TY Sem I

			AY 2021-22						
			rse Information						
Progran	nme	B.Tech. (Informa	ation Technology)						
	emester	Third Year B. Te							
Course			,						
Course		Database Engine	ering						
	Requisites:	Object-Oriented Programming Data Structures, Computer Algorithms							
			6 6	<u> </u>					
Tea	ching Scheme		Examination S	cheme (Marks)					
Lecture		T1	T2	ESE	Total				
Futoria		- 20 20 60							
Practica	ıl -								
Interact			Cred	lits: 2					
	-	1							
		Co	urse Objectives						
1 7	To introduce basic c		e management system	18					
	Fo impart conceptua		<u> </u>						
3 7	Fo elaborate issues a	ssociated with tran	nsaction management						
			O) with Bloom's Tax	konomy Level					
	nd of the course, the		-		Apply				
		query language in database creation and interaction							
		chniques for efficient data storage and retrieval rency control protocol on database transactions							
CO3 (compare the concur	rency control prote	beor on database trans	actions	Analyze				
Module		Mo	dule Contents		Hours				
	Introduction:	1110							
Ι		s, Types of Databa	ase Systems, Data abs	traction, Data Models,	3				
	Architecture of Database Systems.								
	Relational Mode	el: Structure of Re	lational Databases, da						
II	Relational Mode Relational Algeb	el: Structure of Re ra, Tuple Relation	al Calculus, Domain I	Relational Calculus	5				
Π	Relational Mode Relational Algeb Integrity Constr	el: Structure of Re ra, Tuple Relation caints and Design	al Calculus, Domain l Domain Constraints	Relational Calculus , Referential Integrity,	5				
Π	Relational ModeRelational AlgebIntegrity ConstrTriggers, Norma	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona	al Calculus, Domain I Domain Constraints Dependencies, Deco	Relational Calculus , Referential Integrity, omposition.	5				
	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery Processi	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona ng: Query proces	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n	Relational Calculus , Referential Integrity, omposition. neasures of query cost,					
Ш	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormaQuery ProcessiEvaluation of	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expression	Relational Calculus , Referential Integrity, omposition.	5				
	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormaQuery ProcessiEvaluation ofLanguage (SQL)	el: Structure of Re- ra, Tuple Relation caints and Design forms, Functiona ng: Query proces expression, Equiv 2), Unstructured	al Calculus, Domain I Domain Constraints Dependencies, Deco ssing, Query Cost, n valence of Expressi Query Language	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB,					
III	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation ofLanguage (SQINoSQL)Indexing and H	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv L), Unstructured	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expression Query Language and secondary Indice	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files,	5				
	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormaQuery ProcessiEvaluation ofLanguage (SQINoSQL)Indexing and HStatic Hashing, I	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv L), Unstructured	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expression Query Language and secondary Indice	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB,					
III	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of oLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.	el: Structure of Re ra, Tuple Relation caints and Design forms, Functiona ng: Query proces expression, Equiv L), Unstructured fashing: Ordered Dynamic hashing,	al Calculus, Domain I Domain Constraints Dependencies, Deco using, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap	5				
III IV	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of aLanguage (SQINoSQL)Indexing and HStatic Hashing, 1indices.Transactions: P	el: Structure of Re ra, Tuple Relation caints and Design forms, Functiona ng: Query process expression, Equiv L), Unstructured Cashing: Ordered Dynamic hashing, roperties and states	al Calculus, Domain I Domain Constraints Dependencies, Deco ssing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap	5				
III	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of aLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Constr	el: Structure of Re ra, Tuple Relation caints and Design forms, Functiona ng: Query process expression, Equiv L), Unstructured (ashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution of Protocols, 2 phase	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph	5				
III IV	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of oLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Cobased protocols,	el: Structure of Re ra, Tuple Relation caints and Design forms, Functiona ng: Query process expression, Equive (), Unstructured (ashing: Ordered a Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution of Protocols, 2 phase protocols, Dead lock	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph	5				
III IV V	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of oLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Cobased protocols,	el: Structure of Re ra, Tuple Relation caints and Design forms, Functiona ng: Query process expression, Equive (), Unstructured (ashing: Ordered a Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution of Protocols, 2 phase protocols, Dead lock	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling	5				
III IV	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of aLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Cabased protocols,Crash RecoverRecovery,Shadow Paging,	el: Structure of Re- ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv 2), Unstructured (ashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling	5				
III IV V	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of aLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Cabased protocols,Crash RecoverRecovery,	el: Structure of Re- ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv 2), Unstructured (ashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling Structure, Log-Based	5 4 5				
III IV V	Relational ModeRelational AlgebIntegrity ConstrTriggers, NormalQuery ProcessiEvaluation of aLanguage (SQINoSQL)Indexing and HStatic Hashing, Iindices.Transactions: PConcurrency Cabased protocols,Crash RecoverRecovery,Shadow Paging,	el: Structure of Re- ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv 2), Unstructured (ashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage oncurrent transaction	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling Structure, Log-Based	5 4 5				
III IV V VI	Relational Mode Relational Algeb Integrity Constr Triggers, Normal Query Processi Evaluation of o Language (SQL) Indexing and H Static Hashing, I indices. Transactions: P Concurrency Co based protocols, Crash Recover Recovery, Shadow Paging, backups.	el: Structure of Re- ra, Tuple Relation raints and Design forms, Functional ng: Query process expression, Equive 2), Unstructured Tashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class recovery with c	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Indez s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage oncurrent transaction Text Books	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling Structure, Log-Based ns, buffer management,	5 4 5 4				
III IV V VI	Relational Mode Relational Algeb Integrity Constr Triggers, Normal Query Processi Evaluation of o Language (SQI NoSQL) Indexing and H Static Hashing, I indices. Transactions: P Concurrency Co based protocols, Crash Recover Recovery, Shadow Paging, backups.	el: Structure of Re- ra, Tuple Relation raints and Design forms, Functional ng: Query process expression, Equive 2), Unstructured Tashing: Ordered a Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class recovery with c	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Indez s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage oncurrent transaction <u>Text Books</u> , and S. Sudarshan, " <i>H</i>	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling Structure, Log-Based	5 4 5 4				
III IV V VI	Relational Mode Relational Algeb Integrity Constr Triggers, Normal Query Processi Evaluation of o Language (SQL) Indexing and H Static Hashing, I indices. Transactions: P Concurrency Co based protocols, Crash Recover Recovery, Shadow Paging, backups.	el: Structure of Re ra, Tuple Relation raints and Design forms, Functiona ng: Query proces expression, Equiv .), Unstructured fashing: Ordered Dynamic hashing, roperties and states ontrol: Lock-Base Time stamp based ry: Failure Class recovery with c	al Calculus, Domain I Domain Constraints Dependencies, Deco sing, Query Cost, n valence of Expressiv Query Language and secondary Indice Comparison of Index s, Concurrent execution d Protocols, 2 phase protocols, Dead lock ssification, storage oncurrent transaction Text Books , and S. Sudarshan, " <i>P</i> 2010.	Relational Calculus , Referential Integrity, omposition. neasures of query cost, ons. Structured Query (MongoDB, MariaDB, es, B+ Tree Index Files, xing, Grid files, Bitmap on, Serializability. locking protocol, Graph handling Structure, Log-Based ns, buffer management,	5 4 5 4 ts",				

	References								
1	J.D. Ullman, "Principles of Database Systems", Galgotia Publications, 2nd Edition, 1999								
2									
2	3 C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Pearson								
5	Education, 8th Edition, 2006.								
	Useful Links								
1	https://nptel.ac.in/courses/106/105/106105175/								
2	http://www.nptelvideos.in/2012/11/database-management-system.html								
3	https://www.tutorialspoint.com/mongodb/mongodb_overview.htm								
4	https://www.tutorialspoint.com/mariadb/mariadb_introduction.htm								

	CO-PO Mapping													
		Programme Outcomes (PO) PSO											50	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1					3							1		
CO2		1			2								1	
CO3	1	2												2
CO3	1	2		1		1.2.2	W 71	1.T.	2. N	[. 1 ¹	2.11.	. 1.		2

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.

Assessment

Assessm	Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total							
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed							
Understand	5	5	10	20							
Apply	10	5	15	30							
Analyze	5	5	15	25							
Evaluate		5	15	20							
Create			5	5							
Total	20	20	60	100							

			ege of Engineering, ided Autonomous Ins					
			AY 2021-22					
		Cou	rse Information					
Progra	amme	B.Tech. (Informa	tion Technology)					
Class,	Semester	Third Year B. Te	ch., Sem V					
Course	e Code							
Course	e Name	Operating System	1					
Desire	ed Requisites:	Computer Archite	ecture					
Te	eaching Scheme		Examination So	cheme (Marks)				
Lectur		T1	T2	ESE	Total			
Tutori		- 20 20 60						
Practi					100			
Intera			Cred	its: 3				
vi u		Co	irse Objectives					
1	To introduce variou							
2	To elaborate operati	•						
3	To comprehend the	~ .						
	· · · ·	<u> </u>	D) with Bloom's Tax	onomy Level				
At the	end of the course, the	· · · · · · · · · · · · · · · · · · ·						
CO1	Distinguish betweer	• •	<u> </u>		Understand			
CO2	Illustrate the concep	· · ·			Apply Analyse			
CO3 Analyse the deadlocks and memory management challenges in operating system								
Modu		Mod	lule Contents		Hours			
	Introduction :							
	· ·			tion, Computer System				
				em Operations, Process				
T	Management, N	Memory Managem	ent, Storage Manag	ement, protection and	5			
1	security.				5			
	System Structu	re: Operating syste						
	system calls, typ	pes of system calls						
	and implementat	tion, operating syste	em structure.					
	Process							
	Process Concep	ot, Process Schedu	uling, Operation on	process, Cooperating				
	process, Thread	Concept, Process Scheduling, Operation on process, Cooperating, Threads, Inter-process Communication (Algorithms evaluation).						
II	Process Sched	us, mer-process	Communication (A	ligorithms evaluation).	8			
II		duling: Basic co		-				
II		duling: Basic co		Criteria, Scheduling				
II		duling: Basic co ltiple processor sche	oncept, Scheduling	Criteria, Scheduling				
II	Algorithms, Mul	duling: Basic co ltiple processor scho ynchronization	oncept, Scheduling eduling, Real time sch	Criteria, Scheduling				
	Algorithms, Mul Inter-process S Background, Cla	duling: Basic co ltiple processor scho ynchronization assical problems of	oncept, Scheduling eduling, Real time sch	Criteria, Scheduling neduling. ical Region, The critical				
	Algorithms, Mul Inter-process S Background, Cla section problem	duling: Basic co ltiple processor scho ynchronization assical problems of	oncept, Scheduling eduling, Real time scl synchronization, Crit	Criteria, Scheduling neduling. ical Region, The critical				
III	Algorithms, Mul Inter-process S Background, Cla section problem Deadlocks	duling: Basic co ltiple processor scho ynchronization assical problems of a, Synchronization H	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S	Criteria, Scheduling neduling. ical Region, The critical	6			
	Algorithms, Mul Inter-process Sy Background, Cla section problem Deadlocks System modes,	duling: Basic co ltiple processor scho ynchronization assical problems of a Synchronization H Deadlock charact	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods	Criteria, Scheduling neduling. ical Region, The critical Gemaphores.	6			
III	Algorithms, Mul Inter-process Sy Background, Cla section problem Deadlocks System modes, Deadlock preven deadlock.	duling: Basic co ltiple processor sche ynchronization assical problems of a, Synchronization H Deadlock charact ntion, Deadlock ave	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods	Criteria, Scheduling neduling. ical Region, The critical Gemaphores.	6			
III	Algorithms, Mul Inter-process Sy Background, Cla section problem Deadlocks System modes, Deadlock preven	duling: Basic co ltiple processor sche ynchronization assical problems of a, Synchronization H Deadlock charact ntion, Deadlock ave	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods	Criteria, Scheduling neduling. ical Region, The critical Gemaphores.	6			
III	Algorithms, Mull Inter-process Sy Background, Cla section problem Deadlocks System modes, Deadlock prevendeadlock. Memory Manage Background, Log	duling: Basic co ltiple processor scho ynchronization assical problems of a, Synchronization H Deadlock charact ntion, Deadlock avo gement ogical Versus Phys	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods f bidance, Deadlock de	Criteria, Scheduling neduling. ical Region, The critical semaphores. For handling deadlocks etection, Recovery from Swapping Contiguous	6			
III	Algorithms, Mull Inter-process Sy Background, Cla section problem Deadlocks System modes, Deadlock. Memory Manage Background, Log Algorithms, Mull	duling: Basic co ltiple processor scho ynchronization issical problems of a, Synchronization H Deadlock charact ntion, Deadlock avon gement ogical Versus Phys ng, Segmentation, S	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods f bidance, Deadlock de sical Address space, Segmentation with pa	Criteria, Scheduling neduling. ical Region, The critical semaphores. for handling deadlocks etection, Recovery from Swapping Contiguous ging.	6			
III IV	Algorithms, MullInter-process SyBackground, Clasection problemDeadlocksSystem modes,Deadlock prevendeadlock.Memory ManageBackground, LocAllocation, PaginVirtual Memory	duling: Basic co ltiple processor scho ynchronization assical problems of a Synchronization H Deadlock charact ntion, Deadlock avon gement ogical Versus Phys ng, Segmentation, S ry: Background,	oncept, Scheduling eduling, Real time sch synchronization, Crit lardware, Monitors, S erization, Methods f bidance, Deadlock de sical Address space, Segmentation with pa Demand paging, Pa	Criteria, Scheduling neduling. ical Region, The critical semaphores. For handling deadlocks etection, Recovery from Swapping Contiguous	6 5 8			

VI	File System Management File concept, access methods, directory and disk structure, file-system mounting VI file sharing, protection. Implementing File System : File system structure, file-system implementation directory implementation, allocation methods, free-space management						
	Text Books						
1	James. L. Peterson and A. Silberchatz ," <i>Operating System Concepts</i> ", Addi Publication, 9th Edition,2018	son Westley					
2	2 Milan Milenkovic, "Operating System – Concept and Design", TMGH,1st Edition,2001						
	References						
1	William Stallings," <i>Operating Systems : Internals and Design Princip</i> Publication,7th Edition,2013	les",Peterson					
2	Crowley Charles ," <i>Operating Systems : A Design-Oriented Approach</i> ",Mc Publication,1 st Edition,2017	Graw Hill					
	Useful Links						
1	https://www.gatevidyalay.com/operating-system/						
2	https://www.javatpoint.com/os-tutorial						
3	https://www.geeksforgeeks.org/operating-systems/						

	CO-PO Mapping													
	Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1												2	2	
CO2			2	3										
CO3					1									
The streng	gth of 1	nappir	ig is to	be wri	itten as	1,2,3;	Where	e, 1:Lo	w, 2:M	ledium	, 3:Hig	gh		

Each CO of the course must map to at least one PO.

