobile computing. Know mobile ad-hoc networks and working of their protocols. Understand the fundamentals mobile devices and operating system
Course Outcomes	 At the end of this course, the students are ab to: Explain the fundamentals of mob computing. Relate the use of mobile IP and cellular in mobile computing. Explain mobile transport layer issues a compare wireless standards. Explain mobile ad-hoc networks a compare routing protocols. Analyze mobile devices, operati systems and development environment.
SYLL	ABUS
N. 4. TI	C 10

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Mobility:	(6)
Issues, challenges, and benefits; Review of mobile and cellular communication	
technology; Review of distributed/network operating systems, ubiquitous computing.	
Global System for Mobile Communication (GSM) System Overview:	
GSM Architecture, Mobility Management, Network Signaling, GPRS	
Mobile IP Networks:	(5)

Physical mobility, challenges, limits and connectivity, mobile IP and cellular IP in mobile computing.	
Mobile Transport Layer:	(5)
Transport layer issues in wireless, Indirect TCP, Snoop TCP, Mobile TCP	
SECTION-B	
Wireless LANs:	
Introduction to IEEE 802.11, Bluetooth technologies and standards.	(6)
Mobile Adhoc Networks:	(6)
Hidden and exposed terminal problems; Routing protocols: DSDV, DSR, AODV.	
Mobile Devices and OS:	(6)
Various types of Devices, Operating System: PalmOS, WindowsCE, Windows Mobile.	
Application Development:	(6)
WWW programming model, Development Environment for Mobile Devices.	
RECOMMENDED BOOKS	

S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	Mobile Communication	Jochen Schiller	Pearson
			Education
2.	Principles of Mobile	U. Hansman and L. Merck	Springer
3.	Computing		
4.	Computer Networks, 4 th Edition	A. S. Tanenbaum	Pearson
	•		Education
5.	Mobility Processes, Computers and	D. Milojicic, F. Douglis	Addison
	Agents		Wesley
6.	Mobile Computing	Raj Kamal	Oxford
			University Pre

РО СО	a	b	c	d	e	f	g	h	i	j	k]
CO1	1											
CO2	2	1			1							
СО3	2				1							
CO4	2	1			1							

CO5	2	1	1	1	2							
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Course Code	IT735
Course Title	Building Enterprise Applications (Theory
Type of Course	Elective
L T P	300
Credits	03
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Business Intelligence(IT635)
Course Objectives	 To expose the students to the essentials building enterprise applications. To elective include designing a developing high quality enterpri applications and other task related to it.
Course Outcomes	 After studying this course, students are ab to: Understand how to build enterpriapplications by learning the ski required and by knowing the life cycle raising an enterprise application. Measure the success of enterpriapplications with the key determinants successful enterprise applications. Model business process by making use requirement elicitation, use case prototyping and understand the concept planning, estimation and enterprianalysis. Classify different types of enterpriarchitecture by understanding the conce of architecture and be able to create documentation of application by making use of different design components su as networking, IT hardware-software a middleware. VI. Construct enterprise applications defining a plan, package structure and setting up a development environment. VIII. Explain the various methodologies code review and be able to compare t analysis methods i.e. static code analysis and dynamic code analysis. VIII. Illustrate the testing concept with variot testing levels and approaches and be able to itesting use of a sperformance testing, penetratit testing etc and to understand the procesting levels and the procesting levels and the procesting levels and the procesting levels and proaches and be able to compare to itesting levels and approaches and be able to compare the apply and dynamic code analysis.

of rolling out an enterprise application.

SYLLABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to I compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour					
Introduction to Enterprise application Introduction to enterprise applications and their types, software engineering methodologies, life cycle of raising an enterprise application, introduction to skills required to build an enterprise application, key determinants of successful enterprise applications, and measuring the success of enterprise applications.						
Incepting enterprise application and business process modeling Inception of enterprise applications, enterprise analysis, business modeling, requirements elicitation, use case modeling, prototyping, non functional requirements, requirements validation, planning and estimation.	8					
Enterprise Architecture and designing enterprise application Concept of architecture, views and viewpoints, enterprise architecture, logical architecture, technical architecture - design, different technical layers, best practices, data architecture and design – relational, XML, and other structured data representations, Infrastructure architecture and design elements - Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of application architecture and design.	8					
SECTION-B						
Constructing enterprise application Construction readiness of enterprise applications - defining a construction plan, defining a package structure, setting up a configuration management plan, setting up a development environment, introduction to the concept of Software Construction Maps, construction of technical solutions layers, methodologies of code review, static code analysis, build and testing, dynamic code analysis – code profiling and code coverage.	11					
Testing and rolling out enterprise application Types and methods of testing an enterprise application, testing levels and approaches, testing environments, integration testing, performance testing, penetration testing, usability testing, globalization testing and interface testing, user acceptance testing, rolling out an enterprise application.	10					
RECOMMENDED BOOKS						
S. No. NAME AUTHOR(S) PU	BLISHER					

S. No.	NAME	AUTHOR(S)	PUBLISHER
1.	Raising Enterprise Applications	AnubhavPradhan,	Wiley India
		Satheesha B. Nanjappa,	First Edition
		Senthil K. Nallasamy,	2012
		VeerakumarEsakimuthu	
2.	Building Java Enterprise Applications	Brett McLaughlin	O' Reily Med

											, Latest	Editio	
3.	So	ftware I &	Require Techni	ments: ques	Styles		S	SorenLa	uesen		Latest Edition By Addison- Wesley Professional		
4.	Sof	tware S	ystems	ements		Brian I	Berenba	ch, Dani	el J.	McGraw-			
	Engineering: In Practice						Paulisł	n, Juerge	eier,	Hill/Osborne			
							Α	rnold R		Media, 2009			
5.	Managing Software Requirements: A						Dean	Leffing	on	First Edition			
		Use	Case A	pproach	ı		Widrig				Pearson 2003		
6.	Softw	are Arc	hitectur Approa	e: A Ca ach	ise Base	ed	V	asudev		Pearson 2009			
7.	Sof	tware T	esting I	Principl	es And		Sri	nivasan	Desikan,		First Ed	lition t	
			Practic	es			Gopa	alaswam	y Rames	sh	Pearso	n 2006	
PO CO	a	b	c	d	e	f	g	h	i	j	k	1	

co	a	U	Ľ	u	c	1	g	п	1	J	ĸ	1
CO 1			2		2							
CO2					2							
CO3				1	2							
CO4					1					2		
CO5	1		2		2							
CO6			1	2	2							
CO7		1		2								
CO8	2	2				1						

