M.Sc., (COMPUTER SCIENCE) (Candidates admitted from 2021-2022 Onwards)

REGULATIONS I. SCOPE OF THE PROGRAMME

Master of Computer Science can be considered to be one of the most prominent Master's level programs in our country. This program mainly deals with the development of computer applications for the purpose of updating computer programming languages. M.Sc.(CS) also aims at creating strong knowledge of theoretical computer science subjects who can be employed in research and development units of industries. The course has a time period of two years with four semesters.

II. SALIENT FEATURES

- > Regular conduct of guest lectures and seminars
- Campus recruitment
- > Provides facilities such as internet access and in-house library
- > Provides career guidance for Post Graduate Courses and the Certifications in programming languages
- Conduct of personality development program
- Visiting faculties from industries

III. OBJECTIVES OF THE COURSE

The course objective of the M.Sc.Computer Science program is to provide advanced and in-depth knowledge of computer science and its applications to enable students pursue a professional career in Information and Communication Technology in related industry, business and research. The course designed to impact professional knowledge and practical skills to the students.

IV. ELIGIBILITY FOR ADMISSION

A Candidate who has passed B.Sc. Computer Science /BCA/B.Sc. Computer Technology / B.Sc. Information Science Degree of Periyar university or any of the Degree of any other university accepted by the syndicate as equivalent thereto subject to such conditions as may be prescribed therefore shall be permitted to appear and qualified for the M.Sc. Computer Science Degree Examinations of the Periyar University after a course of study of two academic years.

V. DURATION OF THE PROGRAMME

- The course shall extend over a period of two academic years consisting of four semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to April.
- The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women (Autonomous) with the approval of Periyar University.

VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the Internal Assessment Marks will be as under:

	Total	=	25 Marks
4.	Attendance	-	05 Marks
3.	Assignment	-	05 Marks
2.	Seminar	-	05 Marks
1.	Average of two Tests	-	10 Marks

Internal Assessment Marks for Practical

	Total	=	40 Marks
3.	Test	-	20 Marks
2.	Observation	-	10 Marks
1.	Attendance	-	10 Marks

PASSING MINIMUM (Theory) - EXTERNAL

In the Semester Examinations, the passing minimum shall be 50 % out of 75 Marks. (38 Marks)

PASSING MINIMUM (Practical) - EXTERNAL

In the Semester Examinations, the passing minimum shall be 50 % out of 60 Marks. (30 Marks)

DISTRIBUTION OF MARKS

Program writing	: 10 Marks
Debugging	: 10 Marks
For Results	: 05 Marks
Viva – voce	:05 Marks

The Passing minimum shall be 50% out of 60 marks (30 Marks)

VII. ELIGIBILITY FOR EXAMINATION

PERCENTAGE	MARKS	
	THEORY	PRACTICAL
75-80	1	2
81-85	2	4
86-90	3	6
91-95	4	8
96-100	5	10

A candidate will be permitted to appear for the Semester Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. A candidate having 65% to 74% of attendance should pay condination fees prescribed by the controller of Examination office.

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (Main and Elective subjects) and securing marks

- a) 75% and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.
- b) 60% and above but below 75% shall be declared to have passed the examinations in first class without Distinction.
- c) 50% and above but below 60% shall be declared to have passed the examinations in second class.

- d) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of two consecutive academic years from the year of admission only will be eligible for University rank.
- e) If she fails to complete her course within the specified period, she can extend for two year's to complete her course.

IX. ELIGIBILITY FOR AWARD OF THE DEGREE

A candidate shall be eligible for the award of the degree only if she has undergone the above degree for a period of not less than two academic years comprising of four semesters and passed the examinations prescribed and fulfilled such conditions have been prescribed therefore.

X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the semester examination in the concerned subject in subsequent semesters and shall pass the examination.

XI. COMMENCEMENT OF THE REGULATIONS

- The regulations shall take effect from the academic year 2021-2022 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2021-22 and thereafter.
- Candidates who were admitted to the PG course of study before 2018-19 shall be permitted to appear for the examinations under those regulations for the period of three years ie., upto and inclusive of the examinations of 2018-19. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

EVALUATION OF EXTERNAL EXAMINATIONS (EE) QUESTION PAPER PATTERN

_ ,						
	Knowledge Level	Section	Marks	Description	Total	
	K1 ,K2,K3,K4	A (Answer All)	20 x 1 = 20 Marks	One Marks		
	K1 ,K2,K3,K4	B (Either or Pattern)	5 x 5=25 Marks	Short Answers	75	
	K1 ,K2,K3,K4	C (3 out of 5)	3 x 10= 30 Marks	Descriptive Type		

External Evaluation (Theory)

Internal Evaluation (Theory)

Knowledge Level	Section	Marks
K1 ,K2,K3,K4	CIA -1 and CIA -2	5
K1 ,K2,K3,K4	Model	5
K1 ,K2,K3,K4	Seminar	5
K1 ,K2,K3,K4	Assignment	5
-	Attendance	5
	Total	25

QUESTION PAPER PATTERN – PRACTICAL

Time duration: 3 Hours

Max. Marks: 60

- 1. One compulsory question from the given list of programs : 30 Marks
- One Either / OR type question from the given list of programs : 30 Marks The Passing minimum shall be 50% out of 60 marks (30 marks)

Distribution of Marks

Problem Understanding : 05 Marks

Program writing	: 10 Marks
Debugging & Result	: 10 Marks
Viva voce	: 05 Marks

QUESTION PAPER PATTERN – Project and Viva voce

Evaluation (External)	: 150 Marks
Viva-voce (External)	: 50 Marks

Continuous Assessment Test (CIA 1 and CIA 2)

Knowledge Level	Section	Marks	Description	Total	
K1	A (Answer All)	10 x1= 10 Marks	MCQ/define		
K2	B (Either or Pattern)	1x 5= 5 Marks	Short Answers	25	
К3	C (Answer 4 out of 6)	1x 10= 10 Marks	Descriptive		

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCE FOR WOMEN (AUTONOMOUS) ELAYAMPALAYAM, TIRUCHENGODE, NAMAKKAL DT.

VISION

To evolve into a center of excellence in higher education through creative and innovative practices to social equity for women.

MISSION

- To provide sufficient learning infrastructure to the students to pursue their studies.
- To provide good opportunity for higher education and favorable environment to the students to acquire education.
- To provide quality academic programs training activities and research facilities.
- To facilitate industry-institute interaction.

PG DEPARTMENT OF COMPUTER SCIENCE

VISION

To provide high academic goals to the students and make them the world leaders both in educational and research through effective teaching.

MISSION

- To create, share and apply knowledge in Computer Science including inter disciplinary areas that extends the scope of Computer Science and benefit humanity.
- To educate students to be successful, ethical and effective problem solvers.
- To prepare the students to contribute positively to the economic well being of our region and nation.

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) DEPARTMENT OF COMPUTER SCIENCE - M.Sc(CS) CURRICULUM (2021-2022 Onwards)

SEM Q 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 111 21P30 112 21P30	COURSE			RRICULUM (2021-	MARKS		
21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21	CODE	TITLE	CREDIT	HOUR	CIA	EE	TOTAL
21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21	P1CS01	Core Course- 1 - Advanced Computer Organization and Architecture	4	4	25	75	100
1 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30 21P30 21P30 21P30	P1CS02	Core Course – 2 - Design and Analysis of Algorithms	4	4	25	75	100
I 21P10 21P10 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30	P1CS03	Core Course- 3 - Web Technologies	4	4	25	75	100
21P10 21P10 21P10 21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21	P1CS04	Core Course- 4 - Advanced Database Management Systems	4	4	25	75	100
21P10 21P10 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30	P1CS05	Core Course- 5 - Software Project Management and Quality Assurance	4	4	25	75	100
21P10 21P20 21P30 21	P1CSE_	Elective I -	4	2	25	75	100
21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30 21P30	P1CSP01	Core Course Practical - 1 - Advanced Database Management Systems lab	3	4	40	60	100
21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30 21P30	P1CSP02	Core Course Practical - 2 - Web Technologies Lab	3	4	40	60	100
21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30		Total	30	30	230	570	800
II 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30 21P30 21P30	P2CS06	Core Course – 6 - Advanced Concepts in Operating System	4	4	25	75	100
II 21P30 21P20 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30	P2CS07	Core Course – 7- Advanced Java Programming	4	4	25	75	100
21P30 21P20 21P20 21P20 21P20 21P30 21P30 21P30 21P30 21P30	P2CS08	Core Course - 8 - Data Mining and Warehousing	4	4	25	75	100
21P20 21P20 21P20 21P30 21P30 21P30 21P30 III 21P30	P3CS09	Core Course - 9 - Network Security	4	4	25	75	100
21P20 21P20 21P30 21P30 21P30 21P30 III 21P30	P2CSE_	Elective II -	3	4	25	75	100
21P20 21P30 21P30 21P30 21P30 21P30 III 21P30	P2CSE_	Elective III -	3	4	25	75	100
21P30 21P30 21P30 21P30 21P30 III 21P30	P2CSP03	Core Course Practical – 3- Advanced Java Programming Lab	2	4	40	60	100
21P30 21P30 21P30 111 21P30	P2CSPR01	Mini Project-I-Domain Study	2	2	40	60	100
21P30 21P30 21P30 21P30 21P30		Total	26	30	230	570	800
21P30 21P30 III 21P30	P3CS10	Core Course – 10-Soft Computing	4	4	25	75	100
21P30 III 21P30	P3CS11	Core Course – 11-Python Programming	4	4	25	75	100
III 21P30	P3CS12	Core Course – 12 - Cloud computing	4	4	25	75	100
21P30	P3CSE-	Elective Course – IV	4	4	25	75	100
		EDC - Resource Management Techniques	4	4	25	75	100
21P30	P3CSP04	Core Course Practical – 4 – Python Programming Lab	2	5	40	60	100
1 1	P3CSPR02	Mini Project II	3	5	40	60	100
		Human Rights	1	-	25	75	100
		Total	26	30	230	570	800
IV 21P40	P4CSPR03	Project	9	-	50	150	200
		Total	9	-	50	150	200
		Grand Total	91	90	740	1860	2600

Elective I

	Course Code	Title
	21P1CSE01	Theory of Computation
Semester I	21P1CSE02	Mobile Communication
	21P1CSE03	Client Server Technology
	21P1CSE04	Internet of Things

Elective II

	Course Code	Title			
	21P2CSE05	Big Data Analytics			
Semester II	21P2CSE06	Multimedia and Virtual Reality			
	21P2CSE07	AI and Expert System			
	21P2CSE08	Compiler Design			

Elective III

	Course Code	Title				
	21P3CSE09	Ad-Hoc Sensor Network				
Semester II	21P3CSE10	Object Oriented Analysis and Design				
	21P3CSE11	Embedded Systems				
	21P3CSE12	Wireless Application Protocol				

Elective IV

	Course Code	Title				
	21P3CSE13	Cyber Security and Computer Forensics				
Semester III	21P3CSE14	Digital Image Processing				
	21P3CSE15	Distributed Computing				
	21P3CSE16	Professional Ethics				

EDC-EXTRA DISCIPLINARY COURSE

Students are expected to opt EDC (Non Major Elective) offered by other departments.

I.A. – INTERNAL ASSESSMENT

E.E. – END SEMESTER EXAMINATIONS

The content of the syllabus and regulations may be followed for at least two sets of students from 2021-22 and it passed in the academic year 2023-2024.



HOUSE AND	VIVEKAN	ANDHA COLLEGE WOMEN (AU	TONOMO	US)	NCES FO	OR	TÜVRheinland CERTIFIED ISO 9001-2008			
"SW EMPOWER"	MG	Elayampalayam, Ti			D L		2021-2022			
Programme	M.Sc Programme Code PCS Regulations									
Department	Computer Science Semester									
			Periods	Credit	Maxim	um Mar	ks			
Course Code	C	course Name	per Week							
			L T P	С	CA	ESE	E Total			
21P1CS01	ADVANCED ORGANIZA	COMPUTER								
21110301	ARCHITECT									
			4 0 0	4	25	75	100			
COURSE	To know Structur	re and functions of Compute	er architecture	and organizati	ions Obser	ve the c	haracteristics of			
OBJECTIVES		r memory concepts. To under		•						
	-	erstand the parallel processi		L						
POs			GRAMME OU	TCOME						
FOS										
PO 1		e of computing fundamental		-						
	• • • •	opriate for the computing spo			n and conce	eptualiz	ation of			
		ls from defined problems an	-		1.1	1	h			
PO 2		te, research literature, and so g fundamental principles of	-			-				
	disciplines.	g fundamental principles of	mautematics, c	omputing set	ences, and	leievain	uomani			
PO 3	-	ate solutions for complex contracts	omputing prob	lems, and desi	gn and eva	luate				
	-	ents, or processes that meet s			-		for public health			
		al, societal & environmental	-				I			
PO 4	Use research-bas	ed knowledge and research	methods includ	ling design of	experimen	ts, anal	ysis and			
	interpretation of	data, and synthesis of the int	formation to pr	ovide valid co	onclusions.					
PO 5		apt and apply appropriate te	-		dern comp	uting to	ols to complex			
		ties, with an understanding of								
PO 6		commit to professional ethic	s and cyber reg	gulations, resp	onsibilities	s, and no	orms of			
PO 7	professional com	puting practice.	magazin inda	andont loomi	na for cont	inual da	walanmant as a			
PO /	computing profes	•	angage in indep		ing for cont	muai de	evelopment as a			
PO 8		wledge and understanding of	of the computir	g and manage	ement princ	viples ar	nd apply these to			
		s a member and leader in a t	-	• •	-	-				
	environments.		, C	1 5		1	5			
PO 9	Communicate eff	fectively with the computing	g community, a	nd with socie	ty at large,	about c	omplex			
	computing activi	ties by being able to compre	hend and write	e effective rep	orts, desigr	n docum	nentation, make			
	effective presenta									
PO 10		assess societal, environment								
	global contexts, and the consequential responsibilities relevant to professional computing practice.									
PO 11		Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary								
PO 12	environments.	opportunity and using innov	ution to mine-	a that annot	nity to ano	to vol-	and wealth for			
PO 12		opportunity and using innov the individual and society a	-	e mai opportu	muy to crea	ue value	t and wearth for			
PO 13		dge of computing to create e		ns and solution	ns for com	olex pro	blems. To			
		and synthesize scholarly lite								
PO 14		tific outlook that solves any			-					
	demands.	, and the second s	- /		•					

PO 15	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Recognize the operation of functional units of a computer and chip
CO 2	Compare the performance of different types of memory
CO 3	Describe the computational operation of hardware units associated with a computing device
CO 4	Demonstrate the operation of processing unit
CO 5	Recognize the operation of parallel processing
Pre-requisites	Computer Organization and Architecture

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

								Mappin	a						
		(3/2	/1 indic	cates the					-	2-mediu	m, 1-we	ak)			
CC)s	KLs POs KLs													
									РО	1			1		
CO	1				1				PO	2			2	2	
									PO				4	ŀ	
									PO				4		
CO	2				2				PO				3		
									PO				3		
									PO				5		
CO	3				3				PO				5		
								PO 9				5			
СО	. 4		4					PO 10 PO 11				4 4			
	4							PO 11 PO 12				4			
								PO 12				4			
CO	5		5					PO 13					4		
00	5							PO 15				4			
						CO /	PO Ma	pping	-	-					
		(3/2	/1 indic	cates the	e streng				trong, 2	2-mediu	m, 1-we	eak)			
						Р	rogram	me Ou	tcome ((POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO5	1	1	2	2	1	1	1	3	3	2	2	2	2	2	2

Direct

- 1. Continuous Assessment Test I, II & Model
- 2. Assignment
- 3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction	Periods	12						
	Structure and Function-Computer Evaluation and Performance: Histo	ory of computers	s- Designing f						
Unit - I	Performance: Microprocessor speed-performance balance-Improvem								
	architecture. Computer Function and Interconnection: Computer Compone	ents-Computer Fu	nction:						
	Instruction Fetch and Execute. Interconnection structures.								
	Cache Memory	Periods	12						
	Characteristics of Memory Systems-Memory hierarchy-Cache memory pr								
Unit - II	design: Cache size-Mapping function. Internal Memory: Semi-conductor main memory: Organization-								
	DRAM & SRAM. External Memory: Magnetic Disk: read and write mech	anism							
	Computer Arithmetic	Periods	12						
	ALU-Integer Representation: Sign magnitude representation-Twos complement Representation-Fixed poir								
Unit - III	Representation. Integer Arithmetic: Negation-Addition & Subtraction. Instruction Sets: Characteristics &								
	Functions: Machine Instruction characteristics: Elements of Machine Instruction. Instruction Sets:								
	Addressing Modes and Formats: Addressing: Immediate- Direct- Indirect	ſ							
	Processor structure & Function	Periods	12						
	Processor Organization- Register organization- Instruction cycle. Control Unit Operations: Micro								
Unit - IV	Operations: The fetch cycle- The Indirect Cycle- The Interrupt cycle- The Execute Cycle- The instruction								
	Cycle. Control of the Processor: Functional Requirements-Control Signals	6							
	Parallel Processing	Periods	12						
	Multiple Processor Organizations: Types of parallel processor Systems- Parallel Organizations. Symmetric								
Unit - V	Multiprocessors: Organization-Multiprocessor Operating System Design considerations. Cache Coherence								
	and the MESI Protocol: Software Solutions-Hardware Solutions-Snoopy Protocols-The MESI								
	Protocol-Read Miss-Read Hit-Write Miss-Write Hit.								
	Total Periods		60						
	10101101000								