Assessment

Assessm	Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total							
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed							
Understand	5	5	10	20							
Apply	10	5	15	30							
Analyze	5	5	15	25							
Evaluate		5	15	20							
Create			5	5							
Total	20	20	60	100							

				AY 2021-22						
				rse Information						
Progra	mme		B.Tech. (Informa	ation Technology)						
Class, S		ter	Third Year B. Tech., Sem V							
Course										
Course	e Nam	e	Computer Algori	ithm						
Desire	d Req	uisites:	Data Structures							
			1							
Те	achin	g Scheme		Examination S	Scheme (Marks)					
Lectur	·e	2 Hrs/week	T1	T2	ESE 7	Total				
Tutoria	al	1 Hr/week	20	20	60	100				
Practic	cal	-								
Interac	ction	-		Crea	lits: 3					
			1							
			Co	urse Objectives						
1	To in	troduce the con	cept of algorithm a	and its complexity						
2	To de	efine various alg	gorithms to solve p	oroblems						
3	To co	mprehend diffe	erent problem level	ls in computer applic	ation					
		Car		O)	T1					
Δt the i	end of		students will be at	O) with Bloom's Tax ale to	xonomy Level					
$\overline{\text{CO1}}$						Apply				
CO2				Apply appropriate algorithm for solving the problemACompare complexity of algorithms in engineering problemAn						
acc	Design dynamic programming for algorithm for a given problem									
CO3	Desig	gn dynamic prog	gramming for algo	<u> </u>	blem	Create				
CO3	Desig	gn dynamic prog	gramming for algo	<u> </u>	blem					
		gn dynamic prog		rithm for a given pro	blem	Create				
	le			<u> </u>	blem					
	le Ir D H	ntroduction: esign and An uffman codes,	Me alysis of Algorit Dynamic Progra	odule Contents	blem thms: Knapsack problem, in multiplication, Longest	Create				
Modul	le Ir D H cc Pi te pa P	ntroduction: esign and An uffman codes, ommon sub-seq rinciples of chniques, chara arallel algorithm rogramming u	Me alysis of Algorit Dynamic Progra uence. parallel algorit acteristics of task a n model using MPI: MPI	odule Contents odule Contents thm Greedy Algorit terming: Matrix-cha thm design: Prel- and interaction, Map basics, send, receive	thms: Knapsack problem,	Create Hours				
Modul	le Ir D H cc Pr te pa P ar A SI	ntroduction: esign and An uffman codes, ommon sub-seq rinciples of chniques, chara arallel algorithm rogramming und communicati II-Pairs Shorte hortest paths an	Ma alysis of Algorit Dynamic Progra uence. parallel algorit acteristics of task a n model using MPI: MPI ion, collective com est Paths (APSP) a d matrix multiplica	odule Contents odule	thms: Knapsack problem, in multiplication, Longest iminaries, Decomposition ping techniques, overhead, e, overlapping computation rshall algorithm,	Create Hours 5				
Modul I II	le Ir D H cc Pr te pa Pr ar A SI FI Si SI	ntroduction: esign and An uffman codes, ommon sub-seq rinciples of chniques, chara arallel algorithm rogramming u nd communicati II-Pairs Shorte hortest paths an low Networks, I ingle-Source Si hortest paths a	Me alysis of Algorit Dynamic Progra uence. parallel algorit acteristics of task a n model using MPI: MPI I ion, collective com est Paths (APSP) a d matrix multiplica Ford Fulkerson me hortest Path (SSS and relaxation, Be	odule Contents odule	thms: Knapsack problem, in multiplication, Longest iminaries, Decomposition ping techniques, overhead, e, overlapping computation rshall algorithm, artite matching	Create Hours 5 5				
Modul I II III	le Ir D H cc Pr te pa Pi ar A SI SI SI SI SI C	ntroduction: esign and An uffman codes, ommon sub-seq rinciples of chniques, chara arallel algorithm rogramming u nd communicati II-Pairs Shorte hortest paths an low Networks, I ingle-Source Si hortest paths a ths in directed tring Matching he Rabin-Karp omputational C	Me alysis of Algorit Dynamic Progra uence. parallel algorit acteristics of task a n model using MPI: MPI I ion, collective com est Paths (APSP) a d matrix multiplica Ford Fulkerson me hortest Path (SSS and relaxation, Be Acyclic graphs, To g: algorithm, Knuth-I Geometry: Determi	odule Contents odule	thms: Knapsack problem, in multiplication, Longest iminaries, Decomposition ping techniques, overhead, e, overlapping computation rshall algorithm, artite matching nm, Single-source shortest stra's algorithm m. pair of segments intersects,	Create Hours 5 5 4				

1	Thomas H. Cormen, Charles E. Leiserson and Ronald L. Rivest, <i>"Introduction to Algorithms"</i> , Third Edition the MIT Press Cambridge, London, England, 2009								
2	2 Anath Grama, Ansul Gupta, George Karypis, Vipin Kumar, " <i>Introduction to parallel computing</i> ", Second Edition, Pearson Education, 2003 (For mdule IV)								
	References								
	Keierences								
1	Horrowitz, Sahni Rajasekaran, "Computer Algorithms", Computer Science, W. H. Freeman and company Press, New york, 1997								
2									
	Useful Links								
1	https://nptel.ac.in/courses/106/104/106104019/								
2	https://nptel.ac.in/courses/106/101/106101060/								

	CO-PO Mapping													
	Programme Outcomes (PO) PSO													
	1	1 2 3 4 5 6 7 8 9 10 11 12 1 2												
CO1					3							1		
CO2		1			2								1	
CO3	1	2												2
The stren	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High													
Each CO	of the	course	must r	nap to	at leas	t one P	Ю.							

Assessment

Assessme	Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total							
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed							
Understand	5	5	10	20							
Apply	10	5	15	30							
Analyze	5	5	15	25							
Evaluate		5	15	20							
Create			5	5							
Total	20	20	60	100							

(Government Aided Autonomous Institute) AY 2021-22 Course Information Programme B.Tech. (Information Technology)									
Programme B.Tech. (Information Technology)									
Class, Semester Third Year B. Tech., Sem V									
Course Code									
Course Name Database Engineering Lab									
Desired Requisites: Object-Oriented Programming, Data Structures, Computer Algorithms									
Teaching Scheme Examination Scheme (Marks)									
Lecture - LA1 LA2 ESE Total									
Tutorial - 30 30 40 100									
Practical 2 Hrs/Week									
Interaction - Credits: 1									
Course Objectives									
1 To introduce ER diagram for database system representation									
2 To define basic and advanced SQL queries for Relational database systems.									
3 To compare various transaction management protocols									
Course Outcomes (CO) with Bloom's Taxonomy Level									
At the end of the course, the students will be able to,									
CO1 Illustrate relational database system in the form of ER diagram Apply CO2 Laborational database system in the form of ER diagram Apply									
CO2 Implement basic and advanced SQL Query on databases Apply									
CO3 Evaluate transaction processing and recovery mechanisms in database Evaluate management system									
management system									
List of Experiments / Lab Activities									
List of Experiments:									
 Implement SELECT and PROJECT operation Assignment, Implement INSERT, DELETE and UPDATE operation database Perform String operations and Aggregate functions on database Perform Inner and Outer Join operations on database Assignment, Domain constraints & Referential Integrity Assignment Program for sparse index and dense index Assignment Program for static hashing Assignment, Program for Dynamic hashing Assignment Program for log based protocol for transaction Assignment Program for log based protocol for transaction Assignment Implementation of JDBC/ODBC driver for database connectivity Program for Time Stamp protocol for transaction Assignment Program for Deadlock Detection Assignment Program for Deadlock Detection Assignment perform CRUD (Create, Read, Update, Delete) operations on MongoDB databases Working with command prompts and create database and tables on MariaDB. Perform CRUD (Create, Read, Update, Delete) operations on MariaDB. Perform CRUD (Create, Read, Update, Delete) operations on MariaDB. Perform CRUD (Create, Read, Update, Delete) operations on MariaDB. 									
¹ McGraw-Hill Education, 6th Edition, 2010.									
2 Raghu Ramakrishnan, " <i>Database Management Systems</i> ", McGraw-Hill Education, 3rd Edition, 2003.									
References									
1 J.D. Ullman, " <i>Principles of Database Systems</i> ", Galgotia Publications, 2nd Edition, 1999									

2	Wiederhold, "Database Design", McGraw Hill Inc, 2nd Edition, 1983							
3	C.J.Date, A.Kannan, S.Swamynathan, "An Introduction to Database Systems", Pearson							
5	Education, 8th Edition, 2006.							
	Useful Links							
1	https://nptel.ac.in/courses/106/105/106105175/							
	http://www.nptelvideos.in/2012/11/database-management-system.html							

CO-PO Mapping														
	Programme Outcomes (PO)									PS	60			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1	2			2						2	1		
CO2		2			2						3	2	1	
CO3					2						2	3		1
The stren	oth of	The strength of mapping is to be written as 1.2.3; Where, 1:Low, 2:Medium, 3:High												

Each CO of the course must map to at least one PO.

Assessment									
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing. LA1, LA2 together is treated as In-Semester Evaluation.									
Assessment Based on Conducted by Typical Schedule (for 26-week Se				Marks					
LA1	Lab activities,	Lab Course	During Week 1 to Week 6	30					
LAI	attendance, journal	Faculty	Marks Submission at the end of Week 6	50					
LA2	Lab activities, Lab Course		During Week 7 to Week 12	30					
LAZ	attendance, journal	Faculty	Marks Submission at the end of Week 12	30					
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40					
Lab ESE	attendance, journal	Faculty	Marks Submission at the end of Week 18	40					

Week 1 indicates starting week of a semester. The typical schedule of lab assessments is shown, considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

Assessment

Assessment Plan based on Bloom's Taxonomy Level									
Bloom's Taxonomy Level	T1	T2	ESE	Total					
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed					
Understand	5	5	10	20					
Apply	10	5	15	30					
Analyze	5	5	15	25					
Evaluate		5	15	20					
Create			5	5					
Total	20	20	60	100					

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)						
AY 2021-22						
Course Information						
Programme B.Tech. (Information Technology)						
Class, Semester Third Year B. Tech., Sem V						
Course Code						
Course Name Mini Project - 2						
Desired Requisites: Java programming						

Teachin	g Scheme	Examination Scheme (Marks)							
Lecture	-	LA1	LA2	Lab ESE	Total				
Tutorial	-	30	30	40	100				
Practical	2 Hrs/Week								
Interactio	-	Credits: 1							
n									

	Course Objectives							
1	To provide guidance to select & build the ideas							
2	To find real-world challenges by IT based Solution							
3	3 To inculcate team spirit in students by project management							
	Course Outcomes (CO) with Bloom's Taxonomy Level							
At the	end of the course, the students will be able to,							
CO1	Implement the software application using trending/specified programming language/technology	Apply						
CO2	CO2 Identify the real world problems & apply software engineering practices Analyze							
CO3								

List of Experiments / Lab Activities

List of Experiments:

Mini-project is to be carried out in a group of maximum 5 to 6 students. Each group will carry out a mini-project by developing any application software based on the following areas.

1. Design and develop application using any one or more programming languages: Java with concepts swing, AWS, threading, APIs, etc.

2. Industry based problem / Sponsored application /Game/ Interdisciplinary application /socially useful application / Problem solving of previously learned complex concepts.

3. Project group should achieve all the proposed objectives of the problem statement.

4. The work should be completed in all aspects of design, implementation and testing and follow software engineering practices.

5. Project reports should be prepared and submitted in soft and hard form along with the code and other dependency documents. Preferable use online code repositories (github/bitbucket)

6. Project will be evaluated continuously by the guide/panel as per assessment plan.

7. Presentation and report should use standard templates provided by department.

Project report (pre-defined template) should be prepared using Latex/Word and submitted along

with soft copy on CD/DVD (with code, PPT, PDF, Text report document & reference material) or

on an online repository.

Students should maintain a project log book containing weekly progress of the project.

	Text Books								
1	1 Rajendra Kumbhar, " <i>How to Write Project Reports, Ph. D. Thesis and Research Articles</i> ", Universal Prakashan, 2015								
2	2 Marilyn Deegan, " <i>Academic Book of the Future Project Report</i> ", A Report to the AHRC & the British Library, 2017								
	References								
1	https://www.youtube.com/watch?v=0oSDa2kf5I8 (report writing)								
2									
	Useful Links								
1	https://pats.cs.cf.ac.uk/wiki/lib/exe/fetch.php?media=project-report.pdf								
2	2 http://users.iems.northwestern.edu/~hazen/Writing%20Project%20Reports%202004a.pdf								
3	https://www.upgrad.com/blog/java-project-ideas-topics-for-beginners/								
4	https://www.geeksforgeeks.org/computer-science-projects/								

CO-PO Mapping														
		Programme Outcomes (PO)									PSO			
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		1			2							3		
CO2										2			2	
CO3							3				2			1
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Each CO of the course must map to at least one PO.														

Assessment									
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing. LA1, LA2 together is treated as In-Semester Evaluation.									
Assessment Based on Conducted by Typical Schedule (for 26-week Sem)				Marks					
LA1	Lab activities,	Lab Course	During Week 1 to Week 6	20					
LAI	attendance, journal	Faculty	Marks Submission at the end of Week 6	30					
LA2	Lab activities,	Lab Course	During Week 7 to Week 12	30					
LAZ	attendance, journal	Faculty	Marks Submission at the end of Week 12	50					
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40					
Lab ESE	attendance, journal	Faculty	Marks Submission at the end of Week 18	40					

Week 1 indicates starting week of a semester. The typical schedule of lab assessments is shown, considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

Assessment Plan based on Bloom's Taxonomy Level (Marks) (For lab Courses)									
Bloom's Taxonomy Level	LA1	LA2	Lab ESE	Total					
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed					
Understand									
Apply	15	10	10	35					
Analyze	5	10	5	20					
Evaluate	5	5	10	20					
Create	5	5	15	25					
Total Marks	30	30	40	100					

		(Government Aided	2021-22							
			Information							
Programme										
Class, Seme		B.Tech. (Information Technology) Third Year B. Tech., Sem V								
Course Code										
Course Nan		Mini Project - 3								
Desired Rec		Android programmi	ησ							
	laistest	Thatora programmi								
Teachi	ng Scheme		Examination S	cheme (Marks)						
Lecture	-	LA1	LA2	Lab ESE	Т	otal				
Futorial	-	30	30	40	1	00				
Practical	2 Hrs/Week			. I						
Interaction	-		Cred	lits: 1						
		1								
		Course	Objectives							
	<u> </u>	to select ideas in mob		velopment						
		allenges by IT based								
3 To b		ls of student to work in		тттт.						
At the end o		rse Outcomes (CO) was students will be able to		conomy Level						
Imn		nobile application		g/specified program	mming	Apply				
	uage/technology			5-F L	8					
and Ti										
		d problems & apply s ication and detailed p								
		ication and detailed p	roject report for s	ubmission		•				
CO3 Desi	gn software appl	ication and detailed p		ubmission		Analyze Create				
CO3 Desi	gn software appl	ication and detailed p	roject report for s	ubmission		•				
CO3 Desi	gn software appl	ication and detailed p	roject report for s ents / Lab Activ	ubmission ities		•				
CO3 Desi List of Expe Min Eacl	gn software appl eriments: i-project is to be a group will carry	ication and detailed p List of Experim	roject report for s ents / Lab Activ of maximum 5 to	ubmission ities 0 6 students.	based or	Create				
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	References								
1	https://www.youtube.com/watch?v=0oSDa2kf5I8 (report writing)								
	Useful Links								
1	https://pats.cs.cf.ac.uk/wiki/lib/exe/fetch.php?media=project-report.pdf								
2	http://users.iems.northwestern.edu/~hazen/Writing%20Project%20Reports%202004a.pdf								
3	https://www.upgrad.com/blog/java-project-ideas-topics-for-beginners/								
4	https://www.geeksforgeeks.org/computer-science-projects/								

	CO-PO Mapping													
	Programme Outcomes (PO)												PS	60
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		1			2							3		
CO2										2			2	
CO3							3				2			1
The stren	gth of 1	nappir	ig is to	be wri	itten as	, 1,2,3;	Where	e, 1:Lo	w, 2:N	ledium	, 3:Hig	gh		

Each CO of the course must map to at least one PO.

		Asses	sment							
There are three components of lab assessment, LA1, LA2 and Lab ESE.										
IMP: Lab ES	E is a separate head of	passing. LA1, LA	A2 together is treated as In-Semester Evaluat	ion.						
Assessment Based on Conducted by Typical Schedule (for 26-week Sen			Marks							
LA1	Lab activities,	Lab Course	During Week 1 to Week 6	30						
LAI	attendance, journal	Faculty	Marks Submission at the end of Week 6	50						
LA2	Lab activities,	Lab Course	During Week 7 to Week 12	30						
LAZ	attendance, journal	Faculty	Marks Submission at the end of Week 12	50						
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40						
Lau ESE	attendance, journal	Faculty	Marks Submission at the end of Week 18	40						
Week 1 indica	ates starting week of a	semester. The tvr	bical schedule of lab assessments is shown,							

considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

Assessment Plan based o	on Bloom's Tax	conomy Level (Marks) (For la	b Courses)
Bloom's Taxonomy Level	LA1	LA2	Lab ESE	Total
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Understand				
Apply	15	10	10	35
Analyze	5	10	5	20
Evaluate	5	5	10	20
Create	5	5	15	25
Total Marks	30	30	40	100