Course Code	IT785
Course Title	Project-1
Type of Course	Core
LT P	006
Credits	03
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 100 Nil
Course Objectives	1. Students learning skills to tackle realist problems as they would be solved in the re- world.
	 2. Increased student control over his or her learning 3. Teachers serving as facilitators help in clarity of objectives to be achieved. 4. Students (usually, but not always) working in pairs or groups.
Course Outcomes	Upon successful completion of this cours the students will be able to: I. Formulate system requirement specifications for a real line engineering problem.
	II. Determine feasibility of developing the software/system.
	III. Design, implement and test appropriate solution to the problem.
	IV. Learn and perform project plannin monitoring and manageme activities.
	V. Work effectively as a team member.

<u>ро</u> со _	a	b	c	d	e	f	g	h	i	j	k	l
CO1	1					1				2		
CO2	2			1	1							

CO3	1	1	2	2	2					
CO4	1						1		2	
CO5							2	1	1	

Course Code	IT786
Course Title	Industrial Training (after 6th Semester)
Type of Course	Core
LTP	000
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Nil
Course Objectives	 To enable students to integrate theory with practice. To introduce students to work culture and industrial practices. To provide opportunity for students to work with industrial practitioners.
Course Outcomes	 Upon successful completion of training, t students are able to: Apply skills and knowledge related recent technologies. II. Demonstrate practical skills and devel projects. III. Demonstrate interpersonal skills a ability for team work. IV. Compile areport on their work a project.

РО СО	a	b	c	d	e	f	g	h	i	j	k	I
CO1	1		2	2	2	1	1					1
CO2		2	2	2	2	1	1					
CO3								1	2			
CO4										2	2	

SYLLABUS FOR B.E. (I.T.) EIGHTH SEMESTER COURSE INFORMATION SHEET

Course Code	IT831
Course Title	Digital Image Processing (Theory)
Type of Course	Core
LTP	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Computer Graphics(IT532),Digital Signal Processing(IT731)
Course Objectives	 To teach students the fundamentals digital image processing on the compute To introduce students to basic princip of digital images, image data structur and image processing algorithms.
Course Outcomes	 I. To enable student to understand image digitization and encoding techniques. II. To learn image enhancement in spatial frequency domain for better interpretati and also understand different kinds noises for enabling noise reduction. III. Understand the compression technolo for digital images. IV. Understand and analyse the segmentati logic and basic image processi functions that can help in identifyi boundaries, edges and objects/regions in given digital image. V. Learn various pattern recogniti techniques.
SYLL	ABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A					
Introduction to Image Processing: Digital Image representation, Sampling &	(4)				
Quantization, Steps in image Processing, Image acquisition, color image representation, color models.					
Image Transformation & spatial Filtering:	(6)				
Intensity transform functions, histogram processing, Spatial filtering, fourier transforms					
and its properties, Walsh transform, Hotelling transforms, Haar and slant transforms,					

Les en Dardemations	(4)
Image Restoration:	(4)
image degradation and restoration process, Noise Models, Noise Filters, degradation	
function, Inverse Filtering	
SECTION-B	
Image Compression: Coding redundancy, Interpixel redundancy, Psychovisual redundancy, Huffman Coding, Arithmetic coding, Lossy compression techniques, JPEG Compression	(6)
Image Segmentation & Representation: Point, Line and Edge Detection, Thresholding, Edge and Boundary linking, Hough transforms, Region Based Segmentation, Boundary representation, Boundary Descriptors, Regional Descriptors	(12)
Object Recognition: Patterns and Patterns classes, Recognition based on Decision Theoretic methods	(6)

S. No.				NAN	1E				AUI	THOR(S)	PU	BLISHER		
1.		D	igital	Image	Proce	essing		C	Gonzale	Addison Wesley 1992					
2.	Co	mput	ter Vis	sion - Edit	A Firs ion	t Gur	se 2nd		Boyle and Thomas				Blackwell Science 199		
3.	Introductory Techniques for 3-D Computer Vision								Truce	co&Ver	ri	Prentice Hal Latest Editic			
4.	Introductory Computer Vision and Image Processing								-	Low		McGraw-Hi 1991			
5.	Machine Vision								n, Kastı	uri and S	Schunk	McC	Graw-Hil 1995		
6.	6. Image -Processing, Analysis and Machine Vision 2nd edition							S	Sonka, Hlavac, Boyle				PWS Publishing,19		
PO CO		a	b	c	d	e	f	g	h	i	j	k	1		
CO	1	2		1											
CO2	2			1		2									
CO	3					1		2							
CO ₂	1				2			1							
CO	5			2	1										

Course Code	rse Code IT 881								
Course Title	Digital Image Processing (Practical)								
Type of Course	Core								
LT P	003								
Credits	02								
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical) Course Prerequisites	00 50 Digital Signal Processing(IT731)								
Course Objectives	 To develop an overview of the field of image processing, understand the fundamental algorithms. To implement, prepare and read the current image processing research literature, gain experience in applying image processing algorithms to real problems. 								
Course Outcomes	 I. Understanding different image file formats and conversions among file typ II. Implement various image enhancement techniques and understand commands, parameters to illustrate different kinds of noise present in images. III. Learn the techniques of histogram processing for improving image quality IV. Understand and implement the segmentation logic and basic image processing functions that can help in identifying boundaries, edges and objects/regions in a given digital image 								
SYLL	ABUS								
List of Experiments:1.Reading and displaying images in difference	nt formats using different color models.								
2. Converting color images into monochrom	e images.								
3. Understanding brightness, contrast and in	tensity concept of images								
4. Images enhancements using grey level tra	nsformations								
5. Image enhancements using spatial filters	Image enhancements using spatial filters								
6. Image enhancements in frequency domain	Image enhancements in frequency domain								
7. Homomorphic Filtering	Homomorphic Filtering								
8. Image Noise removal and inverse filtering	g of images								