Text Books	
1	Computer Organization & Architecture - Designing for Performance by William Stallings, 10th
	Edition, 2016, PEARSON Prentice Hall Publication. (Unit –I: Chapter 1,2 &3 Unit-II : Chapter 4,5&6
	Unit-III : Chapter 9,10&11 Unit – IV: Chapter 12 &16 Unit –V: Chapter 18)
References	
1	Computer Systems Organizations & Architecture by John D. Carpinelli, First Edition, 2007, PEARSON
	Prentice Hall Publication.
2	Computer Architecture: Concepts and Evaluation by Gerrit A. Blaauw, First Edition, 2008, PEARSON
	Prentice Hall Publication.
3	Computer System Architecture and Parallel Processing by Kai Hwang, Faye A. Briggs, 2009, McGraw-Hill
	Publications.
4	Computer organization & Design by David A Peterson and John L Hennessy, 2013, Fifth Edition.
E-References	·
1	www.tutorialspoint.com/computer_organization/index.asp
2	en.wikipedia.org/wiki/Computer_architecture
3	www.slideshare.net/kumar_vic/computer-system-architecture
4	www.cs.ucr.edu > ~bhuyan > Lecture1-2
5	ece752.ece.wisc.edu/lect01-intro.ppt

0



WOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.											
Programme	M.Sc Programme Code	PC	Ś	Regulations	2021-2022							
Department	Computer Science		Semester		1							
	Periods Credit Maximum Marks											
Course Code	Course Name	per Week										
		L T P	С	CA ES	E Total							
21P1CS02	DESIGN AND ANALYSIS OF			I I								
211 10502	ALGORITHMS	4 0 0	4	25 75	100							
COURSE	To Know the Fundamentals of the Analysis	-	ficiency. Und	lerstand the divide	e and conquer							
OBJECTIVES	methodology.Analysis search and boundary	algorithm										
POs	PRO	OGRAMME OU	TCOME									
PO 1	Apply knowledge of computing fundamenta											
	knowledge appropriate for the computing sp	-		and conceptualiz	ation of							
	computing models from defined problems a	-										
PO 2	Identify, formulate, research literature, and	-	1 01	U								
	conclusions using fundamental principles of	t mathematics, co	omputing scie	ences, and relevan	t domain							
PO 3	disciplines. Design and evaluate solutions for complex of	computing probl	ame and dasi	an and avaluate								
105	systems, components, or processes that meet			•	for public health							
	and safety, cultural, societal & environmental	-	with appropri		for public iteatur							
PO 4	Use research-based knowledge and research		ing design of	experiments, ana	vsis and							
	interpretation of data, and synthesis of the in			-	5							
PO 5	Create, select, adapt and apply appropriate t	echniques, resou	irces, and mo	dern computing to	ools to complex							
	computing activities, with an understanding											
PO 6	Understand and commit to professional ethi	cs and cyber reg	ulations, resp	onsibilities, and n	orms of							
	professional computing practice.											
PO 7	Recognize the need, and have the ability, to	engage in indep	endent learnii	ng for continual d	evelopment as a							
PO 8	computing professional. Demonstrate knowledge and understanding	of the computin	a and manage	mont principles a	nd apply those to							
r0 a	one own work, as a member and leader in a	-										
	environments.	team, to manage	e projects and	in mutualselpina	li y							
PO 9	Communicate effectively with the computir	ng community, a	nd with societ	ty at large, about	complex							
	computing activities by being able to comp	rehend and write	effective repo	orts, design docur	nentation, make							
	effective presentations.											
PO 10	Understand and assess societal, environmen	ital, health, safet	y, legal, and c	cultural issues with	nin local and							
	global contexts, and the consequential respo		-									
PO 11	Function effectively as an individual and as	a member or lea	der in diverse	e teams and in mu	ltidisciplinary							
DO 10	environments.		41									
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for											
PO 13	the betterment of the individual and society	-	s and solution	s for complex pr	oblems To							
1015	To apply knowledge of computing to create effective designs and solutions for complex problems. To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.											
PO 14	To develop scientific outlook that solves an	-		-								
	demands.	'										
PO 15	Apply knowledge of computing fundamenta	als, computing sp	pecialization,	mathematics, and	domain							
	knowledge appropriate for the computing sp	pecialization to the	he abstraction	and conceptualiz	ation of							

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Summarize the relevance of algorithms for computational problems
CO 2	Differentiate different algorithmic approaches, techniques and methods.
CO 3	Apply optimization techniques for improving the efficiency of algorithms.
CO 4	Analyze each and every algorithm techniques
CO 5	Analyze a given algorithm for its efficiency based on time and space it occupies.
Pre-requisites	Data Structures

Knowledge Levels

1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing

					(CO / PC)/KI	Mannin	σ						
		(3/2	/1 indic	ates the					-	2-mediu	m, 1-we	eak)			
CO)s	KLs POs KLs								Ls					
									PO	1			1	l	
CO) 1				1				PO	2			2	2	
									PO				2	1	
									PO				2		
CO	2				2				PO				3		
									PO				3		
					_				PO				5		
CO	3				3				PO						
								PO 9				4			
CO	. 4		4				PO 10 PO 11				4 4				
	4		4					PO 12				4			
								PO 12				4			
CO	5		5					PO 14					2	-	
	-						PO 15				4				
						CO /	PO Ma	pping							
		(3/2	/1 indic	ates the	e streng				trong, 2	2-mediu	m, 1-we	eak)			
						Р	rogram	me Ou	tcome ((POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	2	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	3	3	3	3	3	3	3
CO5	1	1	2	2	1	1	1	3	2	2	2	2	2	2	2

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus								
	Introduction	Periods	12						
	Notion of Algorithm - Fundamentals of Algorithmic Solving - Important Problem types - Fundamentals								
Unit - I	the Analysis of Algorithm Efficiency - Analysis Framework - Asymptotic	Notations - and l	Mathematical						
	Analysis of Recursive and Non-Recursive Algorithms.								
	Divide and conquer methodology	Periods	12						
Unit - II	Merge Sort - Quick Sort - Binary search - Binary Tree Traversal - Multiple	lication of large in	itegers-						
Unit - II	Strassen's matrix multiplication Greedy method - Prim's algorithm	m - Kruskal's	algorithm -						
	Dijkstra's Algorithm								
	Transform and Conquer	Periods	12						
Unit - III	Balanced Search Tree - AVL Tree - Heaps and Heap Sort - Dynamic Pro	ogramming - Co	nputing a						
Unit - m	binomial coefficient - Warshall's and Floyd's algorithm.								
	Optimal binary search tree	Periods	12						
Unit - IV	Knapsack problem - Backtracking - N-Queens problem - Hamiltonian circ	cuit problem - sub	set sum						
	problem.								
	Branch and bound	Periods	12						
Unit - V	Assignment problem - Knapsack problem - Traveling salesman problem.								
	Total Periods		60						

Text Books	
1	Anany Levitin, Introduction to the Design and Analysis of Algorithm, 3rd Edition, Pearson Education Asia,
	2012. (Unit-I: Chapter 1,2 Unit-II: Chapter 4,9 Unit-III: Chapter 6,8 Unit-IV:Chapter 8,11 Unit-V: Chapter
	11)
References	
1	T.H.Cormen, C.E.Leiserson, R.L. Rivest and C.Stein, Introduction to Algorithms, PHI Pvt. Ltd., 2001.
2	Sara Baase and Allen Van Gelder, Computer Algorithms – Introduction to Design and Analysis, Pearson
	Education Asia, 2003
3	A.V.Aho, J.E. Hopcroft and J.D.Ullman, The Design and Analysis of Computer Algorithms, Pearson
	Education Asia 2003.
E-References	
1	www.cs.cornell.edu
2	www.cs.duke.edu
3	www.slideshare.net/gayuuuuuu
4	slideplayer.com/slide/10050190/
5	myonlinetext.blogspot.com/2015/12





Elayampalayam, Tiruchengode-637 205. Programme M.Sc Programme Code PCS Regulations 2021-2022 Department **Computer Science** Semester 1 Periods Credit Maximum Marks Course Code Course Name per Week Т Р L С CA ESE Total WEB TECHNOLOGIES 4 0 4 25 0 75 100 21P1CS03 Understanding the basic concepts of web design with HTML and Cascading Style Sheets.Exposure on COURSE **OBJECTIVES** developing websites for any domain using PHP & MySQL Server Technologies.Exposure on designing databases using MySQL Server Technology POs PROGRAMME OUTCOME **PO** 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements Identify, formulate, research literature, and solve complex computing problems reaching substantiated **PO 2** conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. PO 3 Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration PO 4 Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. PO 5 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. PO 6 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice. PO 7 Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional. Demonstrate knowledge and understanding of the computing and management principles and apply these to PO 8 one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. PO 9 Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations. PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. PO 13 To apply knowledge of computing to create effective designs and solutions for complex problems. To identify, analyse and synthesize scholarly literature relating to the field of Computer Science. PO 14 To develop scientific outlook that solves any problem, encompassing the expected aspects of market demands. PO 15 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Understand the basics of web design using HTML and cascading style sheets.
CO 2	Understand the basics of PHP.
CO 3	Learn about PHP control structures, functions, string handling and arrays
CO 4	Acquire knowledge in file system, cookies and sessions and understand PHP types
CO 5	Implement connecting database with PHP and MySQL.
Pre-requisites	-

Knowledge Levels 1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs KLs PO 1 CO 1 **PO** 2 PO 3 PO 4 PO 5 CO 2 PO 6 PO 7 PO 8 CO 3 PO 9 PO 10 PO 11 CO 4 PO 12 PO 13 CO 5 PO 14 PO 15 CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs) COs PO7 PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15 CO1 CO2 CO3 CO4 CO5

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus									
	HTML Basics	Periods	12							
	Understanding HTML - Formatting text by Using Tags - Creating Lists and Backgrounds -									
Unit - I	it - I Hyperlinks and Anchors. Creating Tables- Creating simple Forms. Style Sheets and Graphics									
	to Style Sheets - Cascading Style sheetsFormatting Text using Style Sh	eets - Formatting	Paragraphs using							
	Style Sheets.									
	Introducing PHP	Periods	12							
Unit - II	Why PHP and MySQL-Server-Side Scripting Overview - Getting Started	with PHP - Learn	ing PHP Syntax							
Unit - II	and Variables- PHP Control Structures and Functions.									
	Learning Passing Information with PHP	Periods	12							
Unit - III	Learning PHP String Handling - Learning Arrays- Learning PHP Number	Handling								
	More PHP	Periods	12							
Unit - IV	Working with the File System -Working with Cookies and Sessions - Lea	rning PHP Types.	MySQL							
Unit - IV	Database Integration: Introducing Databases and MySQL									
	Learning Database Administration and Design	Periods	12							
Unit - V	Integrating PHP and MySQL Performing Database Queries - Integrating	Web Forms and								
	Databases-MySQL Gotchas.									
	Total Periods		60							

Text Books	
1	Microsoft Step by Step – HTML and XHTML, Faithe Wempen. PHI, 2009 (Unit-I) Steve Suehring, Tim
	Converse, and Joyce Park, PHP6 and MySQL Bible, Wiley Publishing, Inc., 2010. (Units II, III, IV & V)
References	
1	Jay Greenspan and Brad Bulger, MySQL/PHP Database Applications, M & T Books, 2001.
2	Adam Trachtenberg and David Sklar, PHP Cookbook, OReilly, 2nd Edition, 2006.
3	W. Jason Gilmore, Beginning PHP and MySQL from Novice to Professional, Apress, 4th Edition, 2010.
4	Luke Welling, Laura Thomson, PHP and MySQL® Web Development, Pearson Education, Inc., 4th
	Edition, 2009.
E-References	
1	www.w3schools.com/php/
2	www.geeksforgeeks.org/html-basics/
3	www.tutorialspoint.com/php/
4	www.studytonight.com/php/introduction-to-php
5	www.guru99.com/php_tutorials.html

8 1 3



WOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.									
Programme	M.Sc	Programme Code	PO	ons	2021-2022					
Department	Con	puter Science		1						
Course Code	Periods Credit Maximum Marks Course Name per Week									
	L T P C CA ESE ADVANCED DATABASE									
21P1CS04	ADVAN MANAG	75	100							
COURSE OBJECTIVES		cs of Data base managemen e the principles of web and n	•		nced and obj	ject orio	ented database			
POs		PRO	GRAMME OU	TCOME						
PO 1	knowledge appro	e of computing fundamental priate for the computing spe ls from defined problems an	ecialization to	the abstraction						
PO 2	-	te, research literature, and so g fundamental principles of r	-			-				
PO 3	systems,compone	ate solutions for complex co ents,or processes that meet s al,societal &environmental c	pecified needs				r public health			
PO 4		ed knowledge and research a data, and synthesis of the inf				, analys	sis and			
PO 5	Create, select, ad	apt and apply appropriate te ties, with an understanding of	chniques, reso	urces, and mod		ing tool	ls to complex			
PO 6	Understand and c	commit to professional ethic			onsibilities, a	and nor	rms of			
PO 7	•	ed, and have the ability, to e	ngage in indep	oendent learnin	ng for continu	ual dev	elopment as a			
PO 8	computing professional. Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.									
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.									
PO 10		ussess societal, environmenta and the consequential respon								
PO 11	Function effectiv environments.	ely as an individual and as a	member or lea	ader in diverse	teams and in	n multi	disciplinary			
PO 12	Identify a timely	opportunity and using innov the individual and society a		e that opportur	nity to create	value a	and wealth for			
PO 13	To apply knowled	dge of computing to create e and synthesize scholarly lite	effective design							
PO 14		tific outlook that solves any								
PO 15	Apply knowledge	e of computing fundamental priate for the computing spe		-						

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Summarize the basics of advance data modeling andAdvance SQL
CO 2	Differentiate different Database concepts and Concurrency Control.
CO 3	Apply various databases and data models in the different kind
CO 4	Analyze each and every databases and database systems
CO 5	Analyze different information systems and multimedia and spatial databases
Pre-requisites	Database Management Systems

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

		(3/2	/1 indic	ates the				Mappin on, 3-s		2-mediu	m, 1-we	ak)			
CO	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weCOsKLsPOs								KLs						
									РО	1			1		
CO	1				1				PO	2			2	2	
									PO						
									PO				4		
CO	2				2				PO				3		
									PO				3		
									PO				5		
CO	3				3				PO				5		
									PO				5		
CO								PO 10					4		
CO	4		4					PO 11 PO 12				4 4			
								PO 12					4		
CO	5				4			PO 14					4		
00	5							PO 15					4		
						CO /	PO Ma	pping	101						
		(3/2	/1 indic	ates the	e streng				trong, 2	2-mediu	m, 1-we	eak)			
								me Ou				,			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Relational Databases	Periods	12							
	Object oriented databases - Complex data types, Object-oriented data model, Object-oriented									
Unit - I	Persistent programming languages - Object relational databases - Nested	relations, Complex	k types,							
	Inheritance, Reference types, Querying with complex types, Functions an	d procedures, Obj	ect-oriented							
	versus object-relational.									
	Distributed databases	Periods	12							
Unit - II	Homogeneous and heterogeneous databases, Distributed data storage, Distributed transactions, Commit									
Unit - II	protocols, Concurrency control in distributed databases, Availability, Distributed query processing,									
	Heterogeneous distributed databases.									
	Directory systems	Periods	12							
Unit - III	Parallel databases - I/O parallelism, Inter query parallelism, Intra query parallelism, Intra operation									
Unit - III	parallelism, Interoperation parallelism, Design of parallel systems.									
	Spatial databases and spatial, Geographic data	Periods	12							
Unit - IV	Representation of geometric information - Design databases, Geographic	data, Spatial queri	es, Indexing o							
Unit - I v	spatial data - Temporal and time series databases - Time in databases- Time specification in SQL, Temporal									
	query language.									
	Multimedia databases	Periods	12							
Unit - V	Multimedia data formats, Continuous media data, Similarity-based retrieval - Web databases - Web									
Unit - v	fundamentals, URL, HTML, Client side scripting and Applets, Web serve	rs and sessions, S	ervlets, Server							
	side scripting, Improving performance.									
	Total Periods		60							