				AY 2021-22					
Duca				rse Information					
Program	mme Semester		B. I ech. (Inform Third Year B. T	ation Technology)					
Class, 5 Course			Third Tear D. T	ech., Sem v					
Course			Professional Fle	ctive 1: Distributed	Computing				
	Requisite	s:	Tioressional Lie	enve 1. Distributed	Computing				
Desireu	<u> nequisite</u>	5							
Tea	ching Sche			Examination	Scheme (Marks)				
Lecture		s/week	T1	T2	ESE	Total			
Tutoria		-	20	20	60	100			
Practica		-							
Interact	tion	-		Cre	edits: 3				
			Co	urse Objectives					
1	To introdu	ce the var		nodern distributed s	vstems.				
			<u>^</u>		onsistency and replicat	ion, fault			
2			and distributed fil	•	in repriou	,			
		•		•	distributed computing				
5	Pium		1 2	D) with Bloom's T	1 0				
At the e	nd of the c		students will be						
		Comprehend the fundamentals of various big data analytics techniques							
	<u> </u>		ous approach to in	Analyze					
		the reliability and performance of various algorithms of distributed Eva							
000	system								
Module			Mad	ile Contents		Hours			
would		uction to	Distributed Sys			nours			
T		Task Creation and Termination (Async, Finish), Tasks in Java's Fork/Join							
Ι		Framework, Computation Graphs, Work, Span, Multiprocessor							
	Schedu	<u> </u>							
		•	tem with Paralle						
		Parallel Speedup, Amdahl's Law, Reciprocal ArraySum using Async-							
тт		Speedup	, Amdahl's Law,	Recipiocal Allays	um using Async-	7			
II	Finish,					7			
II	Finish, Recipro	ocalArray			um using Async- n Java's Fork/Join	7			
II	Finish, Recipro Framev	ocalArray	Sum using Re			7			
II 	Finish, Recipro Framev	ocalArray vork o nal Par a	Sum using Re		n Java's Fork/Join	7			
	Finish, Recipro Framev Function Futures Framev	ocalArray vork onal Para :: Tasks w vork, Mer	Sum using Re allelism: vith Return Value noization, Java S	ecursiveAction's i , Futures in Java's F treams, Data Races	n Java's Fork/Join Fork/Join				
	Finish, Recipro Framev Futures Framev Data fl	ocalArray vork onal Para :: Tasks w vork, Mer ow Syncl	Sum using Re allelism: vith Return Value noization, Java S pronization and	ecursiveAction's i , Futures in Java's I treams, Data Races Pipelining:	n Java's Fork/Join Fork/Join				
III	Finish, Recipro Framev Functio Futures Framev Data fl Split-pl	ocalArray vork onal Para :: Tasks w vork, Mer ow Syncl nase Bar	Sum using Re allelism: vith Return Value noization, Java S pronization and	ecursiveAction's i , Futures in Java's I treams, Data Races Pipelining:	n Java's Fork/Join Fork/Join	6			
	Finish, Recipro Framev Futures Futures Framev Data fl Split-ph with Ph	ocalArray vork onal Para :: Tasks w vork, Mer ow Syncl nase Barn assers,	Sum using Re allelism: vith Return Value noization, Java S aronization and riers with Java	ecursiveAction's i , Futures in Java's F treams, Data Races Pipelining: Phasers, Point-to-J	n Java's Fork/Join Fork/Join and Determinism Point Sychronization				
III	Finish, Recipro Framew Function Futures Framew Data fl Split-ph with Ph One-Di	ocalArray vork onal Para oral Para : Tasks w vork, Mer ow Syncl nase Barn nasers, mensiona	Sum using Re allelism: with Return Value moization, Java S pronization and riers with Java I Iterative Avera	ecursiveAction's i , Futures in Java's F treams, Data Races Pipelining: Phasers, Point-to-J	n Java's Fork/Join Fork/Join	6			
III	Finish, Recipro Framew Futures Framew Data fl Split-ph with Ph One-Di Data Fl	ocalArray vork onal Para : Tasks w vork, Mer ow Synch nase Barn nasers, mensiona ow Parall	Sum using Re allelism: with Return Value moization, Java S monization and riers with Java al Iterative Avera lelism	ecursiveAction's i , Futures in Java's F treams, Data Races Pipelining: Phasers, Point-to-J	n Java's Fork/Join Fork/Join and Determinism Point Sychronization	6			
III IV	Finish, Recipro Framew Futures Framew Data fl Split-ph with Ph One-Di Data Fl Data Fl	ocalArray vork onal Para : Tasks w vork, Mer ow Synch nase Barn assers, mensiona ow Parall outed Ma	Sum using Re allelism: with Return Value moization, Java S aronization and riers with Java al Iterative Avera lelism p Reduce:	ecursiveAction's i , Futures in Java's H treams, Data Races Pipelining: Phasers, Point-to-J ging with Phasers,	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism,	6			
III	Finish, Recipro Framev Futures Framev Data fl Split-pl with Ph One-Di Data Fl Distrib Introdu	ocalArray vork onal Para : Tasks w vork, Mer ow Syncl nase Barn nasers, mensiona ow Parall outed Ma ction to N	Sum using Re allelism: with Return Value moization, Java S aronization and riers with Java al Iterative Avera elism p Reduce: Map-Reduce, Hac	ecursiveAction's i , Futures in Java's F treams, Data Races Pipelining: Phasers, Point-to-1 ging with Phasers, loop Framework, S	n Java's Fork/Join Fork/Join and Determinism Point Sychronization	6			
III IV	Finish, Recipro Framew Futures Framew Data fl Split-ph with Ph One-Di Data Fl Distrib Introdu IDF Ex in Spar	ocalArray vork onal Para : Tasks w vork, Mer ow Synch nase Barn asers, mensiona ow Parall outed Ma ction to N ample, Pa k	Sum using Re allelism: with Return Value moization, Java S pronization and riers with Java al Iterative Avera lelism p Reduce: Map-Reduce, Hac age Rank Example	ecursiveAction's i , Futures in Java's F treams, Data Races Pipelining: Phasers, Point-to-1 ging with Phasers, loop Framework, S	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism, park Framework, TF-	6			
III IV	Finish, Recipro Framew Futures Framew Data fl Split-pl with Ph One-Di Data Fl Distrib Introdu IDF Ex in Spar	ocalArray vork onal Para : Tasks w vork, Mer ow Syncl nase Barn asers, mensiona ow Parall outed Ma ction to M ample, Pa k Server P	Sum using Re allelism: with Return Value noization, Java S aronization and riers with Java al Iterative Avera lelism p Reduce: Map-Reduce, Hac age Rank Examp rogramming:	ecursiveAction's i , Futures in Java's H treams, Data Races Pipelining: Phasers, Point-to- ging with Phasers, loop Framework, S le, Demonstration:	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism, park Framework, TF- Page Rank Algorithm	6			
III IV	Finish, Recipro Framew Futures Framew Data fl Split-pl with Ph One-Di Data Fl Data Fl Distrib Introdu IDF Ex in Spar Client- Introdu	ocalArray vork onal Para : Tasks w vork, Mer ow Syncl nase Barn nasers, mensiona ow Parall outed Ma ction to N ample, Pa k Server P ction to	Sum using Re allelism: with Return Value noization, Java S nonization and tiers with Java al Iterative Avera lelism p Reduce: Map-Reduce, Hac age Rank Examp rogramming: Sockets, Seriali	ecursiveAction's i , Futures in Java's H treams, Data Races Pipelining: Phasers, Point-to-J ging with Phasers, loop Framework, S le, Demonstration:	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism, park Framework, TF- Page Rank Algorithm on, Remote Method	6 7 7 7			
III IV V	Finish, Recipro Framew Futures Framew Data fl Split-pl with Ph One-Di Data Fl Distrib Introdu IDF Ex in Spar Client- Introdu Invocat	ocalArray vork onal Para : Tasks w vork, Mer ow Synch nase Barn nasers, mensiona ow Parall outed Ma ction to N ample, Pa k Server P ction to ion, Multi	Sum using Re allelism: with Return Value moization, Java S pronization and riers with Java al Iterative Avera lelism p Reduce: Map-Reduce, Hac age Rank Examp rogramming: Sockets, Seriali ticast Sockets, P	ecursiveAction's i , Futures in Java's H treams, Data Races Pipelining: Phasers, Point-to-J ging with Phasers, loop Framework, S le, Demonstration:	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism, park Framework, TF- Page Rank Algorithm	6			
III IV V	Finish, Recipro Framew Futures Framew Data fl Split-pl with Ph One-Di Data Fl Distrib Introdu IDF Ex in Spar Client- Introdu Invocat	ocalArray vork onal Para : Tasks w vork, Mer ow Syncl nase Barn nasers, mensiona ow Parall outed Ma ction to N ample, Pa k Server P ction to	Sum using Re allelism: with Return Value moization, Java S pronization and riers with Java al Iterative Avera lelism p Reduce: Map-Reduce, Hac age Rank Examp rogramming: Sockets, Seriali ticast Sockets, P	ecursiveAction's i , Futures in Java's H treams, Data Races Pipelining: Phasers, Point-to-J ging with Phasers, loop Framework, S le, Demonstration:	n Java's Fork/Join Fork/Join and Determinism Point Sychronization Pipeline Parallelism, park Framework, TF- Page Rank Algorithm on, Remote Method	6 7 7			

2	George Coulouris, Jean Dollimore, Tim Kindberg, , "Distributed Systems: Concepts and Design", 4th Edition, Pearson Education, 2005.									
References										
1	A. S. Tanenbaum and M. V. Steen, "Distributed Systems: Principles and Paradigms", Second									
1	Edition, Prentice Hall, 2006									
	Useful Links									
	Module I, II, III, IV									
	https://www.coursera.org/learn/parallel-programming-in-java?specialization=pcdp#syllabus									
1	Module V, VI									
	https://www.coursera.org/learn/distributed-programming-in-									
	java?specialization=pcdp#syllabus									

	CO-PO Mapping														
	Programme Outcomes (PO)													PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1	3		1					1					2		
CO2		1													
CO3	2											1		1	
CO3	$\frac{2}{2}$	 	 	1		1 2 2	W /l			[]	2.11:	1		1	

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.

Assessment Plan based on Bloom's Taxonomy Level												
Bloom's Taxonomy Level	T1	T2	ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand												
Apply	5	10	5	20								
Analyze	5	5	10	20								
Evaluate	5	5	15	25								
Create	15	10	10	35								
Total	20	20	60	100								

		×	Aided Autonomous AY 2021-22	, ,						
		Cou	irse Information							
Program	me		ation Technology)							
Class, Se			Third Year B. Tech., Sem V							
Course (· · · · ·							
Course I		Professional Ele	ctive 1:Advanced I	Programming Languages						
	Requisites:	C & CPP Progra		6 6 6 6						
		8	8							
Teac	hing Scheme		Examination Scheme (Marks)							
Lecture	3 Hrs/week	T1	T1 T2 ESE Total							
Tutorial	-	20	20	60	100					
Practica	l –		-							
Interacti			С	redits: 3						
		I								
		Co	ourse Objectives							
1 7	o introduce para	digm of Ruby and G		anguage						
		of Ruby for file han	<u> </u>	<u> </u>						
		res of Go language f	<u> </u>							
- -		ourse Outcomes (C								
At the en		he students will be a								
		riented programming concepts using Ruby								
			pt of File handling using Ruby and Go language							
		· ·	or Synchronization problem using Go Language							
	ropose the soluti				Create					
Module		Mo	dule Contents		Hours					
Ι	Numbers, Tex Nil)		& Hashes, Symbol	Command Line Arguments, s, Expressions (True, False,	7					
Π	Flow Control Conditionals, Classes, Moo Attributes, Inh Methods, Attr (Access Contr	& Statements and Loops, Error & Exce lules & Objects : eritance, Persistence ibutes & Variables: ol), Instance Variable	Properties ption Handling, Tl Simple Ruby C Setter & Getter r es		7					
III	Meta-program Strings, Vari	e e	Types, Modules a ethods & Const	& Classes, Blocks & tants, Custom Structures, Reading file, writing file.	6					
IV	Introduction, types, files, sc	ope, number, string v		on, variables, assignments, lice	6					
V		-	types, functions, co	ontrol statements, methods,	6					
VI	Concurrency with Shared variables: Race condition, mutual exclusion, memory synchronization ,package implementation									
			T4 D 1							
	•			ramming Language: Everyth	ing You Ne					
t	o <i>Know</i> ", O'Reil Alan A. A. Doi	ly; 1st edition (12 Fe	ebruary 2008)							

	References								
1	Yukihiro Matsumoto, David Flanagan, " <i>The Ruby Programming Language</i> ", Shroff,1 st Edition, 2008.								
2	Caleb Doxsey, "An Introduction to Programming in Go", CreateSpace Independent Publishing Platform (3 September 2012)								
	Useful Links								
1	https://onlinecourses.swayam2.ac.in/aic20_sp37/preview								
2	https://www.javatpoint.com/ruby-tutorial								
3	https://www.ruby-lang.org/en/documentation/quickstart/								
4	https://gobyexample.com/								
5	https://www.javatpoint.com/go-tutorial								
6	https://www.coursera.org/specializations/google-golang								

	CO-PO Mapping													
	Programme Outcomes (PO)												PS	0
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1				2										
CO2		2			3								2	
CO3			3		3								2	1
The streng	oth of	mannir	ng is to	he wr	itten as	123.	Where	1.10	$w 2 \cdot N$	Iedium	3.Hic	, h	-	

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.

Assessment

Assessme	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	T2	Lab ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

				ege of Engineering, ded Autonomous Ins	0					
			· · · · · · · · · · · · · · · · · · ·	Y 2021-22	,					
			Cour	se Information						
Progra	amme		B.Tech. Informat							
Class,	Semes	ster	Third Year B. Te	ch., Sem V						
Cours	e Cod	e								
Cours	e Nam	e	Professional Elec	tive 1: Graph Theor	у					
Desire	d Req	uisites:								
Те	aching	g Scheme		Examination So	cheme (Marks)					
Lectu		3 Hrs/week	T1	T2	ESE	Total				
Futori		-	20	20	60	100				
Practi	cal	-		11	I					
ntera		-		Cred	its: 3					
			1							
			Cou	rse Objectives						
1		ovide basics o								
2				h in concern with a						
3	To co			applications of grap	•					
			,) with Bloom's Tay	konomy Level					
			e students will be a			1				
C O 1	Sumi	marize the basi	c concepts of grap	hs, circuits and trees		Understand				
C O2	Appl	y matrix opera	tions of graphs on	real-time application	1	Analyze				
CO3	Desig	gn graphs for in	ndependent researc	ch		Create				
			•			1				
Modu				le Contents		Hours				
Ŧ			Graphs, Paths a		1 . 11					
Ι	g	raphs, Isomorp	hism of graphs, Pa		nplete and bi-partite	6				
		ut Set and Pla	anar Graph:							
			Cut sets, connectivity and separability, network flows, isomorphism,							
	C	ut sets, conn	• •	•	-					
П	C P	ut sets, conn lanner graphs	, Kuratowski's tv	wo graphs, represe	entation of planner	7				
II	C P	ut sets, conn lanner graphs	, Kuratowski's tv	wo graphs, represe	-	7				
Π	C P gr	ut sets, conne lanner graphs raphs, detectio	, Kuratowski's tw on of Planarity,	wo graphs, represe	entation of planner of graphs, Edge	7				
II	C P gr C	ut sets, conn- lanner graphs raphs, detection olouring of gra	, Kuratowski's two on of Planarity, aphs,The four-colo	wo graphs, represe Vertex Colouring ur and five-colour th	entation of planner of graphs, Edge	7				
	C P gr C V	ut sets, conn- lanner graphs raphs, detection olouring of gra Veighted Grap	, Kuratowski's two on of Planarity, aphs,The four-colo oh and Matrix rep	wo graphs, represe Vertex Colouring ur and five-colour th presentation:	entation of planner of graphs, Edge neorems					
Ш	C P C C V E	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs	, Kuratowski's two on of Planarity, aphs,The four-colo oh and Matrix rep s, Hamiltonian cycl	wo graphs, represe Vertex Colouring ur and five-colour th	entation of planner of graphs, Edge neorems ation of graphs,	7 6				
	C P gr C V E C	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep a, Hamiltonian cycl Weighted graphs,	wo graphs, represe Vertex Colouring ur and five-colour th presentation: es, Matrix represent	entation of planner of graphs, Edge neorems ation of graphs,					
	C P C C V E C C th G	ut sets, conn- lanner graphs raphs, detection olouring of gra- veighted Grap ulerian Graphs, hordal graphs, ecorem and its raph Algorith	, Kuratowski's two on of Planarity, aphs,The four-colo bh and Matrix rep a, Hamiltonian cycl Weighted graphs, application m :	wo graphs, represe Vertex Colouring ur and five-colour th presentation: es, Matrix represent Matching's in graph	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage'					
III	C P gr C V E C th G G T	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs hordal graphs, leorem and its raph Algorith ravelling sales	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep s, Hamiltonian cycl Weighted graphs, application m: man's problem &	wo graphs, represe Vertex Colouring ur and five-colour th presentation: es, Matrix represent Matching's in graph Chinese postman pr	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in	6				
	C P gr C V E C th G T gr	ut sets, conn- lanner graphs raphs, detection olouring of gra- veighted Grap ulerian Graphs hordal graphs, heorem and its raph Algorith ravelling sales raphs, Shortes	, Kuratowski's tw on of Planarity, aphs,The four-colo oh and Matrix rep s, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl	wo graphs, represe Vertex Colouring ur and five-colour th presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm,	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage'					
III	C P C C V E C C th G T g g A	ut sets, conn- lanner graphs raphs, detection olouring of gra- Veighted Grap ulerian Graphs hordal graphs, hordal graphs, eorem and its raph Algorith ravelling sales raphs, Shortes lgorithm, Bell	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep , Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith	wo graphs, represe Vertex Colouring ur and five-colour th presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm,	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in	6				
III IV	C P C C V E C C th G T g g A S	ut sets, conn- lanner graphs raphs, detection olouring of gra- veighted Grap ulerian Graphs, hordal graphs, hordal graphs, hordal graphs, teorem and its raph Algorith ravelling sales raphs, Shortes lgorithm, Bellion panning Tree	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep a, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith	wo graphs, represe Vertex Colouring ur and five-colour th presentation: les, Matrix represent Matching's in graph Chinese postman pr kstra's algorithm, m	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall	6				
III	C P G C V E C C th G T g g A S T	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs, hordal graphs, hordal graphs, hordal graphs, teorem and its raph Algorith ravelling sales raphs, Shortes lgorithm, Belli panning Tree rees, Spannin	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep , Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith ; g tree in graphs,	wo graphs, represe Vertex Colouring ur and five-colour th presentation: es, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spannin	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall	6				
III IV	C P gr C E C th G T gr S T K	ut sets, conn- lanner graphs raphs, detection olouring of gra- Veighted Grap ulerian Graphs hordal graphs, heorem and its raph Algorith ravelling sales raphs, Shortes lgorithm, Belli panning Tree rees, Spannin ruskal's algorith	, Kuratowski's tw on of Planarity, aphs,The four-colo oh and Matrix rep s, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith ; g tree in graphs, thm, Independence	wo graphs, represe Vertex Colouring ur and five-colour th presentation: les, Matrix represent Matching's in graph Chinese postman pr kstra's algorithm, m	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall	6				
III IV V	C P gr C W E C th G T gr S T K K	ut sets, conn- lanner graphs raphs, detection olouring of gra- veighted Grap ulerian Graphs hordal graphs, hordal graphs, hord	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep s, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith ; g tree in graphs, thm, Independence 'Graph Thoery:	wo graphs, represe Vertex Colouring ur and five-colour the presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spanning e sets and covering i	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall ng tree algorithms, n graphs	6				
III IV	C P gr C V E C th th G T gr gr S T K K	ut sets, conn- lanner graphs raphs, detecti- olouring of gra- Veighted Grap ulerian Graphs, hordal graphs, hord	, Kuratowski's tw on of Planarity, aphs, The four-colo bh and Matrix rep a, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith : g tree in graphs, thm, Independence 'Graph Thoery: Applications of	wo graphs, represe Vertex Colouring ur and five-colour the presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spanning e sets and covering i	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall	6				
III IV V	C P gr C V E C th th G T gr gr S T K K	ut sets, conn- lanner graphs raphs, detection olouring of gra- veighted Grap ulerian Graphs hordal graphs, hordal graphs, hord	, Kuratowski's tw on of Planarity, aphs, The four-colo bh and Matrix rep a, Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith : g tree in graphs, thm, Independence 'Graph Thoery: Applications of	wo graphs, represe Vertex Colouring ur and five-colour the presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spanning e sets and covering i	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall ng tree algorithms, n graphs	6 7 7				
III IV V	C P gr C V E C th th G T gr gr S T K K	ut sets, conn- lanner graphs raphs, detecti- olouring of gra- Veighted Grap ulerian Graphs, hordal graphs, hordal graphs, hordal graphs, teorem and its raph Algorith ravelling sales raphs, Shortes lgorithm, Belli- panning Tree rees, Spannin ruskal's algori- pplications of erfect Graphs,	, Kuratowski's tw on of Planarity, aphs,The four-colo bh and Matrix rep , Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith : g tree in graphs, thm, Independence 'Graph Thoery: Applications of aphs)	wo graphs, represe Vertex Colouring ur and five-colour the presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spanning e sets and covering i	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall ng tree algorithms, n graphs	6 7 7				
III IV V VI	C P gr C W E C th th G T gr gr S T K K A P C	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs, hordal graphs, horda	, Kuratowski's tw on of Planarity, aphs, The four-colo bh and Matrix rep , Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith : g tree in graphs, thm, Independence : Graph Thoery: Applications of aphs)	wo graphs, represe Vertex Colouring ur and five-colour the presentation: les, Matrix represent Matching's in graph Chinese postman pr cstra's algorithm, m Minimum spanning e sets and covering i graphs in switching	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall ng tree algorithms, n graphs	6 7 7 6				
III IV V	C P gr C V E C th C th G T gr g S T K K K A P G G	ut sets, conn- lanner graphs raphs, detecti- olouring of gra Veighted Grap ulerian Graphs, hordal graphs, horda	, Kuratowski's tw on of Planarity, aphs, The four-colo bh and Matrix rep , Hamiltonian cycl Weighted graphs, application m: man's problem & st path and Dijl man-Ford Algorith ; g tree in graphs, thm, Independence Graph Thoery: Applications of aphs) 7 <i>ph Theory With Ap</i> ation, 2011	wo graphs, represe Vertex Colouring ur and five-colour the presentation: es, Matrix represent Matching's in graph Chinese postman preservations Chinese postman preservations of the set of	entation of planner of graphs, Edge neorems ation of graphs, ns, Hall's 'marriage' oblem, Distances in Floyd – Warshall ng tree algorithms, n graphs g theory, Directed	6 7 7 6 • Science ", 2 ⁿ				

