SCHEME OF INSTRUCTION & SYLLABI

Programme: Computer Science & Engineering

Scheme of Instructions: Second Year B. E. in Computer Science & Engineering

Semester-IV

. 1				_	Seme	ester-	IV						
Sr. No.	Course		Course Title	L	Т	P		Course			1 SCHE	ME	
140	Category	Code					Hrs/Wk	Credits	CT-1	CT-2	TA/CA	ESE	TOTAL
1	BSC	BCS2401	Discrete Mathematics & Graph Theory	3	1	-	4	4	15	15	10	60	100
2	PCC	BCS2402	Software Engineering	3	-	-	3	3	15	15	10	60	100
3	PCC	BCS2403	Operating System	3	-		3	3	15	15	10	60	100
4	PCC	BCS2404	Database Management System	3	-	-	3	3	15	15	10	60	100
5	PCC	BCS2405	Theoretical Foundation of Computer Science	3	1	-	4	4	15	15	10	60	100
6	PCC	BCS2406	Computer Network	3	-	-	3	3	15	15	10	60	100
7	PCC	BCS2407	Database Management System Lab	-	-	2	2	I	-	-	25	25	50
8	PCC	BCS2408	Operating System Lab		-	2	2	1	-	-	25	25	50
9	PCC	BCS2409	Computer Network Lab	-	~	2	2	1	-		25	25	50
0	PROJ	BCS2410	Micro Project I		-	2	2	1	-	-	25	25	50
1	MCC	BAU2404	Group Reading of Classics	2	-	2	2	Audit	-	-	- 1	-	-
			Total	20	02	08	30	24	90	90	160	460	800

L- Lecture

T-Tutorial

P-Practical

CT1- Class Test 1

TA/CA- Teacher Assessment/Continuous Assessment

CT2- Class Test 2

ESE- End Semester Examination (For Laboratory End Semester performance)

Course Category	HSMC (Hum., Soc. Sc, Mgmt.)	BSC (Basic Sc.)	ESC (Engg. Sc.)	PCC (Programme Core courses)	PEC (Programme Elective courses)	OEC (Open Elective courses from other discipline)	Project / Seminar / Industrial Training	MCC (Mandatory Courses)
Credits	**	04	#6	19	*		01	Yes
Cumulative Sum	06	26	18	31	44.	**	01	*

PROGRESSIVE TOTAL CREDITS: 58+24 = 82

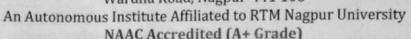
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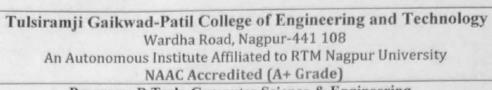
	Prog	nam: B. Tech. Computer Science and Engineer	ing		ON	
Semeste		Name of Course	L	T	P	Credits
IV	BCS2401	Discrete Mathematics and Graph Theory	3	1	-	4
		Course Contents				
Unit I	Operations, Relations: Ordere Matrix of Relation Relations & Partit a relation, Partial of Functions: Defini	d pairs and n-tuples, Product Sets and Partitions on, Paths in Relations and Digraphs, Properties ons, Compatible Relation, Composition of Relation, Composition, Partially ordered set, Hasse Diagramation, Composition of functions, Types of Function, Characteristics function of a set with Theorem	s, Relatof Resons, Tons.	ation lation Frans	s and	d Digraphs equivalence Closure o
Unit II	Combinatorics: R Pigeonhole Princi	ules of Sum and Product, Permutations, Combina ple, Recurrence Relation, Linear Recurrence Solutions, Applications of Relations and Functio	tions. Relat		with	Constan
Unit III	Groups, Ring an Groups, subgroup Integral Domain a	d lattices: Algebraic Systems, Semi Groups, C s, Isomorphism, Automorphisms and Homor nd Fields Lattices and Algebraic Systems, Principle of defined by Lattices, Boolean Lattices.	Group	ism	grou	ip, Rings
Unit IV	Fuzzy Set & Fuzz Fuzzy set, Relation & classical logic.	y Logic :Fuzzy sets & systems, Crisp set, opera between Crisp and Fuzzy set, Fuzzy Relation, C	tions Overv	& co	ombi of Fu	nations or izzy Logic
	representation of gr circuits, Reach abil Binary tree, Undire examples), Minima of algebraic express	sic concepts of graph theory, Digraphs, Basic detaphs, Subgraphs and quotient graphs, Isomorphicity and connectedness, Node base, Euler's path & cted tree, Spanning tree, Weighted graphs (Only of spanning tree by Prim's algorithm &Kruskal's alsions by Venn diagram and binary tree.	grapl Hami lefinit	ns, Pa lton's	aths at s pat	and h, Tree,
Text Book		Mohamatan William C.D.				
T1 F	fill	Mohapatra, "Elements of Discrete Mathematics	", 4th	Edit	ion,	McGraw-
T2 K	Kenneth H. Rosen, "	Discrete Mathematics and its Applications", & 7th	h edit	ion.	McG	raw-Hill
T3 E	Bernard Kolman, Ro th edition, Prentice I	bert C. Busby, Sharon Cutler Ross, "Discrete r	nathe	matic	al st	ructures",
deference l						
E	dition, Pearson Edu					
П	111	rete mathematical structures with application", 3	rdEdi	tion,	Tata	McGraw
seful Link						
		rses/106/106/106106183/				
2 ht	tps://nptel.ac.in/cou	rses/111/107/111107058/				R DE DE

