TY Sem I

	Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)								
				AY 2022-23					
			Cou	rse Information					
Progra	amme		B.Tech. (Informa	tion Technology)					
Class,	Seme	ster	Third Year B. Te	ch., Sem V					
Cours	e Cod	e	5IT301						
Cours	e Nan	ne	Database Enginee	ering					
Desire	ed Req	uisites:							
Т	eachin	ng Scheme		Examination	Scheme (I	Marks)			
Lectu	re	2 Hrs/week	MSE	ISE	ES	E	Total		
Tutori	orial - 30 20 50					100			
		-		Cr	edits: 2				
			Co	urse Objectives					
1	To ir	ntroduce basic	concepts of data	base manageme	nt systems	6			
2	Toir	mpart conceptu	ual designs for da	itabases					
3	lod	lescribe issues	associated with	transaction mana	gement				
At the	and of	Course the	students will be ab	J) with Bloom's T	axonomy	Level			
At the		t the course, the	students will be ab	ic t0,		Bloom's	Bloom's		
СО		Course Outcome Statement/s Taxonomy							
CO1	Man	ipulate the rela	ational databases				Applying		
CO2	Insp	bect databases	using Query lang	guages		V	Evaluating		
CO3	Eval	uate transactio	on processing tec	hniques		V	Evaluating		
Modu	lle	dule Module Contents							
T	-	Introduction: Database Systems, Types of Database Systems, Data abstraction, Data Models,							
1	I L A	ntroduction: Database System Architecture of E	is, Types of Databa Database Systems.	se Systems, Data a	bstraction,	Data Models,	3		
П		ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constru- Triggers Normal	as, Types of Databa Database Systems. el: Structure of Rel ra, Tuple Relationa raints and Design:	se Systems, Data a ational Databases, al Calculus, Domai Domain Constrain Dependencies, Dep	bstraction, database so n Relationa ts, Referen compositio	Data Models, chema, keys, l Calculus tial Integrity, n	3 5		
Ш	I F F I T C E L L	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Triggers, Normal Duery Processi Evaluation of e Language (SQL NoSQL)	as, Types of Databa Database Systems. el: Structure of Rel ora, Tuple Relationa raints and Design: I forms, Functional ng: Query process expression, Equiva .), Unstructured	se Systems, Data a ational Databases, al Calculus, Domai Domain Constrain Dependencies, Dep sing, Query Cost, alence of Express Query Language	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD	Data Models, chema, keys, il Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB,	Hours 3 5 5		
II III IV	I F F I T C E L L N N I S S in	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Triggers, Normal Query Processi Evaluation of e Language (SQL NoSQL) ndexing and Ha Static Hashing, I ndices.	as, Types of Databa Database Systems. el: Structure of Rel ra, Tuple Relationa raints and Design: l forms, Functional ng: Query process expression, Equiva .), Unstructured ashing: Ordered an Dynamic hashing, O	se Systems, Data a lational Databases, al Calculus, Domai Domain Constrain Dependencies, Dea sing, Query Cost, alence of Express Query Language nd secondary Indice Comparison of Inde	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD es, B+ Tree exing, Gric	Data Models, chema, keys, l Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB, Index Files, I files, Bitmap	Hours 3 5 5 4		
II III IV V	I F F I I I S S iii I C C b	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Triggers, Normal Duery Processi Evaluation of e Language (SQL NoSQL) ndexing and Ha Static Hashing, I ndices. Fransactions: Pa Concurrency Ce ased protocols,	as, Types of Databa Database Systems. el: Structure of Rel ra, Tuple Relationa raints and Design: l forms, Functional ng: Query process expression, Equiva .), Unstructured ashing: Ordered ar Dynamic hashing, Or roperties and states ontrol: Lock-Based Time stamp based	se Systems, Data a ational Databases, al Calculus, Domai Domain Constrain Dependencies, Dec sing, Query Cost, alence of Express Query Language nd secondary Indice Comparison of Inde , Concurrent execu d Protocols, 2 phase protocols, Dead loo	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD es, B+ Tree exing, Grid tion, Serial e locking p ck handling	Data Models, chema, keys, l Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB, Index Files, l files, Bitmap izability. rotocol, Graph	Hours 3 5 5 4 5		
II III IV V VI	I F F F F I I C C F S S S b b	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Triggers, Normal Query Processi Evaluation of c Language (SQL NoSQL) ndexing and Ha Static Hashing, I ndices. Transactions: P Concurrency Co vased protocols, Crash Recover Recovery, Shadow Paging, vackups.	as, Types of Databa Database Systems. el: Structure of Rel ra, Tuple Relationa raints and Design: I forms, Functional ng: Query process expression, Equiva D), Unstructured ashing: Ordered an Dynamic hashing, O roperties and states ontrol: Lock-Based Time stamp based y: Failure Classi recovery with co	se Systems, Data a lational Databases, al Calculus, Domain Domain Constrain Dependencies, Dea sing, Query Cost, alence of Express Query Language nd secondary Indice Comparison of Inde , Concurrent execu d Protocols, 2 phase protocols, Dead loo ification, storage	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD es, B+ Tree exing, Grio tion, Serial e locking p ck handling Structure, ns, buffer	Data Models, chema, keys, il Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB, Index Files, I files, Bitmap izability. rotocol, Graph Log-Based management,	Hours 3 5 5 4 5 4		
II III IV V VI	I F F I I I S S iii I S S iii C C S S b	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Friggers, Normal Query Processi Evaluation of e Language (SQL NoSQL) Indexing and Ha Static Hashing, I Indices. Fransactions: P. Concurrency Co ased protocols, Crash Recover Recovery, Shadow Paging, backups.	as, Types of Databa Database Systems. el: Structure of Rel ra, Tuple Relationa raints and Design: l forms, Functional ng: Query process expression, Equiva .), Unstructured ashing: Ordered ar Dynamic hashing, O roperties and states ontrol: Lock-Based Time stamp based y: Failure Classi recovery with co	se Systems, Data a ational Databases, al Calculus, Domai Domain Constrain Dependencies, Dea sing, Query Cost, alence of Express Query Language nd secondary Indice Comparison of Inde , Concurrent execu d Protocols, 2 phase protocols, Dead loo ification, storage	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD es, B+ Tree exing, Gric tion, Serial e locking p ck handling Structure, ns, buffer	Data Models, hema, keys, l Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB, Index Files, l files, Bitmap izability. rotocol, Graph Log-Based management,	Hours 3 5 4 5 4 4		
II III IV V VI	I F F I I I I S S iii I I S S iii I I C C B B C C F F S S b	ntroduction: Database System Architecture of E Relational Mode Relational Algeb ntegrity Constr Friggers, Normal Query Processi Evaluation of o Language (SQL VoSQL) ndexing and Ha Static Hashing, I ndices. Fransactions: P Concurrency Co Dased protocols, Crash Recover Recovery, Shadow Paging, Dackups.	tz Henry E Korth	se Systems, Data a lational Databases, al Calculus, Domain Domain Constrain Dependencies, Dec sing, Query Cost, alence of Express Query Language nd secondary Indice Comparison of Inde , Concurrent execu d Protocols, 2 phase protocols, Dead loc ification, storage ncurrent transaction Text Books and S. Sudarshap	bstraction, database so n Relationa ts, Referen compositio measures sions. Stru (MongoD es, B+ Tree exing, Gric tion, Serial e locking p ck handling Structure, ns, buffer	Data Models, chema, keys, l Calculus tial Integrity, n. of query cost, ictured Query B, MariaDB, Index Files, l files, Bitmap izability. rotocol, Graph Log-Based management,	Hours 3 5 4 5 4 5 4		

2	Raghu Ramakrishnan, "Database Management Systems", McGraw-Hill Education, 3rd Edition, 2003.								
References									
1	J.D. Ullman, "Principles of Database Systems", 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								
	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			
	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
T1	- 11 6			1 .		1 T	0.1	r 1.	2 11	1				

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

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Col	llege of Engineering, Sang Aided Autonomous Institute	li)					
			(Governmenn)	AY 2022-23	/					
			Cou	Irse Information						
Progr	amme		B.Tech. (Informa	ation Technology)						
Class.	Seme	ster	Third Year B. Te	ech., Sem V						
Cours	e Code	2	5IT302							
Cours	e Nam	e	Operating System							
Desire	ed Req	uisites:	Computer Archit	ecture						
			1							
T	eachin	g Scheme		Examination Schem	e (Marks)					
Lectu	re	3 Hrs/week	MSE	ISE 1	ESE	Total				
Tutor	ial	-	30	20	50	100				
		-		Credits: 3						
		<u> </u>	Co	ourse Objectives						
1	To ir	ntroduce vario	us system calls a	and system programs						
2	To d	escribe OS fu	nctionalities							
3	Toc	omprehend the	services provided	by operating system						
		Co	urse Outcomes (C	O) with Bloom's Taxonon	ny Level					
At the	end of	the course, the	students will be a	ble to,	D1	DL				
CO		Bloom's Tevonomy								
00		Level	Description							
CO1	Disti	Understanding								
CO2	Illust	trate the conce	ept of process ar	nd synchronization	III	Applying				
CO3	Analyse the deadlocks and memory management challenges IV									
005	in									
	syste	em								
Modu	ıle		Mod	ule Contents		Hours				
	I	ntroduction :								
	N	lotion of oper	ating systems, C	omputer system organiza	ion, Computer					
	S	ystem archite	cture, Computer	System Structure, Ope	rating System					
.	C	perations, P	rocess Managem	nent, Memory Manager	nent, Storage	-				
1	Ν	lanagement, pr	otection and secur	ity.		5				
	S	System Structure: Operating system services, user operating system								
	ir	interface, system calls, types of system calls, system programs, operating								
	s	ystem design ar	nd implementation,	, operating system structure						
	P	rocess								
	P	rocess Concep	t, Process Schedu	ling, Operation on proces	ss, Cooperating					
Π	p	rocess, Thread	ls, Inter-process	Communication (Algorithm	ns evaluation).	8				
	P	rocess Sched	uling: Basic co	ncept, Scheduling Criter	a, Scheduling					
	A	lgorithms, Mul	tiple processor sch	eduling, Real time scheduli	ng.					
	I	nter-process S	ynchronization							
Ш	B	ackground, C	Classical problem	is of synchronization, C	ritical Region,	6				
	Т	he critical sec	ction problem, Sy	nchronization Hardware,	Monitors,					
	S	emaphores.								
		eadlocks								
IV	S	ystem modes,	Deadlock characte	erization, Methods for hand	lling deadlocks	5				
	L fi	eadlock preve	ntion, Deadlock a	voidance, Deadlock detect	ion, Recovery					
1	1 11	on acaulock.								

	Memory Management	
	Background, Logical Versus Physical Address space, Swapping Contiguous	
v	Allocation, Paging, Segmentation, Segmentation with paging.	
•	Virtual Memory: Background, Demand paging, Page replacement, Page	8
	replacement algorithms, Allocation of frames, thrashing (Only concept),	
	Demand segmentation. Virtualization concept and case studies	
	File System Management	
	File concept, access methods, directory and disk structure, file-system	
VI	mounting, file sharing, protection.	
1	Implementing File System : File system structure, file-system	6
	implementation, directory implementation, allocation methods, free-space	
	management	
	Text Books	
1	James. L. Peterson and A. Silberchatz ,"Operating System Concepts", Ad	ldison Westley
-	Publication, 9th Edition, 2018	
2	Milan Milenkovic, "Operating System – Concept and Design", TMGH,1st Edition	,2001
	References	
1	William Stallings," Operating Systems : Internals and Design Print	ciples",Peterson
	Publication,7th Edition,2013	
2	Crowley Charles ," Operating Systems : A Design-Oriented Approach", N Publication 1 st Edition 2017	Ac Graw Hill
	Llooful I inks	
1	https://www.gatevidyalay.com/operating_system/	
2	https://www.iavatpoint.com/os-tutorial	
3	https://www.geeksforgeeks.org/operating-systems/	
5	imposition de constat de constat de la constat de	

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 stren	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High													

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

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			Walchand Colle (Government Ai	ege of Engineering, Sang ided Autonomous Institute	gli 2)	
			A	¥ 2022-23	-)	
			Cour	se Information		
Progra	amme		B.Tech. (Informat	ion Technology)		
Class,	Seme	ster	Third Year B. Tec	h., Sem V		
Cours	e Cod	9	5IT303			
Cours	e Nam	e	Computer Algorith	hm		
Desire	ed Req	uisites:	Data Structures			
T	eachin	g Scheme		Examination Schen	ne (Marks)	
Lectur	re	2 Hrs/week	MSE	ISE	ESE	Total
Tutori	ial	1	30	20	50	100
		-		Credits: 3	3	
			Cou	rse Objectives		
1	Too					
2	To a	nalyse standa	rd algorithms for p	arallelism involved		
3	Tol	Inderstand par	allel algorithms			
		Сон	rse Outcomes (CO)) with Bloom's Taxono	mv Level	
At the	end of	the course, the	students will be able	e to.		
		· · · · · · · · · · · · · · · · · · ·		7	Bloom's	Bloom's
CO		Cou	irse Outcome State	ement/s	Taxonomy	Taxonomy
001	0.1				Level	Description
	Sele	ct and apply a	ppropriate logic to	r solving the problem.		Applying
C02		iyse the algorit	riate algorithm for	the given problem		Creating
	Des	igh the approp		the given problem.	VI	Cleaning
Modu	ıle		Module	e Contents		Hours
	Ι	ntroduction:				
Т	Γ	Design and Anal	ysis of Algorithm C	Greedy Algorithms: Knap	osack problem,	5
-	H	Iuffman codes,	Dynamic Progra	mming: Matrix-chain	multiplication,	J
		ongest common	sub-sequence.	design. Proliminarias	Decomposition	
	r te	echniques, char	acteristics of task	and interaction. Mappi	ng techniques.	
П	0	verhead, paralle	algorithm model	and more and a suppris	-8,	5
	P	rogramming	using MPI: MPI	basics, send, receive	, overlapping	
	c	omputation and	communication, co	llective communication		
ш	A	III-Pairs Shorte	st Paths (APSP) ar d matrix multiplicat	id Maxflow ion The Floyd-Warshall	algorithm	4
m	F	low Networks, 1	Ford Fulkerson met	hod, Maximum Bipartite	matching	-
	S	ingle-Source S	hortest Path (SSSP	· · · · · · · · · · · · · · · · · · ·	2	
IV	S	hortest paths a	and relaxation, Bel	llman-Ford algorithm, S	Single-source	4
	S	hortest paths in	n directed Acyclic	graphs, Topological so	ort, Dijkstra"s	·
	a	igoriunin tring Matching	, •			
	r T	The Rabin-Karn	• algorithm. Knuth-M	Iorris-Pratt algorithm		
I V		p	<i>o</i> , 			

Computational Geometry: Determining whether any pair of segments intersects, Finding the convex hull, Finding the closest pair of points.

4

	Complexity class and Approximation Algorithm						
VI	NP-Completeness: NP completeness and reducibility, NP-complete problem. Approximation Algorithms: The vertex-cover problem, The travelling- salesman problem, The set-covering problem	4					
		I					
	Text Books						
1	Thomas H. Cormen, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Third Edition the MIT Press Cambridge, London, England, 2009	Algorithms",					
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						
1	Horrowitz, Sahni Rajasekaran, "Computer Algorithms", Computer Science, W. I and company Press, New york, 1997	H. Freeman					
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	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	oth of	monnie	a in to	ha mi	44.000.000	1. L or	<u>)</u> . N	[]:	2.11	~1.				