PO CO	a	b	c	d	e	f	g	h	i	j	k	l
CO1	2		1									
CO2			1		2							
CO3	1				2							
CO4				2			1					
9. Image color enhancements using pseudo coloring techniques 10. Point, Line, Edge and Boundary Detections in images 11. Histogram Matching and specification on images 12. Boundary Linking techniques on images 13. Thresholding of Images 14. Magnification of Images 15. Image representation and Description techniques												
of the program	mmin	g lang	uage s	such as	s Java	, C/C+-	+, C#, N	IATLA	B		ii aily	

Course Code	11832
Course Title	Embedded System Design (Theory)
Type of Course	Core
LTP	310
Credits	04
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Microprocessor(IT433)
	Computer Architecture(IT434)
Course Objectives	 To introduce students to the embedd systems, its hardware (micro-controlle and software. To explain real time operating syster inter-task communication and exemplary case of RTOS.
Course Outcomes	 Upon completion of this course, the stude will be able to: Understand the differences betwee Microprocessors & Microcontrolle embedded & external memory device CISC & RISC processors, Harvard & V Neumann Architectures. Learn and understand the architectur addressing modes, instructions interrup timers/counters, serial communicati and applications of 8051 Microcontrolle Apply and evaluate 8051 based solution to real problems Learn and understand the featur architecture, memory organization instructions, addressing Modes of P 16C6X/7X Microcontroller Learn the evolution of architectures us for Embedded Software Development Understand and apply real-time system design techniques.
SYLL Note: The Semester question paper of a subject equal marks. First question, covering the who nature, be compulsory. Rest of the paper v questions each and the candidate is required section.	ABUS ect will be of 50 Marks having 7 questions le syllabus and having questions of conceptu will be divided into two parts having thu to attempt at least two questions from ea

SECTION-A

Hour

Introduction	to Microcontrollers		
Comparison of devices, CISC	f Microprocessors and Micr and RISC processors, Harv	ocontrollers. Embedded ar ard and Von Neumann Ar	nd external memory chitectures.
Overview of 8	8 bit Microcontrollers		
Overview of 8 Counters, Seri 89C51 microc	051, Architecture, addressir al Communication and appl ontroller.	g modes and instructions. cations. Interfacing Overv	Interrupts, Timer/ view of Atmel
		SECTION-B	
PIC Microcor	ntrollers		
Introduction and Memory Organ ADC. Input Carteria	nd features, PIC 16C6X/7X nization, Instructions, Addra apture, Output Compare, Fro	Architecture, Registers, I essing Modes, I/O Ports, Ir equency Measurement, Se	Reset actions, nterrupts, Timers, rial I/O Device
Software Dev	elopment & Tools	•	
Embedded Sys Scheduling arc compilers and Recursion, De	stem Evolution Trends, Rou chitecture, Algorithms, Intro Integrated Development En bugging Strategies, Simulat	nd – Robin, Robin with In duction to assembler, Cor vironment IDE, Object Or ors.	terrupts, Function npiler and Cross riented Interfacing,
Real Time Or	perating Systems		
RTOS Archite lata, Operating management, i	ecture, Task and Task States g System Services: message interrupt Routines in an RTC	Tasks and Data, Semaphy queues, timer function, ev OS environment, Basic De	ores and shared vents, memory sign Using RTOS
RECOMMEN	NDED BOOKS		
C No	NAME		

 N. 1 101		ine	
1.	The 8051 Microcontroller and	Muhammed Ali Mazidi,	Pearson 2 nd
	Embedded Systems	Janice Gillispie Mazidi and	Edition
	-	Robin D. Mckinlay	
 2.	The 8051 Microcontroller: Architecture,	Kenneth J. Ayala	Pearson 2 nd
	Programming & Applications		Edition
3.	Microcontrollers (Theory and	Ajay Deshmukh	TMH
	Applications)		Publishers
4.	An Embedded Software Primer	David E. Simon	Addison
			Wesley
 5.	Specification and Design of Embedded	D. D. Gajski, F. Vahid, S.	Prentice Hall
	Systems, Latest Edition	Narayan, J. Gong	
-			

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
CO1	2											

CO2		2							
CO3			2	1					
CO4		2							
CO5	1								
CO6				1	1				

Course Code	IT 882
Course Title	Embedded System Design (Practical)
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Microprocessor(IT433)
Course Objectives	1. To design, implement, test and docum the microprocessor-based systems.
Course Outcomes	 After completion of this course, the stude are able to: Understand the working of 8051 base embedded systems. II. Program the 8051 for real lapplications. III. Understand the working of PIC base embedded systems. IV. Program the PIC microcontroller practical applications.
SYLL	ABUS

Practical based on theory.

PO	a	b	c	d	e	f	g	h	i	j	k	l
co												
CO1	1											
CO2		2			2							
CO3	1											
CO4		2			2							

ELECTIVE- II COURSE INFORMATION SHEET

Course Code	IT833
Course Title	Software Testing And Quality Assurance
	(Theory)
Type of Course	Elective
L T P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Software Engineering(IT632)
Course Objectives	 To make students aware about the importance of the software testing during software development. To prepare the student for software testing and debugging. It will further latter the foundation for advanced courses Software quality assurances.
Course Outcomes	 After completion of this course, the studen are able to: Appreciate and apply the concept software process and project management process by making use of projemanagement techniques. Relate and explain SQA concept activities and Quality Assurar Standards Classify, define and relate the importar of Risk Management and Char Management in Project Management Define, choose and compare various T Strategies for Conventional and Obj Oriented Softwares. Compare and contrast various Testin Techniques along with Conventional T Case Design Methods. Define, choose and compare Testin process for Client/Server based, W based and Real Time Systems.
SYLL Note: The examiner shall set seven questions	ABUS s of 10 marks each. First question has to
compulsory having parts covering the whole	syllabus. Three questions have to be set fro

compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

Hour	SECTION-A						
(07)			ntroduction:				
	Project	Software Process, Process Models,	oftware Process, Characteristics of a				
L	Project	Software Process, Process Models,	onware process, Unaracteristics of a				