Text Books	
1	Henry Korth, F., Abraham Silberchatz, Sudarshan, S.Database System Concepts, 6th Edition, Mc Graw
	Hill International Editions,2011.
2	Ramez Elmasri, Shamkant B. Navathe, Fundamentals of Database Systems , Pearson Education, 7th Edition ,
	2016.
References	
1	Gary Hanson, W., James Hanson, V., Database Management and Design, Prentice Hall of India Pvt.
	Ltd.,1999.
2	Alex Benson, Stephen Smith and Kurt Thearling, Building Data Mining Applications for CRM,
	TataMcGraw-Hill,2000
3	Stefano Ceri, Giuseppe Pelagatti, Distributed Databases: Principles and Systems , Mc Graw-Hill Computer
	Science Series.
E-References	
1	onlinecourses.nptel.ac.in/noc16_cs04/preview
2	www.coursera.org/learn/database-management-systems
3	www.astera.com/type/blog/database-management-software
4	www.nibusinessinfo.co.uk/content/types-database-system
5	www.slideshare.net/vikasjagtap3

BU CONTANAL INSTITUTION	VIV	EKANANDHA COL	LEGE OF A	ARTS AND	SCIEN	CES	ISO 9001:2008			
HOMEN EMPOWERNELL		FORWOME Elayampalayam, Tir				CERTIFIED WWW.tuc.com				
Programme	M.Sc Programme Code PCS Regulations									
Department		puter Science		Semester			2021-2022			
Department		puter Science	Periods	Credit	Movimu	n Mork	_			
Course Code	Periods Credit Maximum Marks Course Name per Week									
		L T P C CA ESE								
21P1CSO5	SOFTWARE PR	OJECT MANAGEMENT		1			-			
21110305	AND QUA	LITY ASSURANCE	4 0 0	4	25	75	100			
COURSE	Use of different L	ife cycle Model for software	e development.	.Have the mat	nematical fo	oundati	on in finding of			
OBJECTIVES	project cost of alg	orithms. Understand differe	nt algorithmic	design strateg	ies					
POs		PROC	RAMME OU	TCOME						
PO 1		of computing fundamentals								
		priate for the computing spe s from defined problems and			and concep	otualiza	tion of			
PO 2		e, research literature, and so	-		lems reachi	ing sub	stantiated			
	-	fundamental principles of n	nathematics, co	omputing scien	nces, and re	levant	domain			
PO 3	disciplines.	ate solutions for complex co	mputing proble	ame and desig	n and evalu	1910				
		nts,or processes that meet sp		-			or public health			
	-	l,societal &environmental co								
PO 4		ed knowledge and research n lata, and synthesis of the info		• •	-	s, analys	sis and			
PO 5	-	apt and apply appropriate tec	-			ing too	ls to complex			
	computing activit	ies, with an understanding o	f the limitation	IS.	-	-	-			
PO 6	Understand and control of the professional comp	ommit to professional ethics	and cyber reg	ulations, respo	onsibilities,	and not	rms of			
PO 7	+ ·	ed, and have the ability, to end	ngage in indep	endent learnin	g for contin	ual dev	velopment as a			
	computing profes	sional.								
PO 8		wledge and understanding of a member and leader in a te				-				
	environments.		ani, to manage	e projects and		apinar.	y			
PO 9		ectively with the computing	•	-	-					
		ies by being able to compre-	nend and write	effective repo	rts, design o	docume	entation, make			
PO 10	effective presenta Understand and a	ssess societal, environmenta	l, health, safet	y, legal, and cu	ıltural issue	s within	n local and			
		nd the consequential response	-							
PO 11		ely as an individual and as a	member or lea	der in diverse	teams and i	in multi	disciplinary			
PO 12	environments. Identify a timely o	opportunity and using innov	ation to pursue	that opportun	ity to create	e value	and wealth for			
		the individual and society at	-	unu opportun						
PO 13		lge of computing to create en	-		-	-				
PO 14		and synthesize scholarly liter ific outlook that solves any p	-		-					
PO 15	Apply knowledge	of computing fundamentals								

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Summarize the relevance of software project management
CO 2	Differentiate different software configuration and tools
CO 3	Apply various software cost techniques in the different kind
CO 4	Analyze each and every algorithm techniques
CO 5	Analyze a given software for its efficiency based on the configuration
Pre-requisites	Software Engineering

Knowledge Levels

1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing

					() / KL 1	Mannin	a						
		(3/2	/1 indic	cates the						2-mediu	m, 1-we	ak)			
СО	s				KLs	-			POs						
									РО	1			1		
CO	1				1				PO	2			1		
									PO	3					
									PO				1		
CO	2				1				PO				1		
									PO				1		
									PO				1		
CO	3				1				PO			1			
									PO				1		
	4				1				PO 1				1		
CO	4		1					PO 11 PO 12				1			
								PO 12					1		
CO	5				1			PO 14					1		
60	5				1			PO 15					1		
						CO /	PO Ma	pping	101						
		(3/2	/1 indic	cates the	e streng				trong, 2	2-mediu	m, 1-we	eak)			
						-	rogram					,			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	Introduction	Periods	12								
TT. 1 T	Product Life cycle - Project life cycle models - Water fall model - Prototyping model - RAD model - Spiral										
Unit - I	Model - Process Models - The ISO-9001 Model-The Capability Maturity I	Model- Metrics									
	Software Configuration Management	Periods	12								
	Definitions and terminology - The processes and activities - Configuration	n Audit - Metrics	-Tools and								
Unit - II	Automation- Software Quality Assurance - Define Quality - Quality Control and Assurance - SQA Analysts										
	Functions - QA Tools - Organizational Structures - Profile of a successful	l SQA-Measures	of SQA success.								
	Project Initiation	Periods	12								
Lin:t III	Project Planning and Tracking - What, Cost, When and How - Organizational Processes - Assigning										
Unit - III	Resources - Activities to specific to Project Tracking - Project Closure - When and How.										
	Quality Management	Periods	12								
Unit - IV	Software Quality, Software Quality Dilemma-Achieving Software Quality-Software Testing										
Unit - I v	Strategies-Strategic Approach-Test Strategies for Conventional Software	and Object Orient	ted Software.								
	Project Management	Periods	12								
Unit - V	The People, The Product, The Process - Project Scheduling - Risk Manag	ement -Maintenar	nce and								
Unit - v	Reengineering - Business Process Reengineering - Software Re Engineering - Reverse Engineering -										
	Restructuring - Forward Engineering.										
	Total Periods		60								

Text Books	
1	Gopalaswamy Ramesh, Managing Global Software Projects Tata McGraw Hill.Publishing Company Ltd,
	New Delhi, 2006
2	Pressman, Roger, Software Engineering, A Practitioners approach, 7th edition, Tata Mc Graw Hill, 2006.
	6th Edition
References	
1	Philip B Crosby, Quality is Free: The Art of Making Quality Certain MassMarket, 2004.
2	Bob Hughes and Mike Cotterell Software Project Management,2nd Edition, Tata McGraw Hill Publishing
	Company Ltd., New Delhi, 2002.
E-References	
1	wikipedia.org
2	www.tutorialspoint.com
3	www.slideshare.net
4	www.slidegeeks.com
5	www.slideteam.net/



Co the state	WOMEN (AUTONOMOUS)									
HOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.									
Programme	M.Sc	Programme Code		PO	CS	Regulat	tions	2021-22		
Department		M.Sc CS			Semester			Ι		
20P1CSP01	Core Course Advanced Da	Practical - 1 tabase Management	Perio per W		Credit	Maxim	um Mar	ks		
	System Lab		L T	Р	С	CA	ESH	E Total		
			0 0	4	3	40	60	100		
COURSE OBJECTIVES	 To know the basic commands in SQL To understand the DML ,DDL Statements To familiarize in the Data Schemes To understand and program in PL/SQL 									
		LIS	T OF P	RAC	CTICALS					
1	Basic SQL Qu i) DDL Sta	eries tements ii) DML Stater	nents							
2		s using built in function	S							
3	Simple Querie	s Using set operations								
	Item (<u>item_id: integer</u> , item_name: string, price: integer) Sale (<u>bill_no: integer</u> , bill_data: date, cust_id: integer, item_id: integer, qty_sold: integer) For the above schema, perform the following: 1. Create the tables with the appropriate integrity constraints 2. Insert around 10 records in each of the tables 3. List all the bills for the current date with the customer names and item numbers.									
5	 4. List the details of the customer who have bought a product which has a price>200 Database Schema for a Student Library scenario Student(<u>Stud_no: integer</u>, Stud_name: string) Membership (<u>Mem_no: integer</u>, Stud_no: integer) Book (<u>book_no: integer</u>, book_name:string, author: string) Iss_rec(<u>iss_no:integer</u>, iss_date: date, Mem_no: integer, book_no: integer) For the above schema, perform the following: Create the tables with the appropriate integrity constraints Insert around 10 records in each of the tables List all the student names with their membership numbers List all the issues for the current date with student and Book names List the details of students who borrowed book whose author is CJDATE 									
6	 5. List the details of students who borrowed book whose author is CJDATE Database Schema for a Employee-pay scenario employee(emp_id: integer, emp_name: string) department(dept_id: integer, dept_name:string) paydetails(emp_id: integer, dept_id: integer, basic: integer, deductions: integer, additions: integer, DOJ: date) payroll(emp_id: integer, pay_date: date) For the above schema, perform the following: Create the tables with the appropriate integrity constraints Insert around 10 records in each of the tables List the employee names who joined after particular date List the details of employees whose basic salary is between 10,000 and 20,000 List the details for an employee_id=5 									

7	Write a PL/SQL program to implement trigger
8	Write a PL/SQL program to implement cursor
9	Write a PL/SQL program to prepare student mark list
10	Write a PL/SQL program to prepare employee pay bill

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205. M.Sc Programme Code PCS Regulations 2021-22 Programme M.Sc CS Department III Semester Periods Credit Maximum Marks 21P1CSP02 **Core Course Practical - 2** per Week Web Technologies Lab L Т Р С ESE CA Total 0 4 3 0 40 60 100 COURSE Creating simple web pages, forms & CSS 1. **OBJECTIVES** Implement working with cookies and sessions in PHP 2. 3. Connecting PHP and MySQL in real time applications LIST OF PRACTICALS 1 To create a simple web page for your department 2 To create simple forms using HTML To create a simple web page using Cascading Style Sheets 3 4 Implementation of cookies 5 Implementation of Students Feedbacks System using PHP and MySQL Implementation of online registration form using PHP and MySQL 6 7 Implementation of Library Management System using PHP and MySQL 8 Implementation of Banking Transaction System using PHP and MySQL Webpage Kit Counters using Session tracking 9 10 To create Simple Shopping Application



Sie and the	VIVEKAN	ANDHA COLLEGE	OF AR'	ГS А	AND SCIEN	NCES F	OR	ISO 9001:2008		
	WOMEN (AUTONOMOUS)									
NOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	ode-6	37 205.					
Programme	M.Sc	Programme Code		PCS Regulat			Regulations 2021-20			
Department	Con	nputer Science			Semester			2		
			Perio	ds	Credit	Maxim	um Mai	:ks		
Course Code	C	course Name	per We	eek						
			L T	Р	С	CA	ESI	E Total		
21P2CS06	Advanced Con	cepts in Operating System	4 0	0	4	25	75	100		
COURSE	On successful co	mpletion of this course we le	earn the f	unda	mentals of Op	erating Sys	stems ar	chitecture,		
OBJECTIVES		nplementing DSM compone								
POs		PROG	JRAMM	EOU	ЛСОМЕ					
PO 1		e of computing fundamental								
		priate for the computing spe				and conce	eptualiz	ation of		
	· · ·	ls from defined problems an	-				1.	1 1		
PO 2	-	te, research literature, and so	-				-			
		g fundamental principles of i	natnema	1CS, C	computing scie	ences, and	relevan	t domain		
PO 3	disciplines.	ate solutions for complex co	mouting	nroh	lome and dasi	an and ave	luoto			
FO 5	-	ents, or processes that meet s		-		-		for public healt		
		al, societal & environmental c			with appropri			for public near		
PO 4	· · · · ·	ed knowledge and research			ling design of	experimer	ts. anal	vsis and		
		data, and synthesis of the inf				-				
PO 5	-	apt and apply appropriate te		-				ols to complex		
	computing activi	ties, with an understanding of	of the lim	itatio	ns.	-	_	_		
PO 6	Understand and	commit to professional ethics	s and cyb	er reg	gulations, resp	onsibilities	s, and n	orms of		
	professional com	puting practice.								
PO 7	-	eed, and have the ability, to e	ngage in	indep	pendent learnii	ng for cont	inual de	evelopment as a		
	computing profe									
PO 8		wledge and understanding o		-	• •	-	-			
		s a member and leader in a to	eam, to m	nanag	e projects and	in multidi	sciplina	ıry		
	environments.			•,	1 . 1	. 1	1 /	1		
PO 9		fectively with the computing		•		• •		-		
	effective present	ties by being able to compre-	nend and	write	e effective repo	orts, desigi	1 docum	ientation, make		
PO 10	· · · · ·	assess societal, environmenta	l health	safet	v legal and c	ultural issu	ues with	uin local and		
1010		and the consequential respon								
PO 11	-	ely as an individual and as a			÷		~ ~ ~			
	environments.	,						I J		
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for									
	the betterment of the individual and society at large.									
PO 13		dge of computing to create e		lesig	ns and solutior	ns for com	plex pro	blems. To		
		and synthesize scholarly lite		-		-				
PO 14	To develop scien	tific outlook that solves any	problem,	enco	mpassing the	expected a	spects of	of market		
demands.										
	Apply knowledg									

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Understand the concepts of Operating System
CO 2	To learn about DSM
CO 3	To analyze the basics of Operating System Algorithms and Multiprocessor System Architecture
CO 4	To implement distributed database operating system in various places
CO 5	Design and Establish the Operating system to apply in various places
Pre-requisites	Operating System Concepts

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs KLs PO 1 CO 1 **PO** 2 PO 3 PO 4 PO 5 CO 2 PO 6 PO 7 PO 8 CO 3 PO 9 PO 10 PO 11 CO 4 PO 12 PO 13 CO 5 PO 14 PO 15 CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs) COs PO7 PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15 CO1 CO2 CO3 CO4

CO5

Knowledge Levels

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the	Syllabus								
	Introduction to Operating System	Periods	12						
	Overview: Introduction- Functions of operating systems - Design Approa	ches - Types of A	dvanced						
Unit - I	Operating Systems. Synchronization Mechanisms: Introduction - Concept	t of Process - Con	current Process						
Unit - I	The critical section Problem. Process Deadlocks: Introduction - Prelimina	ries - Models of I	Deadlocks -						
	Models of Resources - A Graph-Theoretic Model of a System State - Nec	essary and Suffici	ent Conditions						
	for a Deadlock.								
	Architectures of Distributed Systems	Periods	12						
	Architectures of Distributed Systems: Introduction - Motivation - System	Architecture Typ	es - Distribute						
Unit - II	operating Systems - Issues in Distributed operating System - Communication Network - Communication								
Unit - II	Primitives. Distributed Shared Memory: Introduction - Architecture and Motivation - Algorithms for								
	Implementing DSM - Memory Coherence - Coherence Protocols - Design Issues.								
	Multiprocessor System Architectures	Periods	12						
	Multiprocessor System Architectures: Introduction - Motivations - Basic	Multiprocessor Sy	vstem						
Unit - III	Architecture - Interconnection networks for Multiprocessor System - Caching - Hypercube Architecture.								
Onit - III	Multiprocessor Operating Systems: Introduction - Structures - Operating System Design Issues - Threads -								
	Process Synchronization - Process Scheduling - Memory Management - Reliability/Fault Tolerance.								
	Database Operating Systems	Periods	12						
Unit - IV	Database Operating Systems: Introduction - Concurrency Control: Database Systems - Serializability								
onn iv	Theory - Distributed database systems - Lock based and Timestamp based algorithm - Concurrency control								
	algorithms.	1							
	CASE STUDY	Periods	12						
	CASE STUDY: Linux History- Design Principles-Kernel Modules- Process Management -Scheduling -								
Unit - V	Memory Management - File Systems- Input and Output - Interprocess Co								
	SecurityiOS: About iPhone iOS 4 App Development Essentials-The Anat	omy of an iPhone	4 - iOS 4						
	Architecture and SDK Frameworks - iOS Media Layer		1						
	Total Periods		60						

Text Books	
1	1.Advanced Concepts in Operating Systems", Mukesh Singhal, Niranjan G.Shivarathr, 2017
2	2.Operating System Concepts, Abraham Silberschatz, Peter B. Galvin and Greg Gagne, Ninth Edition,
	John Wiley and Sons Inc, 2018.
3	3.Neil Smyth, "iPhone iOS 4 Development Essentials â€" Xcode", Fourth Edition, Payload media, 2011
References	
1	1.Operating System in depth: Design & Programming, Thomas.W,Doeppner, First Edition 2010.
2	2. The Linux Programming Interface: A Linux and Unix System Programming handbook, Michal Kerisk,
	First Edition, 2010.
E-References	·
1	1.https://books.google.co.in/books//Advanced_Concepts_InOperatingSystems.html
2	2.https://www.bookdepository.com/Advanced-Concepts-Operating-Systems
3	3.https://www.sfitengg.org//CSC201-advanced%20operating%20systems