	References									
1	Parthasarathy K. R., " <i>Basic Graph Theory</i> ", McGraw-Hill Professional Publishing,3 rd Edition, 1994									
	Useful Links									
1	Module I, II, III, IV, V, VI https://onlinecourses.swayam2.ac.in/cec20_ma03/preview									

	CO-PO Mapping														
		Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	3		1										2		
CO2			2												
CO3	2													1	
The stren	gth of 1	nappir	ng is to	be wr	itten as	; 1,2,3;	Where	e, 1:Lo	w, 2:M	ledium	, 3:Hig	gh			
Each CO	of the		must r	nan ta	at leas	t one P	0								

Each CO of the course must map to at least one PO.

Assessment

Assessme	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	T2	ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

				ege of Engineering,				
			1	ded Autonomous Ins	titute)			
				AY 2021-22				
			-	se Information				
Progra		4	B.Tech. (Informat					
Class,			Third Year B. Tec	n., Sem V				
Course								
Cours					s of Artificial Intellig	ence		
Desire	d Req	uisites:	Basic Course in P	robability and Linear	r Algebra			
Т	o obim	- Cahama		Enomination C	hama (Marka)			
Lectur		g Scheme 3 Hrs/week	T1	Examination So T2	ESE	Total		
Tutori		5 mis/week	20	20	60 ESE	100		
Practi		-	20	20	00	100		
Intera				Credi	ite. 3			
mera	cuon	-		Cieu	118. 5			
			Соц	rse Objectives				
1	Toin	troduce the cor		es in Artificial Intelli	vence			
2				plication areas of Ar				
3		<u> </u>	<u> </u>	in Artificial Intellig	¥			
3	1001)) with Bloom's Tax				
At the	and of		students will be abl	/	Unomy Level			
CO1			concepts of Artificia			Apply		
		·	-		aial Intelligence			
CO2				l structures of Artifi	cial intelligence	Analyse		
CO3	Build	an expert system	em in Artificial Inte	lligence		Create		
						1		
Modu				le Contents		Hours		
Ŧ			n Solving by Search		1 1 1 1 0 1			
Ι					search, Uninformed	7		
		nowledge Rep	search, CSP proble	ms				
II		0 1		tation, First order log	ria I	7		
		nowledge Rea	¥		gic-i			
III				t order logic-L Baysi	an network, decision	6		
111		etwork	-II, Interence III Phs	t ofder logic-i, Daysi	an network, decision	0		
		lanning						
IV		0	Planning, Plan s	pace planning. F	Planning graph and	6		
- '		raphplan	B, 1 min 1	r	o or opin unit	Ĩ		
		lachine Learn	ing					
V			e	lecision tress, Rein	forcement learning,	7		
	L	earning in neur	al network, Deep Le	earning: A review.		/		
		xpert systems						
VI			•	nents of Expert system	ems, Architecture of	6		
	E	S, Building an	Expert system					
	P • •			Fext Books				
1					e", McGraw Hills 3 rd			
2			Foundations of Art	ificial Intelligence ar	nd Expert Systems", N	Iacmilan India		
	Ltd.,	2007.		D . £				
	D	all on d NI		References		2010 (2-1		
1		-	Artificial Intellige	nce – A Modern App	roach", Prentice-Hall,	2010 (3rd		
-	editio							
2			Hazarika "Fundam	entals Of Artificial I	ntelligence" (NPTEL/	Swayam		
2	Cour	se)						
		30)						
			U	Jseful Links				

1	Module	I,II,III													
	https ht	tps://on	lineco	urses.n	ptel.ac	.in/noc	:19_m	e71/uni	t?unit=	=7⩽	son=8				
2	Module	IV,V													
	https://onlinecourses.nptel.ac.in/noc19_me71/unit?unit=16&lesson=17														
3 Module VI															
5	³ Vlabs,iitb.ac.in														
CO-PO Mapping															
	Programme Outcomes (PO) PSO														
				1 .	r ogran		uccon		•)					100	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C01	1	2	32		5	-	7			10	11	12	1 2	1	3
CO1 CO2		2			5	-	7			10	11	12	1 2	1	3
		2	2		5	-	7			10	11	12	1 2	1	3
CO2 CO3			23	4	5	6	7	8	9		11 , 3:Hig		1 2	2	3

Assessm	Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total							
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed							
Understand	5	5	10	20							
Apply	10	5	15	30							
Analyze	5	5	15	25							
Evaluate		5	15	20							
Create			5	5							
Total	20	20	60	100							

o familiarize with	A Cours B.Tech. (Informa Third Year B. Te Professional Elec Artificial Intellige T1 20 Cours s component of sof puting concepts to s	ch., Sem V tive - 1: Soft Con ence, Tool like M Examination T2 20 Cre rse Objectives ft computing.	nputing	Total 100				
emester Code Name Requisites: hing Scheme 3 Hrs/week - I - ion - Co introduce various io impart soft comp io familiarize with Course	Cours B.Tech. (Informa Third Year B. Te Professional Elec Artificial Intellige T1 20 0 Cours s component of sof puting concepts to s	se Information tion Technology) ch., Sem V tive - 1: Soft Con ence, Tool like M Examination T2 20 Cre rse Objectives ft computing.	nputing atlab/Scilab Scheme (Marks) ESE 60					
emester Code Name Requisites: hing Scheme 3 Hrs/week - I - ion - Co introduce various io impart soft comp io familiarize with Course	Third Year B. Te Professional Elec Artificial Intellige T1 20 0 Cours s component of soforting concepts to soforting concepts t	ch., Sem V tive - 1: Soft Con ence, Tool like M Examination T2 20 Cre rse Objectives ft computing.	nputing atlab/Scilab Scheme (Marks) ESE 60					
Code Name Requisites: hing Scheme 3 Hrs/week - I - ion io introduce various io impart soft comp io familiarize with Course	Professional Elec Artificial Intellige T1 20 0 Cours s component of sof puting concepts to s	tive - 1: Soft Con ence, Tool like M Examination T2 20 Cre rse Objectives ft computing.	atlab/Scilab Scheme (Marks) ESE 60					
Name Requisites: hing Scheme 3 Hrs/week - I - ion - Co introduce various fo impart soft comp fo familiarize with Course	Artificial Intellige T1 20 Cours s component of sof puting concepts to s	ence, Tool like M Examination T2 20 Cro rse Objectives ft computing.	atlab/Scilab Scheme (Marks) ESE 60					
Requisites: hing Scheme 3 Hrs/week - I - ion - Co introduce various 3 in part soft comp 3 in familiarize with Court	Artificial Intellige T1 20 Cours s component of sof puting concepts to s	ence, Tool like M Examination T2 20 Cro rse Objectives ft computing.	atlab/Scilab Scheme (Marks) ESE 60					
hing Scheme 3 Hrs/week - l - ion - co introduce various co impart soft comp co familiarize with Cour	T1 20 Course S component of sof soft concepts to soft	Examination T2 20 Cre rse Objectives ft computing.	Scheme (Marks) ESE 60					
hing Scheme 3 Hrs/week - l - ion - co introduce various co impart soft comp co familiarize with Cour	20 Cours s component of sof puting concepts to s	T2 20 Creation rse Objectives ft computing.	ESE 60					
3 Hrs/week - - - - - - - - - - - - -	20 Cours s component of sof puting concepts to s	T2 20 Creation rse Objectives ft computing.	ESE 60					
i - introduce various	20 Cours s component of sof puting concepts to s	20 Cre rse Objectives ft computing.	60					
on - o introduce various o impart soft comp o familiarize with Cour	Cours component of sof puting concepts to s	Cro rse Objectives ft computing.		100				
on - o introduce various o impart soft comp o familiarize with Cour	s component of sol puting concepts to s	rse Objectives	edits: 3					
o introduce various o impart soft comp o familiarize with Cour	s component of sol puting concepts to s	rse Objectives	edits: 3					
o impart soft comp o familiarize with Cour	s component of sol puting concepts to s	ft computing.						
o impart soft comp o familiarize with Cour	s component of sol puting concepts to s	ft computing.						
o impart soft comp o familiarize with Cour	s component of sol puting concepts to s	ft computing.						
o familiarize with Cour	<u> </u>							
Cour	the swarm intellige	solve engineering	and optimization problem	IS.				
		ence methods						
d of the course, the	se Outcomes (CO) with Bloom's T	axonomy Level					
	students will be a	ble to,						
Classify hard and so	ft computing conc	epts		Analyze				
Compare the workin	ng of swarm intellig	gence methods		Analyze				
ustify the soft comp	outing technique fo	or given problem		Evaluate				
	Mod	ule Contents		Hours				
Introduction								
				5				
		•	e					
			computing.					
	,							
Fundamental Concept, Evolution of Neural network, Basic models of ANN,								
^	hms (CA)			+				
		Ferminologias in	GA Genetic operators					
	-	-	-					
	·			4				
	^	fuzzy sets		1				
		v	d their properties. Fuzzy					
				4				
		III III III	,, J					
				1				
		, Particle Swar	m Optimization (PSO),	A				
				4				
-								
	· · ·	. ,		1				
		GA/ANN/SI, Ap	plication of soft					
			*	5				
		•						
	Compare the working astify the soft compared the soft c	Compare the working of swarm intelligustify the soft computing technique forModeIntroductionHistory, Scope of Soft ComputingNetworks, Application scope ofSwarm Intelligence, Hybrid SystemArtificial Neural Network (ANN)Fundamental Concept, Evolution ofimportant terminologies of ANseparability, AND,OR, EXORLearning, Unsupervised Learningproblem.Genetic Algorithms (GA)Introduction, basic operators and TSelection, crossover, reproductionvs. Genetic algorithm, simple genthe schema theorem, classificationto GA to real world problem.Introduction, Classical set and fIntroduction, Classical set (crisp smodels, Membership function, Defreal world problem.Swarm Intelligence (SI)Ant colony optimization (ACO)Harmony search (HS), ArtificialLearning Based Optimization AlgoApplications of soft computingHybrid System, optimization using	Introduction Module Contents Introduction History, Scope of Soft Computing, components of Networks, Application scope of ANN, Fuzzy Lo Swarm Intelligence, Hybrid System, Hard vs. Soft C Artificial Neural Network (ANN) Fundamental Concept, Evolution of Neural network important terminologies of ANN, Mc-Culloch separability, AND,OR, EXOR problem solving Learning, Unsupervised Learning, Application to problem. Genetic Algorithms (GA) Introduction to classical set and fuzzy sets Introduction, Classical set (crisp set) Fuzzy sets an models, Membership function, Defuzzification. Appreal world problem. Swarm Intelligence (SI) Ant colony optimization (ACO), Particle Swar Harmony search (HS), Artificial Bee Colony algo Learning Based Optimization Algorithm (TLBO). Applications of soft computing Hybrid System, optimization using GA/ANN/SI, App	Module Contents Introduction History, Scope of Soft Computing, components of Soft Computing- Neural Networks, Application scope of ANN, Fuzzy Logic, Genetic algorithm, Swarm Intelligence, Hybrid System, Hard vs. Soft Computing. Artificial Neural Network (ANN) Fundamental Concept, Evolution of Neural network, Basic models of ANN, important terminologies of ANN, Mc-Culloch Pitts Neuron, Linear separability, AND,OR, EXOR problem solving by ANN, Supervised Learning, Unsupervised Learning, Application to ANN to real world problem. Genetic Algorithms (GA) Introduction, basic operators and Terminologies in GA, Genetic operators – Selection, crossover, reproduction and mutation – fitness function, traditional vs. Genetic algorithm, simple genetic algorithm, general genetic algorithm, the schema theorem, classification of GA, Genetic programming. Application to GA to real world problem. Introduction to classical set and fuzzy sets Introduction, Classical set (crisp set) Fuzzy sets and their properties, Fuzzy models, Membership function, Defuzzification. Application to Fuzzy logic to real world problem. Swarm Intelligence (SI) Ant colony optimization (ACO), Particle Swarm Optimization (PSO), Harmony search (HS), Artificial Bee Colony algorithm (ABC), Teaching Learning Based Optimization Algorithm (TLBO).				

1	Jyh-Shing Roger Jang, Chuen-Tsai Sun, and Eiji Mizutani " <i>Neuro Fuzzy and Soft computing:</i> A Computational Approach to Learning and Machine Intelligence", Prentice Hall, New Delhi, 1986.								
2	Goldberg, David E, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, New Delhi, 1989.								
	· · · · · · · · · · · · · · · · · · ·								
3	Sivanandam S N and Deepa S N, "Principles of Soft computing", Wiley India Edition., 2008.								
	References								
1	Timothy J. Ross, " <i>Fuzzy Logic with Engineering Application</i> ", Tata McGraw Hill, New Delhi, 2004.								
2	Robert J Schalkff, "Artificial Neural Networks", McGraw Hill, New Delhi, 1997.								
3	Sivanandam S N and Deepa S N," <i>Introduction to Genetic algorithms</i> ", Springer Verlag, Heidelberg, 2008.								
	Useful Links								
	https://onlinecourses.nptel.ac.in/noc21_cs11/preview (Week no 1,2,3,4,5,8)								
1	Or								
	https://nptel.ac.in/courses/106/105/106105173/ (Week no 1,2,3,4,5,8)								
2	https://www.urbanpro.com/online-class/cs-302-new-soft-computing/1794165								

	CO-PO Mapping													
	Programme Outcomes (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	2													
CO2		2		2										
CO3					3									1
	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.													