Manage	ment Process and its Phases, Software N	leasurements, Metrics, Sche	duling,		
Estimati	on.			(00)	
Softwar Quality Reviews Softwar Quality	Concepts, Quality Control, Quality Associations of Formal Technical Reviews, Review e Safety, Quality Assurance Standards, IS Factors, CMM, TQM, Six Sigma, SPICE, S	lards : surance, SQA Activities, So Guidelines, Software Reli O 9000, ISO 9001:2000, ISO Software Quality Assurance M	oftware ability, O 9126 Ietrics.	(08)	
Risk M Risks, 1 Softwar Process: Manage	anagement and Change Management: Risk Identification, Risk Projection, Risk e Configuration Management, Baselines, S Version Control, Change Control, C ment for Web Engineering.	So k Refinement, The RMMM Software Configuration Items onfiguration Audit, Config	oftware I Plan, S, SCM uration	(07)	
	SECTIO	DN-B			
Softwar Object (and Bet Perform Process.	re Testing: Festing, Verification and Validation, Tes Driented Software, Unit Testing, Integration a Testing, System Testing, Recovery Testin ance Testing, Metrics for Source Code Debugging Strategies.	at Strategies for Convention n Testing, Validation Testing, ng, Security Testing, Stress T , Metrics for Testing, Deb	al and Alpha Sesting, ugging	(07)	
Testing Testing, Structur Testing Testing Based	Software Testing Fundamentals, Black Box Flow Graph Notation, Independent Progr e Testing, Condition Testing, Data Flow T Methods, Equivalence Partitioning, Bounda Methods: Applicability of Conventional Festing, Scenario-Based Testing, Random InterClass Test Case Design	and White Box Testing, Bas am Paths, Graph Matrices, C Testing, Loop Testing, Graph ary Value Analysis, Object O Test Case Design Methods, Testing and Partition Testi	is Path Control Based riented Fault- ing for	(08)	
Testing	Process:	Design Dhase and Drogram	Dhaga	(08)	
Testing, Shelf So Testing	Testing Client/Server Systems, Testing W oftware, Testing in Multiplatform Environm Security.	e, Design Phase and Program Veb based Systems, Testing C ient, Testing for Real Time Sy	off-the- ystems,		
S No	NAME	AUTHOR(S)	PUR	IISHFR	
1.	Software Engineering, Seventh Edition	Ian Sommerville	Pe Edi	arson arson	
2.	Software Engineering: A Practitioner's Approach, Sixth Edition	R.S. Pressman	Tata I	McGrav Hill	
3.	Effective Methods for Software Testing, Second Edition	William E. Perry	John	Wiley & Sons	
4.	Software Engineering: Theory and Practice, Second Edition	S.L. Pfleeger, J.M. Atlee	Pe Edu	Pearson Education	
5.	Software Engineering, Second Edition	K.K. Aggarwal, Yogesh Singh	Ne Inter	New Age Internationa	
6.	An Integrated Approach to Software	PankajJalote	Narosa		

An Integrated Approach to Software Engineering, Second Edition Software Quality Assurance – Principles and Practice

7.

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Narosa

Nina S Godbole

8.	Software Testing Techniques, Second	Boris Beizer	Dreamtech
	Edition		

РО СО	a	b	c	d	e	f	g	h	i	j	k	1
CO1									1		2	2
CO2								1		2		
CO3								2			2	1
CO4					1			2	2		2	
C05					1				2		2	1
CO6					1				2		2	1