WOMEN EMPOWERNEN		Elayampalayam, Ti	ruchengo	de-6	37 205.				
Programme	M.Sc	Programme Code		Р	CS	Regulat	tions	2021-2022	
Department	Con	puter Science			Semester			2	
Course Code		ourse Name	Period per We		Credit	Maxim	um Mark	S	
Course Code			L T	Р	С	CA	ESE	Total	
21P2CS07	ADVANCED.	JAVA PROGRAMMING	4 0	0	4	25	75	100	
COURSE OBJECTIVES		anced java concepts .To lea g and deploy an web applica		asic	concepts web a	application	ns. To un	derstandhow 1	
POs			GRAMMI	E OL	ЛСОМЕ				
PO 1	knowledge appro	e of computing fundamental opriate for the computing sp ls from defined problems ar	ecializatio	n to	the abstraction				
PO 2	Identify, formula	te, research literature, and s g fundamental principles of	olve comp	lex c	computing prob		-		
PO 3	systems,compone	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration							
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the in	methods in	ncluo	• •	-	ts, analys	sis and	
PO 5		apt and apply appropriate te ties, with an understanding	-			lern comp	uting too	ls to complex	
PO 6	Understand and or professional com	commit to professional ethic puting practice.	es and cybe	er reş	gulations, respo	onsibilities	, and nor	rms of	
PO 7	Recognize the ne computing profes	ed, and have the ability, to essional.	engage in a	ndep	oendent learnin	ig for cont	inual dev	elopment as a	
PO 8		Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary							
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.								
PO 10		Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.							
PO 11		ely as an individual and as a				*			
PO 12	Identify a timely	opportunity and using inno the individual and society a	-	ursu	e that opportun	nity to crea	te value	and wealth fo	
PO 13	To apply knowle	dge of computing to create and synthesize scholarly life	effective d	-		-	-		
PO 14		tific outlook that solves any		-					
PO 15	Apply knowledge knowledge appro	e of computing fundamental opriate for the computing sp ls from defined problems an	ecializatio	n to	the abstraction				

COs	COURSE OUTCOME
CO 1	To revisit the important concepts of Core Java Programming.
CO 2	To understand the concepts of creating software components using BDK and to implement RPC mechanism
	through RMI.
CO 3	To learn about the server side scripting using servlets
CO 4	To understand the elements of JSP and its syntax and creating custom tags
CO 5	To acquire knowledge in connecting databases with JSP and creating, testing, debugging and deploying web
	applications
Pre-requisites	Basic Java Programming Concepts

Knowledge Levels

1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing

					(CO / PC) / KL I	Mappin	g						
		(3/2	/1 indic	ates the						2-mediu	m, 1-we	eak)			
CO	S				KLs				POs	8			K	Ls	
									PO	1			1		
CO	1				1				PO				2	2	
									PO				4		
									PO				4		
CO	2				3				PO				3		
									PO				3		
									PO				5		
CO	3				2				PO				5		
								PO 9					5		
СО	4		5				PO 10 PO 11				4 4				
0	4		5					PO 11 PO 12				4			
								PO 12				4			
СО	5		6					PO 14				4			
00			-				PO 15				4				
						CO /	PO Ma	pping							
		(3/2	/1 indic	ates the	e streng				trong, 2	2-mediu	m, 1-we	eak)			
~~						Р	rogram	me Ou	tcome ((POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO3	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO4	1	1	2	2	1	1	1	3	3	2	2	2	2	2	2
CO5	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the	Synabus								
	Networking	Periods	12						
	Networking: Networking Basics-Java and The Net-INetAddress Class-IN	etAddress Examp	le-						
Unit - I	TCP/IP-DataGrams-A simple network communication using TCP/IP & U	DP-A tour of SW	ING- Buliding						
	GUI Application using SWING-RMI: An Overview of RMI-Building a S	Simple Client/Serv	ver Application						
	using RMI.								
	Servlets	Periods	12						
Unit - II	Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-The javx.servlet Package-Reading								
Unit - II	Servlet Parameters- The javax.servlet.http Package-Handling HTTP Requests and Responses-Using								
	Cookies-Session Tracking								
	JSP	Periods	12						
Unit - III	JSP - Elements of JSP-JSP Syntax and Semantics- Expressions and Scriptlets-Declarations- Request								
	Dispatching.								
	The Page directive	Periods	12						
Unit - IV	The Page directiveSession and Thread Management-JSP Tag Extension	s: Introduction to	Custom						
Unit - I v	Tag-Developing your first Custom Tag.								
	JSP Applications	Periods	12						
	JSP Applications: -Database Access with JDBC-Overview of JDBC-JDB	C Drivers-Connec	cting to a						
Unit - V	Database with DriverManager-The Statement Interface-Result Sets-Using	g Metadata-JSP an	d XML-JSP						
	Testing and Debugging-Deploying Web Applications.								
	Total Periods		60						

Text Books	
1	H. Schildt, 2002, Java 2 Complete Reference, 5th Edition, Tata McGraw Hill, New Delhi.(Unit
	I,UnitII,Unit III).
2	Joseph O'Neil, 1998, Java Beans Programming from the ground Up, Tata McGraw Hill, New
	Delhi(Unit II).
3	Phil Hanna ,JSP 2.0: The Complete Reference, Tata McGraw Hilll Edition,2003 New Delhi(Unit IV,
	Unit V).
References	
1	James Koegh,2003, J2Me: The complete Reference, Tata McGraw Hill, Ne Delhi.
2	J.McGovern, R.Adatia, Y.Fain, 2003, J2EE 1.4 Bible, Wiley-Dreamtech India Pvt.Ltd, New Delhi
E-References	
1	www.w3schools.com
2	www.javatpoint.com
3	https://java-made-easy.com

0 * 3



WOMEN EMPOWERNEN		Elayampalayam, Ti	rucheng	ode-6	37 205.						
Programme	M.Sc	Programme Code		PO	ions	2021-2022					
Department	Computer Science Semester							2			
Course Code	C	Periods Credit Maximum Marks Course Name per Week									
	L T P C CA ESE To										
21P2CS08	Data Min	ing and Warehousing	4 0	0	4	25	75	100			
COURSE OBJECTIVES	-	ots of database technology. Uses of the data to be mined. To				-					
POs		PRO	GRAMM	IE OU	JTCOME						
PO 1	knowledge appro	e of computing fundamental opriate for the computing spe ls from defined problems an	ecializati	on to	the abstraction						
PO 2	-	tte, research literature, and so g fundamental principles of		-			-				
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration										
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.										
PO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.										
PO 6	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.										
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.										
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.										
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.										
PO 10		assess societal, environmenta and the consequential respon									
PO 11	global contexts, and the consequential responsibilities relevant to professional computing practice. Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.										
PO 12	Identify a timely	opportunity and using innov f the individual and society a		pursu	e that opportur	nity to crea	te value	e and wealth for			
PO 13	To apply knowle	dge of computing to create e	effective	-		-	-				
PO 14		identify, analyse and synthesize scholarly literature relating to the field of Computer Science. To develop scientific outlook that solves any problem, encompassing the expected aspects of market demands.									
PO 15	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of										

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Evaluate and implement a wide range of emerging and newly-adopted methodologies and technologies to
	facilitate the knowledge discovery
CO 2	Assess raw input data, and process it to provide suitable input for a range of data mining algorithms
CO 3	Discover and measure interesting patterns from different kinds of databases
CO 4	Characterize and discriminate data summarization forms and determine data mining functionalities
CO 5	Design and implement of a data-mining application using sample, realistic data sets and modern tools
Pre-requisites	Database Concepts

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

								Mappin	a							
		(3/2	/1 indic	ates the						2-mediu	m, 1-we	ak)				
CO	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs								KLs							
									PO	1		1				
CO	1		1					PO 2					2			
									PO	3		4				
									PO	4		4				
CO	2				2				PO			3				
								PO 6					3			
									PO			5				
CO	3		4					PO 8					5			
								PO 9					5			
			3					PO 1			4					
CO	4							PO 1			4					
								PO 12					4			
	E		5				PO 13 PO 14					4 4				
	CO 5		5				PO 14 PO 15					4				
						CO /	PO Ma	nning	101	5			4	•		
		(3/2)	/1 indic	ates the	e strend				rong 7	2-mediu	m 1-we	ak)				
		(3/2)	/ I mare	utes in	e su eng			me Ou			iii, 1 we	uix)				
COs	COs PO1 PO2				PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
C01		2	PO3	PO4												
	3		1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO5	1	1	2	2	1	1	1	3	3	2	2	2	2	2	2	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	Introduction to Data Mining	Periods	12								
	Introduction: Data Mining - Data Mining Functionalities - Kinds of Patterns can be Mined - Classification										
Unit - I	Data Mining Task Primitives - Major Issues. Data pre-processing: Descriptive Data Summarization - Data										
	Cleaning - Data Integration and Transformation - Data Reduction - Data Discretization and concept										
	Hierarchy Generation.										
	Data warehouse and OLAP Technology	Periods	12								
Unit - II	Data warehouse and OLAP Technology: Data Warehouse - A Multidimer	nsional Data Mode	el - Data								
Unit - II	Warehouse Architecture - Data Warehouse Implementation - From data w	varehouse to data	mining.								
	Mining Frequent Patterns, Associations, and Correlations	Periods	12								
	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts - Efficient and Scalable Frequent										
Unit - III	Itemset Mining Methods - Mining various kinds of Association Rules- From Association Mining to										
Unit - III	Correlation Analysis Constraint Based Association Mining. Classification and prediction: Issues										
	regarding classification and prediction - Decision Tree Induction - Bayesian classification - Rule Based										
	Classification - Classification by Back propagation - Prediction.										
	Cluster Analysis	Periods	12								
	Cluster Analysis: Types of Data in Cluster Analysis - A categorization of Major Clustering Methods -										
Unit - IV	Partitioning Methods - Hierarchical Methods - Density Based Methods - Grid Based Methods - Model										
	Based Clustering Methods - Outlier Analysis - Mining Time-Series Data - Mining Sequence Patterns in										
	Biological Data.										
	Spatial Data Mining, Applications and Trends in Data Mining	12									
	Spatial Data Mining - Multimedia Data Mining - Text Mining -Mining the World Wide Web. Applications										
Unit - V	and Trends in Data Mining: Applications - Data Mining System Products and Research Prototypes -										
	Additional Themes on Data Mining - Social Impacts of Data Mining - Trends in Data mining.										
	Total Periods		60								

Text Books								
1	Jiwei Han, Michelien Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers							
	an Imprint of Elsevier, 3rd Edition, 2012.(Unit I: Chapter 1,2, Unit II: Chapter 3, Unit III: Chapter 5, 6,							
	Unit IV: Chapter 7,8 Unit V: Chapter 10,11)							
References								
1	Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2014.							
2	Pang-NingTan,Michael Steinbach,Vipin Kumar, Introduction to Data Mining, Pearson, 2014							
E-References								
1	freevideolectures.com › Computer Science › IIT Madras							
2	videolectures.net/is2011_grobelnik_warehouses							
3	www.learnerstv.com/video/Free-video-Lecture-1636-Computer-Science							
4	mydatamine.com/2011/04/top-10-data-mining-video-sites							
5	www.slideshare.net/vivekjv/data-warehouse-modeling-presentation							





		WOMEN (A	UIO	NU	MO	05)			CERTIFIED www.tux.com ID 9105078407		
WOMEN EMPOWERMENT		Elayampalayam, T	Firuch	engo	ode-6	537 205.					
Programme	M.Sc	Programme Code			ations	2021-2022					
Department	Co	Computer Science Semester							2		
			P	erio	num Mar	ks					
Course Code	(Course Name	pe	r We	eek						
			L	Т	P	С	CA	ESE	E Total		
	NETV	4	0	0	4	25	75	100			
21P2CS09											
COURSE	To learn about t	he Security architecture sec	curity ty	pes	and	security me	chanismsTo	o learn al	oout the		
OBJECTIVES	Network securit	y has four objectives: confi	dential	ity, i	integ	rity, availab	ility, and no	n repudia	ation To gain		
	the knowledge of Securing inform										
POs		PR	OGRA	MM	E OI	JTCOME					
PO 1	Apply knowleds	ge of computing fundament	als, co	nput	ting	specializatio	on, mathemat	tics, and	domain		
_ `		opriate for the computing s		-	-	-					
	0 11	els from defined problems	-					1			
PO 2	Identify, formul	ate, research literature, and	solve c	comp	olex	computing	problems rea	ching su	bstantiated		
	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain										
	disciplines.										
PO 3	Design and eval	uate solutions for complex	compu	ting	prob	lems, and d	esign and ev	aluate			
	systems, components, or processes that meet specified needs with appropriate consideration for public healt										
	and safety,cultural,societal &environmental consideration										
PO 4	Use research-based knowledge and research methods including design of experiments, analysis						ysis and				
	interpretation of data, and synthesis of the information to provide valid conclusions.										
PO 5		dapt and apply appropriate		-			nodern comj	puting to	ols to complex		
	computing activities, with an understanding of the limitations.										
PO 6	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.										
							-				
PO 7	-	eed, and have the ability, to	o engag	e in	inde	pendent lea	rning for con	itinual de	evelopment as		
	computing profe		6.4				· · · ·		1 1 1		
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these t one own work, as a member and leader in a team, to manage projects and in multidisciplinary										
	environments.	as a member and leader in a	i team,	to n	ianag	ge projects a	ind in multic	uscipiina	ry		
PO 9		factively with the computi	na com	mur	ity .	and with so	pioty of lorgo	about a	omploy		
FO 9	Communicate effectively with the computing community, and with society at large, about complex										
	computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.										
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and										
1010											
PO 11	global contexts, and the consequential responsibilities relevant to professional computing practice. Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary										
_	environments.										
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for										
	the betterment of the individual and society at large.										
PO 13							blems. To				
		and synthesize scholarly l			-						
PO 14	To develop scientific outlook that solves any problem, encompassing the expected aspects of mar							of market			
	demands.										
PO 15	Apply knowledg	ge of computing fundament	als, con	nput	ting	specializatio	on, mathemat	tics, and	domain		
	knowledge appr	opriate for the computing s	peciali	zatic	on to	the abstract	ion and conc	eptualiza	ation of		

	computing models from defined problems and requirements							
COs	COURSE OUTCOME							
CO 1	To understand the concept of security and Encryption algorithms							
CO 2	To analyze public key cryptography and Message Authentication algorithms							
CO 3	To Describe and learn about the Electronic mail Security concepts							
CO 4	To Demonstrate about the web security considerations							
CO 5	To learn about the intruders and virus protections							
Pre-requisites	Computer Network Concepts							

Knowledge Levels 1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs KLs PO 1 CO 1 **PO** 2 PO 3 PO 4 PO 5 CO 2 PO 6 PO 7 PO 8 CO 3 PO 9 PO 10 PO 11 CO 4 PO 12 PO 13 CO 5 PO 14 PO 15 CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs) COs PO7 PO1 PO2 PO3 PO4 PO5 PO6 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15 CO1 CO2 CO3 CO4 CO5

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction to Security	Periods	12									
	Introduction: Security Trends-The OSI Security Architecture - Security Attacks - Security Services-											
Unit - I	Security Mechanisms- Model for Network Security - Symmetric Encryption	ion and Message (Confidentiality									
Unit - I	Symmetric Encryption Principles - Symmetric Block Encryption Algorith	nms - Stream Ciph	ers and RC4 -									
	Cipher Block Modes of Operations - Location of Encryption Devices-Key	y Distribution.										
	Public Key Cryptography and Message Authentication Periods											
	Public Key Cryptography and Message Authentication: Approaches to M	essage Authentica	tion - Secure									
Unit - II	Hash Functions and HMAC - Public Key Cryptography Principles - Public Key Cryptography Algorithms											
	Digital Signatures - Key Management. Authentication Applications: Kerberos - X.509 Authentication											
	service - Public Key Infrastructures	•										
	Electronic Mail Security	Periods	12									
Unit - III	Electronic mail Security: Pretty Good Privacy (PGP) - S/MIME. IP Security: IP Security Overview - IP											
onn m	Security Architecture - Authentication Header - Encapsulating Security Payload - Combining security											
	Associations .	•										
	Web Security	Periods	12									
Unit - IV	Web Security: Web Security Considerations- Security Sockets Layer (SSL) and Transport Layer Security											
	(TLS) - Secure Electronic Transaction. Network Management Security: Basic Concepts of SNMP -											
	SNMPV1 Community facility - SNMPV3.											
	Intruders	Periods	12									
	Intruders: Intruders - Intrusion Detection - Password Management - Malicious Software: Viruses and											
Unit - V	Related Threats - Virus Countermeasures - Distributed Denial of Service	Attacks. Firewall	s: Firewall									
	Design Principles - Trusted Systems - Common Criteria for IT Security Evaluation.											
	6 I I I I I I I I I I I I I I I I I I I											

Text Books	
1	William Stallings, "Network Security Essentials â€" Applications and Standards", 6th Edition, Global
	Edition Pearson Education, 2017. EditionUnit I: Chapter 1 & 2, Unit II: Chapter 3 & 4, Unit III: Chapter
	5 & 6, Unit IV : Chapter 7 & 8, Unit-V (Chapter 9, 10 & 11)
References	
1	V.K.Pachghare, "Cryptography and Information Security", PHI 2013.
2	William Stallings, "Cryptography and Network Security", Pearson Education – 2008.
3	Behrouz A Forouzan, Sophia Chung Fegan, "Data Communications and Networking", TMH-2013.
E-References	
1	https://www.edx.org/learn/network-security
2	https://www.udemy.com/courses/it-and-software/network-and-security/
3	https://www.edureka.co/blog/what-is-network-security/



Elayampalayam, Tiruchengode-637 205.