Assessme	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	Τ2	ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

			ollege of Engineeri Aided Autonomous					
		Oovernment	AY 2021-22	Institute)				
		Co	ourse Information					
Progra	amme	-	rmation Technology	y)				
0	Semester		Tech., Sem. V	,,				
Course	e Code							
Course	e Name	Professional H	Elective - 1:Data Ma	nagement, Protection and	l Governance			
Desire	d Requisites:							
Те	aching Scheme		Examination	n Scheme (Marks)				
Lectur	<u>Ų</u>	T1	T2	ESE	Total			
Tutori	al -	20	20	60	100			
Practi	cal -			· · ·				
Intera			Cı	redits: 3				
		C	Course Objectives					
1	To introduce high		lata life cycle manag	gement				
2	To compare vario	us aspects of data	storage, data availa	bility, data protection.				
3				hitectures data protection				
	<u> </u>		CO) with Bloom's '	<u>^</u>				
At the	end of the course,	,	· · · · · · · · · · · · · · · · · · ·	v				
CO1			liance and governar	nce of data	Apply			
CO2		· · · · · · · · · · · · · · · · · · ·	ypes of data threats to ensure data center security					
				ndustry standards in da	Analyze a Create			
CO3	management	1		2				
	U				I			
Modu	le	Μ	Iodule Contents		Hours			
	Introduction	to data life cycle	management (DL	M)				
	Goals of data	life cycle manag	ement, Challenges	involved- Volume of da	a			
Ι	source, Ubiqu	ity of data locati	ons, User demand	for access, Stages of da	a 4			
	life cycle – c	reation, storage,	usage, archival, de	estruction, Risks involve	d			
	without DLM	, benefits, best pra	actices					
	Data storage	and data availab	oility					
	Storage tech	nology: Hard Dis	k Device (HDD), S	olid State Devices (SSD),			
	memory device	ces, Data access	- block, files, object	t, Data center End to Er	d			
	View – overv	iew of complete s	stack including stora	ige, network, host, cluste	r,			
		applications, virtual machines, cloud storage, Storage virtualization						
Π	technologies -	RAID level, sto	orage pooling, stora	ge provisioning, Advand	e 8			
11	topics in stor	rage virtualizatio	n – storage provis	sioning, thinprovisionin	g, o			
	Cloud storage	- S3, glacier, sto	rage tiering, High A	vailability-Introduction	0			
	high availabil	ity, clustering, fa	ailover, parallel acc	cess, Disaster Recovery	-			
	Need of disa	ster recovery, 1	Building blocks - g	global cluster, wide-are	1 -			
	connector (W	connector (WAC), heartbeat, Split-brain – problem and solutions o Preparing						
	for DR – fired	rill						
	Introduction	to data protectio	on					
	Introduction-N	Need for data pro	otection, basic of b	ack-up/restore, Snapsho	ts			
				(cloning, DevOps), De				
TTT	duplication, H	Replication, Long	g Term Retention -	- LTR, Archival, Desig	n 8			
III	duplication, Replication, Long Term Retention – LTR, Archival, Design considerations-System recovery, Solution architecture, Backup v/s Archival,							
111	considerations	-System recovery		ture, Backup v/s Archiva	1,			
111		• •	y, Solution architect	ture, Backup v/s Archiva (s, cloud), challenges wit				

IV	Data Threats and Data center security Type of Threats-Denial of Service (DoS), man in the middle attacks, Unintentional data loss, Repudiation, Malicious attacks to steal data, Understanding, Identification and Threat modelling tools, Introduction to Ransomware, Security- Authorization and authentication - access control, Transport Layer Security (TLS), key management, security in cloud, Design and architecture considerations for security	7				
v	VData regulation, compliance and governance Regulations requirements and Privacy Regulations-General Data Protection Regulation (GDPR), The Health Insurance Portability and Privacy Act of 1996 (HIPPA), PII (Personal Identity Information), Information Governance Auditing, Legal Hold, Data classification and tagging (Natural Language Processing)					
VI	Applications uninterrupted Understand data management aspects of traditional and new edge applications, Reference architecture/best practices (pick 2-3 case studies from below topics)- Transactional Databases (Oracle, MySQL, DB2), NoSQL Databases (MongoDB, Cassandra), Distributed applications (micro service architectures), Cloud applications – Platform as Service (PaaS), Software as Service (SaaS), Kubernetes, Multi-Tiered applications, ETL workloads, Data analytics (AI/ML)	7				
1	Text Books Robert Spalding, "Storage Networks: The complete Reference" Tata McGraw-Hill	2017				
2	Vic (J.R.) Winkler, "Securing The Cloud: Cloud Computing Security Techniques of (Syngress/Elsevier) - 978-1-59749-592-9, 2017					
3	TBD – online reference for each topic.					
1	References					
1	O'Reilly, Martin Kleppmann, "Designing Data-Intensive Applications" 2012 TBD: provide more online material details and books (This can include some	me nublicly				
2	available white-paper, solution guides etc.)	me publiciy				
1	Useful Links	. 1				
1	https://www.enterprisestorageforum.com/storage-hardware/storage-virtualization.h	ntml				
	https://searchstorage.techtarget.com/definition/data-life-cycle-management https://www.hitechnectar.com/blogs/three-goals-data-lifecycle-management/					
2	https://www.hitecnnectar.com/blogs/three-goals-data-lifecycle-management/ https://www.bmc.com/blogs/data-lifecycle-management/					
	nups.//www.unc.com/utogs/uala-mecycle-management/					

CO-PO Mapping														
Programme Outcomes (PO)												PSO		
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
3												3		
3	2												3	
	3													
	1 3 3	1 2 3 3 3 2 3 3	1 2 3 3 2 3 3	P 1 2 3 4 3 2 4 3 2 4 3 2 4 3 2 4 3 2 4 3 2 4 3 3 4 3 4 3 4 3 4 3 4 3 4 3 4	Program 1 2 3 4 5 3	Programme C	Programme Outcom	Programme Outcomes (PC	Programme Outcomes (PO) PSO 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3					

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.

Assessment

Assessment Plan	n based on Bloor	n's Taxonomy I	Level (Marks)	
Bloom's Taxonomy Level	T1	T2	ESE	Total
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Understand	5	5	10	20
Apply	10	5	15	30
Analyze	5	5	15	25
Evaluate		5	15	20
Create			5	5
Total	20	20	60	100

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			2021-22				
D			Information				
Program		B.Tech. (Information					
Class, Se		Third Year B. Tech.,	Sem V				
Course C				- D.4			
Course N		Open Elective - 1: Jo		g using Python			
Desired I	Requisites:	Computer Programm	ing				
Теас	hing Scheme		Examination Sc	heme (Marks)			
Lecture	2 Hrs/week	T1	T2	ESE	Total		
Tutorial		$\begin{array}{c c c c c c c c c c c c c c c c c c c $					
Practical		20	20	00	100		
Interacti			Credi	ts· ?			
meracu							
		Course	Objectives				
1 T	o introduce the sig	nificance of Python in					
		programming paradigr					
	A	ent libraries of Python	.				
· · ·	Cou	rse Outcomes (CO) w	vith Bloom's Tax	onomy Level			
		students will be able to					
		amming concepts in P			Apply Evaluate		
		ing python programming libraries					
CO3 D	anion annlination .		Billion				
	esign application t	using Python libraries			Create		
			<u> </u>				
		Module	Contents		Create Hours		
	Introduction to	Module Python:	Contents	atrol Structures String	Hours		
	Introduction to The basic eleme	Module Python: nts of python, Branchi	Contents ng Programs, Cor	ntrol Structures, String	Hours		
Module	Introduction to The basic eleme and Input, Iterat	Module Python: nts of python, Branchi	Contents ng Programs, Cor	ntrol Structures, Strings ons, Recursion, Globa	Hours		
Module	Introduction to The basic eleme and Input, Iterat variables.	Module Python: nts of python, Branchi ion, Functions and sc	Contents ng Programs, Cor	-	Hours		
Module I	Introduction to The basic eleme and Input, Iterat variables. Advanced featu	Module Python: nts of python, Branchi ion, Functions and sc res of Python:	Contents ng Programs, Cor oping, Specificati	ons, Recursion, Globa	Hours 4		
Module	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files,	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and	Contents ng Programs, Cor oping, Specificati I Parameters, Str	-	Hours 4		
Module	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func	Contents ng Programs, Cor oping, Specificati I Parameters, Str ctions as Objects.	ons, Recursion, Globa	Hours 4		
Module I II	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Obj	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program	Contents ng Programs, Cor oping, Specificati l Parameters, Structions as Objects. nming:	ons, Recursion, Globa	Hours 4 5		
Module I	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Obj Abstract Data T	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program	Contents ng Programs, Cor oping, Specificati l Parameters, Structions as Objects. nming:	ons, Recursion, Globa	Hours 4 5		
Module I II	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Obj Abstract Data T Hiding.	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program	Contents ng Programs, Cor oping, Specificati l Parameters, Structions as Objects. nming:	ons, Recursion, Globa	Hours 4 5		
Module I II	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module:	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh	Contents ng Programs, Cor oping, Specificati 1 Parameters, Str ctions as Objects. nming: eritance, Encapsu	ons, Recursion, Globa	Hours 4 4 5 4 4		
Module I II III	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Obj Abstract Data T Hiding. Module: Importing mod	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program	Contents ng Programs, Cor oping, Specificati d Parameters, Str ctions as Objects. nming: eritance, Encapsu	ons, Recursion, Globa	Hours 4 4 5 4 4		
Module I II	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mod Composition.	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh	Contents ng Programs, Cor oping, Specificati 1 Parameters, Str ctions as Objects. nming: eritance, Encapsu	ons, Recursion, Globa	Hours 4 4 5 4 4		
Module I II III	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Obj Abstract Data T Hiding. Module: Importing mod Composition. Data Visualizat	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func- ject-Oriented Program ypes and Classes, Inh odule, Math mod	Contents ng Programs, Cor oping, Specificati d Parameters, Str ctions as Objects. nming: eritance, Encapsu ule, Random	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages	Hours 4 4 5 4 4		
Module I II III IV	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mo Composition. Data Visualizat Matplot lib, Bar	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box	Contents ng Programs, Cor oping, Specificati d Parameters, Str ctions as Objects. nming: eritance, Encapsu ule, Random	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages	Hours 4 4 5 4 4 4		
Module I II III	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mod Composition. Data Visualizati Matplot lib, Bar Python-Numpy	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func- ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library	Contents ng Programs, Cor oping, Specificati I Parameters, Stra- ctions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot	Hours 4 5 4 5 4 5 5		
Module I II III IV	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mod Composition. Data Visualizati Matplot lib, Bar Python-Numpy	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func- ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N	Contents ng Programs, Cor oping, Specificati I Parameters, Stra- ctions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages	Hours 4 5 4 5 4 5 5		
Module I II III IV	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mo Composition. Data Visualizati Matplot lib, Bar Python-Numpy NumPy: Introdu	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N :	Contents ng Programs, Cor oping, Specificati I Parameters, Stri- ctions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I umpy array index	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot	Hours 4 4 5 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
Module I II III IV V	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mod Composition. Data Visualizat Matplot lib, Bar Python-Numpy NumPy: Introdu Pandas Library Pandas: Series,	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N :	Contents ng Programs, Cor oping, Specificati I Parameters, Stri- ctions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I umpy array index ing missing data	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot	Hours 4 4 5 4 5 4 5 4 5 4 4 5 4		
Module I II III IV V	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mod Composition. Data Visualizat Matplot lib, Bar Python-Numpy NumPy: Introdu Pandas Library Pandas: Series,	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N : Data frames, manag perations, data input an	Contents ng Programs, Cor oping, Specificati d Parameters, Str ctions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I umpy array index ing missing data d data output.	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot	Hours 4 4 5 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
Module I II III IV V VI	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mo Composition. Data Visualizati Matplot lib, Bar Python-Numpy NumPy: Introdu Pandas Library Pandas: Series, concatenation, o	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N : Data frames, manag perations, data input an	Contents ng Programs, Coroping, Specificati d Parameters, Stractions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I umpy array index ing missing data d data output.	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot ing, Numpy operations. , groupby, merging &	Hours 4 4 5 4 5 4 4 4 4 4 4 4 4 4 4 4 4 4 4		
Module I II III IV V VI	Introduction to The basic eleme and Input, Iterat variables. Advanced featu Modules, Files, Dictionaries, Lis Classes and Ob Abstract Data T Hiding. Module: Importing mo Composition. Data Visualizati Matplot lib, Bar Python-Numpy NumPy: Introdu Pandas Library Pandas: Series, concatenation, o	Module Python: nts of python, Branchi ion, Functions and sc res of Python: System Functions and ts and Mutability, Func- ject-Oriented Program ypes and Classes, Inh odule, Math mod ion: Graph, Pie Chart, Box Library ction, Numpy array, N : Data frames, manag perations, data input an Tex "Core Python Program	Contents ng Programs, Coroping, Specificati d Parameters, Structions as Objects. nming: eritance, Encapsu ule, Random plot, Histogram, I umpy array indexu ing missing data d data output. t Books uming", Dreamtec	ons, Recursion, Globa ings, Tuples, Lists and ilation and Information module, Packages Line chart, Sub plot	Hours 4 4 5 4 5 4 4 4 4 4 4 4 4 1 1 7		

1	1Barry, Paul, Head First Python, O Rielly, 2nd Edition, 2010							
2	Lutz, Mark, Learning Python, O Rielly, 4th Edition, 2009							
	Useful Links							
1	https://onlinecourses.nptel.ac.in/noc21_cs32/preview							
2	https://docs.python.org/3/tutorial/							
3	https://www.learnpython.org/							

	CO-PO Mapping														
		Programme Outcomes (PO)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1			2										3		
CO2				2	3							2		3	
CO3									1			2		3	
The streng	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Eash CO	- f 41					4 D	0								

Each CO of the course must map to at least one PO.

Assessme	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	T2	ESE	Total								
Remember	Not	Not Allowed	Not Allowed	Not								
	Allowed			Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

				ege of Engineering,	6				
			1	ided Autonomous Ins	stitute)				
				se Information					
Progra	amme		B.Tech. (Informat						
Class,		ster	Third Year B. Tec						
Cours				,					
Cours	e Nam	e	Open Elective - 2:	Cloud Computing S	ystem				
Desire	ed Req	uisites:	Computer Networ	ks					
Te	achin	g Scheme		Examination S	cheme (Marks)				
Lectur		3 Hrs/week	T1	T2	ESE	Total			
Tutori		-	20	20	60	100			
Practi		-		-					
Intera		-		Cred	its: 3				
			·						
				rse Objectives					
1	1		nentals of virtualization						
2				ent model in cloud co	omputing				
3	Toey	<u> </u>	ficance of virtualiza		TI				
At the	end of		students will be abl)) with Bloom's Tax le to	conomy Level				
CO1	1					Understand			
$\frac{\text{CO1}}{\text{CO2}}$			hend the fundamentals of cloud computation eployment model to host services on cloud						
CO3				a center applications		Apply Analyze			
				11					
Modu	le		Modu	le Contents		Hours			
Ι	V S. C	irtualization an AAS, Cloud De loud, Cloud Pla		g, Cloud Reference M Public Cloud, Private	Iodel: IAAS, PAAS, Cloud and Hybrid	7			
II	H		are-Meta, Server ualization, Storage V		ktop Virtualization,	6			
III	N Pi In	etwork Functi ublic Cloud Ne ıfrastructure, V	ions tworking: Route53,	Content Delivery No ctions: Cloud Firewa		6			
IV	V A	PC fundamenta ccess Control I	List, Network Addre	te Subnets, Security	Groups, Network	7			
V	S C	omputing, Res	ment in Cloud Compource Management	puting, Data Manage in Cloud	ement in Cloud	7			
VI	0	pen Source and	oud Computing l Commercial Cloud g, Fog Computing	ls, Cloud Simulator,	Research trend in	6			
			r	Fext Books					
1	Graw	Hill Education	Christian Vecchiola n, 3rd Edition, 2011	, S. Thamarai Selvi	, "Mastering cloud				
2			m Mahmood and R arson, 1st Edition, 2		ud Computing: Conc	epts, Technology			
				References					
1			Thomas Erl, and		od, <i>"Cloud Compu</i> tion, 2013	ting: Concepts,			

2	Srinivasan, J. Suresh, "Cloud Computing: A practical approach for learning and implementation", Pearson, 2nd Edition, 2012												
	Useful Links												
1	Module: I, II, IV, V, VI												
https://nptel.ac.in/content/syllabus_pdf/106105167.pdf													
2	https://aws.amazon.com/												

	CO-PO Mapping														
		Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	1		2										2		
CO2			3												
CO3	2													3	
The stren	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Each CO	of the	course	must r	nap to	at leas	t one P	Ю.				-				

Assessment

Assessme	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	T2	ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

TY Sem II

	Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)							
	AY 2021-22							
	Course Information							
Programme	B.Tech. (Information Technology)							
Class, Semester	Third Year B. Tech., Sem VI							
Course Code								
Course Name	Unix Operating System							
Desired Requisites:	Operating System							

Teachi	ng Scheme		Examination	n Scheme (Marks)	
Lecture	2 Hrs/week	T1	T2	ESE	Total
Tutorial	-	20	20	60	100
Practical	-				

Interact	ion	-				(credits	s: 2	
				Cour	se Ob	jectives			
							~ .		