	Course Outcomes	CL	Class Sessions
BCS2401.1	Apply formal proof techniques & Analyze types of relations and functions to solve the problems.	3	9
BCS2401.2	Solve recurrence relations, generating functions and combinatorial problems.	4	9
BCS2401.3	Apply the concepts of Groups, Rings and Lattices	3	9
BCS2401.4	Interpret fuzzy set theory and uncertainty concepts	4	9
BCS2401.5	Analyze computational problems in graph theoretical framework.	3	9

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		am: B.Tech. Computer Science & Engine				
Semest	ter Course Code	Name of Course	L	T	P	Credits
IV	BCS2402	Software Engineering	3	-	-	3
	1	Course Contents	to A I	011010	d Te	oha ola av
Unit I	Software Process Fra Software Engineer Practices, Modeling Hierarchy, System N	ware Characteristics, Software Engineer amework, Software Myths ring Principles and Practice: Communication Practices, Construction Practice & Dep Modeling, Requirements Engineering process tirements Specification.	inication loyment,	Pract	ices, m Ei	Planning
Unit II	Process Models, Spe Agile Process Model Deployment.	Models The Waterfall Model, Incremental cialized Process Models, The Unified Process, Agile metrics, Extreme Programming (X) enario Based Modeling, Flow Oriented Modeling, Fl	ess Mode (P), Scru	el, CO m, Ka	COM nban,	O Model Software
Unit III	Design Concepts: Refactoring. Creating an architecture	Abstraction, Pattern modularity, Informaticular design: software architecture, Data dal Design, assessing alternative architectura ecture.	lesign, Ar	chitec	tural	styles and
Unit IV	software, Black-Box testing, System testing, Product metrics: So Model, Metrics for I maintenance. Metrics quality.	A strategic approach to software testing, to and White-Box testing, Validation g, the art of Debugging. oftware Quality, Framework for Product of Design Model, Metrics for source code, M for Process and Products: Software Meas	metrics, letrics for urement,	Metric r testii Metri	es for	Analysis letrics for software
Unit V	reviews, Statistical S standards. Risk management - RMMM, Risk Respo management using Ji Repository, SCM Proc Reverse Engineering	nt Software quality assurance, Software oftware quality Assurance, Software relia Risk strategies, Software risks, Risk id use development & Risk Response Contra, Change Management- Software Confeess, Estimation, Software reengineering, A practical approach	bility, The entification	on, Ri	sk re	00 quality
ext Book	S					
T1 S	Software Engineering-A	A Practitioner's Approach (Sixth Edition)-R	loger Pres	ssman	(TM	H)
T2 S	Software Engineering (Ninth Edition)-Ian Summerville (Pearson E	ducation)		
O Larry State Control of the Control		Theory and Practice (Fourth Edition) - Pfle				
eference		, and a second of the	-5-1			
R1 S	Software Engineering-S	chaum's Series (TMH)				
		A Primer, Waman S Jawadekar, Tata McGr	ov. IEH	2000		
R3 R	Rajib Mall, Software Pr	oject Management, 5th Edition, McGrawH	aw-Hill,	2008		
	The second secon	San Latition, Micarawi	111			
seful Link	ks					

	Course Outcomes	CL	Class Sessions
BCS2402.1	Understand the knowledge of basic Software Engineering Principals and Practices.	2	09
BCS2402.2	Analyze fundamentals of software process models.	4	09
BCS2402.3	Apply designing Concept for creating software architectural design.	3	09
BCS2402.4	Understand software Testing strategies, Unit Testing, system testing and Product metrics	2	09
BCS2402.5	Analyze steps for improving the software quality	4	09