WEN EMPOWERING	Engunpungun, in denengode och zoor												
Programme	MSc	Programme Code		ł	PCS		Regulations		2020-21				
Department		M.Sc CS				II							
21P2CSP03	ADVANCED			eriods Week	Cr	edit	Maxim	um Mar	ırks				
	PROGRAMN	IING LAB	L	т Р		С	CA	ESI	E Total				
			0	0 4	2	2	40	60	100				
COURSE OBJECTIVES	except 2. Design progra	 exception handling, applets & event handling Design and develop network communications, JDBC & simple server side scripting programs using Servlets & JSP 											
	LIST OF PRACTICALS												
1	Write a Progra	im to prepare a student n	nark l	ist us	ng swi	ng							
2	Write a Progra	um to perform event hand	lling	in Sw	ing								
3	Write a Progra	m to implement RMI											
4	Write a HTMI	to Servlet Applications											
5	Write a Create	a simple servlet program	n to c	lispla	/ cooki	e's inf	ormation						
6	Write a simple	e program to implement t	the co	oncept	of JDI	BC							
7	Write a progra	m to implement the cond	cept o	of JDE	C & S	Swing							
8	Write a progra	m for simple registration	n forr	n in JS	SP								
L	1												

Subject Title	MINI PROJECT-DOMAIN STUDY	Semester	II		
Subject Code	21P2CSPR01	Specialization	NA		
Туре	Mini Project - 1	L:T:P:C	2:0:2:0		
Fotal Marks : 40 Fhe Passing min	Marks imum shall be 40% out of 60 marks ((24 Marks)			
FIRST REVIEW	7 :		(15 Marks)		
1. Project T	tle				
2. Project Pl	atform				
3. Details of	Guide				
4. Problem	Description / Modules				
5. Presentat	on (PPT)				
FINAL REVIEV	۷:		(25 Marks)		
1. Documen	tation				
2. Screens S	hots				
3. DFD / EF	D / System Flow Diagram (Whicheve	r Applicable)			
4. Presentat	on (PPT)				
1. Tresentat					





NOWEN EMPOWERNEN	Elayampalayam, Tiruchengode-637 205.													
Programme	M.Sc	tions	2021-2022											
Department	Cor	nputer Science				Semester			3					
Department		iputer betenee	D											
/				eriod		Credit	Maxim	um Marl	KS					
Course Code	(Course Name	-	Wee										
			L	<u>Т</u> 0	P 0	C 4	CA 25	ESE						
21P3CS10	SOF	75	100											
COURSE OBJECTIVES	use of heuristics	ith neural network concepts based on human experience oft computing using												
POs		PRO	GRAI	MME	τοτ	ТСОМЕ								
PO 1		e of computing fundamentation oppriate for the computing sp												
PO 2	Identify, formula	Is from defined problems ar ate, research literature, and s g fundamental principles of	olve c	omp	lex c	computing prob		-						
PO 3	disciplines. Design and evalu	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health												
		al, societal & environmental	_						-					
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and													
	-	data, and synthesis of the in			-									
PO 5		lapt and apply appropriate te					lern comp	uting too	ols to complex					
		ties, with an understanding commit to professional ethic												
PO 6	professional con		s and	cybe	rreş	guiations, respo	misionnes	s, and no						
PO 7	-	eed, and have the ability, to	engago	e in i	nder	endent learnin	g for cont	inual de	velopment as					
PO 8	computing profe Demonstrate kno		of the	comj	outin	ig and manage	ment princ	ciples an	d apply these					
PO 9	computing activi	fectively with the computing ties by being able to compre	-			•								
PO 10	effective present	ations. assess societal, environment	al ha	alth	safat	v legal and o	ultural ice	les with	n local and					
1010		and the consequential response												
PO 11	-	vely as an individual and as				-	-	• •						
	environments.								• • /					
PO 12	Identify a timely	opportunity and using inno	vation	to p	ursu	e that opportun	ity to crea	te value	and wealth fo					
	the betterment of	f the individual and society a	t larg	e.										
PO 13		dge of computing to create					-							
		and synthesize scholarly lite			-		-							
PO 14		tific outlook that solves any	probl	em,	enco	mpassing the e	expected a	spects of	f market					
PO 15		e of computing fundamentatopriate for the computing sp		-	-									

computing models from defined problems and requirements

COs	COURSE OUTCOME
CO 1	Know the primitive functions of Neural network concepts.
CO 2	Understand the Back propagation
CO 3	Implement various Adaptive Resonance Theory
CO 4	Perform Fuzzy Set Theory operations
CO 5	Implement Genetic algorithms
Pre-requisites	we have to know about neural network and gentic algorithm

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

					(<u> </u>) / KL.I	Mappin	σ							
		(3/2	/1 indic	ates the						2-mediu	m, 1-we	ak)				
CC)s				KLs			POs					KLs			
									РО	1			1			
CO	1		1						PO	2		2				
									PO				4			
									PO				4			
CO	2		2						PO				3			
									PO			3 3 5 5 5 4 4 4 4				
	•								PO							
CO	3		3					PO 8								
									PO PO 1							
CO	. 4		4					PO 10								
	4							PO 12								
									PO 1				4			
CO	5		4					PO 14				4				
			т					PO 15				4				
						CO /	PO Ma	pping								
		(3/2	/1 indic	ates the	e streng				trong, 2	2-mediu	m, 1-we	eak)				
G O						Р	rogram	me Ou	tcome ((POs)						
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the	Syllabus											
	Fundamentals of Neural Networks	Periods	12									
	Basic Concepts of Neural Network-Model of an Artificial Neuron - Neural Network Architec											
Unit - I	Characteristics of Neural Networks - Learning Methods - Taxonomy of Neural Network Architectures -											
	History of Neural Network Research - Early Neural Network Architectures - Some Applications Domain.											
	Backpropagation Networks	Backpropagation Networks Periods										
	Architecture of Backpropagation Network - Backpropagation Learning -	Illustrations - App	lications - Effect									
Unit - II	of Tuning Parameters of the Backpropagation Neural Network - Selection of various Parameters in											
	Backpropagation Neural Network - Variations of Standard Backpropagati	ion Algorithms.										
	Adaptive Resonance Theory (ART):	Periods	12									
Unit - III	Introduction - Classical ART networks - Simplified ART Architecture - ART1 - Architecture of ART1 -											
Unit - III	Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture of ART2 - ART2 Algorithm											
	-Applications.											
	Fuzzy Set Theory:	Periods	12									
Unit - IV	Fuzzy Sets - Fuzzy Relations. Fuzzy Systems: Fuzzy Logic - Fuzzy Rule based system - Defuzzification											
Unit - I v	Methods - Applications. Fuzzy Backpropagation Networks: LR-type Fuzzy Numbers - Fuzzy Neuron -											
	Fuzzy Backpropagation Architecture.											
	Fundaments of Genetic algorithms:	Periods	12									
Unit - V	Basic Concepts - Creation of Offsprings - Encoding - Reproduction. Gene	etic Modeling: Cro	oss Over -									
Unit - V	Inversion and Deletion - Mutation Operator - Bit Wise Operators.											
	Total Periods		60									

Text Books	
1	Rajasekaran. S and Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI,
	New Delhi-2012.
References	· ·
1	Jyh-Shing Roger Jang, Chuen-Tsai Sun, EijiMizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall
	of India, 2003.
2	George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall,
	1995.
3	James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and
	Programming Techniques", Pearson Edn., 2003
E-References	· ·
1	rkala.in/lectures.php
2	https://en.wikipedia.org/wiki/Soft_computing
3	https://www.slideshare.net/pkabhijithnair/introduction-to-soft-computing-17433519
4	https://www.myreaders.info/html/body_soft_computing.html
5	https://studymafia.org/soft-computing-seminar-and-ppt-with-pdf-report

0 - 3



WOMEN EMPOWERNEN												
Programme	M.Sc	Programme Code		Р	CS	Regulati	ions	2021-2022				
Department	Con	puter Science			Semester			3				
Course Code	C	ourse Name	Perio per W		Credit	ım Mar	Marks					
			L T	Р	С	CA	ESE	Total				
21P3CS11	PYTHON	PYTHON PROGRAMMING40042575										
COURSE OBJECTIVES	in analysis of alg	Analyze the efficiency of algorithmic problem solving Techniques. Acquire the mathematical foundation analysis of algorithms. Understand different control logic in design strategies. Applydesign principles and concepts to write source code.										
POs		PRO	GRAMM	IE OU	ЛСОМЕ							
PO 1	knowledge appro	e of computing fundamental opriate for the computing spo ls from defined problems an	ecializati	on to	the abstraction							
PO 2	-	te, research literature, and so g fundamental principles of		-			-					
PO 3	systems,compon	ate solutions for complex co ents,or processes that meet s al,societal &environmental c	pecified	needs				or public health				
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the int	methods	inclu	• •	-	ts, analy	vsis and				
PO 5	Create, select, ad	apt and apply appropriate te ties, with an understanding of	chniques	, reso	urces, and mo		ting too	ols to complex				
PO 6		commit to professional ethic				onsibilities,	and no	orms of				
PO 7		eed, and have the ability, to e	engage in	inde	pendent learnir	ng for conti	nual de	velopment as a				
PO 8	Demonstrate kno	wledge and understanding o s a member and leader in a t		-		-	-					
PO 9		fectively with the computing ties by being able to compre ations.	-	•		• •		-				
PO 10		assess societal, environmenta and the consequential respor										
PO 11		ely as an individual and as a										
PO 12	Identify a timely	opportunity and using innov the individual and society a		pursu	e that opportur	nity to creat	e value	and wealth for				
PO 13	To apply knowle	dge of computing to create each and synthesize scholarly lite	effective	-		-	-					
PO 14		tific outlook that solves any		-		-						
PO 15	Apply knowledg	e of computing fundamental priate for the computing spe	-	-	-							

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Recognize the operation of algorithmic problem solving Technique.
CO 2	Identify and handle basic tokens of python programs and practice to write small coding in python.
CO 3	Describe the computational operation of conditionals, function and string modules.
CO 4	Demonstrate the operation list and advanced list operations and applications.
CO 5	Recognize the operation of files and exceptions and illustrative programs.
Pre-requisites	basoc knowledge of any programming language concepts loop, if else , how operators used etc.

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

					(<u> </u>)/KI 1	Mappin	σ							
		(3/2	/1 indic	ates the						2-mediu	m, 1-we	ak)				
CO	s				KLs			POs					KLs			
									РО	1			1			
CO	1		1						PO	2			2	2		
									PO				4			
									PO				4			
CO	2				2				PO							
									PO			$ \begin{array}{r} 3 \\ 3 \\ 5 \\ 5 \\ 5 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \end{array} $				
									PO							
CO	3		3					PO 8								
									PO							
60	4		4					PO 10 PO 11								
CO	4		4				PO 11 PO 12									
									PO 1							
СО	5		4					PO 14				4				
0	5		4					PO 15				4				
						CO /	PO Ma	pping	101							
		(3/2	/1 indic	ates the	e streng				trong, 2	e-mediu	m, 1-we	eak)				
								me Ou				,				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Python:	Periods	12				
	Introduction - Python interpreter and interactive mode - Values & Types -	Variable - Expre	ssions and				
T:4 T	Statements - Assigning Values in Python, Variable Declaration, Multiple	Assignment - Ope	erators - Types				
Unit - I	of Operators, Operator Precedence - Modules and Functions: Modules, Fu	unction Definition	and Use,				
	Defining a Function, Calling Function, Uses of Function, Advantages of H	Functions - Flow of	of Execution.				
	Parameters and Arguments:	Periods	12				
	Functions with No Arguments, Functions with Arguments, Functions with	h Return Value. C	onditionals:				
Unit - II	Booleans Values and Operators - Operators - Operator Precedence - Decision Making - if, ifa€ Else,						
	If…Elif… Else & Nested statements - Iteration - Fruitful Functions - Sco	pe of Variable - C	Blobal and Loc				
	Variable in Function, Nonlocal Variable - Composition - Recursion.						
	Strings:	Periods	12				
	String Slices - String are Immutable - String Functions and Methods - String Module - Lists as Array. Lists						
Unit - III	Accessing Elements in Lists Using Subscript Operator, List Operations, List Slices, List Methods, List						
	Loop, Mutability, Aliasing, Cloning Lists, List Parameters, Deleting List Elements, Python Functions for						
	List Operations, List Comprehension.						
	Tuples:	Periods	12				
	Advantages of Tuple Over List, Accessing Values, Updating Tuples, Delete Tuple Elements, Tuple						
Unit - IV	Assignment, Tuple Methods, Other Tuple Operations, Tuples As Return Values, Built-in Functions with						
Ont IV	Tuple, Variable Length Arguments Tuples - Dictionaries: Built-in Dictionary Functions and Methods,						
	Access update and Add Elements, Delete and Remove Elements, Sorting, Iterating through, Reverse						
	Lookup, Inverting a Dictionary, Memorization(Memos)						
	Files:	Periods	12				
Unit - V	Reading and Writing, Format Operator, Command Line Arguments - Errors and Exceptions: Errors,						
Unit - v	Exceptions. Modules: Writing Modules, Locating Modules. Packages: Ste	eps to create a Pyt	hon Package.				
			-				

Text Books	
1	Dr. S. Suresh kumar Problem Solving and Python Programming Charulatha Publications 2018
References	
1	Kenneth A. LambertThe Fundamentals of Python First Programs 2011 Cengage Learning ISBN:
	978-1111822705.Python Essentials Reference
2	Hitchhikers Guide to Python (http://docs.python-guide.org/en/latest): Under active developmentand still
	somewhat incompletebut there is good stuff.
3	Writing Idiomatic Python (Focused on not just getting the code to work, but how to write it in a really
	"Pythonic" way.
E-References	
1	www.tutorialspoint.com/python programs
2	en.wikipedia.org/wiki/python programms
3	www.slideshare.net/kumar_vic/pythan for better programming.
4	www.slideshare.net/ShivamGupta276/python-seminar-ppt

HOMEN ENDOREMENT

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES

FORWOMEN (AUTONOMOUS)

A	ISO 9001:2008
TÜVRheinland	
GERTIFIED	www.tuv.com ID 9105078407

NOMEN EMPOWERMENT									
Programme	M.Sc	Programme Code		PC	CS	Regulat	ions	2021-2022	
Department	Com	puter Science			Semester			3	
Course Code	C	ourse Name	Period per We		Credit	Maxim	Maximum Marks		
	CLOU	L T P C CA ESE CLOUD COMPUTING 4 0 0 4 25 75							
21P3CS12								100	
COURSE		cs of Cloud Computing.Und					oud Con	puting.	
OBJECTIVES	Identify the purpo	ose of Cloud Storage Eval	uate cloud	serv	ices with com	panys.			
POs		PRO	GRAMMI	E OU	TCOME				
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements							
PO 2	-	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain							
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration								
PO 4	Use research-base	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.							
PO 5		apt and apply appropriate te ies, with an understanding o	-			lern compu	uting too	ols to complex	
PO 6		ommit to professional ethic				onsibilities	, and no	rms of	
PO 7		ed, and have the ability, to e	engage in i	ndep	endent learnin	ig for conti	inual de	velopment as a	
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.								
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.								
PO 10		Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.							
PO 11		ely as an individual and as a							
PO 12	Identify a timely	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.							
PO 13	To apply knowled	To apply knowledge of computing to create effective designs and solutions for complex problems. To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.							
PO 14	To develop scient	ific outlook that solves any							
PO 15	Apply knowledge knowledge appro	lemands. Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements							

COs	COURSE OUTCOME				
CO 1	Basic Knowledge on Cloud Computing.				
CO 2	Understand the models and services of Technologies.				
CO 3	Apply Cloud techniques for improving the efficiency of business.				
CO 4	Analyze each and every service in cloud computing.				
CO 5	Analyze a given algorithm for its efficiency based on cloud management.				
Pre-requisites	Programming skills, familiar with databases				