1	To introduce design principal and philosophy of the Unix/Linux OS.
2	To impart the architecture of Unix/Linux OS.

2	To impart the architecture of Unix/Linux OS
3	To demonstrate system call of Linux/Unix.

To demonstrate system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level

	Course Outcomes (CO) with bloom s Taxonomy Level								
At the	At the end of the course, the students will be able to,								
CO1	Interpret design principal and philosophy of the Unix/Linux OS	Apply							
CO2	Analyze the architecture of Unix/Linux OS	Analyze							
CO3	Compare various IPCs in Linux OS	Analyze							

Module	Module Contents	Hours
Ι	IntroductionGeneral Overview of the System - History, System Structure, User Perspective, Operating System Services, Assumption About Hardware.Introduction to the KERNEL: Architecture of UNIX OS, Introduction to system concepts, Kernel Data Structure, System Administration	5
II	The Buffer Cache Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, advantages and disadvantages of cache.	4
III	Internal Representation of Files Inodes, structure of the regular file, directories, conversion of a pathname to inode, super block, inode assignment to a new file, allocation of disk blocks, other file types.	4
IV	System calls for the file System Open, Read, write, File and Record Locking, LSEEK, Close, File Creation, Creation of Special File, Change Directory and Change Root, Change Owner and Change Mode, Stat and Fstat, Pipes, Dup, Link, Unlink.	4
V	Structure of Process Process stages and transitions, layout of system memory, the context of a Process, saving context of a process, manipulation of the process address space.	4
VI	Process Control Process creation, signals, process termination, awaiting process termination, invoking other programs, the user id of a process, the shell, system Boot and the Init process, Process Scheduling, system call for time, clock.	5

1	Maurice J. Bach, "The Design of Unix Operating System", PHI, 1994.											
2	Sumitabha Das, "Unix Concepts and Applications", TMGH, 4th Edition, 2017.											
	References											
1	Beej Jorgensen, "Beej's Guide to Unix IPC", Brian -Beej Jorgensen Hall, Version 1.1.2,											
1	December, 2010											
2	Kay Robbins, Steve Robbins, "UNIX Systems Programming: Communication, Concurrency and											
2	Threads", Pearson, 2nd Edition, December, 2015											
3	Eric Raymond, "Art of UNIX Programming", Pearson, 1st edition, October, 2003											
	Useful Links											
	https://nptel.ac.in/courses/106/102/106102132/											
1	(Intro to Unix System Calls Part 1/2, Kernel Data Structures, Process structure, Context											
1	Switching, Fork, Context-Switch, Process Control Block, Locking, File System Implementation,											
	File System Operation)											
2	https://onlinecourses.nptel.ac.in/noc19_cs50											
2	(Processes, Scheduling in Linux, IPC, thread)											
3	https://github.com/suvratapte/Maurice-Bach-Notes											
4	https://github.com/mit-pdos/xv6-public											
5	https://www.geeksforgeeks.org/introduction-to-unix-system/											
6	http://www.di.uevora.pt/~lmr/syscalls.html											

	CO-PO Mapping														
		Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1			3						2						
CO2		2										2	2		
CO3			2	1										1	
The streng	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Each CO	of the	course	must 1	map to	at leas	t one P	Ю.								

Assessm	Assessment Plan based on Bloom's Taxonomy Level												
Bloom's Taxonomy Level	T1	T2	Lab ESE	Total									
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed									
Understand	5	5	10	20									
Apply	10	5	15	30									
Analyze	5	5	15	25									
Evaluate		5	15	20									
Create			5	5									
Total	20	20	60	100									

				ge of Engineering ded Autonomous Ir		
			1	Y 2021-22		
				se Information		
Progra	amme		B.Tech. (Informati			
Class,		ster	Third Year B. Tec			
Cours	e Code	9				
Cours	e Nam	e	Parallel Computin	g		
Desire	d Req	uisites:	Computer Algorith	nm		
Те	eachin	g Scheme		Examination	Scheme (Marks)	
Lectur	re	2 Hrs/week	T1	T2	ESE	Total
Tutori	ial	1	20	20	60	100
Practi	cal	-				1
Intera	ction	-		Cre	dits: 3	
				rse Objectives		
1		^	allel computing in o	A		
2			ocess of parallelizat			
3	To co	omprehend threa	ad and process conc	ept in parallel com	puting	
		<u> </u>	0.4 (60		T 1	
Atthe	and of		rse Outcomes (CO		ixonomy Level	
CO1	1		students will be able uting algorithm to s		nrohlom	Apply
CO1 CO2			ode to speed-up the	<u> </u>		Apply Apply
CO2 CO3			lgorithm for the eng			Create
	Desig	gii the parallel a	igoritimi for the eng	incernig problem		Create
Modu	le		Moo	dule Contents		Hours
Ι	P	arallel Computi	ng: Motivation and	scope		6
II	G	PGPU Program	ming : OpenACC, (CUDA, OpenCL		4
III		A	sor architecture and		ory systems	4
IV	D	ichotomy and c	organization of paral	lel platforms		4
<u>V</u>			costs in parallel mac			4
VI	R	outing mechani	sm and processor m	apping techniques		4
	Amad	h Cromo Are-1		Text Books	"Intro duction to a	mallal accuration = "
1			rson Education, 200		, "Introduction to pa	railei computing,
					Programming", Fir	st Edition. Packt
2		shing, 2019	- ontarinar offarina,			st Lannon, I workt
	1					
			F	References		
1	Horre	owitz, Sahni Ra			omputer Science, W.	H. Freeman
	and c	company Press,	New york			
				seful Links		
1			urses/106/102/1061			
2	https:	://nptel.ac.in/co	urses/106/102/1061	02163/		

CO-PO Mapping

		Programme Outcomes (PO)												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1					3							1		
CO2		1			2								1	
CO3	1	2												2
The stren	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High													
Each CO	of the	course	must r	nap to	at leas	t one F	Ю.							

Assessment Plan based on Bloom's Taxonomy Level							
Bloom's Taxonomy Level	T1	Τ2	ESE	Total			
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed			
Understand	5	5	10	20			
Apply	10	5	15	30			
Analyze	5	5	15	25			
Evaluate		5	15	20			
Create			5	5			
Total	20	20	60	100			

		Walchand Co	ollege of Engineeri	ng, Sangli						
	(Government Aided Autonomous Institute)									
AY 2021-22										
D		1	urse Information							
Progra			nation Technology)							
	Semester	Third Year B. 7	l'ech., Sem VI							
Course			0 / T 1							
Course		Unix Operating System Lab Operating System, (C/python) Programming language								
Desired	l Requisites:	Operating Syste	em, (C/python) Prog	gramming language						
Te	aching Scheme	Examination Scheme (Marks)								
Lecture -		LA1	LA2	Lab ESE	Total					
Tutoria	I	30	30	40	100					
Practic										
Interac			С	redits: 1						
		0								
1	To use verieus esst		ourse Objectives							
1	To use various system									
2 3	To elaborate the vari			he need month and have						
5	A		v	he real world problems						
Atthe			CO) with Bloom's T	raxonomy Level						
	end of the course, the				Apply					
		erence between thread and process								
		lifferent system calls for Linux/Unix programming nt various inter process communications available in operating system								
	Implement various n	ner process com	inumeations availab	ie in operating system	Apply					
		List of Exr	periments / Lab Ac	tivities						
 IPC: Interrupts and Signals: signal(any three type of signal), alarm, kill, signal File system Internals: Stat, fstat, ustat/lock/flock. Threading concept: In c language (P thread) clone, threads of java IPC: Semaphore: semaphore. h-semget, semctl, semop IPC: Message Queue: msgget, msgsnd, msgrcv IPC: Shared memory : shmget, shmat, shmdt IPC: Sockets: socket system calls in C/socket programming of Java/python. IPC: Pipe/FIFO Scripting writing in Linux and python 										
			Text Books							
1	Maurice J. Bach, "T	he Design of Uniz		", PHI, 1994.						
2	/	0 0	1 07	GH, 4 th Edition, 2017.						
I	,	1	,							
			References							
1	Beej Jorgensen, "Beej's Guide to Unix IPC", Brian -Beej Jorgensen Hall, Version 1.1.2, December, 2010									
2	Kay Robbins, Steve Robbins, "UNIX Systems Programming: Communication, Concurrency and Threads", Pearson, 2nd Edition, December, 2015									
3	Eric Raymond, "Art of UNIX Programming", Pearson, 1st edition, October, 2003									
			Useful Links							
1	https://users.cs.cf.ac.uk/Dave.Marshall/C/									
2	https://github.com/suvratapte/Maurice-Bach-Notes									
3	https://github.com/mit-pdos/xv6-public									
4	https://www.geeksforgeeks.org/introduction-to-unix-system/									
5.	https://github.com/beejjorgensen/bgipc									
6.	http://www.di.uevora.pt/~lmr/syscalls.html									
	Course Contents for	· PTach Programm	Donortmont of Info	ormation Technology, AY202	21.22					

CO-PO Mapping														
		Programme Outcomes (PO) PSO												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		2		1									1	
CO2					3							2	2	
CO3		1		2										2
The streng								e, 1:Lo	w, 2:M	ledium	, 3:Hig	gh		
Each CO	of the	course	must r	nap to	at leas	t one P	0.							

Each CO of the course must map to at least one PO.

Assessment							
There are three components of lab assessment, LA1, LA2 and Lab ESE.							
IMP: Lab ESE is a separate head of passing. LA1, LA2 together is treated as In-Semester Evaluation.							
Assessment	Based on	Conducted by	Typical Schedule (for 26-week Sem)	Marks			
LA1	Lab activities,	Lab Course	During Week 1 to Week 6	30			
LAI	attendance, journal	Faculty	Marks Submission at the end of Week 6	50			
T A D	Lab activities,	Lab Course	During Week 7 to Week 12	20			
LA2	attendance, journal	Faculty	Marks Submission at the end of Week 12	30			
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40			
LauESE	attendance, journal	Faculty	Marks Submission at the end of Week 18	40			

Week 1 indicates starting week of a semester. The typical schedule of lab assessments is shown, considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

Assessment Plan based on Bloom's Taxonomy Level						
Bloom's Taxonomy Level	LA1	LA2	Lab ESE	Total		
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed		
Understand	5			05		
Apply	20	20	20	60		
Analyze	5	5	10	20		
Evaluate		5	5	10		
Create			5	5		
Total	30	30	40	100		

				ege of Engineering, ided Autonomous Inst	0					
			1	AY 2021-22						
				rse Information						
Progra	amme		B.Tech. (Informat	tion Technology)						
Class, Semester Third Year B. Tech., Sem VI										
Course	e Cod	e								
Course	e Nam	ie	Web Technology							
Desire	d Req	uisites:	Basic Programmi	ng Concepts						
		g Scheme		Examination Sc						
Lectur		-	LA1	LA2	ESE	Total				
Tutori		-	30	30	40	100				
Practio		2 Hrs/week								
Intera	ction	1 Hr/week		Credi	its: 2					
			Car	ursa Obiactivas						
1	Toir	troduce the prin		<pre>Irse Objectives Ipplications developm</pre>	ent process					
2				side web technologie						
<u>2</u> 3				nt in web and content						
5	10 0		<u> </u>	D) with Bloom's Tax	<u> </u>					
At the	end of		students will be ab	/						
CO1		evelop web-based application using client and server side web technologies								
CO2		reate a web page with elements and attributes								
CO3		reate a web page with elements and attributes Creates a web page with elements and attributes Creates a solution for various application using web frameworks Creates and Creates a solution for various application using web frameworks Creates and								
						I				
Modu	le	Module Contents Hours								
		ITML and CSS		1						
		HTML introduction, HTML editors, elements, attributes, headings, paragraphs, styles, formatting, lists, tables, layout, forms								
Ι		CSS Introduction, syntax, selectors, colors, backgrounds, borders, margins,								
		padding, outline, text family, font family, navigation bar, dropdowns, forms,								
~ -			d components	family, navigation	bar, dropdowns, forms	,				
		avascript	id components							
		Introduction to Javascript, syntax, variables, operators, data types, functions,								
II		objects, events, date formats, math, control flow statements, forms, objects and								
		its properties, object classes, components, Introduction to server-side and client-								
		side scripting language								
		HP								
		Basics of PHP, installation of PHP, comments, variables, echo/print, data types,								
III		strings, numbers, math, constants, operators, control flow statements, arrays,								
	F	Form handling, form validation, form required, from URL, form complete, date								
		and time, file handling, open, read, write, upload, cookies, session,								
		Object oriented PHP								
IV		What is OOP?, classes and objects, constructor, destructor, access modifiers,								
		inheritance, interfaces, abstract classes, static keyword								
		atabase Handl	8			2				
	- I N	MySQL database connectivity, MySQL connect, creating database, inserting								
V		data, prepared statements, various queries used in PHP								
V	d	· ·	Bootstrap and responsive web design							
V	d	ootstrap and r	-	0	notom brittons (-1-1-					
	d B Ir	ootstrap and r	ootstrap, installatio	on of bootstrap, grid s	ystem, buttons, tables,					
V VI	d B Ir V	ootstrap and r ntroduction to B ertical forms, he	ootstrap, installatio prizontal forms, dro	on of bootstrap, grid s opdowns, responsive t	abs, progress bar,	2				
	d B Ir V al	ootstrap and r htroduction to B ertical forms, ho lerts, pagination	ootstrap, installatio prizontal forms, dro , badges, labels, pa	on of bootstrap, grid s opdowns, responsive t ge headers, tooltips, 1	-	2				
	d B Ir V al	ootstrap and r htroduction to B ertical forms, ho lerts, pagination	ootstrap, installatio prizontal forms, dro	on of bootstrap, grid s opdowns, responsive t ge headers, tooltips, 1	abs, progress bar,	2				

List o	of Experiments:
1.	Program on HTML basic tags for text formatting.
2.	Program on HTML tag to handle multimedia elements on web page.
3.	Program on HTML tag to create forms and UI elements.
4.	Program on CSS properties for HTML web page.
5.	Program on applying event handling on HTML web page using JavaScript.
6.	Program on applying layout to HTML webpage.
7.	Program on PHP controls statements.
8.	Program on PHP string operations.
9.	Program on PHP form creation and data handling.
10.	Program on session management using PHP.
11.	Program on Cookies management using PHP.
12.	Program on PHP to connect MySQL database for CURD operations.
13.	Program on Bootstrap/ responsive web design using different components.
	Text Books
1	P.J. Deitel & H.M. Deitel Pearson, "Internet and World Wide Web How to program", Pearson Education India, 4 th Edition, 2009
2	Jon Duckett, "HTML and CSS: Design and Build Websites", John Wiley & Sons, Inc, 1 st Edition, 2011
	References
1	Steven M. Schafer, "HTML, XHTML and CSS", Wiley India Edition, 5th Edition, 2010
2	Ivan Bayross ,"Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP", BPB Publications, 4th Edition , 2006
	Useful Links
1	https://www.coursera.org/learn/web-app#syllabus
2	https://www.coursera.org/specializations/web-applications
2	https://www.udamy.com/course/foundations.of front and dayslonment/

	3	https://www.udemy.com/course/foundations-of-front-end-development/
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	CO-PO Mapping													
		Programme Outcomes (PO) PSO												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		2		1										
CO2									2					
CO3					2									1
The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
	Each CO of the course must map to at least one PO.													

Assessment

The assessment is based on 2 in-semester evaluations (ISE) of 10 marks each, 1 mid-sem examination (MSE) of 30 marks and 1 end-sem examination (ESE) of 50 marks. MSE is based on the modules taught till MSE (typically Module 1-3) and ESE is based on all modules

with 30-40% weightage on modules before MSE and 60-70% weightage on modules after MSE.

Assessment Plan based on Bloom's Taxonomy Level							
Bloom's Taxonomy Level	LA1	LA2	Lab ESE	Total			
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed			
Understand	5			05			
Apply	20	20	20	60			
Analyze	5	5	10	20			
Evaluate		5	5	10			
Create			5	5			
Total	30	30	40	100			

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)					
AY 2021-22					
Course Information					
Programme	B.Tech. (Information Technology)				
Class, Semester	Third Year B. Tech., Sem VI				
Course Code					
Course Name	Mini Project - 4				
Desired Requisites:	Database Engineering				

Teaching	Scheme	Examination Scheme (Marks)						
Lecture	-	LA1	LA2	Lab ESE	Total			
Tutorial	-	30	30	40	100			
Practical	2 Hrs/Week							
Interaction	-	Credits: 1						

Course Objectives							
1	To introduce latest database system and it's design						
2	To find real-world challenges by IT based Solution						
3	To build the soft skills of student to work in team.						
Course Outcomes (CO) with Bloom's Taxonomy Level							
At the end of the course, the students will be able to,							
CO1	Demonstrate the database design	Apply					
CO2	Identify the real world problems & apply software engineering practices	Analyze					
CO3	Design software application with backend and project report for submission	Create					
1							

List of Experiments / Lab Activities

List of Experiments:

Mini-project is to be carried out in a group of maximum 5 to 6 students.

Each group will carry out a mini-project by developing any application software based on the following areas.

1. Data based application development using any trending database system like: structured and unstructured DBs (PGSQL, NoSQL, MongoDB, oracle, Maria Db, RDF, firebase, etc.)

2. Industry based problem / Sponsored application /Game/ Interdisciplinary application /socially useful application / Problem solving of previously learned complex concepts.

3. Project group should achieve all the proposed objectives of the problem statement.

4. The work should be completed in all aspects of design, implementation and testing and follow software engineering practices.

5. Project reports should be prepared and submitted in soft and hard form along with the code and other dependency documents. Preferable use online code repositories (github/bitbucket)

- 6. Project will be evaluated continuously by the guide/panel as per assessment plan.
- 7. Presentation and report should use standard templates provided by department.
- 8. Ppreferably choose DB other than taught in MySQL/MSSQL.