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7	Progra	m: B. Tech. Computer Science and	I Engineerin	g		
Semester	Course Code	Name of Course	L	T	P	Credits
IV	BCS2403	Operating System	3	-	-	3
		Course Contents				
Unit I	Introduction Evolution of OS, Ty services provided by Microkernel Operation	OS, system programs and system can be systems.	cessary for n	nodern o cture: Lay	perating vered, N	g systems, Monolithic,
Unit II	Types of scheduler,	cess control Block, Process states, I context switch, threads, multithrea algorithm (FIFO, SJF, Priority, and R	iding model.	Goals o	mitive f schee	Processes, duling and
Unit III	Process Cooperation Concurrency condition conditional critical	n and Synchronization ons, Critical section problem, softwaregions and monitors, classical in tics, Prevention, Avoidance, Detection	are and hardy	vare solu communi	tion, se ication	emaphores, problems.
Unit IV	paging, page faults an	nt n, Relocation, Paging, Segmentation ad instruction restart, page replacement concept, Access methods, Disk spar structures, Recovery, Log-struct	ent algorithms ace manager	s nent and	space	allocation
Unit V	Protection & Recover Goals of Protection, a	ery access matrix, implementation, Secur	rity problem.			
Text Book	S				4	
T.1	Wiley Indian Edition	oncepts (8th Edition) by Silberscha (2010).				
T.2	Modern Operating Sy	stems (Third Edition) by Andrew S	Tanenbaum,	Prentice 1	Hall Inc	dia (2008).
T.3	Operating Systems by	D.M. Dhamdhere, Tata McGraw H	ill 2nd edition	n.		
Reference	Books					
R.1	India, 2000	th Ed) - Internals and Design Princi				
R.2	Operating System: Co	oncepts and Design by Milan Milenle	kovik, McGr	aw Hill H	ligher l	Education
Useful Lin						
1		rses/106/105/106105214/				
2	https://nptel.ac.in/cou	/106/102/106102122/				

	Course Outcomes	CL '	Class Sessions
BCS2403.1	Recognize OS evolution and structures.	2	9
BCS2403.2	Discuss a process scheduling algorithms.	2	9
BCS2403.3	Demonstrate Process Deadlock and its prevention.	3	9
BCS2403.4	Interpret memory management problems and file access techniques.	3	9
BCS2403.5	Analyze OS Security & its protection	4	9

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-		ram: B. Tech. Computer Science & E			-	G 11
Semes		Name of Course	L	T	P	Credits
IV	BCS2404	Database Management System	03	-	-	03
	INTRODUCTION TO	Course Contents		-	-	
Unit I	Introduction: Databa Data Modeling: Data E-R diagrams: Comp Relational Model: Ba Relational Integrity:	se Concepts, Database System Architect Models, Basic Concepts, entity, attributionents of E-R Model, conventions, consist concepts, Attributes and Domains, Commain, Entity, Referential Integrities, Basic Operations, Tuple and Domain rel	tes, relativerting E Codd's Ri Schema	-R diagules. Diagran	ram into n.	
Unit II	SQL: Characteristics distinct, like, in, bet having clause, Sub	FO SQL and PL/SQL s and advantages, SQL Data Types, D ween, all, any, joins, set operations, a queries, alias, sequence, handling null : Constant, variables, Operators, Contro	ggregate values,	case,	ons, gro	up by clause ow functions
Unit II	Normalization: 1NF,	Functional Dependency, Purpose 2NF, 3NF, BCNF. Decomposition: los alued Normalization (4NF), Join Dependence	ssless joi	n decor	npositio	n dependenc
Unit IV	trees, Concepts of Fu QUERY PROCESSIN Overview: Query Pro-	OGICAL: Concept of Physical and log nctional dependency. IG AND OPTIMIZATION rocessing and Optimization, measures ng and Materialization, Structure of que	of que	ry cost	estimat	
UnitV	serializability, Syster based recovery, conc solution to concurren locking Recovery System: fa	ACTIONS s, properties of transactions, serialized recovery, Two- Phase Commit protourrent executions of transactions and recovery related problems, deadlock, two-phase illure classification, checkpoints, buffer	ocol, Re elated pro ase locking	covery oblems, ng prote	and Ato Locking ocol, Iso	omicity, Log g mechanism lation, Inten
Text Bo	oks					
T1	Database System Conce Fifth Edition.	epts by AviSilberschatz, Henry F. Kor	th, S. Su	idarshar	, Tata N	AcGraw Hill
T2	Fundamentals of Databa	se Systems - Elmasiri and Navathe, Ad	ldison W	esley, 2	000.	
T3		base Systems, C J Date, A.Kannan, S.Sv	wamynat	han –Ei	ght Edit	ion.
Referen	ce Books					
R1	Database Management Publication, Third Edition	Systems - by Raghu Ramakrishnan and on.	Johanne	s Gehrl	ce, Tata	McGraw Hil
R2	Data Mining Technique	s, Arun K Pujari, 3rd edition, Orient Bla	ickswan/	Univers	ities Pre	ss, 2013
Useful I	Links					
1	https://nptel.ac.in/course					
2	https://nptel.ac.in/course	es/106/104/106104135/				