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

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

Walchand College of Engineering, Sangli						
(Government Aided Autonomous Institute)						
AY 2022-23						
Course Information						
Programme	B.Tech. (Information Technology)					
Class, Semester	Third Year B. Tech., Sem V					
Course Code	5IT351					
Course Name	Database Engineering Lab					
Desired Requisites:	Programming Lab					

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

	Course Objectives							
1	To demonstrate basic concepts of conceptual database des	ign						
2	To introduce database schemas in DBMS							
3	To illustrate between various transaction management proto	cols						
	Course Outcomes (CO) with Bloom's Taxonomy Level							
At the	At the end of the course, the students will be able to,							
		D.	•	DI				

СО	Course Outcome Statement/s	Bloom's Taxonomy Level	Bloom's Taxonomy Description
CO1	Summarize real world problems into relational databases		Applying
CO2	Execute Query languages on databases	III	Applying
CO3	Study transaction processing techniques	IV	Analysing

List of Experiments / Lab Activities

List of Experiments:

- 1. Implement SELECT and PROJECT operation Assignment, Implement INSERT, DELETE and UPDATE operation database
- 2. Perform String operations and Aggregate functions on database
- 3. Perform Inner and Outer Join operations on database Assignment, Domain constraints & Referential Integrity Assignment
- 4. Program for sparse index and dense index Assignment
- 5. Program for static hashing Assignment, Program for Dynamic hashing Assignment
- 6. Program for log based protocol for transaction Assignment
- 7. Implementation of JDBC/ODBC driver for database connectivity
- 8. Program for Time Stamp protocol for transaction Assignment
- 9. Program for Deadlock Detection Assignment
- 10. perform CRUD (Create, Read, Update, Delete) operations on MongoDB databases
- 11. filtering for data efficiently on MongoDB databases
- 12. Working with command prompts and create database and tables on MariaDB.
- 13. Perform CRUD (Create, Read, Update, Delete) operations on MariaDB.

	Text Books
1	Abraham Silberschatz, Henry F. Korth, and S. Sudarshan, "Database System Concepts", McGraw-Hill Education, 6th Edition, 2010.
2	Raghu Ramakrishnan, "Database Management Systems", McGraw-Hill Education, 3rd Edition, 2003.

References

1	J.D. Ullman, "Principles of Database Systems", 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 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

						CO-I	PO Ma	apping	5					
				P	rograi	mme C	outcon	nes (P	O)				PS	50
	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	igth of	mappi	ng is t	o be w	ritten a	as 1,2,3	; whe	re, 1: I	Low, 2	: Medi	um, 3:	High		

Each CO of the course must map to at least one PO, and preferably to only one PO.

		Assessment				
There are three IMP: Lab ESE	There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%					
Assessment	Based on	Conducted by	Typical Schedule	Marks		
LA1	Lab activities, attendance, journal	Lab Course Faculty	During Week 1 to Week 8 Marks Submission at the end of Week 8	30		
LA2	Lab activities, attendance, journal	Lab Course Faculty	During Week 9 to Week 16 Marks Submission at the end of Week 16	30		
Lab ESE	Lab activities, journal/ performance	Lab Course Faculty and External Examiner as applicable	During Week 18 to Week 19 Marks Submission at the end of Week 19	40		
Week 1 indicates starting week of a semester. 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 and related activities if any.						

	Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)							
	AY 2022-23							
			Co	ourse Information	1			
Progra	amme		B.Tech. (Informa	ation Technology)				
Class,	Semes	ster	Third Year B. Te	ech., Sem V				
Cours	e Code	2	5IT345					
Cours	e Nam	e	Mini Project - 2					
Desire	ed Req	uisites:	Java programmir	ng				
		~ -			~ -			
Те	eaching	g Scheme		Examinati	on Scheme	e (Marks)		
Practi	cal	2 Hrs/Week	LA1	LA2	Lab E	SE	Total	
Intera	ction	-	30	30	40		100	
					Credits: 1			
			С	ourse Objectives				
1	Тор	lan for various	s activities of the	project and dist	ribute the	work amongs	t team members.	
2	To d deliv	evelop studer ery of Semina	it's abilities to tra ar based on the N	nsmit technical i ⁄lini Project.	informatio	n clearly and	test the same by	
3	To u Mini Proje	nderstand the	importance of d	ocument design	by compi	ling Technica	l Report on the	
		Co	urse Outcomes (C	CO) with Bloom's	s Taxonon	ıy Level		
At the	end of	the course, the	e students will be a	ble to,			1	
СО		Co	urse Outcome Sta	atement/s		Bloom's Taxonomy Level	Bloom's Taxonomy Description	
CO1	Unde	erstand, plan	and execute a M	ini Project with t	eam		Applying	
CO2	Prep	are a technic	al report based o	n the Mini projec	ct	I	Remembering	
CO3	CO3Deliver technical seminar based on the Mini Project workIVAnalysingcarried out					Analysing		
					I			
	List of Experiments / Lab Activities							

List of	f 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.
	 Industry based problem / Sponsored application /Game/ Interdisciplinary application /socially useful application / Problem solving of previously learned complex concepts. Project group should achieve all the proposed objectives of the problem statement. The work should be completed in all aspects of design, implementation and testing and follow software engineering practices. 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) Project will be evaluated continuously by the guide/panel as per assessment plan. 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.
	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 & 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)							PS	50					
	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, and preferably to only one PO.

Assessment					
There are three components of lab assessment, LA1, LA2 and Lab ESE.					
IMP: Lab ESE	is a separate hea	d of passing.(min 40 %), L	A1+LA2 should be min 40%		
Assessment	Based on	Conducted by	Typical Schedule	Marks	

LA1	Lab activities, attendance,	Lab Course Faculty	During Week 1 to Week 8 Marks Submission at the end of Week 8	30	
LA2	Lab activities, attendance, journal	Lab Course Faculty	During Week 9 to Week 16 Marks Submission at the end of Week 16	30	
Lab activities,Lab Course Faculty andDuring Week 18 to Week 19Lab ESEjournal/External Examiner asMarks Submission at the end ofperformanceapplicableWeek 19				40	
Week 1 indicates starting week of a semester. 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 and related activities if any.					

	Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)							
	AY 2022-23							
			Cours	se Information				
Progra	amme		B.Tech. (Informat	ion Technology)				
Class,	Semes	ster	Third Year B. Tec	h., Sem V				
Cours	e Code	e.	5IT346					
Cours	e Nam	e	Mini Project - 3					
Desire	ed Req	uisites:	Android Programm	ning				
Т	eachin	g Scheme		Examination	Scheme (M	(farks)		
Practi	cal	2 Hrs/Week	LA1	LA2	Lab H	SE	Total	
Intera	ction	-	30	30	40		100	
				Cr	edits: 1			
	1		Cour	rse Objectives				
1	Тор	lan for various	activities of the pr	oject and distribu	ute the wor	k amongst	team members.	
2	To d	evelop student	's abilities to trans	mit technical info	ormation cl	early and te	est the same by	
4	deliv	ery of Seminar	based on the Min	i Project.				
3	To u Mini	nderstand the i	importance of doc	ument design by	compiling	Technical	Report on the	
	Proje	ect work carried	d out.					
A + 1	1 0	Cou	rse Outcomes (CO)) with Bloom's Ta	axonomy L	evel		
At the	end of	the course, the	students will be able	e to,		Bloom's	Ploom's	
CO		Co	urse Outcome Stat	ement/s		Taxonomy	Taxonomy	
						Level	Description	
CO1	Unde	erstand, plan a	nd execute a Mini	Project with tear	n		Applying	
CO2	2 Prepare a technical report based on the Mini project IV Analysing					Analysing		
CO3	³ Deliver technical seminar based on the Mini Project work IV Analysing					Analysing		
	out							
			List of Experi	iments / Lab Acti	ivities			

List of	f 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 mobile application using any scripting language with android studios (Kotlin, Java, etc) (Flutter/Eclipse/ android studio/etc.)
	 Industry based problem / Sponsored application /Game/ Interdisciplinary application /socially useful application / Problem solving of previously learned complex concepts. Project group should achieve all the proposed objectives of the problem statement.
	 The work should be completed in all aspects of design, implementation and testing and follow software orginaaring 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/bithue/gat)
	 Project will be evaluated continuously by the guide/panel as per assessment plan. 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.
	Text Books
	Paiondra Kumbhar "How to Write Project Penarts Dh. D. Thesis and Pessarch Articles"
1	Universal Prakashan, 2015
2	Marilyn Deegan, "Academic Book of the Future Project Report", A Report to the AHRC & 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)												
	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, and preferably to only one PO.

	Assessment											
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%												
Assessment	Based on	Conducted by	Typical Schedule	Marks								
	Lab activities,		During Week 1 to Week 8									
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30								
	journal		Week 8									

	Lab activities,		During Week 9 to Week 16								
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30							
	journal		Week 16								
Lab activities, Lab Course Faculty and During Week 18 to Week 19											
Lab ESE	journal/	External Examiner as	Marks Submission at the end of	40							
	performance	Week 19									
Week 1 indicat	tes starting week	of a semester. Lab activitie	s/Lab performance shall include per	rforming							
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 ar	nd related activition	es if any.									

			Walchand Colle	oge of Engineering	Sanoli							
	(Government Aided Autonomous Institute)											
			A	Y 2022-23	,							
			Cour	se Information								
Progra	amme		B.Tech. (Information	tion Technology)								
Class,	Seme	ster	Third Year B. Tea	ch., Sem V								
Cours	e Code	e	5IT311									
Cours	e Nam	e	Professional Elec	tive 1: Distributed Co	omputing							
Desire	ed Req	uisites:										
T		C I		F • • • • •								
I e	eaching	g Scheme	MCE	Examination Sci	neme (Marks)	T-4-1						
Lectu	re	3 Hrs/week	MSE	ISE	ESE	lotal						
Tutor	al	-	30	20	50	100						
		-		Credit	s: 3							
1	T . : .		Cou	rse Objectives								
1	101r	troduce the va	rious aspects of mo	dern distributed syste	ems							
2	Toel	aborate distrib	outed architecture, s	ynchronization and f	ault tolerance							
3	Toex	xplain the cont	emporary knowled	ge in distributed com	outing							
		Cou	rse Outcomes (CO) with Bloom's Tax	onomy Level							
At the	end of	the course, the	e students will be a	ble to,								
CO		C			Bloom's	Bloom's						
CO Course Outcome Statement/s Taxonomy Taxonomy Level Description												
CO1 Comprehend the fundamentals of distributed computing II Understanding												
Distinguish the various approach to implement distributed II Understanding												
CO2	envir	onment	ious approach to m	prement distributed	IV	Anarysing						
CO3	Eval	uate the reliabi	lity and performance	ce of various	V	Evaluating						
	algor	ithms of distri	buted system									
Modu	الم		Modu	a Contents		Hours						
Mouu		ntroduction to	Distributed Syste			110015						
	T	ask Creation a	nd Termination (A	svnc Finish) Tasks i	n Iava's Fork/Ioin							
I	F	ramework. Co	mputation Graphs.	Work, Span, Multip	ocessor	6						
	S	cheduling	inpatation Orapilo,	, , on, open, ment								
	D	Distributed Sys	stem with Parallel	ism:								
п	P	arallel Speedu	p , Amdahl's Law, I	Reciprocal Array Sur	n using Async-	7						
ш	F	inish, Recipro	cal Array Sum usin	g Recursive Action's	in Java's	/						
	F	ork/Join Fram	ework									
	F	unctional Par	allelism:		/ T ·							
111		utures: Tasks v	with Return Value,	Futures in Java's For	K/J0111 d Dotorminism	6						
		ate flow Sync	hronization and P	leallis, Data Naces all								
	S	nlit-nhase Ba	rriers with Java F	Phasers Point-to-Poi	nt Sychronization	1						
IV	N N	vith Phasers.	One-Dimensional	Iterative Averagin	ng with Phasers	7						
	P	ipeline Paralle	lism, Data Flow Pa	rallelism	8	7						
	D	Distributed Ma	ap Reduce:									
V	Introduction to Map-Reduce, Hadoop Framework, Spark Framework, TF-											
v	Π	DF Example,	Page Rank Exa	mple, Demonstration	on: Page Rank	7						
	A	lgorithm in Sp	park									
	C	lient-Server I	Programming:		n							
VI	Ir	ntroduction to	Sockets, Serializa	ation/Deserialization,	Remote Method							
	li T	vocation, Mu	Iticast Sockets, Pub	lish-Subscribe Mode	, Demonstration:	6						
	F	11e Server usin	ig Sockets									
			r	Fext Books								
				CAL DUUNS								

1	Andrew S. Tanenbaum and Maarten Van Steen, "Distributed Systems: Principles and Paradigms", 2 nd edition, Pearson Education, 2007.
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 Edition, Prentice Hall, 2006
	Useful Links
1	Module I, II, III, IV https://www.coursera.org/learn/parallel-programming-in-java?specialization=pcdp#syllabus 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	CO2 1 1														
CO3 2 1 1 1															
The stren	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High														