	Knowledge Levels														
1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing															
								Mappin	-						
(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)															
CO	s				KLs				POs				K	Ls	
									PO				1		
CO	1				1				PO				1		
									PO				1		
СО	r				1				PO -				1		
	2				1				PO				1		
								PO 6 PO 7					1		
СО	3		1				PO 8				1				
							PO 9				1				
								PO 10				1			
CO	4		1				PO 11					1			
								PO 12					1		
								PO 13				1			
СО	5		1				PO 14				1				
						<u> </u>	PO Ma		PO 1	5			1		
		(3/2	/1 indic	entas the	a strand				trong	modiu	m, 1-we	ak)			
		(3/2	/ I muit	ates th	c such	-		ime Ou	-		III, 1-wc	ак)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1															
	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus							
	Cloud Computing Basics: Periods							
Unit - I	Cloud Computing Overview-Applications-Intranets and the Cloud. Your Organization and Cloud							
Unit - I	Computing: When you can use Cloud computing-Benefits-Limitations-Se	curity Concerns.						
	Cloud Computing Technology: Periods 12							
Unit - II	Cloud Hardware and Infrastructure-Clients-Security-Network-Services. Accessing the Cloud:							
Unit - II	Platforms-Web Applications-Web APIâ€~s-Web Browsers.							
	Cloud Storage:	Periods	12					
Unit - III	Overview- Cloud Storage Providers. Standards: Applications-Client-Infra	structure-Service.						
	Software as a Service: Periods 1							
Unit - IV	Overview-Driving forces-Company offerings-Industries. Software plus Se	ervices: Overview	-Mobile Device					
Unit - Iv	Integration-Providers-Microsoft Online.							
	Local Clouds and Thin Clients:	Periods	12					
Linit V	Virtualization in Your Organization-Server Solutions-Thin Clients. Migra	ting to the Cloud:	Cloud Services					
Unit - V	for Individuals-Enterprise-Class Cloud Offerings-Migration.							
	Total Periods		60					

Text Books							
1	1 Anthony T.Velte Toby J.Velte Robert Elsenpeter Cloud Computing –A Practical Approach Tata						
	McGraw Hill Education Pvt. Ltd						
References							
1	Michael Miller," Cloud Computing: Web based Applications that change the way you work and						
	Collaborate online", Que Publishing, August 2010.						
2	Haley Beard, "Cloud Computing Best Practices for Managing and Measuring Processes for on						
	demand computing, Applications and Data Centers in the Cloud with SLAs", Emereo Pvt. Ltd, July 2011.						
E-References							
1	www.learnerstv.com/video/Free-video-Lecture-18965-Computer-Science						
2	nptel.ac.in/courses/106105033/41						
3	freevideolectures.com › Computer Science › UC Berkeley						
4	class.coursera.org/massiveteaching-001/lecture/33						
5	www.south.cattelecom.com/Technologies/CloudComputing/lec01.pdf						



Elayampalayam, Tiruchengode-637 205.

WOMEN EMPOWERWEN	Elayampalayam, Tiruchengode-637 205.									
Programme	M.Sc	M.Sc Programme Code PCS Regulations								
Department		Computer Science Semester								
21P3CSP04	Core Course Practical – 4			Periods per Week				um Mai	ks	
	PTHONPR	OGRAMMING LAB	L	Т	Р	С	CA	ESI	E Total	
			0	0	5	2	40	60	100	
COURSE OBJECTIVES	2. Imple	2. Implement a python program from files								
		LIST OF PRACTICALS								
1	To compute th	To compute the GCD of Two Numbers.								
2	Find square root of a Number.									
3	To find the exponentiation of a given positive Number.									
4	To perform Linear search from the list of Elements									
5	List the first N prime Numbers.									
6	Find the Maximum of a list of Numbers.									
7	Implementation Insertion Sort									
8	Remove all the duplicate elements in a list									
9	Implement a p	by thon program find the r	nost	frec	luen	t words in a	a text read	l from	a file	
10	Simulate bouncing ball using Pygame									

Subject Title	MINI PROJECT - II	Semester	III
Subject Code	21P3CSPR02	Specialization	NA
Туре	Mini Project - II	L:T:P:C	0:0:3:5
Total Marks : 40 The Passing mini	Marks mum shall be 40% out of 60 mar	ks (24 Marks)	
FIRST REVIEW	:		(15 Marks)
6. Project Tit	le		
7. Project Pla	atform		
8. Details of	Guide		
9. Problem D	Description / Modules		
10. Presentatio	on (PPT)		
FINAL REVIEW	<i>.</i> :		(25 Marks)
6. Document	ation		
7. Screens Sh	nots		
8. DFD / ER	D / System Flow Diagram (Which	ever Applicable)	
9. Presentatio	on (PPT)		
10. Final Proje	ect Report (with executable formation	t including complete source	e code)

Subject Title	Major Project	Semester	IV
Subject Code	21P4CSPR03	Specialization	NA
Туре	Major Project	L:T:P:C	0:0:0:9
FIRST REVIE	ZW:		(10 Marks)
1. Pro	blem Identification		
2. Pro	blem definition		
3. Pre	sentation		
SECOND REV	/IEW:		(10 Marks)
1. Pro	ject Analysis		
2. Des	sign & Module description		
FINAL REVIE	EW:		(20 Marks)
1. DF	D / ERD / System Flow Diagram	(Whichever Applicable)	
2. Co	ding and Implementation		
3. Pre	sentation		
4. Fin	al Project Report (with executable	e format including complete so	ource code)
	The Passing minimum shall	be 40% out of 60 marks (24 I	Marks)



PO 14 PO 15

demands.

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



Elayampalayam, Tiruchengode-637 205. M.Sc Regulations 2021-2022 Programme Programme Code PCS **Computer Science** Department Semester 1 Periods Credit Maximum Marks Course Code Course Name per Week Т Р CA L С ESE Total 2 0 0 4 100 THEORY OF COMPUTATION 25 75 21P1CSE01 COURSE To provide he knowledge on Learning about automata, grammar, language, and their relationships. To **OBJECTIVES** gives an understanding of the power of Turing machine, and the decidable nature of a problem. To gives the idea on new trends and applications POs PROGRAMME OUTCOME PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements PO 2 Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. Design and evaluate solutions for complex computing problems, and design and evaluate PO 3 systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration Use research-based knowledge and research methods including design of experiments, analysis and PO 4 interpretation of data, and synthesis of the information to provide valid conclusions. Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex PO 5 computing activities, with an understanding of the limitations. PO 6 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice. Recognize the need, and have the ability, to engage in independent learning for continual development as a PO 7 computing professional. PO 8 Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. Communicate effectively with the computing community, and with society at large, about complex PO 9 computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations. Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and PO 10 global contexts, and the consequential responsibilities relevant to professional computing practice. Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary PO 11 environments. PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. To apply knowledge of computing to create effective designs and solutions for complex problems. PO 13

To identify, analyse and synthesize scholarly literature relating to the field of Computer Science

To develop scientific outlook that solves any problem, encompassing the expected aspects of market

COs	COURSE OUTCOME				
CO 1	Summarize of Automa Theory, Non Deterministic Automata				
CO 2	Context Free Grammar and Pushdown Automata				
CO 3	Apply various Closure Properties				
CO 4	Analyze the Undecidable problems				
CO 5	Analyze a given grammar type and characteristics				
Pre-requisites	Compiler Design				

]	Know	ledge	Level	S						
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g
		(3/2	/1 indic	ates the				Mappin on, 3-si	-	2-mediu	m, 1-we	eak)			
CC)s	(2) -			KLs			,	POs				K	Ls	
									PO				1		
СО	1				1				PO				2		
									PO	3			4	1	
									PO	4			4	ł	
CO	2				2				PO				3		
									PO				3		
							PO 7				5				
CO	3		3				PO 8 PO 9				5 5				
							PO 10				4				
СО	4		4				PO 10				4				
								PO 12				4			
								PO 13				4			
CO	5		4				PO 14				4				
								PO 15					4		
							PO Ma								
	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs)														
COs				201			-				2011	2010	2010	2011	2015
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12		PO14	
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the S	•	~ • •	1.2				
	Regular Languages	Periods	12				
	Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deter	ministic Finite Au	utomata (NFA) -				
Unit - I	Regular Expression	ns - Pumping					
	lemma for Regular languages - Equivalence and minimization of Finite A	utomata.					
	Context Free Languages Periods 12						
	Context-Free Grammar (CFG) - Parse Trees - Ambiguity in grammars and	d languages - Equ	ivalence of Pars				
Unit - II	trees and derivation - Normal forms for CFG - Definition of the Pushdow	n automata - Lang	guages of a				
	Pushdown Automata - Equivalence of Pushdown automata and CFG - Pumping lemma for CFL.						
	Closure Properties	Periods	12				
	Turing machines 8 Closure properties of Regular Sets: Complement and Intersection - Closure properties of						
Unit - III	CFL: Union, Concatenation, Kleene Closure, Intersection and Complement - Turing Machines - Language						
	of a Turing machine - Turing machine as a computing device - Various techniques for construction of TMs						
	- Equivalence of one tape and multi-tape Turing machines.						
	Undecidability	Periods	12				
11.4 117	A language that is not Recursively Enumerable (RE) - An undecidable problem that is RE - Undecidable						
Unit - IV	problems about Turing Machine - Rice theorem for Recursive and Recursively enumerable languages -						
	Post's Correspondence Problem						
	Recent Trends & Applications	Periods	12				
TT.: 1 T7	Matrix grammar - Programmed grammar - Random context grammar - Regular Control grammar -						
Unit - V	Lindenmayer systems - A glance on DNA computing and Membrane com	puting.					
	Total Periods 60						

Text Books	
1	John E. Hopcroft and Jeffery D. Ullman, Introduction to Automata Theory, Languages and Computations,
	3rd Edition, Pearson Education, Delhi, 2007.
2	Kamala Krithivasan and R. Rama, Introduction to Formal Languages, Automata Theory and Computation,
	Pearson Education, Delhi, 2009.
References	· ·
1	Harry R. Lewis and Christos H. Papadimitriou, Elements of the theory of Computation, Second Edition,
	Prentice-Hall of India Pvt. Ltd, 2003.
2	J. Martin, Introduction to Languages and the Theory of Computation, Third Edition, Tata Mc Graw Hill,
	New Delhi, 2003.
3	Micheal Sipser, Introduction of the Theory and Computation, Thomson Learning, 1997.
E-References	
1	www.geeksforgeeks.org/regular-expressions-regular-grammar-and-regular-languages/
2	brilliant.org/wiki/context-free-languages/
3	infolab.stanford.edu/~ullman/ialc/spr10/slides/rs2.pdf
4	www.javatpoint.com/introduction-to-undecidability
5	slideplayer.com/slide/11239479/



A CONTRACT OF A	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)							ISO 9001:2008
WOMEN EMPOWERNEN		Elayampalayam, Ti	rucheng	ode-6	537 205.	1		
Programme	M.Sc	Programme Code		PCS Reg			Regulations 2021	
Department	Con	Computer Science Semester						1
Course Code	C	ourse Name	Perio per W		Credit	Maxim	um Ma	rks
			L T	Р	С	CA	ESI	E Total
21P1CSE02	MOBILE	COMMUNICATION	2 0	0	4	25	75	100
COURSE OBJECTIVES		s familier with fundamentals CDMA) according to the co				•		•
POs		PRO	GRAMM	IE OU	JTCOME			
PO 1	knowledge appro	e of computing fundamental priate for the computing spe ls from defined problems an	ecializati	on to	the abstraction			
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.							
PO 3	systems,compone	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration						
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the inf	methods	inclu	• •	-	ıts, anal	ysis and
PO 5	Create, select, ad	apt and apply appropriate te	chniques	, reso	urces, and mo		uting to	ools to complex
PO 6	Understand and o	computing activities, with an understanding of the limitations. Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.						
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.							
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.							
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.							
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.							
PO 11	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.							
PO 12		Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.						
PO 13		dge of computing to create e		desig	ns and solution	ns for com	plex pro	oblems.
PO 14 PO 15	To develop scien	yse and synthesize scholarly tific outlook that solves any						
	demands.	lemands.						

COs	COURSE OUTCOME			
CO 1	To understand the basic concepts of wireless communication			
CO 2	To gain knowledge of SDMA,FDMA,TDMA and CDMA mobile communication standard, its architecture,			
	logical channels, advantages and limitations			
CO 3	Demonstrate the knowledge of Satellite system and Broadcast system			
CO 4	Apply the concept of Wireless LAN in real life time applications			
CO 5	Compare different Mobile Network layer and Mobile Transport layer			
Pre-requisites	-			

Knowledge Levels 1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs KLs POs PO 1 CO 1 **PO 2** PO 3 PO 4 CO 2 PO 5 PO 6 PO 7 CO 3 PO 8 PO 9 PO 10 PO 11 CO 4 PO 12 PO 13 CO 5 PO 14 PO 15 CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs) COs PO1 **PO2** PO3 PO4 PO5 PO6 PO7 **PO8** PO9 PO10 PO11 PO12 PO13 PO14 PO15 CO1 CO2 CO3 CO4

CO5

Direct

1. Continuous Assessment Test I, II & Model

- 2. Assignment
- 3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus							
	Introduction	Periods	12					
	Applications - A Short history of wireless communication - A market for	mobile communic	cation - A short					
Unit - I	history of wireless communication - Some open research topics - A simpl	ified reference mo	odel. Wireless					
	transmission: Frequencies for radio transmission - Signals - Antennas - Si	gnal propagation	- Multiplexing -					
	Modulation - Spread spectrum - Cellular systems							
	Medium Access Control	Periods	12					
	Motivation for a specialized MAC - SDMA - FDMA - TDMA - CDMA -	Comparison of S	/T/F/CDMA.					
Unit - II	Telecommunications systems: GSM-DECT-TETRA-UMTS and IMT-2000							
	Satellite systems Periods							
Unit - III	History - Applications - Basics - Routing - Localization - Handover - Exa	mples. Broadcast	systems -					
Unit - III	Overview - Cyclical repetition of data - Digital Audio Broadcasting - Digital Video Broadcasting -							
	Convergence of broadcasting and mobile communications							
	Wireless LAN	Periods	12					
Unit - IV	Infra red vs radio transmission - Infrastructure and ad-hoc network -IEEE 802.11 - HIPERLAN - Bluetootl							
	Mobile Network Layer	Periods	12					
Unit - V	Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc networks. Mobile Transport Layer:							
Unit - V	Traditional TCP - Classical TCP improvements - TCP over 2.5/3G wirele	ss networks						
	Total Periods		60					

Text Books	
1	Jochen Schiller, Mobile Communications, Pearson Education, Second Edition, 2003.
References	
1	William Stallings, Wireless Communications and Networks, Pearson Education, 2015.
2	Asoke K Talukder http://www.amazon.com/Mobile- Computing
	Applications-McGraw-Hill-Communications/dp/0071477330Mobile Computing: Technology,
	Applications, and Service Creation, TataMcGraw-Hill Communications Engineering, 2012.
E-References	
1	www.readorrefer.in/article/Mobile-Computing
2	www.readorrefer.in/article/Characteristics-of-Mobile-Computing
3	www.slideshare.net/manishreddy27/mobile-communication-72543084
4	www.powershow.com/view0/7841ea-NjI3N/Fundamentals_of_Mobile_communication_powerpoint_ppt_pr
	esentation
5	cs.wmich.edu ‰ ~llilien ‰ teaching ‰ Sec.1





Elayampalayam, Tiruchengode-637 205.