Course Title System Simulation and Modeling (Theory Type of Course Core L T P 310 Credits 04 Total Lectures 45 Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) 1. To gain knowledge about system and behavior so that students can transfo the physical behavior of a system into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the studet are able to: I. Define, explain, and discuss fundamental elements of discrete-event simulation. II. Analyse a real world problem, and ap modelling methodologies to develop discrete-event simulation. III. Recognise the cost/benefits of compu simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	Course Code	IT833						
Type of Course Core L T P 310 Credits 04 Total Lectures 45 Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in the transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the studet are able to: Define, explain, and discuss fundamental elements of discrete-event simulation. Analyse a real world problem, and approxed induction, the generation of meaning results, decision making, and risks. Interpret and contrast discrete-event techniques (including parallel a distributed) for implementing a soluti to a simulation problem. Formulate judgements and synthes conclusions through research of simulation topic. 	Course Title	System Simulation and Modeling (Theory						
L T P 310 Credits 04 Total Lectures 45 Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) Course Outcomes After completion of a system into mathematical model that can in turnsform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the studee are able to: Define, explain, and discuss fundamental elements of discrete-event simulation including analytical element random processes, random variates a input to simulation. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation model. Recognise the cost/benefits of compu simulation, the generation of meaning results, decision making, and risks. Interpret and contrast discrete-event techniques (including parallel a distributed) for implementing a soluti to a simulation problem. Formulate judgements and synthes conclusions through research of simulation topic. 	Type of Course	Core						
Credits 04 Total Lectures 45 Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Course Assessment (Sessional) 50 Course Objectives Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) Course Objectives Data Structures and Algorithm (IT431) Course Objectives After completion of a system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in the transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the studee are able to: I. Define, explain, and discuss fundamental elements of discrete-event simulation. II. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation model. III. Recognise the cost/benefits of comput simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-even techniques (including parallel a distributed) for implementing a soluti to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	LT P	310						
Total Lectures 45 Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives After completion of a system internation and behavior so that students can transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the student are able to: I. Define, explain, and discuss fundamental elements of discrete-event simulation including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation. III. Recognise the cost/benefits of comput simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation roblem.	Credits	04						
Course Assessment Methods: 50 End Semester Assessment (University Exam.) 50 Continuous Assessment (Sessional) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in the transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the studeed are able to: I. Define, explain, and discuss fundamental elements of discrete-ewas simulation including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and approximulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-evatechniques (including parallel a distributed) for implementing a soluti to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	Total Lectures	45						
End Semester Assessment (University Exam.) 50 Continuous Assessment (Sessional) 50 Course Objectives Data Structures and Algorithm (IT431) Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the student are able to: I. Define, explain, and discuss fundamental elements of discrete-evs simulation including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation model. III. Recognise the cost/benefits of comput simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	Course Assessment Methods:							
Continuous Assessment (Sessional) 50 Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in the transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the student are able to: I. Define, explain, and discuss fundamental elements of discrete-evolution including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and approximulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-evolution for implementing a soluti to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	End Semester Assessment (University Exam.)	50						
Course Prerequisites Data Structures and Algorithm (IT431) Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in th transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the students can transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the students can transform processes, random variates a inputs to simulation. I. Define, explain, and discuss fundamental elements of discrete-evon simulation including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and appinodelling methodologies to develop discrete-event simulation model. III. Recognise the cost/benefits of compute simulation. II. Recognise the cost/benefits of compute simulation problem. V. Interpret and contrast discrete-event techniques (including parallel a distributed) for implementing a solution to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	Continuous Assessment (Sessional)	50						
Course Objectives 1. To gain knowledge about system and behavior so that students can transfor the physical behavior of a system intrimathematical model that can in the transform into a efficient algorithm simulation purpose. Course Outcomes After completion of this course, the student are able to: I. Define, explain, and discuss fundamental elements of discrete-event simulation including analytical element random processes, random variates a inputs to simulation. II. Analyse a real world problem, and approved discrete-event simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic. 	Course Prerequisites	Data Structures and Algorithm (IT431)						
Course Outcomes After completion of this course, the stude are able to: I. Define, explain, and discuss fundamental elements of discrete-ew simulation including analytical elemer random processes, random variates a inputs to simulation. II. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation model. III. Recognise the cost/benefits of compute simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event distributed) for implementing a soluti to a simulation problem. V. Formulate judgements and synthes conclusions through research of simulation topic.	Course Objectives	 To gain knowledge about system and behavior so that students can transfor the physical behavior of a system into mathematical model that can in tu transform into a efficient algorithm simulation purpose. 						
simulation topic.	Course Outcomes	 After completion of this course, the studen are able to: Define, explain, and discuss the fundamental elements of discrete-event simulation including analytical element random processes, random variates a inputs to simulation. Analyse a real world problem, and app modelling methodologies to develop discrete-event simulation model. Recognise the cost/benefits of comput simulation, the generation of meaning results, decision making, and risks. IV. Interpret and contrast discrete-event techniques (including parallel a distributed) for implementing a soluti to a simulation problem. Formulate judgements and synthes conclusions through research of 						
	A177 1	simulation topic.						

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

(05)
(10)
-

Oueuein	g Models:		(10)
Single se	erver queueing system, introduction to a	rrival and departure time, flo	owcharts
for arriv	al and departure routine. Event graphs	of queueing model. Determine	ning the
events ar	nd variables, Event graphs for inventory n	nodel.	
	SECTI	ON-B	
Random	Numbers:		(5)
Introduct	tion to Random Numbers, Importance	of Random Numbers in Sin	nulation,
Mid-Squ	are random number generator,	Residue method, Ar	ithmetic
Congrue	ntialgenerator, Testing Numbers for Rand	lomness, Chi-Square Test.	
Distribu	tion Functions :		(10)
Stochast	ic activities, Discrete probability functio	ns, Cumulative distribution f	unction,
Continuo	ous probability functions. Generation of	random numbers following b	oinomial
distributi	on, poisson distribution, continuou	s distribution, normal dist	ribution,
exponent	tial distribution, uniform distribution.		
Simulati	on Languages:		(5)
Basic Int	roduction to Special Simulation Languag	es:-GPSS/ MATLAB/ Networ	rk
Simulato	rs.		
RECON	IMENDED BOOKS		
S. No.	NAME	AUTHOR(S)	PUBLISHER
1	Simulation Modeling and Analysis	Averill M. Law and W.	Tata McGraw
	Hill		
			Publication.
2	System Simulation	Geoffery Gordon	Prentice-Hall
			T. 11.

			muia
3	System Simulation	D.S. Hira	S. Chand
			Publication
4	MATLAB Programming for Engineers	Stephen J. Chapman	Thomson
			learning Inc.
5	Discrete-Event System Simulation	Jerry Banks, John S.	Prentice-Hall of
		Carson, Barry L. Nelson	India
		and David M. Nicol	
6	Getting Started with MATLAB 7	RudraPratap	Oxford
			University Pres

PO CO	a	b	c	d	e	f	g	h	i	j	k	1
C01	1			2								
CO2	1	2			2							
CO3	1				2							

CO4	1		2	1				
CO5			2	1			 	

Course Code	IT833
Course Title	Object Oriented Analysis And Design
	(Theory)
Type of Course	Core
LT P	310
Credits	04
Total Lectures	45
Course Assessment Methods:	
End Semester Assessment (University Exam.)	50
Continuous Assessment (Sessional)	50
Course Prerequisites	Object Oriented Programming (IT334)
Course Objectives	 To provide students in-depth theoreti base and fundamentals of Object Oriem Programming paradigm using C++. To prepare students mind setup to lea new computer languages on their own a to prepare them to design and co various projects using C++.
Course Outcomes	After completion of this course, the studen
	are able to:
	 base and fundamentals of Object Orien Programming paradigm using C++. II. Learn basic programming features of C III. To understand the implementation a memory allocation of classes & objects IV. To learn the concept of code reusabil using inheritance in object orien systems. V. To learn the overloading mechanism unary and binary operators. VI. To study how the data flows between the program and I/O devices in C framework. VII. To learn reading and writing data from files and various file handling operation in C++.
	 VIII. To enable students to analyse information systems in real-world settings and preparand OO design for the same. IX. To learn the various standard stand
SVLL	analysis.