Project report (pre-defined template) should be prepared using Latex/Word and submitted along with soft copy on CD/DVD (with code, PPT, PDF, Text report document & reference material) or on an online repository.

Students should maintain a project log book containing weekly progress of the project.

	Text Books
1	Rajendra Kumbhar, "How to Write Project Reports, Ph. D. Thesis and Research
1	Articles", Universal Prakashan, 2015

2	Marilyn Deegan, " <i>Academic Book of the Future Project Report</i> ", A Report to the AHRC & the British Library, 2017
	References
1	https://www.youtube.com/watch?v=0oSDa2kf5I8 (report writing)
2	
	Useful Links
1	https://pats.cs.cf.ac.uk/wiki/lib/exe/fetch.php?media=project-report.pdf
2	http://users.iems.northwestern.edu/~hazen/Writing%20Project%20Reports%202004a.pdf
3	https://www.upgrad.com/blog/java-project-ideas-topics-for-beginners/
4	https://www.geeksforgeeks.org/computer-science-projects/

	CO-PO Mapping													
	Programme Outcomes (PO) PSO)	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1		1			2							3		
CO2										2			2	
CO3							3				2			1
The stren	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High													
Each CO	of the	course	must r	nap to	at leas	t one P	Ю.							

	Assessment										
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing. LA1, LA2 together is treated as In-Semester Evaluation.											
AssessmentBased onConducted byTypical Schedule (for 26-week Sem)Marks											
	Lab activities,	Lab Course	During Week 1 to Week 6								
LA1	attendance, journal	Faculty	Marks Submission at the end of Week 6	30							
LA2	Lab activities,	Lab Course	During Week 7 to Week 12	30							
LAZ	attendance, journal	Faculty	Marks Submission at the end of Week 12	50							
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40							
	attendance, journal	Faculty	Marks Submission at the end of Week 18	40							

Week 1 indicates starting week of a semester. The typical schedule of lab assessments is shown, considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

Assessment Plan	Assessment Plan based on Bloom's Taxonomy Level (Marks) (For lab Courses)											
Bloom's Taxonomy Level	LA1	LA2	Lab ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand												
Apply	15	10	10	35								
Analyze	5	10	5	20								
Evaluate	5	5	10	20								
Create	5	5	15	25								
Total Marks	30	30	40	100								

		chand College of vernment Aided A	0 0,	e						
	()21-22	,						
		Course In	formation							
Programme		B.Tech. (Inform	nation Technolo	gy)						
Class, Semester		Third Year B.								
Course Code										
Course Name		Mini Project - 5	5							
Desired Requisites: AIML, Web Technology										
		1								
Teaching Scheme Examination Scheme (Marks)										
Lecture	-	LA1	LA2	Lab ESE	Total					
Tutorial	-	30 30 40 100								
Practical	2 Hrs/Week			· ·						
Interaction	-		Cre	edits: 1						
		Course C	bjectives							
	roduce latest web									
	d real-world challe	<u> </u>								
3 To bui	ld the soft skills o									
At the end of the		comes (CO) wit		onomy Level						
	e course, the studer ment AI based app				Apply					
^	fy the real world p			ering practices.	Analyze					
Desig	·		-	ed project report for	Create					
	ssion and evaluation									
		ist of Experimer	nts / Lab Activit	ies						
List of Experim										
Each group				tudents. application software	based on the					
following are 1. Development	using any web ap	plication or AIM	I. based applicat	tion						
				erdisciplinary applica	tion /socially					
	ation / Problem so				5					
				ng monitoring, environ	nment, Social					
	ty Development, h									
4. Web applica Ruby on Rail	-	using any front	end technology	y: PHP, NODE.JS, d	jango. Flask,					
	pplication develop	pment using any	trending databa	ase system like: MyS	QL, PGSQL,					
	-	l the proposed ol	ojectives of the p	roblem statement.						
7. The work sh software engi	ould be complete neering practices.	d in all aspects	of design, imple	ementation and testin	-					
	and other depe			oft and hard form use online code						
 Project will b Presentation a Project report with soft cop 	e evaluated contin and report should t (pre-defined temp y on CD/DVD (w	use standard tem plate) should be ith code, PPT, P	plates provided b prepared using L DF, Text report		e material) or					
		Text	Books							

1	Rajendra Kumbhar, "How to Write Project Reports, Ph. D. Thesis and Research Articles", Universal Prakashan, 2015									
2	Marilyn Deegan, "Academic Book of the Future Project Report", A Report to the AHRC &									
	² the British Library, 2017									
	References									
1	https://www.youtube.com/watch?v=0oSDa2kf5I8 (report writing)									
	Useful Links									
1	https://pats.cs.cf.ac.uk/wiki/lib/exe/fetch.php?media=project-report.pdf									
2	http://users.iems.northwestern.edu/~hazen/Writing%20Project%20Reports%202004a.pdf									
3	https://www.upgrad.com/blog/java-project-ideas-topics-for-beginners/									
4	https://www.geeksforgeeks.org/computer-science-projects/									

	CO-PO Mapping													
	Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	1 2 3													
CO2										2			2	
CO3	CO3 3 1 1													
The streng	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High													
Each CO	ofthe		manat e	non to	at loog	t ama D	0							

Each CO of the course must map to at least one PO.

	Assessment										
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing. LA1, LA2 together is treated as In-Semester Evaluation.											
Assessment	Based on	Typical Schedule (for 26-week Sem)	Marks								
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LAI	attendance, journal	journal Faculty Marks Submission at the end		50							
LA2	Lab activities,	Lab Course	During Week 7 to Week 12	20							
LAZ	attendance, journal	Faculty	Marks Submission at the end of Week 12	30							
Lab ESE	Lab activities,	Lab Course	During Week 15 to Week 18	40							
Lab ESE	attendance, journal	Faculty	Marks Submission at the end of Week 18	40							

Week 1 indicates starting week of a semester. The typical schedule of lab assessments is shown, considering a 26-week semester. The actual schedule shall be as per academic calendar. Lab activities/Lab performance shall include performing experiments, mini-project, presentations, drawings, programming and other suitable activities, as per the nature and requirement of the lab course. The experimental lab shall have typically 8-10 experiments.

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Understand													
Apply	15	10	10	35									
Analyze	5	10	5	20									
Evaluate	5	5	10	20									
Create	5	5	15	25									
Total Marks	30	30	40	100									

				ollege of Engineeri	0, 0						
			(Government	t Aided Autonomous	s Institute)						
			C	AY 2021-22							
D			1	ourse Information							
Progra		4		nation Technology)							
<u>Class,</u>			Final Year B. T	ech., Sem VI							
Course			Due fereite une 1 E1		nt ala a f Diatailacta 1 Ona						
					entals of Distributed Ope	erating System					
Desire	d Req	uisites:	Operating Syste	ems, Distributed Ne	twork						
T	1.	G 1		T							
		Scheme 3		1 1	Scheme (Marks)	T-4-1					
Lectur	e	5 Hrs/week	T1	T2	ESE	Total					
T4	al	HIS/Week	20	20	60	100					
Tutori Practio		-	20	20	00	100					
Intera		-		C							
Intera	cuon	-		Cr	redits: 3						
				ourse Objectives							
1	Toir	troduce fund		Course Objectives es of distributed syst	tame						
1 2			us distributed sys								
$\frac{2}{3}$					ming and armahanizati						
3	10 00				aming and synchronizati						
A 4 4 h a			,	CO) with Bloom's	Taxonomy Level						
			he students will b		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	Understand					
				O1 Comprehend the fundamentals of distributed operating systems							
CO2 Compare different distributed file systems											
						Analyse					
CO3				systems tem and application	S	Analyse Analyse					
CO3 Modu	Anal	yze distribute	ed web-based sys Mo	tem and application dule Contents	S	-					
	Anal le Ir	yze distribute	ed web-based sys Mo to distributed Sy	tem and application dule Contents /stems		Analyse					
Modu	Anal	yze distribute ntroduction t efinition and	ed web-based sys Mo to distributed Sy goals, Hardware	tem and application dule Contents	epts, Design issues	Analyse Hours					
Modu	Anal	yze distribute ntroduction t efinition and ommunicati	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchror	tem and application dule Contents /stems and Software conce nization in distribu	epts, Design issues	Analyse Hours					
Modu I	Anal	vze distribute troduction efinition and ommunicati omputer Net sues, synchi	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere conization, Clien	dule Contents ostems and Software concentization in distributed protocols, Messa at Server model &	epts, Design issues ted systems: ge passing and related & its implementation,	Analyse Hours 6					
Modu	Anal	vze distribute troduction efinition and ommunicati omputer Net sues, synchi	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere conization, Clien	dule Contents ostems and Software concentization in distributed protocols, Messa at Server model &	epts, Design issues ted systems: ge passing and related & its implementation,	Analyse Hours					
Modu I	Anal le In D C is re	vze distribute ntroduction t efinition and ommunicati omputer Net sues, synch mote proced	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere conization, Clien lure call and im	tem and application dule Contents /stems and Software concentration in distributed protocols, Messa at Server model & plementation issues	epts, Design issues ted systems: ge passing and related	Analyse Hours 6					
Modu I	Anal le Ir D C C is re R	ntroduction t efinition and ommunicati omputer Net sues, synchromote procect PC, DEC RE	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere conization, Clien lure call and im	tem and application dule Contents /stems and Software concentration in distribu ed protocols, Messa at Server model & plementation issues ronization and relation	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN	Analyse Hours 6					
Modu I	Anal le In D C C is re R e	ntroduction t efinition and ommunicati omputer Net sues, synchromote procect PC, DEC RE	ed web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere onization, Clien lure call and im PC Clock synch dolock in distribut	tem and application dule Contents /stems and Software concentration in distribu ed protocols, Messa at Server model & plementation issues ronization and relation	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual	Analyse Hours 6					
Modu I	Anal le Lu D C C is re R e P	ntroduction efinition and ommunicati omputer Net sues, synchi mote proced PC, DEC RE cclusion, Dea rocesses and	d web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere onization, Clien lure call and im PC Clock synch idlock in distribut	tem and application dule Contents //stems and Software concentration in distributed protocols, Messa at Server model & plementation issues ronization and relative ted systems & Distributed Fil	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual	Analyse Hours 6					
Modu I II	Anal le Ir D C C is re R ey P	atroduction t efinition and ommunicati omputer Net sues, synchr emote procect PC, DEC RH cclusion, Dea rocesses and Fhreads, system	d web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere onization, Clien lure call and im PC Clock synch idlock in distribut processors em model, process	tem and application dule Contents //stems and Software concentration in distributed protocols, Messa at Server model & plementation issues ronization and relative ted systems & Distributed Fil	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual e Systems: eduling in distributed	Analyse Hours 6 7					
Modu I	Anal le In D C C is re R ey P	troduction to efinition and ommunication omputer Net sues, synchromote procedor PC, DEC RH cclusion, Dea rocesses and Fhreads, systems: Loa	Mo to distributed Sy goals, Hardware on & Synchron work and Layere ronization, Clien lure call and im PC Clock synch idlock in distribut processors em model, process d balancing and s	tem and application dule Contents /stems and Software concentration in distributed inization in distributed protocols, Messa at Server model & plementation issues ronization and related ted systems & Distributed Fill ssor allocation, scher sharing approach, fa	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual e Systems: eduling in distributed ult tolerance, Real	Analyse Hours 6					
Modu I II	Anal le In D C C C is re R en P f t	atroduction t efinition and ommunicati omputer Net sues, synchr mote proced PC, DEC RF cclusion, Dea rocesses and Threads, syste systems: Load	d web-based sys Mo to distributed Sy goals, Hardware on & Synchron work and Layere onization, Clien lure call and im PC Clock synch dlock in distribut processors em model, process d balancing and s ed systems, Proc	tem and application dule Contents /stems and Software concentration in distributed protocols, Messa at Server model & plementation issues ronization and related ted systems & Distributed Fill ssor allocation, sche sharing approach, fa ess migration and re	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual e Systems: eduling in distributed ult tolerance, Real elated issues	Analyse Hours 6 7					
Modu I II	Anal le II D C C is re R ep P S t	troduction to efinition and ommunicati omputer Net sues, synchi mote proced PC, DEC RE cclusion, Dea rocesses and Threads, syste systems: Load ime distribut Introduction,	Mo to distributed Sy goals, Hardware on & Synchron work and Layere ronization, Clien lure call and im PC Clock synch idlock in distribut processors em model, proces d balancing and s ed systems, Proc , features & goal	tem and application dule Contents /stems and Software concentration in distributed inization in distributed protocols, Messa at Server model & plementation issues ronization and related ted systems & Distributed Fill ssor allocation, scher sharing approach, fa	epts, Design issues ted systems: ge passing and related & its implementation, s, Case Studies: SUN ted algorithms, mutual e Systems: eduling in distributed ult tolerance, Real elated issues	Analyse Hours 6 7					
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Assessment

Assessm	Assessment Plan based on Bloom's Taxonomy Level											
Bloom's Taxonomy Level	T1	T2	ESE	Total								
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed								
Understand	5	5	10	20								
Apply	10	5	15	30								
Analyze	5	5	15	25								
Evaluate		5	15	20								
Create			5	5								
Total	20	20	60	100								

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			AY 2021-22	,					
		Co	urse Information						
Program	me	B.Tech. (Inform	nation Technology)						
Class, Se	mester	Third Year B.	Fech., Sem VI						
Course (Code								
Course N	lame	Professional Elective - 2: Full Stack Development							
Desired 1	Requisites:	Web Technolo	gy						
	hing Scheme		Examination S						
Lecture	3 Hrs/week	T1	T2	ESE	Total				
Futorial	-	20	20	60	100				
Practical			~ -						
nteracti	on -		Cred	its: 3					
			ungo Obiosti-usa						
1 T	o import the desire		ourse Objectives	statio and dynamia	h nagas				
			Scripting Languages	static and dynamic we	o pages				
	o introduce conce								
- 1		<u> </u>	O) with Bloom's Tay	konomy Level					
At the en	d of the course, the	<u>, </u>							
		· · · · · · · · · · · · · · · · · · ·	perties in different we	b applications	Apply				
	create static and dy	A A			Create				
CO3 D	Design and develop	responsive web	applications		Create				
Module		M	odule Contents		Hours				
	HTML 5 and B	Bootstrap:							
	Bootstrap Intro	oduction							
	Introduction, G	etting Started, Grid System, Fixed Layout, Fluid Layout,							
т	Responsive Lay	out, Typography							
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	I Bootstrap Basics Elements:								
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	Python Framework	
V	Introduction to Django, Installation of Django, The Basics of Dynamic, Web Pages, The Django Template System, Interacting with a Database: Models, The Django Administration Site, Form Processing, File Handling Email Functionalities, Sessions and Cookies	6
VI	 Ruby On Rails Introduction, RVM(ruby version manager), Working in Linux(Ubuntu) Platform, Ruby Operators & Ruby Shell, Ruby Data types & Variables, Ruby methods and modules, OOP in Ruby, Basic loops and iterators Rails Rails Installation and Ruby gems, Databases, Statements, RAILS Model, Controller, and Views 	7
	Text Books	
1	Benjamin Jakobus, "Mastering Bootstrap 4", Packt Publisher, 2nd Edition, 2018	
2	Jake Spurlock, "Bootstrap: Responsive Web Development", O'Reilly Pub Edition, 2013	lication, 1st
3	Ethan Brown, "Web Development using Node and Express", O'Really Publisher, 2014.	1st Edition,
	References	
1	Daniel Rubio," <i>Beginning Django Web Application Development and Deple Python</i> ", ApressPublication, 1st Edition, 2017	oyment with
2	Michael Hartl," Ruby on Rails 3 Tutorial Learn Rails by Example", Pearson Publication,1 st Edition,2010	n Education
	Useful Links	
1	https://www.tutorialsteacher.com/nodejs/nodejs-tutorials	
2	https://morioh.com/p/656c3d9c1bce	
3	https://www.tutorialrepublic.com/twitter-bootstrap-tutorial/	
4	https://morioh.com/p/11c3e757a913	
5	https://www.djangoproject.com/start/	

	CO-PO Mapping													
		Programme Outcomes (PO) PSO												
	1	1 2 3 4 5 6 7 8 9 10 11 12 1 2												
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CO2			2		2									3
CO3		2 3 3 3												
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E. I. CO	£ 41				1									

Each CO of the course must map to at least one PO.