MEN EMPOWERMEN		Elayampalayam, T	iruchengo	ode-6	37 205.			
Programme	M.Sc	Programme Code		Р	CS	Regulat	tions	2021-2022
Department	Сог	nputer Science			Semester			1
Course Code	(Course Name	per We	Periods Credit per Week			um Marl	
			L T	P	C	CA	ESE	
21P1CSE02	MOBILE	COMMUNICATION	2 0	0	4	25	75	100
COURSE OBJECTIVES		To make students familier with fundamentals of mobile communication systems. To choose system TDMA/FDMA/CDMA) according to the complexity, installation cost, speed of transmission, channel properties etc.						
POs		PRO	GRAMM	ΕO	JTCOME			
PO 1	knowledge appr	e of computing fundamenta opriate for the computing sp els from defined problems ar	ecializatio	on to	the abstraction			
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.							
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration							
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.							
PO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.							
PO 6	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.							
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.							
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.							
PO 9	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations.							
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.							
PO 11	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.							
PO 12	Identify a timely	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.						
PO 13		edge of computing to create	-	lesig	ns and solution	ns for comp	plex prol	blems.
PO 14	To identify, anal	yse and synthesize scholarly	/ literature	e rela	ting to the field	d of Comp	uter Scie	ence.
PO 15	To develop scier demands.	ntific outlook that solves any	problem,	enco	ompassing the	expected a	spects of	f market

COs	COURSE OUTCOME			
CO 1	To understand the basic concepts of wireless communication			
CO 2	To gain knowledge of SDMA,FDMA,TDMA and CDMA mobile communication standard, its architecture,			
	logical channels, advantages and limitations			
CO 3	Demonstrate the knowledge of Satellite system and Broadcast system			
CO 4	Apply the concept of Wireless LAN in real life time applications			
CO 5	Compare different Mobile Network layer and Mobile Transport layer			
Pre-requisites	-			

Knowledge Levels 1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs KLs POs PO 1 CO 1 **PO 2** PO 3 PO 4 CO 2 PO 5 PO 6 PO 7 CO 3 PO 8 PO 9 PO 10 PO 11 CO 4 PO 12 PO 13 CO 5 PO 14 PO 15 CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) Programme Outcome (POs) COs PO1 **PO2** PO3 PO4 PO5 PO6 PO7 **PO8** PO9 PO10 PO11 PO12 PO13 PO14 PO15 CO1 CO2 CO3 CO4

CO5

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction	Periods	12				
	Applications - A Short history of wireless communication - A market for	mobile communic	cation - A short				
Unit - I	history of wireless communication - Some open research topics - A simpl	ified reference mo	odel. Wireless				
	transmission: Frequencies for radio transmission - Signals - Antennas - Si	gnal propagation	- Multiplexing -				
	Modulation - Spread spectrum - Cellular systems						
	Medium Access Control	Periods	12				
Unit - II	Motivation for a specialized MAC - SDMA - FDMA - TDMA - CDMA -	Comparison of S	/T/F/CDMA.				
Unit - II	Telecommunications systems: GSM-DECT-TETRA-UMTS and IMT-2000						
	Satellite systems Periods						
Unit - III	History - Applications - Basics - Routing - Localization - Handover - Examples. Broadcast systems -						
Unit - In	Overview - Cyclical repetition of data - Digital Audio Broadcasting - Digital Video Broadcasting -						
	Convergence of broadcasting and mobile communications						
	Wireless LAN	Periods	12				
Unit - IV	Infra red vs radio transmission - Infrastructure and ad-hoc network -IEEE 802.11 - HIPERLAN - Bluetoo						
	Mobile Network Layer	Periods	12				
Unit - V	Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc networks. Mobile Transport Layer:						
Unit - V	Traditional TCP - Classical TCP improvements - TCP over 2.5/3G wireless networks						
	Total Periods 60						

Text Books	
1	Jochen Schiller, Mobile Communications, Pearson Education, Second Edition, 2003.
References	
1	William Stallings, Wireless Communications and Networks, Pearson Education, 2015.
2	Asoke K Talukder http://www.amazon.com/Mobile- Computing
	Applications-McGraw-Hill-Communications/dp/0071477330Mobile Computing: Technology,
	Applications, and Service Creation, TataMcGraw-Hill Communications Engineering, 2012.
E-References	·
1	www.readorrefer.in/article/Mobile-Computing
2	www.readorrefer.in/article/Characteristics-of-Mobile-Computing
3	www.slideshare.net/manishreddy27/mobile-communication-72543084
4	www.powershow.com/view0/7841ea-NjI3N/Fundamentals_of_Mobile_communication_powerpoint_ppt_pr
	esentation
5	cs.wmich.edu › ~llilien › teaching › Sec.1

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FORWOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205. Regulations Programme M.Sc Programme Code PCS 2021-2022 Department **Computer Science** Semester 1 Periods Credit Maximum Marks Course Code Course Name per Week L Г P С CA ESE Total CLIENT / SERVER TECHNOLOGY 100 2 0 0 4 25 75 21P1CSE03 COURSE Know the basics of client /server technology. Understand the client server hardware and software **OBJECTIVES** components. Analyze the impact of client/server technology in business. Development and deployment of client server platform. POs PROGRAMME OUTCOME PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements **PO 2** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. Design and evaluate solutions for complex computing problems, and design and evaluate PO 3 systems, components, or processes that meet specified needs with appropriate consideration for public health and safety.cultural.societal & environmental consideration PO 4 Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions. PO 5 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. PO 6 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice. Recognize the need, and have the ability, to engage in independent learning for continual development as a **PO 7** computing professional. PO 8 Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. Communicate effectively with the computing community, and with society at large, about complex PO 9 computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations. PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. To apply knowledge of computing to create effective designs and solutions for complex problems. PO 13 PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.

To develop scientific outlook that solves any problem, encompassing the expected aspects of market

PO 15

demands.

COs	COURSE OUTCOME			
CO 1	Jnderstand the concepts of client /server technology			
CO 2	To learn about s/w and h/w components of C/S technology			
CO 3	To analyze the basics of business in client server technology			
CO 4	To implement distributed client server system in various places			
CO 5	Design and Establish the client server system to apply in various environments.			
Pre-requisites	Computer Networks			

]	Know	ledge	Level	S						
1.Reme	mberi	ng, 2.	Unde	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	3
		(3/2	/1 indic	rates th				Mappin	-	-mediu	m, 1-we	vak)			
СО	s	(3/2			KLs			011, 5 5	POs		III, I we	ur)	K	s	
	5								PO				1		
СО	1				1				PO				2		
									PO	3			4	ŀ	
									PO				4		
CO	2				2				PO				3		
									PO			3			
CO	2		4					PO 7 PO 8				5			
CO	3							PO 9					5		
									PO 1						
СО	4		3					PO 11				4			
								PO 12				4			
								PO 13				4			
CO	5		4					PO 14				4			
						<u> </u>		<u> </u>	PO 1	5			4		
		(2/)	/1 india	ntae th	o strong		PO Ma		trong	modiu	m, 1-we	nak)			
		(3/2		ales in	e su eng			me Ou	-		III, 1-we	ak)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
C01	3	2	1	1	1	1	1	1	1	1			1	1	1
					-						1	1			
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus										
	Introduction to Client Server Computing	Periods	12								
	Benefits of Client Server Computing-Hardware Trends-Components of Client Server										
Unit - I	Applications-Categories of Client Server Applications-Dispelling the Myt	ths-Obstacles-Upf	ront and								
	Hidden-Open Systems and Standards-Setting Organization-Factors for Success.										
	Client Hardware and Software Periods 12										
Unit II	Unit - II Client Components-Client Operating System-GUI-X Window Vs Windowing-Database Access-Applica Logic-Client Server Products-Requirements-GUI Design Standards-Open GUI Standards.										
Unit - II											
	Server Hardware	12									
	Benchmarks-Categories of Server-Features of Server Machines-Classes of Server Machines-Server										
	Environment-Eight layers of Software-Network Management Environment-Network Computing										
Unit - III	Environment-Server Requirements-Platform Independence-Transaction Processing-Connectivity-Intelligent										
	Database-Stored Procedures-Triggers-Load Leveling-Optimizer-Testing and Diagnostic										
	Tools-Reliability-Backup and Recovery Mechanisms- Server Data Managements and Access Tools.										
	Overview of Networking	Periods	12								
Unit - IV	Layers, Interfaces and protocols-Standard Architectures-Network Charact	eristics-Network	Management								
Unit - Iv	Standards-LAN Hardware and Software-LAN Hardware-Network Operat	ing System.									
	Development and Deployment	Periods	12								
Unit - V	Development Methodology-Convert Existing Screen Interfaces-Applicati	on Development	Fools-Managing								
Unit - V	the Production Environment-Production Requirements-Future Trends.										
	Total Periods		60								

Text Books	
1	Dawna Travis Dewire, Client/Server computing, 11th Reprint 2009, Tata McGraw Hill. (Unit–I:Chapter
	1,2,3&4, Unit-II: Chapter 5,6&7,Unit-III :Chapter 8,9,10,11&12) Unit – IV:Chapter 15 &16, Unit
	–V:Chapter 18,18 &19)
References	
1	Jafferey D. Schank, Novellâ€ TM s guide to Client/Server Application and Architecture, 2005 Edition, BPB
	Publications.
2	Robert Orfali, Dan Harkey and Jeri Edwards, Client/Server Survival Guide, 3rd Edition, 2009 John Wiley
	& Sons, Inc.
E-References	
1	oer.nios.ac.in/wiki/index.php/ClientServer_Technology
2	www.tutorialspoint.com/Client-Server-Computing
3	isaaccomputerscience.org/concepts/net_internet_client_server_model
4	www.springer.com/productFlyer
5	www.britannica.com/technology/client-server-architecture



Elayampalayam, Tiruchengode-637 205.

NOMEN EMPOWERMENT		Elayampalayam, Tir	ruchengo	de-63	37 205.							
Programme	M.Sc	Programme Code		ions	2021-2022							
Department	Com	puter Science			Semester			1				
Course Code	C	ourse Name	Period per We	ek	Credit	Maximu	1					
21P1CSE04	INTER	NET OF THINGS	L T 2 0	P 0	C 4	CA 25	ESE 75	Total 100				
COURSE OBJECTIVES	To know the Fundamentals, characteristics of Internet Of Things.Understand the IoT Enabling Technologies.Implementing IoT in whether forecasting.Compare IoT and M2M. Synthesis Commercial IoT.											
POs		PROC	GRAMMI	E OU	TCOME							
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of omputing models from defined problems and requirements										
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.											
PO 3	systems,compone	ate solutions for complex co nts,or processes that meet sp l,societal &environmental c	pecified n	eeds	-	-		or public health				
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.											
PO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.											
PO 6	Understand and c professional com	ommit to professional ethics puting practice.	s and cybe	er reg	ulations, respo	onsibilities,	, and no	rms of				
PO 7	Recognize the ne computing profes	ed, and have the ability, to e sional.	ngage in i	ndep	endent learnin	g for conti	nual dev	velopment as a				
PO 8		wledge and understanding o a member and leader in a to	-			-	-					
PO 9		ectively with the computing ies by being able to compre- tions.		-		-		-				
PO 10		ssess societal, environmenta nd the consequential respon										
PO 11	Function effective environments.	ely as an individual and as a	member	or lea	der in diverse	teams and	in mult	idisciplinary				
PO 12	Identify a timely	opportunity and using innov the individual and society a	-	ursue	that opportun	ity to creat	te value	and wealth for				
PO 13			-	esign	s and solution	s for comp	lex proł	olems.				
PO 14 PO 15	To identify, analy	To apply knowledge of computing to create effective designs and solutions for complex problems. To identify, analyse and synthesize scholarly literature relating to the field of Computer Science. To develop scientific outlook that solves any problem, encompassing the expected aspects of market										

COs	COURSE OUTCOME						
CO 1	Knowledge on IoT						
CO 2	Inderstand IoT enabling Technologies.						
CO 3	Apply IoT techniques for improving the efficiency of algorithms.						
CO 4	Analyze each and every algorithm techniques IN IoT with M2M						
CO 5	Analyze a given algorithm for its efficiency based on IoT management.						
Pre-requisites	-						

]	Know	ledge	Level	S							
1.Rem	emberi	ng, 2.	Unde	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E ⁻	valuat	ing, 6.	Synth	esizinį	3	
		(3/2	/1 indic	rates the				Mappin	-	-mediu	m, 1-we	eak)				
C	Os	(5/2			KLs	ui oi e		011, 5 5	PO:		, i we	uix)	K	Ls		
	00								PO				1			
CO	D 1				1				PO				2			
				•					PO	3			4	1		
									PO	4			4	1		
CO	02				2				PO				3			
								PO 6				3				
C	2.2		3					PO 7 PO 8				5				
U	03								PO				5			
								PO 10					4			
CO	D 4		4					PO 11					4			
								PO 12				4				
								PO 13				4				
CO	05		4					PO 14				4				
								PO 15				4				
		(2)2	/1 : 1.	1	4		PO Ma			1.	1	-1-)				
		(3/2	/ 1 indic	cates the	e streng						m, 1-we	eak)				
COs	DO1	DOD	DOG	DO 1	D05		-		tcome (DO11	DO 10	DO 12	DO14	DO15	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12		PO14		
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction Periods									
Unit - I	Introduction to Internet of Things - Defintion & Characteristics of IoT - Things in IoT - IoT Protocols -									
Unit - I	Logical Design of IoT: IoT functional Blocks - IoT Communication Models - IoT Communication APIs.									
	IoT Enabling Technologies Periods 12									
Unit - II Wireless Sensor Networks - Cloud computing - Bigdata Analytics - Communication Protocols - En										
Systems. Domain Specific IoTs: Home Automation - cities - Retail - Health & Monitor										
	Developing IoT	12								
Unit - III	Introduction - IoT Design Methodology - Case Study on IoT System for V	Weather Monitorin	ng.							
	IoT and M2M	Periods	12							
Unit - IV	Introduction - M2M - Difference between IoT and M2M - SDN and NFV for IoT: Software defined									
Unit - I v	Networking - Network Function Virtualization.									
	IoT System Management with NETCONF-YANG	Periods	12							
Unit - V	Need for IoT System Management - SNMP - NETCONF - YANG. Tools	for IoT: Introduct	tion - Chef -							
	Puppet.									
	Total Periods		60							

Text Books	
1	Arshdeep Bahga, Vijay Madisetti , Internet of Things, A Hands on Approach, Universities Press 2015.
References	
1	Oliver Hersent, David Boswarthick, Omar Elloumi. The Internet of Things – Key applications and
	Protocols, Wiley, 2012.
E-References	
1	internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT
2	www.oracle.com/internet-of-things/what-is-iot/
3	www.theinternetof things.eu
4	www.cisco.com/c/en_in/solutions/internet-of-things/overview.html
5	en.wikipedia.org/wiki/Internet_of_things



Elayampalayam, Tiruchengode-637 205.

WOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengode-6	37 205.								
Programme	M.Sc	Programme Code	PO	CS	Regulatio	ns	2021-2022					
Department	Con	puter Science		Semester			2					
Course Code	С	ourse Name	Periods per Week	Credit	Maximun							
21P2CSE05	BIG DA	TA ANALYTICS	L T P 4 0 0	C 3	CA 25	ESE 75	Total 100					
COURSE OBJECTIVES		Jnderstand the Big Data Platform and its Use cases. Provide an overview of Mining Data StreamTo learn he concept of Hadoop.										
POs		PRO	GRAMME OU	ЛСОМЕ								
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements										
PO 2	-	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain										
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration											
PO 4	Use research-bas	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.										
PO 5		apt and apply appropriate te tes, with an understanding of	-		dern computi	ing too	ls to complex					
PO 6	Understand and c professional com	commit to professional ethic puting practice.	s and cyber reg	gulations, resp	onsibilities, a	and no	rms of					
PO 7	Recognize the ne computing profes	ed, and have the ability, to esional.	engage in inder	oendent learnin	ng for continu	ual dev	velopment as a					
PO 8		wledge and understanding o s a member and leader in a t	-									
PO 9		ectively with the computing ties by being able to compre ations.	•				-					
PO 10		ssess societal, environmentand the consequential respor										
PO 11	Function effectiv environments.	ely as an individual and as a	n member or le	ader in diverse	e teams and in	n mult	idisciplinary					
PO 12		opportunity and using innov the individual and society a	-	e that opportu	nity to create	value	and wealth for					
PO 13	To apply knowled	dge of computing to create e	effective design	ns and solution	ns for comple	ex proł	olems.					
PO 14 PO 15		vse and synthesize scholarly tific outlook that solves any										

COs	COURSE OUTCOME
CO 1	Understand the basic concept of Big Data
CO 2	Illustrates about Mining Data stream and its application
CO 3	Learn and apply about Hadoop in real time application
CO 4	Develop Big Data Solutions using Hadoop Eco System
CO 5	Learn different techniques and to know about how it is applied on Big Data Using Pig and Hive
Pre-requisites	-

]	Know	ledge	Level	s						
1.Remer	nberi	ng, 2.	Unde	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E ⁻	valuat	ing, 6.	Synth	esizin	5
		(3/2	/1 indic	rates the				Mappin	-	-mediu	m, 1-we	eak)			
COs	3	(3/2			KLs	ui oi e		011, 5 5	POs		, i we	uix)	K	5	
	,								PO				1		
СО	1				2				PO				2		
				-					PO				4		
									PO	4			4	1	
CO	2				3				PO				3		
								PO 6				3			
	-		2					PO 7				5			
CO	3		3					PO 8 PO 9				5			
									PO PO 1			4			
CO	4		4					PO 10				4			
00	•							PO 12				4			
								PO 13				4			
CO	5				6			PO 14				4			
								PO 15				4			
							PO Ma								
	[(3/2	/1 indic	cates the	e streng				-		m, 1-we	eak)			
COs							-	ime Ou	1	1					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		
CO1	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO2	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO5	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the S	Syllabus										
	Introduction To Big Data	Periods	12								
	Introduction to Big Data Platform - Challenges of Conventional Systems - Intelligent data analysis - Natu										
Unit - I	of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern	Data Analytic To	ols - Statistical								
	Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.										
	Mining Data Streams	Periods	12								
	Introduction To Streams Concepts - Stream Data Model and Architecture	- Stream Comput	ing - Sampling								
Unit - II	Data in a Stream - Filtering Streams - Counting Distinct Elements in a Stream - Estimating Moments -										
Unit - II	Counting Oneness in a Window - Decaying Window - Real time Analytics Platform(RTAP) Applications -										
	Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.										
	HADOOP	Periods	12								
	History of Hadoop- The Hadoop Distributed File System - Components of Hadoop- Analyzing the Data										
Unit - III	with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS-										
Unit - III	Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job										
	run-Failures-Job Scheduling-Shuffle and Sort - Task execution - Map Reduce Types and Formats- Map										
	Reduce Features.										
	HADOOP Environment	Periods	12								
Unit - IV	Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and In	stallation - Hadoo	р								
Unit - I v	Configuration-Security in Hadoop - Administering Hadoop - HDFS - Mon	nitoring-Maintena	nce Hadoop								
	benchmarks- Hadoop in the cloud.										
	Frameworks	Periods	12								
	Applications on Big Data Using Pig and Hive - Data processing operators	in Pig - Hive serv	vices - HiveQL								
Unit - V	Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphere BigInsights and										
	Streams. Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications.										
	Total Periods		60								