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

NY 2022-23 Course Information Technology) Class, Semester Third Year B. Tech., Sem V Course Code ST312 Course Name Professional Elective 1:Advanced Programming Languages Desired Requisites: C & CPP Programming Teaching Scheme Examination Scheme (Marks) Lecture 3 Hrs/week MSE ESE Total To introduce paradigm of Ruby and Go Programming Language Tao define features of Go language for process synchronization Course Outcome COU with Bloom's Taxonomy Level At the course, the students will be able to, Course Outcome Statement/s Bloom's Taxonomy Level At the course, the students will be able to, Implement the concept of File handling using Ruby and Go III Applying language Course Outcome Statement/s Bloom's Taxonomy Level Module Module Contents Hours Introductin to Rub				Walchand Co (Government	ollege of Engineer Aided Autonomou	ing, Sangli s Institute)									
Course Information Programme B. Tech. (Information Technology) Class, Semester Third Year B. Tech., Sem V Course Code Simulation Third Year B. Tech., Sem V Course Name Professional Elective 1: Advanced Programming Languages Desired Requisites: C & CPP Programming Course Name Professional Elective 1: Advanced Programming Languages Desired Requisites: C & CPP Programming Intorial - Course Objectives Intorial - Occurse Objectives Intorduce paradigm of Ruby and Go Programming Language To define features of Ruby for file handling and error handling Course Obtecomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to. Course Objectives Bloom's Taxonomy Level At the end of the course, the students will be able to. Course Objectives Bloom's Taxonomy Level At the end of the course, the students will				,	AY 2022-23	,									
Programme B. Tech. (Information Technology) Class, Semester Third Year B. Tech., Sem V Course Code SIT312 Course Code SIT312 Course Rame Professional Elective 1:Advanced Programming Languages Desired Requisites: C & CPP Programming Teaching Scheme E Kamination Scheme (Marks) Lecture 3 Hrs week MSE ISE ESE Total Tutorial - 30 20 50 100 Course Objectives - Credits: 3 - - To define features of Ruby por file handling and error handling - - - 3 To elaborate features of Go language for process synchronization - - CO Course Outcome Statement/s Taxonomy Level - - At the end of the course, the students will be able to, III Applying language - - CO1 Apply object oriented programming concepts using Ruby III Applying language - - CO3 Implement the concept of File handling using Ruby and			Course Information												
Chass, Semester Third Year B. Tech., Sem V Course Code STT312 Course Name Professional Elective 1:Advanced Programming Languages Desired Requisites: C & CPP Programming Teaching Scheme Examination Scheme (Marks) Lecture 3 Hrs/week MSE ISE ESE Total 1 To introduce paradigm of Ruby and Go Programming Language 2 To define features of Go language for process synchronization 2 To delaborate features of Go language for process synchronization Bloom's Taxonomy Level At the end of the course, the students will be able to. Bloom's Taxonomy Level Ramony Level COI Apply object oriented programming concepts using Ruby III Applying Applying Goal Propose the solution for Synchronization problem using Go VI Creating Creating Science Introduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Rubmods, Stribers Classes, Modules & Objects: Objects: Simple Ruby Classes, Object Instances, Attributes, Narboles, Symbols, Expressions (True, False, Ni) 7 Module Module Science & Streeption Handling, Threads & Fibers Classes, Object Instances, Attributes, Avariables. Storer & Exception Handling, Threads, Kelbord Visibility (Acc	Progra	amme		B.Tech. (Inform	nation Technology)										
Course Code SFT312 Course Name Professional Elective 1:Advanced Programming Languages Desired Requisites: C & CPP Programming Teaching Scheme Examination Scheme (Marks) Lecture 3 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 Course Objectives - Credits: 3 - - To introduce paradigm of Ruby and Go Programming Language - <td>Class,</td> <td>Seme</td> <td>ster</td> <td>Third Year B. T</td> <td>Tech., Sem V</td> <td></td> <td></td> <td></td>	Class,	Seme	ster	Third Year B. T	Tech., Sem V										
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Teaching Scheme Examination Scheme (Marks) Lecture 3 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 Tutorial - 30 20 50 100 To introduce paradigm of Ruby and Go Programming Language 1 To define features of Ruby for file handling and error handling 3 1 To elaborate features of Go language for process synchronization CO Course Outcomes (CO) with Bloom's Taxonomy Level Attice end of the course, the students will be able to. CO Acourse Outcome Statement/s Bloom's Taxonomy Level Applying	Desire	ed Req	uisites:	C & CPP Progra	amming		00								
Teaching Scheme Examination Scheme (Marks) Lecture 3 Hr/s/week MSE ISE ESE Total Tutorial - 30 20 50 100 - Credits: 3 - Credits: 3 - 1 To introduce paradigm of Ruby and Go Programming Language - - - 2 To define features of Ruby for file handling and error handling 3 - - - 3 To elaborate features of Go language for process synchronization - - - - 4 tthe end of the course, the students will be able to. - - Taxonomy Level -		-		<u> </u>	0										
Lecture 3 Hrs/week MSE ISE ESE Total Tutoial - 30 20 50 100 - Curres Objectives - Credits: 3 1 To introduce paradigm of Ruby and Go Programming Language - - 2 To define features of Ruby for file handling and error handling - - 3 To elaborate features of Go language for process synchronization - - Course Outcomes (CO) with Bloon's Taxonomy Level - - - At the end of the course, the students will be able to. Bloom's Taxonomy Level - - CO1 Apply object oriented programming concepts using Ruby III Applying - CO2 Implement the concept of File handling using Ruby and Go III Applying - CO3 Propose the solution for Synchronization problem using Go VI Creating - Introduction to Ruby Programming Buter history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, Ni) - - I	T	eachin	g Scheme		Examinatio	on Scheme (N	farks)								
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2 To define features of Gu language for process synchronization 3 To elaborate features of Go language for process synchronization Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's CO Course Outcome Statement/s Bloom's Taxonomy Level Taxonomy Descriptio CO1 Apply object oriented programming concepts using Ruby III Applying Ianguage Implement the concept of File handling using Ruby and Go III Applying CO3 Propose the solution for Synchronization problem using Go VI Creating Module Module Contents Hours Introduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, Nil) 7 Classes, Modules & Objects: Objects, Classes, Variables 7 III Classes, Modules & Objects : Simple Ruby Classes, Object Instances, Attributes, Attributes, Missing Methods & Constants, Custom Structures, Dynaming & File Handling: 7 III Meta-programming * File Handling: 6 Meta-programming * Kreptions, Types, Modules & Classes, Blocks & Strings, Variables, Missing Methods & Con	1	To introduce paradigm of Ruby and Go Programming Language													
To elaborate features of Go language for process synchronization Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy CO Course Outcome Statement/s Bloom's Taxonomy CO Course Outcome Statement/s Bloom's Taxonomy CO Apply object oriented programming concepts using Ruby III Applying CO2 Implement the concept of File handling using Ruby and Go III Applying CO3 Propose the solution for Synchronization problem using Go VI Creating Introduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, NI) 7 Classes, Modules & Objects: Objects, Classes, Variables Flow Control & Statements and Properties 7 III Classes, Modules & Objects: Simple Ruby Classes, Object Instances, Attributes, Inheritance, Persistence 7 Metta-programming :Exceptions, Types, Modules & Classes, Blocks & Strings, Variables, Missing Methods & Constants, Custom Structures, Dynamically adding methods, Threads, L'O Objects, Reading file, writing file. 6 III Introduction to Go Language 1 1	2	To de	efine features of	f Ruby for file ha	ndling and error ha	ndling									
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COCourse Outcome Statement/sBloom's Taxonomy LevelBloom's Taxonomy DescriptioCO1Apply object oriented programming concepts using RubyIIIApplyingCO2Implement the concept of File handling using Ruby and Go languageIIIApplyingCO3Propose the solution for Synchronization problem using Go LanguageVICreatingCO3Propose the solution for Synchronization problem using Go LanguageVICreatingIntroduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, Nil)7IPlow Control & Statements and Properties Conditionals, Loops, Error & Exception Handling, Threads & Fibers Classes, Modules & Objects: Simple Ruby Classes, Object Instances, Attributes, Antributes, & Variables: Setter & Getter methods, Method Visibility (Access Control), Instance Variables:7IIIMeta-programming Exceptions, Types, Modules & Classes, Blocks & Strings, Variables, Missing Methods & Constants, Custom Structures, Dynamically adding methods, Threads, I/O Objects, Reading file, writing file.6IVIntroduction, Program Structure: names, declaration, variables, assignments, types, files, scope, number, string variables, arrays, slice6VBasic data types, composite data types, functions, control statements, methods, interface, pointers, structs6VIRace condition, mutual exclusion, memory synchronization ,package implementation7	At the	end of	the course, the	students will be a	able to,			1							
COCourse Outcome Statement/sTaxonomy Taxonomy LevelTaxonomy DescriptioCO1Apply object oriented programming concepts using RubyIIIApplyingCO2Implement the concept of File handling using Ruby and Go languageIIIApplyingCO3Propose the solution for Synchronization problem using Go LanguageVICreatingCO3Propose the solution for Synchronization problem using Go LanguageVICreatingModuleModule ContentsHoursIntroduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, Nil) Classes, Modules & Objects: Objects, Classes, Variables7IIFlow Control & Statements and Properties Conditionals, Loops, Error & Exception Handling, Threads & Fibers Classes, Modules & Objects : Simple Ruby Classes, Object Instances, Attributes, Inheritance, Persistence Methods, Attributes, Variables: Setter & Getter methods, Method Visibility (Access Control), Instance Variables6IIIIntroduction to Go LanguageIntroduction, Program Structure: names, declaration, variables, assignments, types, files, scope, number, string variables, arrays, slice6VBasic data types, composite data types, functions, control statements, methods, interface, pointers, structs6VIRace condition, mutual exclusion, memory synchronization ,package implementation7					~ .		Bloom's	Bloom's							
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CO2 Implement the concept of File handling using Ruby and Go III Applying language CO3 Propose the solution for Synchronization problem using Go Language VI Creating Creating Module Module Contents Hours Introduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, False, Nil) 7 Elses, Nol Classes, Modules & Objects: Objects, Classes, Variables 7 III Flow Control & Statements and Properties 7 Conditionals, Loops, Error & Exception Handling, Threads & Fibers 7 Classes, Modules & Objects : Simple Ruby Classes, Object Instances, Attributes, Inheritance, Persistence 7 Meta- programming & File Handling: 7 Meta- programming : Exceptions, Types, Modules & Classes, Blocks & Strings, Variables, Missing Methods & Constants, Custom Structures, Dynamically adding methods, Threads, I/O Objects, Reading file, writing file. 6 IV Introduction, Program Structure: names, declaration, variables, assignments, types, files, scope, number, strug variables, arrays, slice 6 VI Basic data types, composite data types, functions, control statements, methods, interface, pointers, structs 6 VI Race condition, mutual exclusion, memory synchronization , package implementatio	COI	Appl	y object orient	ed programming of	concepts using Rub	by C		Applying							
CO3Propose the solution for Synchronization problem using Go LanguageVICreatingModuleModule ContentsHoursIntroduction to Ruby Programming Brief history of Ruby, Installing & running Ruby, Command Line Arguments, Numbers, Text & Strings, Arrays & Hashes, Symbols, Expressions (True, 	CO2	lmple langu	ement the conco	ept of File handlin	ng using Ruby and	Go	111	Applying							
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VIConcurrency with Shared variables: Race condition, mutual exclusion, memory synchronization ,package implementation7	V	D B ir	Pata Types and asic data types iterface, pointer	operations: , composite data t rs, structs	types, functions, co	ontrol stateme	ents, methods,	6							
	VI	C R ir	concurrency wat ace condition nplementation	ith Shared varial , mutual exclu	bles: usion, memory	synchronizati	on ,package	7							

	Text Books
1	Davd Flanagan, Yukihiro Mataumoto, "The Ruby Programming Language: Everything You Need to Know", (O'Reilly; 1st edition (12 February 2008
2	Alan A. A. Donovan, Brian W. Kernighan, " <i>The Go Programming Language</i> ", Pearson (Education; First edition (1 February 2016
	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)												PSO	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1				2										
CO2		2			3								2	
CO3	CO3 3 3 2 1													
The strength of mapping is to be written as 1: Low, 2: Medium, 3: High														
Each CO of the course must map to at least one PO.														

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

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ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Colle (Government A	e ge of Engineering , S ided Autonomous Inst	angli								
			A	AY 2022-23									
			Cour	se Information									
Progra	amme		B.Tech. Informati	ion Technology									
Class,	Seme	ster	Third Year B. Tea	ch., Sem V									
Cours	e Code	9	5IT313										
Cours	e Nam	e	Professional Elec	tive 1: Graph Theory									
Desire	ed Req	uisites:											
Те	aching	Scheme		Examination Sch	eme (Marks)								
Lectu	re	3 Hrs/week	MSE	ISE	ESE	Total							
Tutori	ial		30	20	50	100							
1 40011		_	50	Credit	s: 3	100							
			Cou	rse Objectives									
1	To p	rovide basics o	of graph theory										
2	Toil	lustrate variou	s properties of grap	h in concern with app	lications								
3	To a	nalyze the vari	ous algorithm and a	applications of graph	heory								
-		Соп	rse Outcomes (CO) with Bloom's Taxo	nomy Level								
At the	end of	the course, th	e students will be a	ble to,									
		,		,	Bloom's	Bloom's							
СО	CO Course Outcome Statement/s Bloom's Bloom's Taxonomy												
	Level Description												
CO1	CO1Summarize the basic concepts of graphs, circuits and treesIIUnderstanding												
CO2	Appl appli	y various op cation	erations of graph	theory on real-tin	ne IV	Analysing							
coa	Imple	ement the alg	orithms of graphs	theory for engineerir	lg IV	Analysing							
C03	appli	cations											
N. I	1					TT							
Modu		ntraduction to	MOCU Crophs Daths ar	le Contents		Hours							
Ι	Ir	troduction to	graphs, Basic prope	erties of graphs, Comp	plete and bi-	6							
		fut Set and Pla	anar Granh.	pris, Paris and circuit	8								
п	C P g C	but sets, conn lanner graphs raphs, detecti colouring of gr	ectivity and separ s, Kuratowski''s tw ion of Planarity, aphs,The four-colo	rability, network flow wo graphs, represent Vertex Colouring ur and five-colour the	ws, isomorphism, ation of planner of graphs, Edge orems	7							
Ш	Weighted Graph and Matrix representation:IIIEulerian Graphs, Hamiltonian cycles, Matrix representation of graphs, Chordal graphs, Weighted graphs, Matching's in graphs, Hall's 'marriage' theorem and its application6												
IV	IVGraph Algorithm: Travelling salesman's problem & Chinese postman problem, Distances in graphs, Shortest path and Dijkstra's algorithm, Floyd – Warshall Algorithm, Bellman-Ford Algorithm7												
v	S T K	panning Tree rees, Spannin ruskal ^w s algor	tree in graphs, ithm, Independence	Minimum spanning sets and covering in g	tree algorithms, raphs	7							
VI	A P G	erfect Graphs, braphs (or Digr	, Applications of graphs)	graphs in switching	theory, Directed	6							

	Text Books
1	Deo Narsing, "Graph Theory With Applications To Engineering And Computer Science", 2 nd Edition, PHI Publication, 2011
2	Wilson Robin J, "Introduction to Graph Theory", 5th Edition, Longman Publication", 2012
	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	
CO1	3		1										2			
CO2			2													
CO3	2													1		

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Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)											
AV 202223											
			Cour	se Information							
Progra	amme		B.Tech. (Informati	on Technology)							
Class,	Semest	er	Third Year B. Tec	h., Sem V							
Cours	se Code		5IT314	· ·							
Cours	se Name		Professional Election	ve – 1: Fundamentals of	Artificial Intellige	ence					
Desire	ed Requi	isites:	Basic Course in P	robability and Linear Alg	ebra						
Te	eaching	Scheme		Examination Schem	ne (Marks)						
Lectu	ecture 3 Hrs/week MSE ISE ESE Total										
Tutori	ial	-	30	20	50	100					
		-		Credits: 3							
			Com								
1	To int	oduce the co	Cou	rse Objectives							
2	To im	outice the col	ogies for various an	lication areas of AI							
3	To ela	porate state of	f the art applications	in AI							
	10014	Co	urse Outcomes (CO)) with Bloom's Taxonor	nv Level						
At the	end of t	he course, the	e students will be abl	e to,							
		,		,	Bloom's	Bloom's					
СО		Co	urse Outcome State	ement/s	Taxonomy	Taxonomy					
					Level	Description					
CO1	Apply	fundamental	concepts of AI		III	Applying					
CO2	Compa	are the archite	ectural and functiona	l structures of AI	IV	Analysing					
CO3	Build a	an expert syst	em in AI		VI	Creating					
	_			~							
Modu	ile		Modu	le Contents		Hours					
т	AI	and Problem	a Solving by Search	na as stata spaca saar	b Uninformed	7					
1	sea	rch Heuristia	search CSP proble	ng as state space searc	II, UIIIIIUIIIeu	/					
	Kn	owledge Rer	presentation			_					
II	Int	oduction, to	Knowledge represen	tation, First order logic-I		7					
	Kn	owledge Rea	isoning								
Ш	Fir	st order logic	-II, Inference in First	order logic-I, Baysian ne	etwork, decision	6					
	net	work									
117	Pla	network									
	rianning IV Introduction to Planning Plan space planning Planning graph and 6										
IV	Inte	nning coduction to aphplan	Planning, Plan s	pace planning, Plann	ing graph and	6					
10	Inti Gra	nning coduction to aphplan achine Learn	Planning, Plan s	pace planning, Plann	ing graph and	6					
IV V	Intr Gra Ma Intr	anning roduction to aphplan achine Learn roduction to	Planning, Plan s ing ML , Learning d	pace planning, Plann ecision tress, Reinforce	ing graph and	6					
V V	Intr Gra Ma Intr Lea	nning oduction to aphplan achine Learn coduction to arning in neur	Planning, Plan sp ing ML , Learning d ral network, Deep Le	pace planning, Plann ecision tress, Reinforce earning: A review.	ing graph and	6 7					
V	Intro- Gra Ma Intro- Lea Ex	nning roduction to aphplan achine Learn roduction to arning in neur pert systems	Planning, Plan s ing ML , Learning d ral network, Deep Le	pace planning, Plann ecision tress, Reinforce earning: A review.	ing graph and	6					
V V VI	Intr Gra Ma Intr Lea Ex Intr	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu	Planning, Plan sp ing ML , Learning d ral network, Deep Le	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems,	ing graph and ment learning, Architecture of	6 7 6					
V V VI	Intr Gra Ma Intr Lea Ex Intr ES	nning roduction to aphplan achine Learn roduction to arning in neur pert systems roduction, Fu , Building an	Planning, Plan sy ing ML , Learning d ral network, Deep Lean unctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems,	ing graph and ment learning, Architecture of	6 7 6					
V V VI	Intr Gra Ma Intr Lea Ex Intr ES	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu , Building an	Planning, Plan s ing ML , Learning d ral network, Deep Lean inctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems,	ing graph and ment learning, Architecture of	6 7 6					
	Intu Gra Ma Intu Lea Ex Intu ES	anning roduction to aphplan achine Learn roduction to arning in neur pert systems roduction, Fu , Building an	Planning, Plan sp ing ML , Learning d ral network, Deep Lean unctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems, Fext Books	ing graph and ment learning, Architecture of	6 7 6					
V V 1	I ta Intu Gra Ma Intu Lea Ex Intu ES Rich E	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu , Building an	Planning, Plan s ing ML , Learning d ral network, Deep Lean inctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. eents of Expert systems, Fext Books Artificial Intelligence ", N ficial Intelligence and Ex	ing graph and ment learning, Architecture of IcGraw Hills 3 rd e	6 7 6 edition,1991 facmilan India					
IV V VI 1 2	Rich E Janaki Ltd.,20	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu , Building an claine and Kel raman et al., 007.	Planning, Plan s ing ML , Learning d ral network, Deep Lean inctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. eents of Expert systems, Text Books <i>Artificial Intelligence</i> ", <i>N</i> <i>ficial Intelligence and Ex</i>	ing graph and ement learning, Architecture of IcGraw Hills 3 rd of <i>pert Systems</i> ", M	6 7 6 edition,1991 facmilan India					
IV V VI 1 2	Rich E Janaki Ltd.,20	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu , Building an claine and Kel raman et al., 007.	Planning, Plan sp ing ML , Learning d ral network, Deep Lean inctionality /compon Expert system	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems, Fext Books <i>Artificial Intelligence "</i> , N <i>ficial Intelligence and Ex</i> References	ing graph and ment learning, Architecture of IcGraw Hills 3 rd e <i>pert Systems</i> ", M	6 7 6 edition,1991 facmilan India					
IV V VI 1 2	Russel	anning coduction to aphplan achine Learn coduction to arning in neur pert systems coduction, Fu , Building an claine and Kel raman et al., 007.	Planning, Plan s ing ML , Learning d ral network, Deep Lean inctionality /compon Expert system Vin Knight ,Nair, "A "Foundations of Artigonal " Artificial Intelligen	pace planning, Plann ecision tress, Reinforce earning: A review. ents of Expert systems, Text Books <i>Artificial Intelligence ", N</i> <i>ficial Intelligence and Ex</i> References <i>ice – A Modern Approach</i>	ing graph and ement learning, Architecture of IcGraw Hills 3 rd e <i>pert Systems</i> ", M	6 7 6 edition,1991 facmilan India 2010 (3rd					