	Course Outcomes	CL	Class Sessions
BCS2404.1	Understand the basic elements of a relational database management system.	2	9
BCS2404.2	Apply RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.	3	9
BCS2404.3	Analyze the basic of physical, logical memory system and Query Processing and Optimization techniques.	4	9
BCS2404.4	Analyze transaction properties , serializable concept and	4	9
BCS2404.5	Implement Advance Recovery systems, Remote Backup systems and Understand basic concept of Data warehouse and Mining	3	9

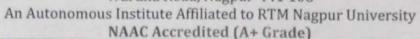
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	Prog	ram: B. Tech. Computer Science and Engineering					
Semester		Name of Course	L	T	P	Credits	
IV	BCS2405	Theoretical Foundation of Computer Science	3	1	-	4	
		Course Contents					
Unit I	grammars, Cho	ngs, induction proof, pigeon-hole principle, conce msky hierarchy. Finite automata, regular languages nite automata, ε-closures, minimization of automata, e	, det	ermi	nisti	e, forma	
Unit II	Regular expression, identities, Regular grammar, right linear, left linear, Pumping lemma for regular sets, Moore and Mealy machine						
Unit III	CFG. Push dow	Context free languages, parse trees and ambiguity, reduction of CFGS, Normal forms of CFG. Push down Automata (PDA), non-determinism. Conversion of PDA to CFG, CFG PDAs, closure and decision properties of CFLs, pumping lemma for CFL.					
Unit IV	IV Turing machines, TM as acceptor, TM as transducers, Variations of TM, linear bound automata, TM as computer of function. Universal TM					bounded	
Unit V	correspondence	rumerable (r.e.) set, recursive sets, Decidability Problem (PCP), Introduction to recursive func- ons, Ackerman function					
Text Bool	ks						
T.1	Introduction to The	eory of Computations by John Martine, TMH publica	tion				
		eory of Computation by Michael Sipser.					
T.3	Introduction to The	eory of Computations by O. G. Kakade, Laxmi Public	ation				
Reference							
15.1		Automata Theory, Languages and Computationi, Pearson Education	on by	Но	ffcro	ft,	
R.2	Introduction to for	mal languages and automata by Peter Linz					
R.3	Elements of the the	eory of Computation by H. R. Levis, C. H. Papadimiti	riou,	РНІ			
Useful Li	nks						
1	https://onlinecours	es.nptel.ac.in/noc21_cs83					

	Course Outcomes	CL	Class Sessions
BCS2405.1	Execute finite automata for simple regular language.	3	9
BCS2405.2	Analyze regular language by regular expression.	4	9
BCS2405.3	Illustrate PDA for CFL.	4	9
BCS2405.4	Analyze working of Turing machine and TM for small set of languages/computations	4	9
BCS2405.5	Apply recursive functions and decompose problem into smaller problem.	3	9