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set from the set of t

Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Object Oriented Concepts	(02)
Difference between Procedure-Oriented and Object-Oriented Programming, Basic Concepts of Object Oriented Programming, Abstract data types: Object, Classes, Data Abstraction and Encapsulation, Inheritance, Polymorphism.	
C++ Programming Language and Functions	(05)
Tokens, Keywords, Identifiers,Basic Data Types, User Defined Data Types, Derived Data Type, Variables, Scope Resolution Operator, Memory Management Operator, Manipulators, Type Cast Operator, Operator Overloading, Operator Precedence, Control Structure, Function Prototype, Call by Reference, Call by Value, Inline functions, Default Argument, Function Overloading	
Classes and Objects	(06)
Structures and Classes, Class declaration, Creating Objects, Assessing Class Members, Class Function Definition, Member Function Definition, Private and Public Member Function, Nesting of Member Functions, Memory Allocation for objects, Array of objects, Objects as Function Arguments.	
Inheritance: Extending Classes	(05)
Base and Derived Classes, Visibility Modes, Concept of Protected Member, Types of Inheritance- Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance.	
Operator overloading	(05)
Definition, Overloading Unary Operators, Overloading Binary Operators, Type Conversions- Built in to Class Type, Class Type to Built in Type, One Class conversion to another Class.	
SECTION-B	
Streams and Templates	(05)
C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted I/O Operations, Manipulators, Templates.	
File Streams	(05)
Classes for File Stream Operation, Opening and Closing a File, Detecting End-of-File, File Pointers and Manipulators, Functions- put() and get(), write() and read().	
Object Oriented Analysis and Object Oriented Design	(08)
Object Oriented Notations and Graphs, Steps in Object Oriented Analysis, Steps in Object Oriented Design, System analysis, System Design, Object Design	

Object Oriented Methodologies

OMT methodology, Object Model, Dynamic Model, Function Model, Relationship among models, Jacksons Model, Booch's OOA and OOD approach.

RECOMMENDED BOOKS

NECO	VINIENDED BOOKS		
S. No.	NAME	AUTHOR(S)	PUBLISHER
1	The C++ Programming Language	BjarneStroustrup	Addison Wesley, 2000
2	Objecting Modeling and Design	James, Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy and William Lorensen	PHI 1998
3	Object Oriented Programming in TURBO C++	Robert Lafore	Galgotia Publications Pvt. Ltd., 199
4	Programming with C++	D.Ravichandran	Tata McGrav Hill, 1996
5	Object Oriented Programming with C++	Balagurusamy	Tata McGrav Hill Publishin Co. Ltd., 200

РО СО	a	b	c	d	e	f	g	h	i	j	k	1
CO1					2							1
CO2					2							1
CO3			1	2								
CO4				2	1							
C05				2	1							
CO6			2	1								
C07			2	1								
CO8									2			1

133

(04)

C09					2		1
0.03							

ry of Computation (Theory) ive
ive
ete Mathematics(IT435)
To construct and prove the equivalence languages described by finite st machines and regular expressio pushdown automata and turing machine
completion of this course, the studen- ble to: cplain and interpret the fundament athematical and computational princip ying the foundation of computer science. ove the equivalence of languages describ finite state machines and the equival- gular expressions. ove and utilize the equivalence of language escribed by pushdown automata and puivalent context free grammars. cplain and apply computable functions rious types of Turing machines and P achines
r q a

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

SECTION-A	Hour
Introduction to finite automata: Strings, alphabet, language operations, finite state machine, finite automation model, acceptance of strings and language, deterministic finite automaton, deterministic finite automaton, equivalence between NFA and DFA, conversion of NFA into DFA, minimization of FSM, equivalence between two FSMs, Moore and Mealy machines.	(12)
Regular expressions and regular languages: Regular sets, regular expressions, identity rules, manipulation rules, manipulation of regular expressions, equivalence between RE and FA, inter conversion, pumping lemma, closure properties of regular sets(proofs not required), regular grammars, right linear and left linear grammars, equivalence between regular linear programming and	(11)

FA							
	SECTIO	N-B					
Context Context push do CFL (pr	t free grammar and languages: free grammar,derivationtrees,chomsky norr wn automata, acceptance of CFL, equivalen oofs omitted)	nal form,greibach normal for ce of CFL and PDA, properti	(8) m, es of				
Turing Turing r enumera required sensitive	Machines: nachine definition model, design of TM, co able language, church's hypothesis, counter),chomsky hierarchy of languages, linear bo e language, introduction of DFCL and DPD.	mputable functions, recursive machine, types of TM's (proc bunded automata and context A. LR(0) grammar	ofs not				
Undecid Undecid universa	lability: lability, properties of recursive & non-recurs il Turing machine	sive enumerable languages,	(7)				
S No	NAME		DUDI ISHED				
1	Introduction to automata theory, languages and computation	Hopcroft H.E. & Ullman	Pearson/Addis n Wesley				
2 An introduction to formal languages and Peter linz Jones automata Le							
3	Introduction to languages and the theory of automata	John C Martin	McGraw-Hil				
4	Elements of theory of computation	H.P. Lewis and C.H. papadimition	Prentice-Hal				
5	Theory of computation	Mishra &Chandrashekharan	PHI Learning Pvt. Ltd				

ро со _	a	b	c	d	e	f	g	h	i	j	k	1
C01	2			1	1							
CO2	1			2	2							
CO3	1			2	2							
CO4	1			2	2						2	
CO5	2			2	1						1	

Course Code	IT834					
Course Title	Mobile Apps Development (Theory)					
Type of Course	Elective					
LT P	310					
Credits	04					
Total Lectures	45					
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Sessional)	50 50					
Course Prerequisites	Java Programming(IT732)					
Course Objectives	1. To expose essentials of mobile ap					
	designing developing testing signing					
	packaging and distributing high quality					
	mobile apps.					
	2. To teach mobile app development usi					
	Android as the development platform.					
Course Outcomes	 Upon successful completion of this course, the students will be able to: List and explain various mob platforms. Explain the building blocks of mob apps development. III. Make use of graphics, animation a multimedia in mobile ap development. IV. Apply testing and distribute mob apps to market. 					
SYLI	ABUS					
Note: The examiner shall set seven question compulsory, having parts covering the whole	s of 10 marks each. First question has to syllabus. Three questions have to be set fro					