2	Prof. Sh	Prof. Shyamanta M Hazarika "Fundamentals Of Artificial Intelligence" (NPTEL/Swayam													
2	Course)														
Useful Links															
1	1 Module I,II,III														
1	https htt	ps://on	linecou	urses.nj	ptel.ac.	in/noc	19_me´	71/unit	?unit=	7&less	on=8				
2	Module	Aodule IV,V													
	https://o	ttps://onlinecourses.nptel.ac.in/noc19_me71/unit?unit=16&lesson=17													
3	Module	VI													
5	Vlabs,iit	tb.ac.in													
						CO-l	PO Ma	apping							
				P	rogra	mme C	Outcon	nes (PC))					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 strength of mapping is to be written as 1: Low, 2: Medium, 3: High															
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			Walchand Co (Government	ollege of Engineeri Aided Autonomous	ng, Sangl i s Institute)	i						
				AY 2022-23								
			Co	ourse Information								
Progra	amme		B.Tech. (Inform	nation Technology))							
Class,	Seme	ster	Third Year B.	Гесh., Sem V								
Cours	e Code	9	5IT315									
Cours	e Nam	ie	Professional El	ective - 1: Soft Cor	nputing	1						
Desire	ed Req	uisites:	Artificial Intell	igence, Tool like M	latlab/Scila	ab						
Те	aching											
Lectu	re	Total										
Tutor	ial	100										
		_		C	redits: 3							
			С	ourse Objectives								
1	To in	troduce variou	us component of	soft computing.								
2	To in	npart soft com	puting concepts t	to solve engineering	g and optin	nization prol	olems.					
3	To fa	miliarize with	the swarm intell	igence methods								
		Cou	rse Outcomes (O	CO) with Bloom's	Taxonom	y Level						
At the	end of	the course, th	e students will be	e able to,								
						Bloom's	Bloom's					
CO		Co	ourse Outcome S	Statement/s		Taxonom	y Taxonomy					
<u>CO1</u>	Class	· C . 1 1 1 .	- <u>C</u>				Description					
$\frac{cor}{cor}$	Class	sily nard and s	on computing co	lligence methods			Analysing					
C02	Lucti	pare the work	ing of swarm file	for real time problem	lom		Evoluating					
COS	Justi	ly the soft con	CO3Justify the soft computing technique for real-time problemVEvaluating									
Modu	ıle		M	odule Contents			Hours					
Modu	ıle Iı	ntroduction	Mo	odule Contents			Hours					
Modu	ile In H	ntroduction listory, Scope	Mo of Soft Computi	odule Contents ng, components of	Soft Com	puting- Neu	Hours					
Modu	ile In H N	ntroduction listory, Scope letworks, App	Mo of Soft Computi plication scope of	odule Contents ng, components of of ANN, Fuzzy Lo	Soft Com	puting- Neu tic algorithm	Hours ral 5					
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	Text Books
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, 1086
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," Introduction to Genetic algorithms", 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: Low, 2: Medium, 3: High														

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Co (Government	ollege of Engineeri Aided Autonomou	i ng, Sangli s Institute)					
			·	AY 2022-23						
			Co	ourse Information						
Progra	amme		B. Tech. (Infor	mation Technology	r)					
Class,	Seme	ster	Third Year B.	l'ech., Sem. V						
Cours	e Code	2	511316	the I.D. to Ma			<u></u>			
Cours	e Nam	e visitos:	Professional El	ective - 1:Data Ma	nagement, P	rotection and	Govern	nance		
Desire	u ney	uisites.								
Те	aching	Scheme		Examination	n Scheme (N	Marks)				
Lectur	re 3 Hrs/week MSE ISE ESE Total									
Tutori	al	_	30	20	5()	10	0		
		-		C	redits: 3					
			С	ourse Objectives						
1	To ir	troduce high-l	level phases of da	ata life cycle manag	gement					
2	Toc	ompare variou	s aspects of data	storage, data availa	bility, data	protection.				
3	To p	ovide exposu	re to various solu	tions/reference arc	hitectures da	ata protection				
		Cou	rse Outcomes (C	CO) with Bloom's	Taxonomy	Level				
At the	end of	the course, th	e students will be	e able to,		DI 1	DI	•		
CO		C	aurea Autaama	Statement/s		Bloom's	Ble	oom's		
CO		C	ourse Outcome	Statement/s		I axonomy Level	Desc	onomy rrintion		
CO1	Appl	v different sta	ndards for compl	iance and governa	nce of data	Ш	An	nlving		
	Disti	nguish variou	s types of data	threats to ensure d	lata center	IV	Ana	alvsing		
CO2	secu	ity						,		
CO3	Desi stand	gn data inter ards in data m	nsive enterprise nanagement	applications and	l industry	VI	Cn	eating		
Modul			-	Module Contents				Hours		
WIGUU	In	troduction to	data life cycle n	nanagement (DLN	()			110015		
T	G	bals of data	life cycle mana	gement, Challenge	es involved	- Volume of Stages of dat	data a life	4		
-	cy	cle - creation	n, storage, usage	e, archival, destru	ction, Risks	involved wi	thout			
	D	LM, benefits, l	best practices		-					
	Da	ata storage ar	nd data availabil	ity						
	St	orage techno	ology: Hard Dis	sk Device (HDD)	, Solid Sta	te Devices (S	SSD),			
	m	emory devices	s, Data access - b	lock, files, object,	Data center	End to End V	iew –			
		tual machines	s cloud storage	Storage virtualizat	ion technolo	usier, applica	uons, Ievel			
п	sto	brage pooling	storage provisi	oning Advance to	pics in stor	oge virtualizat	ion –	8		
	sto	prage provision	ning. thinprovision	oning, Cloud storag	pies in store ge – S3. glad	cier, storage ti	ering.	0		
	Hi	gh Availabili	ty-Introduction	to high availability	y, clustering	g, failover, pa	rallel			
	ac	cess, Disaster	Recovery -Need	d of disaster recov	ery, Buildi	ng blocks - g	lobal			
	cl	uster, wide-a	rea-connector (WAC), heartbeat,	Split-brair	n – problem	and			
	SO	lutions o Prep	aring for DR – fi	redrill						
	In	troduction to	data protection		(Que 1 / 6	. 1 .			
	In	troduction-Ne	ed for data prote	ction, basic of back	x-up/restore,	Snapshots for	data			
ш	pr D	onection I on	py-uala manag	$\frac{1}{1000} = 1 \text{ TP} \Lambda \neq 0$	DevOps)	, De-auplic	auon,	8		
		stem recove	mg renni Ketell	architecture Red	anvai, Desi	Archivol n	aodio	0		
	55		$\gamma_1 \gamma_2 = \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1 \gamma_1$	architecture 124	CKUD V/S	AIUIIVAL L				
1	CO	nsiderations a	and management	(tapes, disks. clou	id), challen	ges with new	edge			

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	Data 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)	5
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
-	Text Books	
1	Robert Spalding, "Storage Networks: The complete Reference" Tata McGraw-Hill, 201	7
2	Vic (J.R.) Winkler, "Securing The Cloud: Cloud Computing Security Techniques and T (Syngress/Elsevier) - 978-1-59749-592-9, 2017	l'actics''
3	TBD – online reference for each topic.	
1	References	
1	TRD: provide more online meterial details and books (This can include come t	which
2	available white-paper, solution guides etc.)	Jublicity
1	Useful Links	
1	https://www.enterprisestorageforum.com/storage-nardware/storage-virtualization.html	
	https://www.hitechnectar.com/blogs/three-goals_data_lifecycle-management/	
2	https://www.hmccom/blogs/data-lifecycle-management/	
-	ingos, www.endecom.org.com.necycle inminigement	

CO-PO Mapping															
	Programme Outcomes (PO) PSO														
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3												3		
CO2	3	2												3	
CO3		3													
	1 6		• .	1	•	1 T	•	3 6 11		TT' 1	l	1	l	I	l

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

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

For passing a theory course, Min. 40% marks in (MSE+ISE+ESE) are needed and Min. 40% marks in ESE are needed. (ESE shall be a separate head of passing)

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)									
				AY 2022-23	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
			Cou	rse Information					
Progra	amme		B.Tech. (Informat	tion Technology)					
Class,	Semes	ter	Third Year B. Tec	ch., Sem V					
Cours	e Code		5OE385						
Cours	e Name	2	Open Elective - 1:	: Joy of Programming	g using Py	/thon			
Desire	ed Requ	isites:	Computer Program	nming					
T	eaching	Scheme		Examination S	cheme (N	(farks)			
Lectu	re	2 Hrs/week	MSE	ISE	ES	SE	Total		
Tutori	ial	al - 30 20 50							
	- Credits: 2								
1	Toint	roduce the size	Col nificance of Duther	in programming					
2	To int	moure the sig	programming parage	ligms in Python					
3	To im	plement differ	ent libraries of Pvth	ion					
		Cou	arse Outcomes (CO)) with Bloom's Tax	konomy L	.evel			
At the	end of	the course, the	students will be ab	le to,					
СО		С	ourse Outcome Sta	atement/s		Bloom's Taxonom Level	s Bloom' ny Taxonon Descripti	's ny ion	
CO1	Imple	ment the progr	ramming concepts in	n Python		III	Applyin	ng	
CO2	Exam	ine the data us	ing python program	ming libraries		V	Evaluati	ng	
CO3	Desig	n application i	ising Python librarie	28		VI	Creating	g	
Modu	ıle		Mod	ule Contents			Hours	1	
	In	troduction to	Python:						
I	Th an va	ne basic elemen d Input, Iterat riables.	nts of python, Brand ion, Functions and	ching Programs, Con scoping, Specification	trol Struc ons, Recu	tures, Strin Irsion, Glol	ngs 4 bal		
П	A M Di	lvanced featu odules, Files, ctionaries, Lis	res of Python: System Functions ts and Mutability, F	and Parameters, Stri Functions as Objects.	ings, Tup	les, Lists a	and 5		
Ш	Cl Al Hi	asses and Obj ostract Data Ty ding.	ject-Oriented Prog ypes and Classes, In	ramming: heritance, Encapsula	ition and 1	Information	ı 4		
IV	Module:Importing module, Math module, Random module, PackagesComposition.Data Visualization:Matplot lib, Bar Graph, Pie Chart, Box plot, Histogram, Line chart, Sub plot								
v	Py Ni op	thon-Numpy umPy: Introc erations.	Library luction, Numpy	array, Numpy arra	ay index	ing, Num	npy 4		
VI	Pa Pa co	indas Library indas: Series, ncatenation, o	: Data frames, man perations, data inpu	aging missing data, t and data output.	groupby,	merging	& 4		

	Text Books							
1	R. Nageswara Rao, "Core Python Programming", Dreamtech Press, 2nd Edition, 2017							
2	Chun, J Wesley, "Core Python Programming", Pearson, 2nd Edition, 2007 Reprint 2010							
	References							
1	Barry, 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 strength of mapping is to be written as 1: Low, 2: Medium, 3: High														

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)											
			l	AY 2022-23							
			Cour	rse Information							
Progra	amme		B.Tech. (Informat	ion Technology)							
Class,	Semes	ster	Third Year B. Tec	h., Sem V							
Cours	e Code	•	50E386								
Cours	e Nam	e	Open Elective - 2:	Cloud Computing Syste	m						
Desire	ed Req	uisites:	Computer Networ	KS							
T	Teaching Scheme Examination Scheme (Marks)										
Lectu	re	3 Hrs/week	MSE	ISE	ESE	Total					
Tutori	ial	-	30	20	50	100					
		-		Credits:	3						
	,		Cou	rse Objectives							
1	To in	troduce funda	amentals of virtuali	zation							
2	To in	npart various	service and deploy	yment model in cloud o	computing						
3	To a	cquaint the sig	gnificance of virtua	lization in data centre							
		Co	urse Outcomes (CC)) with Bloom's Taxono	my Level						
At the	end of	the course, the	e students will be abl	e to,							
					Bloom's	Bloom's					
CO		Co	urse Outcome State	ement/s	Taxonomy	Taxonomy					
					Level	Description					
CO1	Com	prehend the f	undamentals of clo	Understanding							
CO2	Choo	ose virtualizat	ion techniques to c	deploy the service on	III	Applying					
02	cloud	b									
	infra	structure									
CO3	Anal	yze service m	odels for data cen	tre applications	IV	Analysing					
N/l	1.		Mada	L. Comtanta		TT					
Moau		the duration to	Midu Claud Computing	le Contents		Hours					
		irtualization ar	d Cloud Computing	Cloud Reference Mode	Ι. ΙΛΛς ΡΛΛς						
I	v v	AAS Cloud D	anlovment Model: D	hublic Cloud Private Clo	and Uvbrid	7					
	3. C	loud Cloud Pl	atforms in Industry	ublic Cloud, Flivate Clo	uu allu Hybliu						
		irtualization	attornis in industry								
п	и Н	Intualization osted and Ba	re-Meta Server V	irtualization Deskton	Virtualization	6					
11	A	polication Virt	ualization Storage	Virtualization, Desktop	v intualization,	0					
	N	etwork Functi	ions								
	P	ublic Cloud Ne	tworking: Route53.	Content Deliverv Netwo	rks, Resilience	-					
III	In	frastructure, V	irtual Network Fund	tions: Cloud Firewall, D	NS, Load	6					
	В	alancers, Intrus	sion Detection Syste	ems	,						
	V	irtual Private	Clouds (VPC)								
IV	V	PC fundament	als, Public and Priva	te Subnets, Security Gro	ups, Network	7					
	A	ccess Control	List, Network Addre	ess Translation.							
	C	loud Manager	nent								
V	V Service Management in Cloud Computing, Data Management in Cloud 7										
	<u> </u>	omputing, Res	ource Management	in Cloud		1					
VI	0	pen Source and	d Commercial Cloud	ls, Cloud Simulator, Res	earch trend in	6					
	C	loud Computir	ng, Fog Computing			0					
Text Books											
1	Rajk	umar Buyya, (Christian Vecchiola	, S. Thamarai Selvi, "I	Aastering cloud	computing", Mc					
	Juan	ITTI EQUCATIO	n, 510 Euluon, 2011								

2	Thomas Erl, Zaigham Mahmood and Ricardo Puttini, "Cloud Computing: Concepts, Technology & Architecture", Pearson, 1st Edition, 2010
	References
1	Richardo Puttini, Thomas Erl, and Zaigham Mahmood, "Cloud Computing: Concepts, Technology & Architecture", Pearson Prentice Hall, 2nd edition, 2013
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 strength of mapping is to be written as 1: Low, 2: Medium, 3: High Each CO of the course must map to at least one PO.