Assessment

Assessme	nt Plan based	on Bloom's Taxo	nomy Level	
Bloom's Taxonomy Level	T1	T2	ESE	Total
Remember	Not	Not Allowed	Not Allowed	Not
	Allowed			Allowed
Understand	5	5	10	20
Apply	10	5	15	30
Analyze	5	5	15	25
Evaluate		5	15	20
Create			5	5
Total	20	20	60	100

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		(AY 2021-22	minuic)	
		Cou	rse Information		
Program	mme	B.Tech. (Informa	ation Technology)		
Class, S	Semester	Final Year b. Teo	ch., Sem VI		
Course					
Course	Name		ctive - 2: 5G Technol	logy	
Desired	l Requisites:	Computer Netwo	ork		
Теа	ching Scheme		Examination So	cheme (Marks)	
Lecture		T1	T2	ESE	Total
Tutoria	ıl -	20	20	60	100
Practic	al -		· · · · · ·	· · ·	
Interac	tion -		Cred	its: 3	
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	To elaborate the ke				
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A / .1)) with Bloom's Tay	konomy Level	
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	-		ork and spectrum cha	menges	Analyze
	Illustrate the 5G ph	•			Apply
CO3	Compare various ra	idio access technol	ogies for 5G networ	ks	Analyze
Modul	e	Modu	lle Contents		Hours
		Vireless Commun			
Ι			tion Standards From	2G to 5G, Merits	6
	and Demerits of				
	Introduction to				_
II	-		rios of 5G, 5G scena	rios, Ultra reliable	7
			gning 5G new radio		
	Waveform Des		Ware from in 20	AC 5C Weenfermer	
III		v	Waveforms in 3G,	4G, 5G, Waveforms	6
	-	nparison of wavef	orms		
** *	5G Carriers an		1 . 50 1		
IV			imerology in 5G and		7
			erformance evaluation	n	
X 7	Signal Processi	0	Divionation - 1 C	opity Habrid Leas	
V	forming (mmW	•	e Diversity) and Cap	bacity, riyorid beam	7
	Challenges in 5				
	0		nentation,Deploying	hybrid I TE-NR is	
VI	-	•	hitecture, Demand	•	
, 1	-		5G devices, Invest		6
	Regulations on			- <u>-</u> ,	
			Text Books		
			atrick Marsch, "5 G]		
			ridge University Pre		
2	Jonathan Rodriquez	z, "Fundamentals	of 5G Mobile Netwo	<i>rks"</i> , Wiley, 2015	
			References		
1	Patrick Marsch, On			Boldi, "5G System Do	esign –
				erm Research", Wiley	
			Jseful Links		
	Course Contents for	BTach Programma	Doportmont of Inform	ation Technology, AY2	021 22

1 Module I, II, III, IV, V https://nptel.ac.in/courses/108/105/108105134/

	CO-PO Mapping														
	Programme Outcomes (PO) PSO														
	1	1 2 3 4 5 6 7 8 9 10 11 12 1 2										2	3		
CO1	3	3 1 2													
CO2		2													
CO3	2		1											1	
The stren	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Each CO	of the	course	must r	nap to	at leas	t one P	Ю.								

Assessment

Assessme	nt Plan based	on Bloom's Taxo	nomy Level	
Bloom's Taxonomy Level	T1	T2	ESE	Total
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Understand	5	5	10	20
Apply	10	5	15	30
Analyze	5	5	15	25
Evaluate		5	15	20
Create			5	5
Total	20	20	60	100

			Government	Aided Autonomous In AY 2021-22	сыние)			
			Cou	irse Information				
Progra	amme		1	tion Technology)				
Class,		ster	Third Year B. Te	0,,				
Course	e Cod	e						
Course	e Nam	ie	Professional Elec	ctive - 2: Mathematic	s for Machine Learning			
Desire	d Req	uisites:						
Те	achin	g Scheme		Examination S	Scheme (Marks)			
Lectur	ecture 3 Hrs/week T1 T2 ESE							
Futori		-	20	20	60	100		
Practio		-		~				
Intera	ction	-		Crea	lits: 3			
			Co	ourse Objectives				
1	To ir	ntroduce linear	algebra and calcul	us for machine learni	ng.			
2	To ir	npart concepts	of dimensionality	reduction for machin	e learning.			
3	To d	<u> </u>	zed model for real-	* *				
				O) with Bloom's Ta	xonomy Level			
			e students will be a			1		
CO1				chine learning algorit	hms	Apply		
CO2		•	•	ensionality reduction		Analyse		
CO3	Eval	uate the optimi	zation & probabilis	stic algorithms in ma	chine learning	Evaluate		
1 1	•					TT		
Modu		inear Algebra		dule Contents		Hours		
Ι				is and dimensions li	near transformation, four	6		
•		undamental sub		io una annononono, n	neur transformation, four			
		Aatrix Theory						
	N	lorms and spa	ces, eigenvalues a	and eigenvectors, Sp	becial Matrices and their			
II	p	roperties, least	squared and minir	num normed soluti	ons. SVD: Properties and	7		
		-	-		Schmidt process, polar			
	d	ecomposition						
	D	Dimensions Re	duction Algorithn	ns:				
III			0		ysis, minimal polynomial	7		
	a	nd Jordan cano		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			
	C	Calculus:						
IV		L	L .	. 0	t, directional derivatives,	7		
			n, , convex sets, co	nvex functions and it	s properties.			
		Optimization:	10		• .• • .• . • •			
v					l optimization techniques			
v					wton's method, Steepest uction to SVM, Error	6		
				ty, hard and soft mar				
		robability:	,	.,,	<u> </u>			
X 7 X		•	of probability:	conditional proba	bility, Bayes' theorem,			
VI	ir	ndependence,	theorem of total	probability, expecta	ation and variance, few	7		
				ns, joint distributions				
				Text Books				
	W. C	Cheney, "Analy	sis for Applied Ma	Text Books	rk: Springer Science+Busi	ness Media		
1	W. C 2001		sis for Applied Ma		rk: Springer Science+Busi	ness Media		

	References
1	All Modules taken from below link course.
1	https://onlinecourses.nptel.ac.in/noc21_ma38/
	Useful Links
1	https://www.classcentral.com/course/swayam-introduction-to-machine-learning-5288
2	https://web.stanford.edu/~hastie/Papers/ESLII.pdf
	http://users.isr.ist.utl.pt/~wurmd/Livros/school/Bishop%20-
3	%20Pattern%20Recognition%20And%20Machine%20Learning%20-
	%20Springer%20%202006.pdf

	CO-PO Mapping														
		Programme Outcomes (PO) PSO													
	1	1 2 3 4 5 6 7 8 9 10 11 12 1										1	2	3	
C01	3														
CO2		2													
CO3	2		1											1	
The streng	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High														
Each CO	of the	course	must 1	nap to	at leas	t one P	Ю.								

Assessme	nt Plan based	on Bloom's Taxo	nomy Level	
Bloom's Taxonomy Level	T1	T2	ESE	Total
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Understand	5	5	10	20
Apply	10	5	15	30
Analyze	5	5	15	25
Evaluate		5	15	20
Create			5	5
Total	20	20	60	100

		1	ided Autonomous In	stitute)						
			AY 2021-22							
.		1	rse Information							
Program		B.Tech. (Informa								
Class, Se		Third Year B. Teo	ch., Sem VI							
<u>Course (</u> Course N		Drafassianal Elas	time O. LaT Crestance	and Annlingtions						
		Computer Networ	Professional Elective - 2: IoT Systems and Applications							
Desirea	Requisites:	Computer Netwo	IKS							
Teac	hing Scheme		Examination S	cheme (Marks)						
Lecture	3 Hrs/week	T1	T2	ESE	Total					
Futorial	60	100								
Practical	-									
Interacti	on -		Cred	lits: 3						
		C								
1 T	o introduce veriou	s applications of In	urse Objectives							
1			mobile devices and s	ensor networks						
			rough protocols and s							
5 1	A _		D) with Bloom's Ta							
At the en		students will be ab		LUIUII LUIU						
		contributed to the			Apply					
			velop the application	s on cloud	Apply					
		<u> </u>	plication using components							
'	.	· · · · · · · · · · · · · · · · · · ·	•	\						
Module			ile Contents		Hours					
Ι	Introduction to Sensing, Actuati		orking, Communicat	ion Protocols	7					
II	Sensor Network		ons, Interoperability	in IoT	7					
		T Programming:	<u>, , , , , , , , , , , , , , , , , , , </u>	-						
III	Integration of Se	ensors and Actuator	s with Arduino, Intro	duction to Python	7					
111	programming, In	troduction to Rasp	berry Pi, Implementa	tion of IoT with	7					
	Raspberry Pi									
	Introduction to									
IV		ta Handling and A	6							
	Fog Computing									
V	IOT Applicatio Smart Cities and IoT		nnected Vehicles, Sm	nart Grid, Industrial	6					
VI		riculture, Healthcar	e, Activity Monitori	ng	<i>r</i>					
	<u> </u>				6					
			Text Books							
	rshdeep Bahga an dition, 2014			ngs: A Hands-on Appro	ach", VPT, 1					
		"The internet of thi	ings", MIT Press, 1st	Edition, 2015						
			D 4							
			References							
1 a	nd Use Cases ", CH	RC Press, 1 st edition	n, 2017	gs: Enabling Technolog						
/	drian McEwen, H 013	lakim Cassimally, '	' Designing the Inte	rnet Of Things", Wile	y, 1 st Edition					
			Useful Links							
1 h	ttps://onlinecourse	s.nptel.ac.in/noc19_								
		-	•							

	CO-PO Mapping														
		Programme Outcomes (PO)											PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1	1		2										2		
CO2			3												
CO3	2										1	2		3	
	The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.														

Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total						
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed						
Understand	5	5	10	20						
Apply	10	5	15	30						
Analyze	5	5	15	25						
Evaluate		5	15	20						
Create			5	5						
Total	20	20	60	100						

				ege of Engineering, ided Autonomous Ins	0			
				AY 2021-22				
			Cou	rse Information				
Progra	amm	e	B.Tech. (Informat	ion Technology)				
Class,	Seme	ester	Third Year B. Tec	ch., Sem VI				
Cours	e Cod	le						
Cours	e Nar	ne	Open Elective 3:	Web Development an	nd Applications			
Desire	d Re	quisites:	Computer Program	nming				
			1					
Te	eachir	ng Scheme		Examination So	cheme (Marks)			
Lectur	re	2 Hrs/week	T1	T2	ESE	Total		
Tutori	ial	-	20	20	60	100		
Practi	cal	-						
Intera	ction	-		Credi	its: 2			
			Cou	ırse Objectives				
1			mentals of web desig	0				
2		A	<u>v</u>	tic web page design				
3	Тое		<u> </u>	ge for dynamic page	^			
At the	and a		e students will be ab	D) with Bloom's Tax	conomy Level			
CO1			nedia elements in w			Apply		
CO1				for web applications		Apply		
CO3	-		eb services for web	<u>^</u>		Analyse		
		•						
Modu	ıle		Mod	ule Contents		Hours		
]	Introduction to	Internet and Web	:				
	1	Internet, Web, Server Client model, Internet vs. web, Web Browsers, Web						
Ι		Page Addresses (URLs), Anatomy of a web page, Defining web design, the						
	1	medium of the web, Types of web sites, Web Design themes. Web Page						
		Hosting						
		HTML and CS						
		HTML: Elements, Attributes, , Adding text, adding images, Table markup,						
		formatting and fonts, commenting code, color, hyperlink, lists, tables, images,						
II		simple HTML fo			1	5		
		CSS: Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using						
		-	-		· · ·			
			ia boxes, margins, p	badding lists, position	ing using CSS			
		XML	MI uses of VMI	simple YMI and V	ML key components,			
III					cation. XML, XSL and	4		
				•				
		XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSL						
		PHP						
		Introduction to PHP, Using variables and operators, controlling program flo						
1\/		introduction to I	-	-		1		
IV	1	ntroduction to I Working with	arrays, Using fund	ctions and classes,	trolling program flow, PHP Forms, Content	4		
IV	1	ntroduction to I Working with nanagement sys	-	ctions and classes,		4		
	1	ntroduction to I Working with	arrays, Using fund	ctions and classes,		4		
		ntroduction to I Working with nanagement sys JavaScript: The Basic of J	arrays, Using fund tem: WordPress, Dr avaScript: Objects	ctions and classes, rupal, Joomla , Primitives Operati	PHP Forms, Content ons and Expressions,	4		
IV V		ntroduction to I Working with nanagement sys IavaScript: The Basic of J Screen Output a	arrays, Using fund tem: WordPress, Dr avaScript: Objects and Keyboard Input	ctions and classes, rupal, Joomla , Primitives Operati , Control Statements	PHP Forms, Content ons and Expressions, s, Object Creation and	4		
		Introduction to I Working with management sys JavaScript: The Basic of J Screen Output a Modification, A	arrays, Using fund tem: WordPress, Dr avaScript: Objects and Keyboard Input	ctions and classes, rupal, Joomla , Primitives Operati , Control Statements	PHP Forms, Content ons and Expressions,			

	Web Services And Web application									
VI	Introduction to Web Service, Web Services Basics - Creating, Publishing,	4								
	WSDL, SOAP, RSS, Web Application, examples of web applications.	4								
	Text Books									
1	Jennifer Niederst Robbins "Learning Web Designing", O'Reilly Publications", 5th I	Edition,2018								
2	Thomas A. Powell "Web Design: The Complete reference" Mc Graw Hill/ Osborn	e, 1st Edition,								
	2000									
3	Robin Nixon, "Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creat									
	Dynamic Websites", O'Reilly Publications, 3rd Edition, 2014									
	References									
1	Erik T. Ray "Learning XML" O'Reilly Publications, 1st Edition, 2001									
2	Chris Bates, "Web Programing Building Internet Applications", WILEY, Dreamted	h 2nd Edition,								
	2000									
	Useful Links									
1	https://www.coursera.org/learn/web-development#syllabus									
2	https://www.coursera.org/learn/duke-programming-web#syllabus									
3	https://www.javatpoint.com/php-tutorial									
4	https://www.javatpoint.com/xml-tutorial									
5	https://www.softwaretestinghelp.com/web-services-tutorial/									

CO-PO Mapping													
Programme Outcomes (PO)										PS	0		
1	2	3	4	5	6	7	8	9	10	11	12	1	2
								1				2	
		2		2									3
		2		3									3
	1	1 2	1 2 3 2 2	P. 1 2 3 4 2 2 2 2	Program 1 2 3 4 5 1 2 3 4 5 2 2 2 2 2 2 3 3	Programme O	Programme Outcom	Programme Outcomes (PC	Programme Outcomes (PO) PS				

The strength of mapping is to be written as 1,2,3; Where, 1:Low, 2:Medium, 3:High Each CO of the course must map to at least one PO.

Assessment

Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	Τ2	ESE	Total						
Remember	Not	Not Allowed	Not Allowed	Not						
	Allowed			Allowed						
Understand	5	5	10	20						
Apply	10	5	15	30						
Analyze	5	5	15	25						
Evaluate		5	15	20						
Create			5	5						
Total	20	20	60	100						

				lege of Engineering Aided Autonomous In						
			(Oovernment F	AY 2021-22	sillare)					
			Cou	rse Information						
Progra	mme		B.Tech. (Informa							
Class,										
Course	e Cod	9								
Course			Open Elective - 4	: Machine Learning						
Desire	d Req	uisites:								
Те	aching	g Scheme		Examination S	cheme (Marks)					
Lectur		3 Hrs/week	T1	T2	ESE	Total				
Tutori		-	20	20	60	100				
Practio	cal	-								
Intera	ction	-		Crea	lits: 3					
			Co	urse Objectives						
1	To ex	plain the conc		unsupervised machin	ne learning techniqu	es.				
2			s machine learning							
3				s using appropriate m	nachine learning tec	hniques.				
			· · · · · · · · · · · · · · · · · · ·	O) with Bloom's Ta	xonomy Level					
At the			e students will be al							
CO1		pare various	machine learnin	ng algorithms for	Regression and	Analyze				
CO2	Appl	y appropriate l	opriate learning algorithm for a problems. Apply							
CO3	Evalu	ate Machine L	earning algorithms	s with performance p	arameters.	Analyze				
Modu	le		Modul	e Contents		Hours				
1110444		ntroduction:								
Ι			ory, Linear Algebra / - Regression, Clas	7						
		egression:		,						
II				egression, Subset Se		7				
11				gression, Partial Lea		7				
				, Linear Discriminan	t Analysis.					
		rtificial Neura				<i>.</i>				
III				tron Learning, Backp	propagation,	6				
			aining & Validatio	n.						
		lgorithms:	Regression Trees	Stopping Criterion &	Pruning loss					
IV		inctions, Categ	6							
- 1		ecision Trees -	Ŭ							
		lachines,								
		earning Theor	ry:							
V				Class Evaluation Me						
v				Bagging, Committee	Machines and	7				
		tacking, Boosti	ing							
Clustering:										
VI	VI Partitional Clustering, Hierarchical Clustering, Birch Algorithm, CURE Algorithm, Density-based Clustering									
	A	igorunin, Dens	sny-based Clusterin	Ig						
				Text Books						
1				ome H. Friedman, "	The Elements of Sto	ntistical Learning				
	sprir	ger, 2nd Editio	511, 2009.							
				References						
		-								
1				<i>tion and Machine Le</i> , Department of Inform						

	Useful Links									
1	https://www.classcentral.com/course/swayam-introduction-to-machine-learning-5288									
2	https://web.stanford.edu/~hastie/Papers/ESLII.pdf									
	http://users.isr.ist.utl.pt/~wurmd/Livros/school/Bishop%20-									
3	%20Pattern%20Recognition%20And%20Machine%20Learning%20-									
	%20Springer%20%202006.pdf									

CO-PO Mapping									
	Programme Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6			
CO1			1						
CO2	2	1		2	2				
CO3	3		2						

Assessment

Assessment Plan based on Bloom's Taxonomy Level										
Bloom's Taxonomy Level	T1	T2	ESE	Total						
Remember	Not Allowed	Not Allowed	Not Allowed	Not Allowed						
Understand	5	5	10	20						
Apply	10	5	15	30						
Analyze	5	5	15	25						
Evaluate		5	15	20						
Create			5	5						
Total	20	20	60	100						