Note: The examiner shall set seven questions of 10 marks each. First question has to l compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question

paper.					
SECTION-A					
Getting started with Mobility	(08)				
Mobility landscape, Mobile platforms, Mobile apps development, Overview of Android					
platform, setting up the mobile app development environment along with an emulator, a					
case study on Mobile app development.					
Building blocks of mobile apps	(16)				

App user interface designing - mobile UI resources (Layout, UI elements, Draw-able, Menu), Activity states and life cycle, interaction amongst activities. App functionality beyond user interface - Threads, Async task, Services - states and life cycle, Notifications, Broadcast receivers, Telephony and SMS APIs Native data handling - on-device file I/O, shared preferences, mobile databases such as

SQLite, and enterprise data access (via Internet/Intranet).

SECTION-B	
Sprucing up mobile apps	(08)
Graphics and animation - custom views, canvas, animation APIs, multimedia -	
audio/video playback and record, location awareness, and native hardware access	
(sensors such as accelerometer and gyroscope).	
Testing mobile apps	(08)
Debugging mobile apps, White box testing, Black box testing, and test automation of	
mobile apps, JUnit for Android, Robotium, MonkeyTalk.	
Taking apps to Market	(05)
Versioning, signing and packaging mobile apps, distributing apps on mobile market	
place.	
RECOMMENDED BOOKS	

neco			
S. No.	NAME	AUTHOR(S)	PUBLISHER
1	Mobile Apps Development, Edition I,	AnubhavPradhan	Anil V
	2013		Deshpande
2	Android Application Development All	Barry Burd	John Wiley &
	in one for Dummies, Edition: I		Sons
3	Teach Yourself Android Application	Carmen Delessio, Lauren	SAMS
	Development In 24 Hours, Edition: I	Darcey, Shane Conder	

PO CO	a	b	c	d	e	f	g	h	i	j	k]
CO1	1											
CO2	1											

CO3	2	1		1				
CO4	2	1	2	1				

Course CodeIT834Course TitleSoft Computing (Theory)Type of CourseElectiveL T P310Credits04Total Lectures45Course Assessment Methods:Image: Course Assessment Methods:
Course TitleSoft Computing (Theory)Type of CourseElectiveL T P310Credits04Total Lectures45Course Assessment Methods:Image: Soft Course Assessment Methods:
Type of CourseElectiveL T P310Credits04Total Lectures45Course Assessment Methods:
L T P310Credits04Total Lectures45Course Assessment Methods:
Credits 04 Total Lectures 45 Course Assessment Methods: 1
Total Lectures 45 Course Assessment Methods: 45
Course Assessment Methods:
End Semester Assessment (University Exam.) 50
Continuous Assessment (Sessional) 50
Course Prerequisites Artificial Intelligence (IT735)
 Course Objectives 1. To introduce students to soft comput concepts and techniques and foster the abilities in designing. 2. To implement soft computing based solution for real-world problems.
Course Outcomes Students are expected to accomplish to following objectives through this course: I. Understand basic concepts of Neu networks. II. Understand the concepts of fuzzy log operations on fuzzy logic , fuzzy log arithmetic. III. Enumerate the knowledge of uncertain based information. IV. Identify the need of neuro fuzzy system V. Discover the various applications of fuz system V. Understand the concepts of general adorithms
SYLLABUS

Note: The examiner shall set seven questions of 10 marks each. First question has to compulsory, having parts covering the whole syllabus. Three questions have to be set fro Part A and three questions from Part B of the syllabus. Candidate is required to attempt least two questions from each part. All the course outcomes must be covered by the question paper.