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

TY Sem II

AY 2022-23 Course Information Programme Course Information Class, Semester Third Year B. Tech., Sem VI Course Code Stratume Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE Total		Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)										
Course Information Programme B. Tech. (Information Technology) Class, Semester Third Year B. Tech, Sem VI Course Code STT321 Course Name Unix Operating System Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE ESE Total Tatorial - 30 20 50 100 To introduce design, principal and philosophy of the Unix/Linux OS. To introduce design, principal and philosophy of the Unix/Linux OS. Bioom's To offscuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level Bloom's At the end of the course, the students will be able to. Bloom's Bloom's CO Course Outcome Statement/s Bloom's Bloom's CO Course Outcome Statement/s III Applying CO1 Interpret design, principal and philosophy of the Unix/Linux OS IV Analysing CO2 Analyze the architecture of Unix/Linux OS IV Analysing CO3				(Geveniment	AY 2022-23							
Programme B. Tech. (Information Technology) Class, Semester Third Year B. Tech., Sem VI Course Code STT321 Course Code STT321 Course Code Strend System Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/weck MSE ISE ESE Total Tutorial - 30 20 50 100 Course Objectives To inpart the architecture of Unix/Linux OS. To impart the architecture of Unix/Linux OS. To discuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level At the end of the course, the students will be able to, TV Analysing CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying CO4 Module Contents Hours Analysing CO5 Analysing Code Module Contents Hours Interpret design				C	ourse Information	n						
Class, Semester Third Year B. Tech., Sem VI Course Code SIT321 Course Name Unix Operating System Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE ESE Total Tutorial - Course Objectives Total Total 1 To introduce design, principal and philosophy of the Unix/Linux OS. To inpart the architecture of Unix/Linux OS. Total 2 To inpart the architecture of Unix/Linux OS. Totanomy Level Bloom's Taxonomy Level At the end of the course, the students will be able to. Bloom's Taxonomy Level Taxonomy Description COI Course Outcome Statement/s Bloom's Taxonomy Level COI Course Outcome Statement/s III Applying CO2 Analyze the architecture of Unix/Linux OS IV Analyzeing CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Hours Introduction Concrest, Saumption About Hardware. 4 Operating System Services, Assumption About Hardw	Progra	amme		B.Tech. (Inform	nation Technology	7)						
Course Code STF 321 Course Name Unix Operating System Desired Requisites: Operating System Teaching Scheme Exture 2 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 - Curse Objectives - Credits: 2 - To impart the architecture of Unix/Linux OS. 3 To discuss system call of Linux/Unix. Statement/s Bloom's CO Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level CO Course Outcome Statement/s Bloom's Taxonomy Level Analysing CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying Analysing CO2 Analyze the architecture of Unix/Linux OS III Applying Analysing CO3 Apply Linux/Unix system calls III Applying Analysing Module Module Contents Hours Hours Introd	Class,	Semes	ster	Third Year B. 7	Fech., Sem VI							
Course Name Unix Operating System Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 I To introduce design, principal and philosophy of the Unix/Linux OS. To inpart the architecture of Unix/Linux OS. To inpart the architecture of Unix/Linux OS. 3 To discuss system call of Linux/Unix. Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level CO Course Outcome Statement/s Bloom's Taxonomy Level CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Introduction to system Call structure, System Administration Introduction General Overview of the System - History, System Structure, User Perspective, Operating System Structure of the unix/Linux OS, Introduction to system concere	Cours	e Code	9	5IT321								
Desired Requisites: Operating System Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 I To introduce design, principal and philosophy of the Unix/Linux OS. To impart the architecture of Unix/Linux OS. To issues system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level Recent and of the course, the students will be able to, Bloom's Taxonomy Level At the end of the course, the students will be able to, Course Outcome Statement/s Bloom's Taxonomy Description CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Course Outcome Statement/s Bloom's Taxonomy Description Bloom's Taxonomy Description CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Introduction General 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 Hours <t< td=""><td>Cours</td><td>e Nam</td><td>e</td><td>Unix Operating</td><td>g System</td><td></td><td></td><td></td></t<>	Cours	e Nam	e	Unix Operating	g System							
Teaching Scheme Examination Scheme (Marks) Lecture 2 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 - Course Objectives - Course Objectives - 1 To introduce design, principal and philosophy of the Unix/Linux OS. - - - 3 To discuss system call of Linux/Unix. - - Bloom's Taxonomy Level At the end of the course, the students will be able to, - Bloom's Taxonomy Level - CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying - Analyzic the architecture of Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying - </td <td>Desire</td> <td>ed Req</td> <td>uisites:</td> <td>Operating Syste</td> <td>em</td> <td></td> <td></td> <td></td>	Desire	ed Req	uisites:	Operating Syste	em							
Examination Scheme (Marks)Lecture2 Hrs/weckMSEISEESETotalTutorial-302050100Credits: 2Course ObjectivesCourse Objectives1To introduce design, principal and philosophy of the Unix/Linux OS.3To discuss system call of Linux/Unix.Course ObjectivesCourse Outcomes (CO) with Bloom's Taxonomy LevelAt the course, the students will be able to,Course Outcome Statement/sBloom's Taxonomy LevelCO2Course Outcome Statement/sBloom's Taxonomy LevelBloom's Taxonomy LevelCO3Apply Linux/Unix system callsIIIApplyingModuleModule ContentsIIIApplyingModuleIntroduction Concepts, Kernel Data Structure, System AdministrationHoursIOperating System Services, Assumption About Hardware. Introduction to the KERNEL: Architecture of UNIX OS, Introduction to system concepts, Kernel Data Structure, System Administration4IIIBuffer CacheInternal Representation of Files4IIIIndex, structure of the buffer pool, scenarios for retrieval of a buffer, Creating and writing disk blocks, advantages and disadvantages of cache.4IIIProcess stages and transitions, layout of system memory, the context of a Process stage and transitions, layout of system memory, the context of a Process stages and transitions, layout of system memory, the context of a 												
Lecture 2 Hrs/week MSE ISE ESE Total Tutorial - 30 20 50 100 Interval - 30 20 50 100 Image: Course Objectives - Credits: 2 100 100 Image: Course Outcome Statement/s To introduce design, principal and philosophy of the Unix/Linux OS. Image: Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level Bloom's Taxonomy Level At the end of the course, principal and philosophy of the Unix/Linux OS III Bloom's Taxonomy Level Taxonomy Description CO2 Analyze the architecture of Unix/Linux OS III Applying Taxonomy Description CO3 Apply Linux/Unix system calls III Applying Analyze the architecture of Unix/Linux OS IV Analysing CO3 Apply Linux/Unix system calls III Applying Applying Module Module Contents Hours Hours Analysing Introduction Module Kontents Hours <td< td=""><td>T</td><td>eachin</td><td>g Scheme</td><td></td><td>Examinati</td><td>ion Scheme (M</td><td>(arks)</td><td></td></td<>	T	eachin	g Scheme		Examinati	ion Scheme (M	(arks)					
Tutorial - 30 20 50 100 Credits: 2 Course Objectives 1 To introduce design, principal and philosophy of the Unix/Linux OS. 3 To discuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to. Bloom's Taxonomy CO Course Outcome Statement/s Bloom's Taxonomy CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS IV Analysing CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Hours Introduction General Overview of the System - History, System Structure, User Perspective, Operating System Services, Assumption About Hardware. 5 Introduction to the KERNEL: Architecture of UNIX OS, Introduction to system 4 III Buffer headers, structure of the regular file, director	Lectu	re	2 Hrs/week	MSE	ISE	ESI	E	Total				
Image: Construct of the system of the sys	Tutor	ial	-	30	20	50		100				
Course Objectives 1 To introduce design, principal and philosophy of the Unix/Linux OS. 2 To impart the architecture of Unix/Linux OS. 3 To discuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level CO Course Outcomes Statement/s Bloom's Taxonomy Description CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Introduction General Overview of the System - History, System Structure, User Perspective, Operating System Services, Assumption About Hardware. 5 Introduction to the KERNEL: Architecture of UNIX OS, Introduction to system concepts, Kernel Data Structure, System Administration 4 II Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, advantages and disadvantages of cache. 4 IIII Buffer headers, file and Record Locking, LSEEK, Close, File Creation, Creation of Special File, Chape Directory and Change Root, Change Owner and			-			Credits: 2						
Course Objectives Course Outcomes (CO) with Bloom's Taxonomy Level At the architecture of Unix/Linux OS. Bloom's Taxonomy Level At the end of the course, the students will be able to, Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level CO Course Outcome Statement/s Bloom's Taxonomy Level CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Hours Introduction General 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 Hours III Buffer Cache III Appresentation of Files 4 IIII Indees, structure of the Buffer peol, scenarios for retrieval of a buffer, Creation, System File and Record Locking, LSEEK, Close, File Creation, Creati												
1 To introduce design, principal and philosophy of the Unix/Linux OS. 2 To impart the architecture of Unix/Linux OS. 3 To discuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's CO Course Outcome Statement/s Bloom's Taxonomy Level Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying CO4 Module Module Contents Hours Module Module Contents Hours 5 Introduction to the KERNEL: Architecture of UNIX OS, Introduction to system concepts, Kernel Data Structure, System Administration 4 I 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 Buffer headers, 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 V System calls for the file System 4 INV System calls for t				C	Course Objectives							
2 To impart the architecture of Unix/Linux OS. 3 To discuss system call of Linux/Unix. Course Outcomes (CO) with Bloom's Taxonomy Level At the end of the course, the students will be able to, Bloom's Taxonomy Level CO Course Outcome Statement/s Bloom's Taxonomy Level CO1 Interpret design, principal and philosophy of the Unix/Linux OS III Applying CO2 Analyze the architecture of Unix/Linux OS III Applying CO3 Apply Linux/Unix system calls III Applying Module Module Contents Hours Hours Introduction General 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 Hours III Buffer headers, structure of the buffer pool, scenarios for retrieval of a buffer, reading and writing disk blocks, advantages and disadvantages of cache. 4 IIII Indees, structure of the regular file, directories, conversion of a pathname to inde, super block, inde assignment to a new file, allocation of disk blocks, other file types. 4 III System Calls for the file System Qpen, Read, write, File and Record Locking, LSEEK, Close, File Crea	1	To in	troduce design	, principal and ph	nilosophy of the Ur	nix/Linux OS.						
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2 Sumitabha Das, "Unix Concepts and Applications". TMGH. 4 th Edition. 2017.	Modu I II III IV V VI	Ile In G G C In C T B rec In In In In In S C C C au S P P P P P P In In In In In In In In In In S In In In In In In In In In In In In In	ntroduction eneral Overvie perating System introduction to the oncepts, Kernel the Buffer Cac uffer headers, se eading and write internal Repress nodes, structure onder, super blo ther file types. ystem calls for open, Read, wr reation of Spece and Change Moo tructure of Pro- rocess stages a rocess, saving of rocess creation woking other p it process, Pro-	M w of the System m Services, Assum he KERNEL: Arc l Data Structure, S he structure of the buing disk blocks, a sentation of Files e of the regular fick, inode assignment the file System ite, File and Rea cial File, Change file, Stat and Fstat, ocess and transitions, 1 context of a procest rograms, the user cess Scheduling,	- History, System mption About Har chitecture of UNIX System Administra uffer pool, scenario advantages and dis file, directories, co ment to a new file cord Locking, LS Directory and Cha , Pipes, Dup, Link ayout of system r ess, manipulation of ss termination, aw r id of a process, th system call for tim	Structure, User dware. X OS, Introduct ation os for retrieval advantages of c onversion of a e, allocation of SEEK, Close, F inge Root, Char , Unlink. memory, the c of the process a vaiting process he shell, system he, clock.	Perspective, ion to system of a buffer, eache. pathname to disk blocks, file Creation, nge Owner ontext of a ddress space. termination, Boot and the	Hours 5 4 4 4 4 5 5				
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	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://nptel.ac.in/courses/106/102/106102132/ (Intro to Unix System Calls Part 1/2, Kernel Data Structures, Process structure, Context Switching, Fork, Context-Switch, Process Control Block, Locking, File System Implementation, File System Operation)
2	https://onlinecourses.nptel.ac.in/noc19_cs50 (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												0
	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 strength of mapping is to be written as 1: Low, 2: Medium, 3: High														
Each CO	oftha	0.01180	a manuat	mont	a at lac	at ana	DO							

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Col	llege of Engineerin	ng, Sangli		
			(Oovernmeni 1	AY 2022-23	msmare)		
			Cou	irse Information			
Progra	amme		B.Tech. (Informa	ation Technology)			
Class,	Seme	ster	Third Year B. Te	ech., Sem VI			
Cours	e Code	9	5IT322				
Cours	e Nam	ie	Parallel Computi	ng			
Desire	ed Req	uisites:	Computer Algori	ithm			
			1				
Т	eachin	g Scheme		Examination	n Scheme (N	(larks)	
Lectu	re	2 Hrs/week	MSE	ISE	ESE	1	Total
Tutori	ial	1	30	20	50		100
		-		C	redits: 3		
			Co	urse Objectives			
1	To g	et familiar with	parallel Processing	g.			
2	Tole	arn the GPU ba	sed parallel progra	- amming using CUE	DA.		
3	To U	Inderstand Impo	ortance of parallelis	sm			
A 4 41	1(irse Outcomes (C	O) with Bloom's '	l'axonomy l	Level	
At the	ena or	the course, the	students will be at	ble to,		Dloom?g	Dloom'a
CO		С	ourse Outcome S	tatement/s		Dioonii s Taxonomy	Taxonomy
00		e	ourse outcome s	utement/5		Level	Description
CO1	Ident	ify parallel stru	ctures in application	on		IV	Analysing
CO2	App	ly shared, distri ramming metho	buted & NUMA- A	Address space		Ш	Applying
CO3	Anal	yze parallel pro	grams using differ	ent tools		IV	Analysing
Modu	ıle		Mo	dule Contents			Hours
I	P	arallel Computi	ng: Motivation and	d scope			6
) T	SPGPU Program	nming : OpenACC	, CUDA, OpenCL			4
		rends in proces	sor architecture an	a limitations of me	mory system	15	4
V		Communication	costs in parallel m	achines			4
VI	R	louting mechani	ism and processor	mapping technique	s		4
	1	<u> </u>					1
				Text Books			
1	Anat Seco	h Grama, Ansul nd Edition. Pea	l Gupta, George Ka rson Education. 20	arypis, Vipin Kum 003	ar, " <i>Introdu</i> d	ction to paralle	l computing",
2	Jaeg	eun Han, Bha	ratkumar Sharma	, "Learn CUDA	Programm	<i>ing",</i> First E	dition, Packt
	Puoli	5mmg, 2019					
				References			
1	Horr	owitz, Sahni Ra	jasekaran, "Comp	uter Algorithms", (Computer Sc	vience, W. H. Fr	reeman
1	and o	company Press,	New york	.	•		
	1		10240240	Useful Links			
1	https	://nptel.ac.in/col	urses/106/102/1061	102114/			
2	nttps	://nptel.ac.1n/col	urses/106/102/1061	102103/			

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	gth of 1	nappir	ıg is to	be wri	tten as	1: Lov	w, 2: M	ledium	, 3: Hi	gh			