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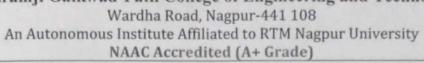
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	n	P. T. J. C						
		ram: B. Tech. Computer Science and E		1	-			
Semester		Name of Course	L	T	P	Credits		
IV	BCS2406	Computer Network	3	-	-	3		
		Course Contents						
Unit I	Physical Layer: Introduction to Networks (LAN, MAN, WAN, PAN), direction of data flow Connection topology; Network Devices, Network Model, Transmission Media, Switching, OS and TCP/IP.							
Unit II	Data Link Layer: Types of errors, framing (character and bit stuffing), error detection & correction methods; Flow control; Protocols: Stop & wait ARQ, Go-Back- N ARQ, Selective repeat ARQ, HDLC							
Unit III	Routing algorithm routing, address n	Logical Addressing, IPv4 Addresses, IPv6 ns: shortest path algorithm, flooding, dinapping: ARP, RARP, Unicast Routing Post, dynamic routing	istance vec	ctor ro				
Unit IV	multiple access p FDMA, TDMA, O Transport Layer	Control: FDDI, token bus, token ring; protocols: Pure ALOHA, Slotted ALOH CDMA r: Internet Protocol (IP) –UDP, TCP, Control Token bucket algorithm.	IA, CSMA	, CSN	IA/CD,	, CSMA/CA		
Unit V		er: Domain Name Space (DNS), TELN TTP, Digital Signature, Communication						
Text Book								
T.1	B. A. Forouzan - "D	ata Communications and Networking (3rd I	Ed.) " – TM	ſΗ				
T.2	A. S. Tanenbaum - "	'Computer Networks (4th Ed.)" - Pearson E	Education/P	HI				
T.3	W. Stallings – "Data	and Computer Communications (8th Ed.)"	– PHI/ Pea	rson E	ducation	1		
Reference	Books							
R.1		Computer Networking -A top down approach	ch featuring	g the in	ternet"	– Pearson		
R.2		Communications and Networking by Wayn	e Tomasi-I	earson	Edition	n		
R.3	Comer – "Internetwo	orking with TCP/IP, vol. 1, 2, 3(4th Ed.)" -	Pearson Ed	ucation	/PHI			
Useful Lin	nks							
1		ourses/108/104/108104139/						
2	http://nptel.ac.in/cou	The state of the s						
3	http://nptel.ac.in/cou	rses/117103064						

Course Code	Course Outcomes	CL	Class Sessions
BCS2406.1	Apply fundamentals of network formation and network devices in physical layer.	3	9
BCS2406.2	Analyze reliable network by error detection and correction technique in data link layer.	4	9
BCS2406.3	Determine network path with the help of routing algorithm in network layer.	4	9
BCS2406.4	Apply access control protocol for communication in network and reliable transmission of data packets in physical layer.	3	9
BCS2406.5	Examine effective communication in network by application layer.	3	9

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	Pı	rogram:B.Tech.ComputerSciencea		neering		
Semester	CourseCode	Name of Course	L	Т	P	Credits
IV	BCS2407	Database Management System Lab	-	-	2	1
		List of Experiment				
		ySQL Server and Interfacing.				CO
2	 Small-larg Distinct on Renaming Computed Simple-co Partial Ma 	attributes attributes mplex conditions (AND, OR, NOT) tching operators (LIKE, %, _, *, ?) C ordering combinations	orting o	n a simple	e table	CO
3	 Simple join Aliasing ta Inner-joins Outer-joins 	ulti-table queries(JOIN OPERATION of the INNER JOIN) bles – Full/Partial name qualification (two and more (different) tables) sive-joins (joining to itself) (restrictions as part of the WHERE) (restrictions clauses)		clauses)		СО
4	o implement Set 1. Union 2. Intersect 3. Minus	Oriented Operations				CO
5	 Creating object. Privilege ma 	L & TCL Commands. ects: tables, views, users, sequences, nagement through the Grant/Revoke processing using Commit/Rollback	Collecti	ons etc.		CO3
6 2	erform following 1. Implementati 2. Boolean oper 3. Arithmetic op 4. Group function	SQL queries on the database. ion of relational operators in SQL rators and pattern matching perations and built in functions ons ate and Time functions				CO3

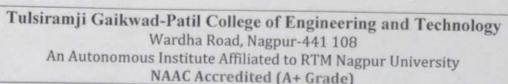
7	Execute DML statements which demonstrate the use of views. Update the base table using its corresponding view. Also consider restrictions on updatable views and perform view creation from multiple tables.	CO4
8	Create Table with primary key and foreign key constraints. 1. Alter table with add n modify 2. Drop table	CO4
9	Perform PL/SQL Programming I 1. Programs using named and unnamed blocks	CO5
10	Perform PL/SQL Programming II 1. Creating stored procedures, and packages 2. Creating functions (). 3. Triggers	C05