Neural Networks: (() History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks. Fuzzy Logic: (() Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. (() Operations on Fuzzy Sets: (C) Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations. (() Fuzzy Arithmetic: Fuzzy Numbers, Fuzzy Equations (() Fuzzy Numbers, Fuzzy Equations (() () Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges. (() Uncertainty based Information: (() () Information & Uncertainty, Non-specificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets. () Introduction of Neuro-Fuzzy Systems: () () Architecture of Neuro Fuzzy Networks. Application of Fuzzy Logic: () Introduction to Neural Networks, J.A.Anderson MIT Pres () 3 Fuzzy Logic G.J. Klin& B. Yuan Prentice					SI	ECTIO	N-A						Hour
History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks. Fuzzy Logic: ((I Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. Operations on Fuzzy Sets: (Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations. Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations SECTION-B Fuzzy Logic: Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges. Uncertainty based Information: Information & Uncertainty, Non-specificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets. Introduction of Neuro-Fuzzy Systems: Architecture of Neuro-Fuzzy Networks. Application of Fuzzy Logic: (C An Overview, GA in problem solving, Implementation of GA RECOMMENDED BOOKS S. No. NAME AUTHOR(S) PUELISH 1 An Introduction to Neural Networks, J.A.Anderson MIT Pres 2 Introduction to Reney of Neural Hertz J. Krogh, R.G. Addison Computation Reural Networks: Algorithm Melanie Mitchell MIT Pres 5 Neural Networks-A Comprehensive Giord Raimer, Wesley 3 Fuzzy Sets & Fuzzy Logic G.J. Klirk B. Yuan Prentice-H Foundations Simon S. Haykin Prentice-H Foundations Applications and Programming Skapura Wesley, Applications and Programming Skapura Wesley, Reading, M	Neural	Network	s:										(05)
Fuzzy Logic: Introduction to Fuzzy Logic, Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation ((f) Operations. Fuzzy Arithmetic: Fuzzy Varithmetic: ((f) Fuzzy Logic: (Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic ((f) Hedges. ((f) Uncertainty based Information: ((f) Information & Uncertainty, Non-specificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy ((f) Application of Neuro-Fuzzy Systems: ((f) Architecture of Neuro-Fuzzy Networks. (f) Application of Fuzzy Logic: (f) Canctic Algorithm: (f) An Introduction to Neural Networks, J.A.Anderson MIT Pres 1 An Introduction to Neural Networks, J.A.Anderson 1 An Introduction to Reneral Networks, J.A.Anderson MIT Pres 2 Introduction to Genetic Algorithm Melanie Mitchell MIT Pres 3 Fuzzy Sets & Fuzzy Logic	History architec reinforc Back F Associa	sry, overview of biological Neuro-system, Mathematical Models of Neurons, ANN tecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and orcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, ciative Memories, Applications of Artificial Neural Networks.										ANN and Delta, vorks,	
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3Fuzzy Sets & Fuzzy LogicG.J. Klir& B. YuanPrentice H4An Introduction to Genetic AlgorithmMelanie MitchellMIT Pres5Neural Networks-A Comprehensive FoundationsSimon S. HaykinPrentice-H6Neural Networks: Algorithms, Applications and Programming TechniquesJ.A. Freeman & D.M. SkapuraAddison Wesley, Reading, MPO COabcdefghijk	2	Introd	uction C	to the T computa	heory o tion	of Neura	ıl	Hertz	J. Krog Palmer	gh, R.G. r,		Addi Wes	son- sley
4 An Introduction to Genetic Algorithm Melanie Mitchell MIT Press 5 Neural Networks-A Comprehensive Foundations Simon S. Haykin Prentice-H Internation 6 Neural Networks: Algorithms, Applications and Programming Techniques J.A. Freeman & D.M. Skapura Addison Wesley, Reading, M PO a b c d e f g h i j k	3	F	uzzy S	ets & F	uzzy Lo	ogic		G.J. 1	Klir& B	8. Yuan		Prentic	e Hall
5 Neural Networks-A Comprehensive Foundations Simon S. Haykin Prentice-H Internation 6 Neural Networks: Algorithms, Applications and Programming Techniques J.A. Freeman & D.M. Skapura Addison Wesley, Reading, M PO CO a b c d e f g h i j k	4	An Int	roductio	on to G	enetic A	lgorith	m	Mel	anie Mi	itchell		MIT	Press
6 Neural Networks: Algorithms, Applications and Programming Techniques J.A. Freeman & D.M. Skapura Addisor Wesley, Reading, M PO a b c d e f g h i j k	5	5 Neural Networks-A Comprehensive Simon S. Haykin Prent Foundations Inter										Prentic Interna	e-Hall tional
PO a b c d e f g h i j k	6	Ne Apj	ural Ne plicatio	etworks: ns and I Fechniq	Algori Progran ues	thms, nming		J.A. F	reeman Skapui	& D.M a	•	Addi Wes Reading	ison ley, 3, Mas
	<u>Р</u> СО _	O a	b	c	d	e	f	g	h	i	j	k	l

CO1	2	2	1	2	2			1	
CO2	2	2	2	2	2			1	
CO3				2	2				
CO4	2	2	2	2	2			1	
CO5					2	2		2	
CO6	2	2	2	2	2	1		2	

Course Code	IT885
Course Title	Seminar
Type of Course	Core
LTP	003
Credits	02
Course Assessment Methods:	
End Semester Assessment (University Exam.)	00
Continuous Assessment (Practical)	50
Course Prerequisites	Nil
Course Objectives	 Investigate some of the current scienti issues facing society. Students will examine and develop se management skills necessary
Course Outcomes	academic success. By studying this subject the students are all
	to:
	I. Develop and deepen understanding of topics being studied.
	II. Develop many forms of communication analytical and problem-solving skills.
	III. Extend a greater amount of interactive between teacher and students.
	IV. Take part in the class and learn active by engaging in these kinds of activities.
	V. Formulate a topic and, guided by the learning outcomes for the course, ta responsibility for their own learning
	VI. Extend collaborative learning and h themselves see each other as people th can learn from.

РО СО	a	b	c	d	e	f	g	h	i	j	k	1
C01	1			2								
CO2		2								2		
CO3								1	2			
CO4										2		1
CO5				1			2					
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CO6					2	1						

Course Code	IT886					
Course Title	Project-II					
Type of Course	Core					
LTP	006					
Credits	03					
Course Assessment Methods: End Semester Assessment (University Exam.) Continuous Assessment (Practical)	00 100					
Course Prerequisites	Nil					
Course Objectives	1. Students learning skills to tackle realis problems as they would be solved in the r world.					
	 Increased student control over his or her learning Teachers serving as facilitators help in clarity of objectives to be achieved. Students (usually, but not always) workin in pairs or groups 					
Course Outcomes	 Upon successful completion of this cour the students will be able to: Formulate system requireme specifications for a real l engineering problem. II. Determine feasibility of developithe software/system. III. Design, implement and test appropriate solution to the problem. IV. Learn and perform project plannin monitoring and management activities. V. Work effectively as a team member 					

P C	a	b	c	d	e	f	g	h	i	j	k	1
CO1	1					1				2		
CO2	2			1	1							
CO3	1	1	2	2	2							
CO4	1								1		2	
CO5									2	1	1	

COURSE INFORMATION SHEET

Course Code Course Title							IT887						
							Industrial Training						
Type of Course							Core						
Duration							6 months						
Credits							25						
Course A	ssessm	ent Me	thods:										
Marks *							350						
Internal A	300												
Course Prerequisites							Nil		•	•			
Course O Course O		 Practice. To introduce students to integrate theory with practice. To introduce students to work culture and industrial practices. To provide opportunity for students to work with industrial practitioners. Upon successful completion of training, the students are able to: IV. Apply skills and knowledge related recent technologies. V. Demonstrate practical skills and developrojects. VI. Demonstrate interpersonal skills and ability for team work. VII. Compile a report on their work and students are students and students are students. 											
* Note: M	arks re	fer to m	id sem	ester ev	aluation	1 and	end seme	ster eva	luation				
	1												
C0 \	a	b	c	d	e	f	g	h	i	j	k	1	
CO1	1		2	2	2	1	1					1	
CO2		2	2	2	2	1	1						
CO3								1	2				
CO4										2	2		