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Co (Government	llege of Engineerin Aided Autonomous	g, Sangli Institute)			
				AY 2022-23				
			Co	urse Information				
Progra	amme		B.Tech. (Inform	nation Technology)				
Class,	Semes	ter	Third Year B. T	ech., Sem VI				
Cours	e Code		5IT371					
Cours	e Nam	e	Unix Operating	System Lab				
Desire	d Requ	uisites:	Operating Syste	em, (C/python) Progr	ramming lan	guage		
		~ -						
T	eaching	g Scheme		Examination	Scheme (N	larks)		
Practi	cal	2 Hrs/Week	LA1	LA2	Lab	ESE		Total
Intera	ction	-	30	30	4()		100
				Cr	edits: 1			
			C	ourse Objectives				
1	To ge	t introduce and	use various syste	m call of Unix/Linu	x OS			
2	To us	e the various IPO	C''s available in O	S.				
3	To in	part the IPC fo	r solving the real	world problems				
		Cou	rse Outcomes (C	CO) with Bloom's T	'axonomy L	evel		
At the	end of	the course, the	students will be a	ble to,				
						Bloom'	s	Bloom's
CO		C	ourse Outcome S	Statement/s		Taxonon	ny	Taxonomy
						Level]	Description
CO1	Expl	ain the differen	ce between thread	l and process		III		Applying
CO2	Imple	ement effective	programing on U	nix/Linux		Π		Applying
CO3	Distin	guishing variou	s IPC''s available	in OS		IV		Analysing
		-	List of Exp	eriments / Lab Act	tivities			
List of	f Exper	iments:		•. •. • •		、 、		
1.	Proce	essing Environn	hent : fork, vfork,	wait, waitpid, exec (all variation	s exec), and	d exit	
2.	IPC:	Interrupts and S	Signals: signal(an	y three type of signa	l), alarm, ki	ll, signal		
3.	File s	system Internals	: Stat, Istat, ustat/	lock/flock.	ofice			
4.	Three IDC:	Samanhara	n c'hanguage (P'u	t competitione, threads	s of java			
5.	IPC:	Semaphore: sen	naphore. n-semge	t, senicti, seniop				
0. 7	IFC.	Shared memory	z. msgget, msgsnt z · shmget_shmat	shmdt				
7. 8	IIC.	Sockets: socket	system calls in C	'socket programmin	or of Java/ny	thon		
9	IPC^{1}	Pine/FIFO	system cans m c	socket programmin	ig of Java/py	tii0ii.		
10	Scrip	ting writing in	Linux and pythor	ı				
	P	6	PJ 1101					
				Text Books				
1	Maur	ice J. Bach, "Th	ne Design of Unix	Operating System".	, PHI, 1994.			
2	Sumi	tabha Das, "Un	ix Concepts and A	Applications", TMG	H, 4 th Editio	n, 2017.		
				References				
1	Beej Dece	Jorgensen, "" mber, 2010	Beej's Guide to	Unix IPC", Brian	-Beej Jorg	ensen Hall	l, Ver	sion 1.1.2,
2	Kay <i>Three</i>	Robbins, <u>Steve</u>	<u>Robbins</u> , "UNIX 2nd Edition, Dec	Systems Programm ember, 2015	ing: Comm	unication,	Сопси	irrency and
3	Eric I	Raymond . "Art	of UNIX Program	<i>nming</i> ", Pearson, 1s	t edition. Oc	tober. 2002	3	
		<u> </u>	<u> </u>		,	,,		
				Useful Links				
1	https:	//users.cs.cf.ac.u	uk/Dave.Marshall	/C/				
2	https:	//github.com/su	vratapte/Maurice-	-Bach-Notes				
3	https://	//github.com/mi	it-pdos/xv6-nublid	2				
4	httns:	//www.geeksfor	rgeeks.org/introdu	- iction-to-unix-system	n/			
Т	mips.	,, ., .,	5	seaton to unix-system				

5.	https://github.com/beejjorgensen/bgipc
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
	2		1									1	
				3							2	2	
	1		2										2
	1	1 2 2 1	1 2 3 2 1 1	P 1 2 3 4 2 1 1 1 1 2 1 1	Program 1 2 3 4 5 2 1 3 3 1 2 3 3 1 2 1 3	Programme C 1 2 3 4 5 6 2 1 3 3 3 3 1 2 1 3 3 3	Programme Outcom 1 2 3 4 5 6 7 2 1 - <	Programme Outcomes (PC 1 2 3 4 5 6 7 8 2 1 3 1	Programme Outcomes (PO) 1 2 3 4 5 6 7 8 9 2 1 9 1 2 1 9 1 2 1 <	Programme Outcomes (PO) 1 2 3 4 5 6 7 8 9 10 2 1	Programme Outcomes (PO) 1 2 3 4 5 6 7 8 9 10 11 2 1 <th>Programme Outcomes (PO) 1 2 3 4 5 6 7 8 9 10 11 12 2 1 2 2 1 2 2 2 2 2 2</th> <th>Programme Outcomes (PO) PS 1 2 3 4 5 6 7 8 9 10 11 12 1 2 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 2 1 1 1 1 2 2 1</th>	Programme Outcomes (PO) 1 2 3 4 5 6 7 8 9 10 11 12 2 1 2 2 1 2 2 2 2 2 2	Programme Outcomes (PO) PS 1 2 3 4 5 6 7 8 9 10 11 12 1 2 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 2 1 1 1 1 2 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, and preferably to only one PO.

		Assessment										
There are three	There are three components of lab assessment, LA1, LA2 and Lab ESE.											
IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%												
Assessment Based on Conducted by Typical Schedule Marks												
	Lab activities,		During Week 1 to Week 8									
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30								
	journal		Week 8									
	Lab activities,		During Week 9 to Week 16									
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30								
	journal		Week 16									
	Lab activities,	Lab Course Faculty and	During Week 18 to Week 19									
Lab ESE	journal/	External Examiner as	Marks Submission at the end of	40								
	performance applicable Week 19											
Week 1 indicates starting week of a semester. Lab activities/Lab performance shall include performing												
avporimonto n	nini project pres	ontotions drawings progra	mming and other suitable activitie	a ac por								

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 and related activities if any.

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute) AY 2022-23									
			Cou	irse Information					
Programme B.Tech. (Information Technology)									
Class,	Seme	ster	Third Year B. Te	ch., Sem VI					
Cours	e Cod	e	5IT372						
Cours	e Nam	e	Web Technology	r					
Desire	ed Req	uisites:	Basic Programmi	ing Concepts					
Т	eachin	g Scheme		Examination	Scheme (M	arks)			
Practi	cal	2 Hrs/week	LA1	LA2	Lab E	SE	Total		
Intera	ction	1 Hr/week	30	30	40		100		
				Cr	edits: 2				
			Co	urse Objectives					
1	To I	Practice the best	t technologies for s	olving web client/se	erver problen	18			
2	To ir	nspect and desig	gn real time web ap	plications					
3	To a	rgue about clier	nt-side or server-sid	le applications					
		Co	urse Outcomes (C	O) with Bloom's T	axonomy Lo	evel			
At the	end of	the course, the	e students will be at	ole to,					
CO			Course Outcome 6	Natomont/a	Bloom's	Bloom's			
CO		,	Course Outcome S	statement/s		I axonomy Level	1 axonomy Description		
CO1	Iden desig	tify the princip	les of coherent web	o coding and good v	visual	Ш	Applying		
	Dem	onstrate the inc	corporation of of CS	SS and Java script i	n an	IV	Analysing		
CO2	HTM	1L page							
CO3	Crea MyS	te web pages us QL	sing Django and da	tabase connectivity	using	VI	Creating		
Modu	le		Moo	dule Contents			Hours		
	E	ITML and CS	S						
	E	ITML introduct	tion, HTML editors	s, elements, attribut	es, headings,	paragraphs,			
I	st	2							
	C								
	р м	ebsite layout a	nd components	family, navigation	n bar, dropdo	owns, forms,			
	J	ava script			_				
п	li	troduction to	Java script, syntax	, variables, operato	ors, data type	es, functions,	2		
11	0 it	bjects, events,	date formats, math	, control flow state	ments, forms	s, objects and	2		
	is properties, object classes, components, introduction to server-side and client-								
	P	HP							
	B	asics of PHP. i	nstallation of PHP.	comments, variable	es, echo/print	t, data types.			
Ш	st	trings, numbers	s, math, constants, o	operators, control fl	ow statement	ts, arrays,	3		
	F	orm handling, t	form validation, for	rm required, from U	JRL, form co	mplete, date			
	a	and time, file handling, open, read, write, upload, cookies, session,							

	Object oriented PHP								
IV	What is OOP?, classes and objects, constructor, destructor, access modifiers.	2							
	inheritance, interfaces, abstract classes, static keyword								
	Database Handling -								
v	MySOL database connectivity MySOL connect creating database inserting	2							
•	data, prepared statements, various queries used in PHP								
	Bootstran and responsive web design								
	Introduction to Rootstran installation of hootstran grid system buttons tables								
VI.	unifold ction to Bootstrap, instantation of bootstrap, grid system, buttons, tables,	2							
VI	ventical forms, nonzontal forms, dropdowns, responsive tabs, progress bar,								
	alens, pagination, badges, fabers, page neaders, toontps, responsive web design.								
	nodejs, angular js, angular, react, etc.								
	List of Experiments / Lab Activities								
List 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 event tantaning on trends weepage using our useripti								
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 MySOL database for CURD operations								
12.	Program on Bootstran/ responsive web design using different components								
13.	Text Books								
	P L Daital & H.M. Daital Pearson "Internet and World Wide Web How to progr	m" Pearson							
1	Education India, 4 th Edition, 2009								
2	Jon Duckett,"HTML and CSS: Design and Build Websites", John Wiley & Sons, In-	c, 1 st Edition,							
2	2011								
	References								
1	Steven M. Schafer, "HTML, XHTML and CSS", Wiley India Edition, 5th Edition, 20	010							
2	Ivan Bayross ,"Web Enabled Commercial Application Development Using HTMI	2, JavaScript,							
	DHTML and PHP", BPB Publications, 4th Edition, 2006								
	Isoful I inke								
1	https://www.coursera.org/learn/web-ann#syllabus								
2	https://www.coursera.org/specializations/web-applications								
2	https://www.udamy.com/course/foundations of front and dayalopmont/								
3	https://www.udemy.com/course/roundations-or-nont-end-development/								
	CO BO Monning								

CO-PO Mapping														
		Programme Outcomes (PO)										PS	0	
	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, and preferably to only one PO.														

[
Assessment									
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%									
Assessment Based on Conducted by Typical Schedule Mark									
	Lab activities,		During Week 1 to Week 8						
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30					
	journal		Week 8						
	Lab activities,		During Week 9 to Week 16						
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30					
	journal		Week 16						
	Lab activities,	Lab Course Faculty and	During Week 18 to Week 19						
Lab ESE	journal/	External Examiner as	Marks Submission at the end of	40					
	performance	applicable	Week 19						
Week 1 indicat	tes starting week	of a semester. Lab activitie	s/Lab performance shall include per	rforming					
experiments, n	nini-project, prese	entations, drawings, progra	mming, and other suitable activities	s, as per					
the nature and	requirement of th	ne lab course. The experiment	ental lab shall have typically 8-10						
experiments ar	nd related activition	es if any.							

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)						
AY 2022-23						
Course Information						
Programme	B.Tech. (Information Technology)					
Class, Semester	Third Year B. Tech., Sem VI					
Course Code	5IT347					
Course Name	Mini Project - 4					
Desired Requisites:	Database Engineering					

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

Course	Obi	iective
Course		

1	To plan for various activities of the project and distribute the work amongst team members
2	To develop student, s abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Mini Project
3	To understand the importance of document design by compiling Technical Report on the Mini Project work carried out

Course Outcomes (CO) with Bloom's Taxonomy Level

At the end of the course, the students will be able to,

СО	Course Outcome Statement/s	Bloom's Taxonomy Level	Bloom's Taxonomy Description
CO1	Understand, plan and execute a Mini Project with team	III	Applying
CO2	Prepare a technical report based on the Mini project	IV	Analyzing
CO3	Deliver technical seminar based on the Mini Project work	IV	Analyzing
COS	carried out		

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. Preferably 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 Articles", Universal Prakashan, 2015								
2	Marilyn Deegan, "Academic Book of the Future Project Report", 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)										PS	С		
	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	Each CO of the course must map to at least one PO, and preferably to only one PO.													

Assessment										
There are three components of lab assessment, LA1, LA2 and Lab ESE. IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%										
Assessment Based on Conducted by Typical Schedule										
	Lab activities,		During Week 1 to Week 8							
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30						
	journal		Week 8							
	Lab activities,		During Week 9 to Week 16							
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30						
	journal		Week 16							
	Lab activities,	Lab Course Faculty and	During Week 18 to Week 19							
Lab ESE	journal/	External Examiner as	Marks Submission at the end of	40						
	performance	applicable	Week 19							

Week 1 indicates starting week of a semester. 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 and related activities if any.

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)							
AY 2022-23							
Course Information							
Programme	B.Tech. (Information Technology)						
Class, Semester	Third Year B. Tech., Sem VI						
Course Code	5IT348						
Course Name Mini Project - 5							
Desired Requisites:	AIML, Web Technology, IoT						

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

	Course Objectives											
1	To introduce latest web technology											
2	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 th	At the end of the course, the students will be able to,											
CO	Course Outcome Statement/s	Bloom's	Bloom's									
co	Course Outcome Statement/s	Level	1 axonomy Description									
CO1	Implement AI based applications or Web application	III	Applying									
CO2	Identify the real world problems & apply software engineering	IV	Analyzing									
CO_2	practices											

List of Experiments / Lab Activities

VI

Creating

List of Experiments:

CO3

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. Development interdisciplinary application using any web technologies/AIML/IoT.

Design software application with backend and detailed project

- 2. Industry based problem / Sponsored application /Game/ Interdisciplinary application /socially useful application / Problem solving of previously learned complex concepts.
- 3. Application area for AI/ML/IoT in Transport, Agriculture, Networking monitoring, environment, Social life Smart City Development, health, smart home, or in any engineering field other than CS/IT etc.
- 4. Web application development using any front end technology: PHP, NODE.JS, Django. Flask, Ruby on Rails, etc
- 5. Data based application development using any trending database system like: MySQL, PGSQL, NoSQL, MongoDB, etc.
- 6. AIML application development using PyTorch, TensorFlow, NLTK etc
- 7. IoT Application development using components.

report for submission and evaluation.

- 8. Project group should achieve all the proposed objectives of the problem statement.
- 9. The work should be completed in all aspects of design, implementation and testing and follow software engineering practices.
- 10. 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)
- 11. Project will be evaluated continuously by the guide/panel as per assessment plan.
- 12. 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.

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2	Marilyn Deegan, "Academic Book of the Future Project Report", A Report to the AHRC & 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)												
	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 stars	- 41 f			- 1		- 10	2	1. T		N	2.	TT: - 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, and preferably to only one PO.

	Assessment										
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IMP: Lab ESE is a separate head of passing.(min 40 %), LA1+LA2 should be min 40%											
Assessment Based on Conducted by Typical Schedule Mar											
	Lab activities,		During Week 1 to Week 8								
LA1	attendance,	Lab Course Faculty	Marks Submission at the end of	30							
	journal		Week 8								
	Lab activities,		During Week 9 to Week 16								
LA2	attendance,	Lab Course Faculty	Marks Submission at the end of	30							
	journal		Week 16								
	Lab activities,	Lab Course Faculty and	During Week 18 to Week 19								
Lab ESE	journal/	External Examiner as	Marks Submission at the end of	40							
	performance	applicable	Week 19								
Week 1 indicat	tes starting week	of a semester. Lab activitie	s/Lab performance shall include per	rforming							
avpariments n	nini project pres	antations drawings progra	mming and other suitable activitie	e ac par							

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 and related activities if any.