	Course Outcomes	CL	Lab Sessions
BCS2407.1	Understand the basic elements of a relational database management system.	2	2
BCS2407.2	Apply RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.	3	2
BCS2407.3	Analyze the basic of physical, logical memory system and Query Processing and Optimization techniques.	4	2
BCS2407.4	Analyze transaction properties , serializable concept and understand locking mechanism	4	2
BCS2407.5	Implement Advance Recovery systems, Remote Backup systems and Understand basic concept of Data warehouse and Mining	3	2

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	Program	: B. Tech. Computer Science an	d Enginee	ring			
Semes		Name of Course	L	Т	P	Credits	
IV	BCS2408	Operating System Lab		-	2	1	
		List of Experiment				-	
1.	Execute C programs	using system calls for UNIX open	rating syste	m.		C01	
2.	Execute C programs to simulate UNIX commands.						
3.	Execute Simple Shell					CO1	
4.	Execute C programs for CPU Scheduling Algorithms						
5	Execute C program for	or Deadlock Avoidance using Bar	nkers Algor	ithm		CO3	
6	Execute C program for Deadlock Detection Algorithm						
7	Execute C program for	Execute C program for Producer Consumer Problem using Semaphores.					
8	Execute C program for IPC using Shared Memory.					CO4	
9.	Execute C program for	or Threading & Synchronization A	Application	s.		CO5	
10.	Execute C programs f	for Memory Allocation Methods v	vith Fixed l	Partition		CO5	
Text Bo	oks						
Tl C	Operating System Concepts and Edition (2010).	(8th Edition) by Silberschatz, Pe	eter B. Galv	vin and (Greg Ga	gne, Wiley	
T2 N	Modern Operating Systems	(Third Edition) by Andrew S Tan	enbaum, Pr	rentice F	Hall India	(2008)	
T3 C	perating Systems by D.M.	Dhamdhere, Tata McGraw Hill 2	nd edition			(2000).	
	ce Books						
R1 C Ir	perating Systems (5th Ed) adia, 2000	- Internals and Design Principle	es by Willi	am Stall	ings, Pre	entice Hall	
R2 0	perating System: Concepts	and Design by Milan Milenkovi	k, McGrav	w Hill H	igher Ed	ucation	
R3 0	perating Systems, 3rd Edit	ion by Gary Nutt, Pearson Educat					
seful L							
1 ht	tps://nptel.ac.in/courses/10	06/105/106105214/					

	Course Outcomes	CL	Lab Session:
BCS2408.1P	Recognize OS evolution and structures.	2	2
BCS2408.2P	Discuss a process scheduling algorithms.	2	2
BCS2408.3P	Demonstrate Process Deadlock and its prevention.	3	2
BCS2408.4P	Interpret memory management problems and file access techniques.	3	2
BCS2408.5P	Analyze OS Security & its protection	4	2

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	Program	: B. Tech. Computer Science and	d Enginee	ring			
Semester	Course Code	Name of Course	L	T	P	C- 11	
IV	BCS2409	Computer Network Lab		1		Credits	
		List of Experiment			2	1	
1.	To demonstrate varie	ous network devices.				(CO1)	
2.	To demonstrate transmission media.						
2							
3.	Implement the even and odd parity in error detection and correction.						
4.	4. Implement the data link layer framing methods.						
5.	5. Configure a network using distance vector routing protocol						
6.	To create a Network using distance vector routing protocol						
7.	To create a Network using link state vector routing protocol.						
	To perform TCP &UDP protocol using.						
8.	To configure TCP/IP	protocol in WINDOW/LINUX.				(CO4) (CO4)	
9.	To implement domain	n name server.					
10.	Configure TELNET	protocol on router for remote acces	c			(CO5)	
ext Books						(CO5)	
T1 B. A.	Forouzan - "Data Com	munications and Networking (3rd E	d) "-TM	(I)			
Reference E	Books	5,000	.d.) – 11v.	111			
R1 W. St	allings - "Data and Cor	mputer Communications (8th Ed.)" -	DLII/ Dani	roon Ed			
seful Link	S	. Cuir Ed.)	TIII/ Fear	rson Edu	cation		
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	j	70/103/100103081/					

Course Code	Course Outcomes	CL	Lab Sessions
BCS2409.1	Apply fundamentals of network formation and network devices in physical layer.	3	2
BCS2409.2	Analyze reliable network by error detection and correction technique in data link layer.	4	2
BCS2409.3	Determine network path with the help of routing algorithm in network layer.	4	2
BCS2409.4	Apply access control protocol for communication in network and reliable transmission of data packets in physical layer.	3	2
BCS2409.5	Examine effective communication in network by application layer.	3	2

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