			Walchand Co	llege of Engineering, Sa	ıgli					
			(Government	Aided Autonomous Institu	te)					
			Ca	AY 2022-23						
Drogre	mmo		D Tash (Inform	ation Technology)						
Close	Somo	ston	D. Iech. (Inform	ation recinology)						
Course Code 5IT231										
Cours	e Cou o Nor		Professional Fle	ctive 2. Fundamentals of	Distributed One	rating System				
Desire	d Reo	n misites:	Operating Syste	ms Distributed Network	Distributed Ope	rating System				
DUSIIC	u Kuy	uisites.	Operating Syster	ins, Distributed Network						
Tea	aching	Scheme		Examination Schen	ne (Marks)					
Lectu	re	3	MSE	ISE	ESE	Total				
		Hrs/week								
Tutori	ial	-	30	20	50	100				
		-		Credits: 3	5	I				
			C	ourse Objectives						
1	To iı	ntroduce fund	amental principles	s of distributed systems						
2	Toc	ompare vario	us distributed syst	em protocols						
3	To d	eliver the con	ncepts of commun	ication, process, naming a	nd synchronizati	on				
		Col	urse Outcomes (C	CO) with Bloom's Taxon	omy Level					
At the	end of	t the course, t	he students will be	e able to,						
СО		C	ourse Outcome S	tatement/s	Bloom's Taxonomy Level	Bloom's Taxonomy Description				
CO1	Com	prehend th	e fundamentals	of distributed operating	; II	Understanding				
CO2	Com	pare different	t distributed file sy	vstems	IV	Analysing				
CO3	Anal	vze distribute	ed web-based syste	em and applications	IV	Analysing				
		5	J							
Modu	le		Mod	lule Contents		Hours				
Ι	I L	ntroduction (Definition and	to distributed Sys goals, Hardware a	s tems and Software concepts, De	sign issues	6				
	0	Communicati	on & Synchroni	zation in distributed syst	ems:					
П	C is re R e	Computer Net ssues, synchr emote proced PC, DEC RI xclusion, Dea	work and Layered conization, Client lure call and imp PC Clock synchro adlock in distribute	protocols, Message passin Server model & its in lementation issues, Case onization and related algo ed systems	ng and related nplementation, Studies: SUN rithms, mutual	7				
Ш	exclusion, Deadlock in distributed systems Processes and processors & Distributed File Systems: Threads, system model, processor allocation, scheduling in distributed 5 III systems: Load balancing and sharing approach, fault tolerance, Real 5 III time distributed systems, Process migration and related issues 5									
IV	L L sj	Distributed S ntroduction, mplementatio pace, consiste	hared Memory: general architec n issues of DSM, ency models, repla	cture of DSM systems granularity, structure of cement strategy, thrashing	, design and shared memory	5				

V		Overview, Features, Basic concepts, System oriented names, Object locating mechanisms, Issues in designing human oriented names, Name caches, Naming and security, DNS Architecture, Processes, Communication, Naming, Synchronization, Consistency and Replication: 7 Web Proxy Caching, Replication for Web Hosting Systems, Replication 7 Ower Applications 7														
VI	VISecurity & Case Study Google FS/BigTable Introduction of Security in Distributed OS, Overview of security techniques, features, Need, Access Control, Security Management ,Java RMI, Sun Network File System, Google case study5															
	Text Books															
1	Pradeep K. Sinha "Distributed Operating Systems Concepts and Design", Wiley–Blackwell,11996															
2	Ge De	eorge esign	Coul ", Pea	ouris rson,	, Jea 2011	n Dol	llimo	re,Tin	n Kir	ndberg	g" <i>L</i>	oistrib	uted	Systems:	Concepts	s and
								Re	fereno	ces						
1	Su	inita l	Mahaj	an &	Seem	a Sha	h "D	istrib	uted C	Сотри	iting "	OXF	ORD,	2013		
								Use	ful Li	nks						
1																
							(СО-Р(O Ma	pping	5					
]	Progra	mme (Outcon	nes (PC))				PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	
CO1		2	1											2	2	
CO2		2													2	
CO3																
The str	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High															
Each C	10	of the	course	e mus	t mar	to at	least	one F	Ю.							

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)										
			l	AY 2022-23						
			Cou	rse Information						
Progra	amme		B.Tech. (Informa	tion Technology)						
Class,	Semes	ster	Third Year B. Te	ch., Sem VI						
Cours	Course Code 5IT332									
Cours	e Nam	e	Professional Elec	ctive - 2: Full Stack De	velopm	ent				
Desire	ed Req	uisites:	Web Technology	,	-					
Te	aching	Scheme		Examination Sch	eme (N	larks)				
Lectur	re	3 Hrs/week	MSE	ISE	ES	E		Total		
Tutori	ial	- 30 20 50 1								
		-		Credits	s: 3					
			,							
			Cou	irse Objectives						
1	To in	npart the desig	gn, development an	d implementation of st	atic and	l dynami	c web p	bages		
2	To de	evelop program	ns for web using So	cripting Languages						
3	To in	troduce conce	ept of responsive we	eb development		1				
At the	and of	the course th	rse Outcomes (CC	D) with Bloom's I axo	nomy I	Level				
At the		the course, th	e students will be a			Bloon	n's	Bloom's		
СО		С	Course Outcome St	tatement/s		Taxon	omv	Taxonomy		
						Leve	el l	Description		
COI	Illust	rate the basi	c elements and p	properties in different	web	Ш		Applying		
	appli	cations						~ .		
CO2	Creat	te static and dy	ynamic web applica	ations				Creating		
COS	Desig	gn and develop	p responsive web a	ppiications		VI		Creating		
Modu	le		Mo	dule Contents				Hours		
1110uu	H'	FML 5 and B	ootstran:					IIOUIS		
	Bo	otstrap Intro	duction							
	Int	roduction, G	etting Started, Gi	rid System, Fixed L	ayout,	Fluid L	ayout,			
т	Re	esponsive Lay	out, Typography					7		
1	Bo	otstrap Basic	es Elements:	a				,		
	Ju	mbotron open	link, Button, Butt	ion Groups, Grid, Tal	ole, For	m, Alert	, Wells	,		
	Da Pr	ogress Bar I i	st Group Dropdow	unon, Pager, Innage, un Collanse Tabs	Giypii	icoli,, C	arouser	,		
	In	troduction to	Node JS:	, conapse, 1005.						
	Ins	stall Node.js	Windows and Lin	ux, Modules, HTTP	Module	, URL N	Aodule.			
	Fin	rst Example.								
Π	Co	onsole, NPM:]	Package Manager,	Node Globals, Node.ja	s OS, 7	ïmer, Er	rors	7		
	Node JS Basics:									
	Assertion V8 Callbacks Events Punycode TTY Web Modules									
	Node JS and MySOL :									
Ш	III Create Connection, Create Database, Create Table, Insert Record, Update									
	Re	cord, Delete H	Record, Select Reco	ord, Select Unique, Dr	op Tabl	e				
	Re	eactJS			_					
T 7	Int	roduction, Te	mplating using JS2	X, Components, State	and Pro	ops, L	ifecycl	e		
IV	of	Components,	Kendering List ar	na Portals, Error Hand Service Side Dondar	iling,	Kouters	, Keduz	6		
	W	ebpack	5a, mmutaoie.js,	Service Side Kendel	mg,	Unit .	r coung,			

Python FrameworkIntroduction to Django, Installation of Django, The Basics of Dynamic, WebVPages, The Django Template System, Interacting with a Database: Models, The Django Administration Site, Form Processing, File Handling Email Functionalities, Sessions and Cookies6Ruby On Rails										
VI	Ruby On RailsIntroduction, RVM(ruby version manager), Working in Linux(Ubuntu)Platform, Ruby Operators & Ruby Shell, Ruby Data types & Variables, RubyVImethods and modules, OOP in Ruby, Basic loops and iteratorsRailsRailsRails Installation and Ruby gems, Databases, Statements, RAILS Model, Controller, and Views									
	Text Books									
1	Benjamin Jakobus "Mastering Bootstran 4" Packt Publisher 2nd Edition 2018									
2	Jake Spurlock, "Bootstrap: Responsive Web Development", O"Reilly Publica Edition, 2013	tion, 1st								
3	Ethan Brown, "Web Development using Node and Express", O"Really Publisher, 1st 2014.	Edition,								
	-									
	References									
1	Daniel Rubio," <i>Beginning Django Web Application Development and Deploym</i> <i>Python</i> ", ApressPublication, 1st Edition, 2017	ent with								
2	Michael Hartl," <i>Ruby on Rails 3 Tutorial Learn Rails by Example</i> ", Pearson H Publication,1 st Edition,2010	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	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1									1				2	
CO2			2		2									3
CO3			2		3									3
The stren	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High													

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

	Walchand College of Engineering, Sangli (Government Aided Autonomous Institute)											
			A	Y 2022-23								
Decement			Cour	se Information								
Progra	amme Somo	stor	B. Iech. (Informat	tion Technology)								
Class, Cours	semes e Code	e ster	5IT333	II., Selli VI								
Cours	e Nam	le	Professional Elec	tive - 2: 5G Technolo	ogy							
Desire	ed Req	uisites:	Computer Networ	rk								
Те	eaching	g Scheme		Examination Scl	heme ((Marks)						
Lectu	re 3 Hrs/week MSE ISE ESE Total											
Tutor	ial	-	30	20		50	100					
		-		Credit	ts: 3							
			~									
1	Te in			rse Objectives								
1		borate the key	v innovations in 50	ommunication								
3	Tode	esign and optim	nize the 5G networ	k in modern tools								
5	10 4		rse Outcomes (CO) with Bloom's Tax	onomy	/ Level						
At the	end of	the course, the	e students will be al	ble to,	J							
СО		Co	ourse Outcome Sta	tement/s		Bloom's Taxonomy Level	Bloom's Taxonomy Description					
CO1	DI Distinguish the evolution of 5G network and spectrum IV Artichallenges											
CO2	Illust	rate the 5G ph	ysical and function	al architecture		III	Applying					
CO3	Com	pare various ra	dio access technolo	ogies for 5G networks	s	IV	Analysing					
	_			-								
Modu	ile	4 1 4 1	Modu	le Contents			Hours					
I	E ai	volution of wind Demerits of	reless Communicat f 2G, 3G, 4G	ion Standards From 2	2G to 5	5G, Merits	6					
П	II R lo	ntroduction to equirements a ow latency com	5G: nd operating scenar munication, Desig	ios of 5G, 5G scenar ning 5G new radio	ios, Ul	tra reliable	7					
Ш	V W be	Vaveform Des Vaveform Desi eyond 5G, Cor	ign Aspects: gn Aspects of 2G, nparison of wavefo	Waveforms in 3G, 40 rms	G, 5G,	, Waveforms	6					
IV	5 L ba	G Carriers an ecFrame Struc andwidth, Cha	d Channels: ture in 5G NR, Nur nnel models for per	nerology in 5G and a formance evaluation	ndaptiv	ve subcarrier	7					
V	S N fc	ignal Processi 1IMO Signal F orming (mmWa	ng: Processing (Receive ave)	e Diversity) and Capa	acity, l	Hybrid beam	7					
VI	Torming (mmWave)Challenges in 5G: Spectrum availability and implementation,Deploying hybrid LTE-NR is critical, Complex network architecture, Demand for extensive 5G networks testing, Scarcity in 5G devices, Investment requirements, Regulations on radiation6											
			7	Text Books								
1 2	Asif Com Jonat	Oseiran, Jose I munications Te than Rodriquez	F.Monserrat and Pa echnology ", Cambr z, "Fundamentals of	trick Marsch, "5G M idge University Press f 5G Mobile Network	obile 6 s, 2016 ks ", W	and Wireless 5 Filey, 2015						

	References
1	Patrick Marsch, Omer Bulakci, Olav Queseth and Mauro Boldi, "5G System Design – Architectural and Functional Considerations and Long Term Research", Wiley, 2018
	Useful Links
1	Module I, II, III, IV, V https://nptel.ac.in/courses/108/105/108105134/
	CO PO Monning

						CO-I	PO Ma	apping	5						
		Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3		1										2		
CO2		2													
CO3	2		1											1	
The stren	The strength of mapping is to be written as 1: Low, 2: Medium, 3: High														

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Co (Government	llege of Engineeri Aided Autonomous	ng, Sangli S Institute)		
				AY 2022-23	,		
			Co	urse Information			
Progra	amme		B.Tech. (Informa	tion Technology)			
Class,	Semes	ter	Third Year B. Te	ch., Sem VI			
Cours	e Code		5IT334				
Cours	e Nam	e	Professional Elec	tive - 2: Data Hand	dling and M	achine Learni	ng
Desire	d Keq	uisites:					
Те	aching	Scheme		Examination	n Scheme (Marks)	
Lectur	re	3 Hrs/week	MSE	ISE	ESI	E	Total
Tutori	al	_	30	20	50		100
		_		<u> </u>	redits: 3		100
	1		Co	ourse Objectives			
1	To re	vise mathema	tical background of	f calculus, linear al	gebra and r	elate probabili	stic approaches
	usefu	I in data classi	incations		data'	1:601	
<u>Z</u>		xpiain various	uata nandling tech	inques involved in	uata science	e nie cycle	
3	nlatfo	emonstrate wo	rking of Machine I	earning functions	and algorith	ims using ope	n source
	platic	Со	ourse Outcomes (C	O) with Bloom's	Taxonomy	Level	
At the	end of	the course, the	e students will be a	ble to,			
СО		C	Course Outcome S	tatement/s		Bloom's Taxonomy Level	Bloom's Taxonomy Description
CO1	Follo soluti	w data pre-pr	ocessing technique	es to get optimized	l learning	II	Understanding
CO2	Pract cluste	ice Machine I	Learning algorithm	s for data classific	ation and	Ш	Applying
CO3	Exan perfo	nine feature e rmances	engineering aspects	s impacting the al	gorithmic	IV	Analysing
N. J.	1.		N				TT
Modu			Moc	lule Contents			Hours
Ι	P C P D	robability: onditional Pro robability, Exj istributions, J	bability, Bayes" Th pectation and Varia oint Distributions a	eorem, Independen ince, Discrete and (ind Covariance	nce, Theorer Continuous	n of Total	6
П	D D	ata Handling ata Sources -F	: Functional and Tech	nnical Aspects, Dat	ta-Collectio	n, Data	7
		ieaning, Data	rreparation, Data V	wrangiing			
Ш	Fi E	iltering and Re	epresenting Data, S d Eigenvectors Geo	calar/Vector / Mata metric Transforma	rix Formats ations	,	6
	F	eature Engine	eering:				
IV	Types of Features, Feature Engineering- Imputation, Discretization,7Categorical Encoding Techniques, Feature Splitting (Train-Test Split),7Handling ond Detecting Outliers, Variable Transformations, Scaling ond Creating Features7						
	E	ssentials of M	Iachine Learning:				
V	V Introduction to Regression, Classification and Clustering Algorithms, Linear and Non-Linear Models, Generalization, Optimization Functions 7						
1.77		lachine Lear	ning Applications	4	and II. 1	on Der -4'	
VI		sing Tools (e.g	g. Jupyter Notebool	k, Spyder, Google	and Hands Colab, Pow	erbi etc)	6
				Text Books			

2 Let \mathbf{D} be the level Manual Manual " M line is the second point of \mathbf{D} is a second point of the	
John Paul Mueller, Luca Massaron, <i>Machine Learning for Dummies</i> , 2 th Edition, 2021	
References	
All Modules taken from below link course.	
https://onlinecourses.nptel.ac.in/noc21_ma38/	
Useful Links	
A Detailed Guide for Data Handling Techniques in Data Science	
1 <u>https://www.analyticsvidhya.com/blog/2022/01/a-detailed-guide-for-data-handling-technic</u>	ues-in-
data-science/	
2 Essential Mathematics for Machine Learning, NPTEL course by IIT Roorkee	
https://nptel.ac.in/courses/111107137	
² Preparing Data for Machine Learning	
https://www.coursera.org/projects/preparing-data-for-machine-learning-models	

						CO-]	PO Ma	apping							
		Programme Outcomes (PO) PSO													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3		1										2		
CO2		2													
CO3	2		1											1	
The stren	gth of 1	mappin	ng is to	be wri	tten as	1: Lov	w, 2: N	ledium	, 3: Hi	gh					

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Colle (Government Ai	ege of Engineering, Sa ided Autonomous Institu	ngli ute)				
			A	AY 2022-23					
Due au			Cour D Tech (Informati	se Information					
Progr	amme	4	B. Iech. (Informati	lon Technology)					
Class,	Semes	ster	Third Year B. Tech	n., Sem VI					
Cours		-	511335 Decfereiten et Electi	0. I.T. C	1 A				
Docim	d Dog	e vicitos:	Computer Network	ive - 2: 101 Systems and	Applications				
Desire	eu neq	uisites:	Computer Network	48					
Т	eachin	g Scheme		Examination Sche	me (Marks)				
Lectu	re	3 Hrs/week	MSE	ISE	ESE	Total			
Tutor	rial - 30 20 50 100								
	- Credits: 3								
	1		Cou	rse Objectives					
1	To in	fer the concept	of Internet of Thing	gs (IoT).					
2	To ap	oply basic WSN	N protocols for IoT s	ystems.					
3	To cr	eate IoT based	applications in diffe	rent paradigms.	T 1				
A 1	1 0	Cor	urse Outcomes (CO)) with Bloom's Taxon	omy Level				
At the	end of	the course, the	students will be abl	e to,					
CO		C	ourse Outcome Stat	amontla	Bloom's	Bloom's			
CO	U Course Outcome Statement/s Taxonomy Taxonomy Level Description								
CO1	CO1 Apply IoT concept in real time scenario III Applying								
CO2	CO1Apply for concept in real time scenarioIIIApplyingCO2Analyze use of WSN protocols in IoT applicationsIIIApplying								
CO3	Deve	lop IoT enable	d services		VI	Creating			
		- I				6			
Modu	Module Module Contents Hours								
Mout	Iodule Module Contents Hours I Introduction to IoT: 7								
Ι		ntroduction to ensing, Actuati	IoT: on, Basics of Netwo	le Contents rking, Communication	Protocols	Hours 7			
I II	IIC III So N	ntroduction to ensing, Actuati ensor Network lachine-to-Mac	IoT: on, Basics of Netwo s: chine Communicatio	le Contents rking, Communication ns, Interoperability in I	Protocols	Hours 7 7 7			
	III So So M In In In R	ntroduction to ensing, Actuati ensor Network Iachine-to-Mac atroduction toIc tegration of Se rogramming, In aspberry Pi	Modul IoT: on, Basics of Netwo ss: whine Communicatio T Programming: msors and Actuators atroduction to Raspbe	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation	Protocols DT tion to Python of IoT with	Hours 7 7 7 7 7			
	In the second se	ntroduction to ensing, Actuati ensor Network Iachine-to-Mac itroduction toIc tegration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: onsors and Actuators atroduction to Raspbe SDN: ata Handling and Ana	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi	Protocols DT tion to Python of IoT with ng, Sensor-Cloud,	Hours 7 7 7 6			
I I II III IV V	In the second se	ntroduction to ensing, Actuati ensor Network lachine-to-Mac attroduction tolo tegration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT	IoT: on, Basics of Netwo ss: chine Communicatio of Programming: ensors and Actuators attroduction to Raspbe SDN: ata Handling and Ana n: Smart Homes, Com	le Contents rking, Communication ns, Interoperability in le with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart	Protocols T tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial	Hours 7 7 7 6 6			
I II III IV V VI	In Second	ntroduction to ensing, Actuati ensor Network lachine-to-Mac introduction tolo tegration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT ase Study: Ag	IoT: on, Basics of Netwo ss: chine Communicatio of Programming: choors and Actuators atroduction to Raspbe SDN: uta Handling and Ana n: Smart Homes, Com- riculture, Healthcare	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart c, Activity Monitoring	Protocols oT tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial	Hours 7 7 7 6 6 6			
I II II IV IV V	In the second se	ntroduction to ensing, Actuati ensor Network lachine-to-Mac attroduction tolo ategration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT case Study: Ag	IoT: on, Basics of Netwo ss: chine Communicatio of Programming: msors and Actuators attroduction to Raspbe SDN: ata Handling and Ana n: Smart Homes, Com riculture, Healthcare	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Fext Books	Protocols T tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial	Hours 7 7 7 6 6 6			
I II III III IV V VI	In Solution of Content	ntroduction to ensing, Actuati ensor Network lachine-to-Mac introduction to lo itegration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT ase Study: Ag deep Bahga an on, 2014	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: consors and Actuators introduction to Raspbe SDN: uta Handling and Ana n: Smart Homes, Com- riculture, Healthcare J d Vijay K. Madisett	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Fext Books ti, <i>"Internet of Things</i> :	Protocols DT tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial A Hands-on App.	Hours 7 7 7 6 6 6 6 7			
I II III IV V VI 1 2	In Contract of the second seco	ntroduction to ensing, Actuati ensor Network lachine-to-Mac attroduction tolo attegration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT dase Study: Ag deep Bahga an on, 2014 iel Greengard,	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: msors and Actuators attroduction to Raspbe SDN: atta Handling and Ana n: Smart Homes, Communication riculture, Healthcare d Vijay K. Madisett <i>"The internet of thin</i>	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Fext Books ti, <i>"Internet of Things:</i>	Protocols T tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial A Hands-on App. ition, 2015	Hours 7 7 7 6 6 6 6 7 6 7 6 6 7 7 6 6 7 7 6 7 6 7 6 7 7 6 6 7 7 7 6 7 7 7 6 6 7 7 7 6 7 7 7 6 7 7 7 6 7 7 7 7 7 7 7			
I II III IV V VI 1 2	In Contract of the second seco	ntroduction to ensing, Actuati ensor Network lachine-to-Mac introduction to loc itegration of Se cogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT deep Bahga an on, 2014 iel Greengard,	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: consors and Actuators introduction to Raspbe SDN: ata Handling and Ana n: Smart Homes, Com- riculture, Healthcare d Vijay K. Madisett <i>"The internet of thin</i>	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Fext Books ti, <i>"Internet of Things:</i> <i>ugs"</i> , MIT Press, 1st Ed	Protocols DT tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial A Hands-on App. ition, 2015	Hours 7 7 7 6 6 6 7			
I II III IV V VI 1 2	In the second se	ntroduction to ensing, Actuati ensor Network lachine-to-Mac attroduction tolo ategration of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT ase Study: Ag deep Bahga an on, 2014 nel Greengard,	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: consors and Actuators introduction to Raspbe SDN: tta Handling and Ana n: Smart Homes, Communication riculture, Healthcare d Vijay K. Madisett <i>"The internet of thim</i>	le Contents rking, Communication ns, Interoperability in Ia with Arduino, Introduc erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Text Books ti, <i>"Internet of Things:</i> <i>ags"</i> , MIT Press, 1st Ed References	Protocols T tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial A Hands-on App. ition, 2015	Hours 7 7 7 6 6 6 7			
I II II IV IV V VI 1 2 1	In and U	ntroduction to ensing, Actuati ensor Network lachine-to-Mac attroduction tolo attroduction of Se rogramming, In aspberry Pi ntroduction to DN for IoT, Da og Computing OT Application mart Cities and oT case Study: Ag deep Bahga an on, 2014 nel Greengard, uru Raj and Am Use Cases", CF	Modul IoT: on, Basics of Netwo ss: chine Communicatio of Programming: ensors and Actuators atroduction to Raspbe SDN: ata Handling and Ana n: Smart Homes, Communication riculture, Healthcare d Vijay K. Madisett <i>"The internet of thin</i> upama C. Raman, <i>"E</i> RC Press, 1 st edition,	le Contents rking, Communication ns, Interoperability in Id with Arduino, Introduce erry Pi, Implementation alytics, Cloud Computi nected Vehicles, Smart e, Activity Monitoring Fext Books ti, <i>"Internet of Things:</i> <i>ags "</i> , MIT Press, 1st Ed References <i>The Internet of Things:</i> 2017	Protocols T tion to Python of IoT with ng, Sensor-Cloud, Grid, Industrial A Hands-on Appl ition, 2015 Enabling Technol	Hours 7 7 7 6 6 6 6 9 0gies, Platforms,			

						Us	eful L	inks							
1	https://	ps://onlinecourses.nptel.ac.in/noc19_cs65/preview													
						CO-l	PO Ma	apping							
				P	rogra	mme C)utcon	nes (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 str	ength of	mappii	ng is to	be wri	itten as	1: Lov	w, 2: M	ledium	, 3: Hi	gh					
Each C	CO of the	course	must r	nap to	at leas	t one P	О.								

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher's assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Coll (Government A	ege of Engineering, Sangli Nided Autonomous Institute)					
	AY 2022-23								
			Cou	rse Information					
Progra	amme		B.Tech. (Informat	tion Technology)					
Class,	Semes	ter	Third Year B. Tec	ch., Sem VI					
Cours	e Code	<u>.</u>	50E392						
Cours	e Nam	e	Open Elective 3:	Web Development and Appl	lications				
Desire	d Req	uisites:	Computer Program	nming					
Te	eaching	g Scheme		Examination Scheme	(Marks)				
Lectur	re	2 Hrs/week	MSE	ISE	ESE	Total			
Tutori	al	-	30	20	50	100			
	- Credits: 2								
	Course Objections								
1	Toir	troduca fundar	Col mentals of web dasis	urse Objectives					
2		mpare client s	ide scripting and sta	gn Itic web page design					
3	Toex	plain server si	ide scripting langua	ge for dynamic page develop	ment				
		Co	urse Outcomes (CO	D) with Bloom's Taxonomy	Level				
At the	end of	the course, the	e students will be ab	le to,	-				
CO		C	<u>O</u> 4 <u>C</u> 4-		Bloom's	Bloom's			
CO		C	ourse Outcome Sta	atement/s	I axonom Level	y Laxonomy Description			
CO1	Use v	veb and multin	nedia elements in w	eb pages	III	Applying			
CO2	Imple	ement static an	d dynamic scripting	for web applications	Ш	Applying			
CO3	CO2 Implement static and dynamic scripting for web applications III Applying								
	CO3Compare various web services for web deploymentIVAnalysing								
	Com	Jare various we	eb services for web	deployment	IV	Analysing			
Modu	le		Mod	ule Contents	IV	Analysing Hours			
Modu	le Ir	atroduction to	Mod Internet and Web Services for medi	ule Contents :		Analysing Hours			
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	JavaScript:							
v	V The Basic of JavaScript: Objects, Primitives Operations and Expressions, Screen Output and Keyboard Input, Control Statements, Object Creation and Modification, Arrays, Functions, Constructors, Pattern Matching ,Positioning Moving and Changing Elements							
	Web Services And Web application							
VI	VI Introduction to Web Service, Web Services Basics – Creating, Publishing,							
	WSDL, SOAP, RSS, Web Application, examples of web applications.							
	Text Books							
1	Jennifer Niederst Robbins "Learning Web Designing", O"Reilly Publications", 5th Ec	lition,2018						
2	2 Thomas A. Powell " <i>Web Design: The Complete reference</i> " Mc Graw Hill/ Osborne, 1st Edition, 2000							
3	Robin Nixon, "Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guid Dynamic Websites", O"Reilly Publications, 3rd Edition, 2014	le to Creating						
	References							
1	Erik T. Ray "Learning XML" O"Reilly Publications, 1st Edition, 2001							
2	Chris Bates, "Web Programing Building Internet Applications", WILEY, Dreamter 2000	h 2nd Edition,						
	Useful Links							
1	1 https://www.coursera.org/learn/web-development#syllabus							
2	2 https://www.coursera.org/learn/duke-programming-web#syllabus							
3	3 https://www.javatpoint.com/php-tutorial							
4	https://www.javatpoint.com/xml-tutorial							
5	https://www.softwaretestinghelp.com/web-services-tutorial/							

						CO-]	PO Ma	apping	g					
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	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1									1				2	
CO2			2		2									3
CO3			2		3									3
The stren	gth of	mappi	ng is t	o be w	ritten a	as 1: L	ow. 2:	Mediu	ım. 3:	High	1	1		1

Assessment

The assessment is based on MSE, ISE and ESE.

MSE shall be typically on modules 1 to 3.

ISE shall be taken throughout the semester in the form of teacher"s assessment. Mode of assessment can be field visit, assignments etc. and is expected to map at least one higher order PO.

ESE shall be on all modules with around 40% weightage on modules 1 to 3 and 60% weightage on modules 4 to 6.

			Walchand Coll (Government A	ege of Engineering, Sa ided Autonomous Institu	ngli ute)			
				AY 2022-23				
D				rse Information				
Progra	amme		B. Tech. (Informat	ion Technology)				
Class,	Seme	ster	Third Year B. Tec	h., Sem VI				
Cours	e Cod	e	50E393	En la mandala af Maria	· · · · · · · · · · · ·			
	d Ran	le misitos:	Open Elective - 4:	Fundamentals of Mach	ine Learning			
Desire	u nu	uisites.						
T	eachin	g Scheme		Examination Sche	eme (Marks)			
Lectu	re	3 Hrs/week	MSE	ISE	ESE	Total		
Tutor	ial	-	30	20	50	100		
		-		Credits	: 3			
			Car	ma Objectives				
1	Toe	volain the conc	ent supervised and u	Irse Objectives	arning technique	20		
2	Toi	troduce variou	s machine learning	algorithms	anning teeninque			
3	Tod	iscuss problem	solving approaches	using appropriate mach	ine learning tech	nniques.		
		Co	urse Outcomes (CO)) with Bloom's Taxon	omy Level	1		
At the	end of	f the course, the	e students will be ab	le to,				
					Bloom's	Bloom's		
CO	CO Course Outcome Statement/s Taxonomy Taxonomy							
	Level Description Compare various machine learning algorithms for Regression IV Analysing							
CO1	CO1 Compare various machine learning algorithms for Regression IV Analysing							
CO2	App	ly appropriate 1	earning algorithm fo	or a problems.	III	Applying		
CON	Eval	uate Machine	Learning algorith	ms with performance	V	Evaluating		
03	para	meters.		*				
	•					**		
Modu		ntus du stism s	Module A Decreasion A not	e Contents		Hours		
	1	Achine Learni	nd Regression Anal	ysis isad laarning Unsuperv	rised learning			
I	li	inear regression	ng concepts, Superv	sost function, gradient	descent. linear	7		
	r	egression with	multiple variables: g	gradient descent				
	Ι	ogistic Regres	sion					
П	C	Classification,	hypothesis repres	entation, decision be	oundary, cost	6		
-	f	unction, simpli	fied cost function a	nd gradient descent, op	timization, one	C C		
		78 all rtificial Nour	al Notworks.					
Ш	I	ntroduction. E	Early Models. Perc	ceptron Learning. Ba	ckpropagation.	6		
	I	nitialization, Tr	raining & Validation		r room ,	-		
	S	Support Vector	r Machine:					
IV	0	Optimization of	ojective, mathematic	es behind large margin	classification,			
	kernels using as SVM							
	Regularization bias/ Variance trade-off error analysis ensemble							
V	n	nethods. pract	tical advice on	how to use learnin	g algorithms.	_		
	p	precision/recall	trade-off		J	7		
	τ	J nsupervised I	Learning					
VI	C	Clustering, k-me	eans, EM, principal	component analysis, out	liers detection	-		
						6		
				Text Books				
-	Trev	or Hastie. Roh	ert Tibshirani. Jeroi	me H. Friedman. "The	Elements of Sta	tistical Learning".		
1	Sprin	nger, 2nd Editio	on, 2009.	- 7				
1								

	References
1	Christopher Bishop, "Pattern Recognition and Machine Learning", Springer, 1st Edition, 2006.
	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				
The strength of manning	is to be written	00 1. L ou 2.	Modium 2.	Uigh			

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

Assessment

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MSE shall be typically on modules 1 to 3.

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