Text Books							
1	Michael Berthold, David J. Hand, Intelligent Data Analysis, Springer, 2007.						
2	Tom White, Hadoop: The Definitive Guide, Third Edition, Oreilly Media, 2012.						
References							
1	Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, Understanding Big Data:						
	Analytics for Enterprise Class Hadoop and Streaming Data, McGrawHill Publishing, 2012						
2 Anand Rajaraman and Jeffrey David Ullman, Mining of Massive Datasets, Cambridge University Pres							
	2012.						
E-References							
1	www.greatlearning.in						
2	www.edx.org						
3	www.slideshare.net/nasrinhussain1/big-data-ppt-31616290						
4	resources.sei.cmu.edu/asset_files/Presentation/2014_017_101_89659.pdf						
5	www.snia.org/sites/default/orig/DSI2014						



WOMEN EMPOWERMENT									
Programme	M.Sc	ons	2021-2022						
Department	Cor		2						
Course Code	(m Mark	S						
			per Week L T	С	CA	ESE	E Total		
21P2CSE06	MULTIME	EDIA AND VIRTUAL							
		REALITY	4 0 0	3	25	75	100		
COURSE	To understand f	undamental trends and evolu	tion of Multim	edia Technolo	ogy. Have har	ndson ki	nowledge in		
OBJECTIVES		ble Audio and Video technol			•••		-		
	devices.To learn	about multimedia skills & 3	BD modeling.						
POs		PRO	GRAMME OU	JTCOME					
PO 1	Apply knowledg	ge of computing fundamenta	ls, computing s	specialization,	mathematics	s, and d	omain		
		opriate for the computing sp			n and concep	otualizat	ion of		
		els from defined problems ar	-		h1	:			
PO 2	-	ate, research literature, and s ng fundamental principles of	-			-			
	disciplines.	ig fundamental principles of	matternatics, v	computing serv	chees, and re	ic vant c	omam		
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate								
	systems,compor	systems, components, or processes that meet specified needs with appropriate consideration for public health							
	and safety, cultural, societal & environmental consideration								
PO 4	Use research-based knowledge and research methods including design of experiments, analysis and								
PO 5	interpretation of data, and synthesis of the information to provide valid conclusions.								
FO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.								
PO 6	Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of								
	professional computing practice.								
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a								
	computing professional.								
PO 8	Demonstrate knowledge and understanding of the computing and management principles and apply these t								
	one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.								
PO 9	Communicate effectively with the computing community, and with society at large, about complex								
	computing activities by being able to comprehend and write effective reports, design documentation, make								
	effective present								
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and								
	global contexts, and the consequential responsibilities relevant to professional computing practice.								
PO 11	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.								
PO 12	Identify a timely	opportunity and using inno	vation to pursu	e that opportu	nity to create	e value a	and wealth for		
ļ	the betterment of the individual and society at large.								
PO 13		edge of computing to create				-			
PO 14	-	lyse and synthesize scholarly		-	-				
PO 15	-	ntific outlook that solves any	problem, enco	ompassing the	expected asp	pects of	market		
	demands.								

COs	COURSE OUTCOME						
CO 1	o understand the concept of Multimedia skills						
CO 2	o know the audio concepts in multimedia						
CO 3	To Describe and learn about the hardware tools used.						
CO 4	To learn about the hardware tools used.						
CO 5	To learn about the virtual reality concepts.						
Pre-requisites	-						

]	Know	ledge	Level	S								
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5		
		(3/2	/1 india	rates the		CO / PC			-	-mediu	m 1-we	eak)					
CC	s	(3/2			KLs	Sui oi e		elation, 3-strong, 2-medium, 1-w POs				KLs					
	5							PO 1				1					
CO	1		1					PO 1 PO 2				2					
								PO 3					4	ļ			
								PO 4					4	ļ			
CO	2		2					PO 5				3					
								PO 6				3					
60	2		3					PO 7				5					
CO	3							PO 8 PO 9				5 5					
								PO 10				4					
CO	4		4					PO 11				4					
								PO 12				4					
								PO 13				4					
CO	CO 5			4				PO 14				4					
										PO 15					4		
		(2)2	/1 • •	, . . .			PO Ma				1	1 \					
	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)																
COs Programme C									DO11	D010	DO10	D014	DOIT				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13				
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1		
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1		
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2		
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3		
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3		

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the	Syllabus								
	Introduction Periods								
Unit - I	what is multimedia - making multimedia - multimedia skills - Text.								
	Sound Periods								
Unit - II	Digital Audio-MIDI-Music CDs. Images: Making Still Images-Color-Image File Formats.								
	Animation-Video.								
	Hardware	Periods	12						
Macintosh versus Windows-Networking-Connections-Memory and Storage devices-Input devices-									
Unit - III	Hardware- Communication Devices.								
	Basic Software Tools Periods								
Unit - IV Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools. 3D Mod									
Unit - IV	Animation Tools - Image Editing Tools - Animation, Video and Digital Movie Tools - Multimedia								
	Authoring Tools.								
	Virtual Reality	Periods	12						
	Introduction - A Generic VR System: VirtualEnvironment -VR Technology-Modes Of Interaction-VR								
Unit - V	Hardware: Sensor Hardware, Head Coupled Displays - Acoustic Hardware-Integrated VR - VR Software:								
	Modeling Virtual Worlds- Physical Simulations - VR Application								
	Total Periods		60						

Text Books							
1	Tay Vaughan, Multimedia making it work, 2014, TMH.(Unit-I :Chapter-1,2,3& 4, Unit-II :Chapter-5,6,7&						
	8, Unit-III :Chapter-9, Unit-IV :Chapter-10 & 11)						
2	John Vince, Virtual Reality Systems, Addison Wesley, 4th Edition						
References							
1	Free T. Hofstetter, Multimedia LITERACY, TMH, 1995						
2	Simoin j., Gibbs, Dionysios C and Tsichriziz, Multimedia Programming , Addison Wesley, 2010.						
3	John F.Koegel Buford, Mutimedia Systems, Addison Wesley, 2014.						
4	Ralf steinmetz and klaranahrstedt, Multimedia : Computing, communications Applications, 2013.						
E-References							
1	www.richardbrice.net/chap01.htm						
2	www.slideshare.net/suprabhabhadran						
3	www.slideshare.net/saishanesarikar						
4	www.slideserve.com/cana/multimedia-and-virtual-reality						
5	slideplayer.com/slide/12781832/						



SUCATIONAL INSTITUT	VIVEKAN	ISO 9001:2008												
		TÜVRheinland CERTIFIED												
NOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengode-6	37 205.			10 31050/840/							
Programme	M.Sc	Programme Code	P	CS	Regula	tions	2021-2022							
Department	Con	nputer Science		Semester			2							
			Periods	Credit	Maxim	um Maı	ks							
Course Code	С	ourse Name	per Week											
			L T P	С	CA	ESI	E Total							
21020507	ARTIFICIAL	INTELLIGENCE AND												
21P2CSE07	EXP	ERT SYSTEMS	4 0 0	3	25	75	100							
COURSE	To introduce the basic principles, techniques, and applications of AI.To impart basic proficiency in													
OBJECTIVES	representing difficult real life problems in a state space representation so as to solve them using AI													
	techniques like searching and game playing.													
POs		PRO	GRAMME OU	JTCOME										
PO 1		pply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of												
		and conce	l conceptualization of											
PO 2		omputing models from defined problems and requirements lentify, formulate, research literature, and solve complex computing problems reaching substantiated												
102	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain													
	disciplines	S remember of the or the second												
PO 3	Design and evalu	Design and evaluate solutions for complex computing problems, and design and evaluate												
	systems,compone	ents, or processes that meet s	pecified needs	with appropri	ate consid	eration	for public health							
	-	al, societal & environmental												
PO 4		ed knowledge and research		0 0	-		ysis							
PO 5	-	of data, and synthesis of the apt and apply appropriate te		-			ols to complay							
105		ties, with an understanding of	-			uting to	ois to complex							
PO 6	· ·	commit to professional ethic			onsibilities	s, andno	orms							
	ofprofessional co	omputing practice		-										
PO 7	-	ed, and have the ability, to e	engage in inde	pendent learni	ng for cont	tinual de	evelopment as a							
	computing profes													
PO 8		wledge and understanding of	-	•	-	-								
PO 9		s a member and leader in a t fectively with the computing	-				-							
		ties by being able to compre												
	effective presenta			r	8-									
PO 10	Understand and a	assess societal, environmenta	al, health, safe	ty, legal, and c	cultural iss	ues with	in local and							
	-	and the consequential respon		<u> </u>	-									
PO 11		ely as an individual and as a	a member or le	ader in diverse	e teams and	d in mul	tidisciplinary							
PO 12	environments Identify a timely	opportunity and using innov	vation to purcu	e that opportu	nity to crea	ate volu	and wealth for							
1012		the individual and society a	-	e mai opportu			e and wearun for							
PO 13		dge of computing to create e	-	ns and solution	ns for com	plex pro	blems							
PO 14		yse and synthesize scholarly												
PO 15	-	tific outlook that solves any	problem, enco	ompassing the	expected a	spects o	of market							
	demands													

COs	COURSE OUTCOME
CO 1	Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations
CO 2	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge
	representation, and learning
CO 3	Demonstrate a fundamental understanding of various applications of AI techniques in intelligent agents,
	expert systems, artificial neural networks and other machine learning models, Robotics
CO 4	Apply scientific method to models of machine learning and Robotics
CO 5	Evaluate Knowledge representation in Expert System by applying Expert System tools
Pre-requisites	-

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

					(CO / PC) / KL I	Mappin	g							
		(3/2	/1 indic	ates th						2-mediu	m, 1-we	eak)				
CO	S				KLs				POs	8		KLs				
_									РО	1			1			
CO	1		2						PO				2			
									PO				4			
									PO				4			
CO	2		3						PO				3			
									PO				3			
									PO				5			
CO	3		2						PO				5			
									PO 9				5			
								PO 10				4				
CO	4		6						PO 1				4			
								PO 12				4				
								PO 13				4				
CO	5				6				PO 1				4			
								PO 15				4				
		(3/2	/1 indic	eatas th	a strong		PO Ma		trong	2-mediu	m 1 wc	ak)				
		(3/2)	/ I muit	ates th	c such		rogram				III, 1-wc	/aK)				
COs	DO 1	DOO	DO2	DO 4	DO5	1	-				DO11	DO 12	DO12	DO14	DO15	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10				PO14		
CO1	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO2	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO3	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO4	1	1	1	1	1	1	2	2 2 2 1 1			1	1	1	1		
CO5	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction to AI	Periods	12									
Unit - I	 What is AI - Foundations of AI - History of AI - The State of the art. Solving Problems by Searching: Problem Solving Agents - Example Problems - Searching for Solution - Uninformed Search Strategies - Informed Search Strategies - Heuristics Functions - Beyond Classical Search: Local search algorithms an optimization problems - Local Search in continuous spaces - Searching with nondeterministic actions - Searching with Partial Observations 											
	Logical Agents	Periods	12									
Unit - II	Knowledge based Agents - Logic - Propositional Logic - Propositional Theorem Proving - Effective Propositional model checking - Constraint Satisfaction problems (CSP): Defining CSP- Constraint Propagation - Backtracking Search for CSPs - Local Search for CSPs - First Order Logic: Syntax and Semantics - Using First order Logic - Knowledge Engineering - Inference in First Order Logic: Unification and Lifting - Forward Chaining - Backward Chaining - Resolution											
	Knowledge Representation	Periods	12									
Unit - III	Ontological Engineering - Categories and Objects - Events - Reasoning Systems for Categories - Reasonin with Default Information. Quantifying Uncertainty: Acting under Uncertainty - Basic Probability Notation Bayesâ€ TM Rule. Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain -The Semantics of Bayesian Networks - Exact Inference in Bayesian Networks - Approximate Inference in Bayesian Networks - First order Probability Models											
	Making Simple Decisions	Periods	12									
Unit - IV	The Basis of Utility Theory - Utility Functions - Decision Networks - Decision Theoretic Expert Systems. Making Complex Decision: Game theory. Learning from Examples: Forms of Learning - Supervised Learning - Decision Trees - Regression and Classification with Linear Models - ANN - SVM - Ensemble Learning - Practical Machine Learning.											
	Expert System	Periods	12									
	Definition - Features of an expert system - Organization - Characteristics - Prospector - Knowledge Representation in expert systems - Expert system tools - MYCIN - EMYCIN											
Unit - V		CIN										

Text Books	
1	Stuart Russel, Peter Norvig, Artificial Intelligence : A Modern Approach 3 Edition, Pearson Education
	2014
2	Donald A.Waterman, A Guide to Expert Systems, Pearson Education
References	
1	George F.Luger, Artificial Intelligence – Structures and Strategies for Complex Problem Solving, Fourth
	Edition, Pearson Education, 2002
2	Elaine Rich, Kevin Knight, Artificial Intelligence 2 Edition, TMH, 1991
3	Dan W. Patterson, Introduction to Artificial Intelligence & Expert Systems, EEE, PHI, 1999
E-References	
1	www.javatpoint.com
2	www.tutorialspoint.com
3	www.mygreatlearning.com
4	www.umsl.edu/~joshik/msis480/chapt11.htm
5	krazytech.com/technical-papers/artificial-intelligence



SUGNIONAL INSTITU	VIVEKAN		ISO 9001:2008												
A LAND AND A LAND A LAN		WOMEN (AU	TON	IOI	мо	US)				Rheinland RTIFIED www.tuv.com ID 9105078407					
HOMEN EMPOWERMENT		Elayampalayam, Ti	ruche	ngo	de-6	37 205.	•								
Programme	M.Sc	Programme Code	PCS Regul					gulations		2021-2022					
Department	Con	puter Science				Semester			2						
			Pe	erioc	ds	Credit	Maxim	um Mar	ks						
Course Code	C	ourse Name	per	We	eek										
			L	Т	Р	С	CA	ESE	3	Total					
21P2CSE08	СОМ	PILER DESIGN	4	0	0	3	25	75		100					
COURSE	To introduce the major concept areas of language translation and compiler design. To enrich the knowledge														
OBJECTIVES	in various phases of compiler and its use. Understand code optimization techniques, code generation, and use														
	of symbol table.														
POs	PROGRAMME OUTCOME														
PO 1		pply knowledge of computing fundamentals, computing specialization, mathematics, and domain													
		nowledge appropriate for the computing specialization to the abstraction and conceptualization of													
		computing models from defined problems and requirements													
PO 2	=	dentify, formulate, research literature, and solve complex computing problems reaching substantiated													
	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain														
PO 3	-	lisciplines. Design and evaluate solutions for complex computing problems, and design and													
	•	Design and evaluate solutions for complex computing problems, and design and evaluatesystems, components, or processes that meet specified needs with appropriate consideration for													
	•	safety,cultural,societal & en		-			uppropriat	consid	ciut						
PO 4	-	ed knowledge and research					experimen	ts, anal	ysisa	and					
	interpretation of	data, and synthesis of the in	forma	tion	to p	ovide valid co	onclusions.	-							
PO 5	Create, select, ad	apt and apply appropriate te	chniq	ues,	reso	urces, and mo	dern comp	uting to	ols t	o complex					
		ties, with an understanding of													
PO 6		commit to professional ethic	s and	cybe	er re	gulations, resp	onsibilities	s, andno	rms	of					
DO 7	professional com				• •	1 (1)	6	• • • •							
PO 7	computing profes	ed, and have the ability, to e	engage	e 1n :	inde	pendent learni	ng for cont	inual de	velo	opment as a					
PO 8		wledge and understanding of	f the	rom	nutir	a and manage	ment prin	vinles an	nd ar	only these to					
10.8		s a member and leader in a t			-		-	-	-						
PO 9		fectively with the computing				1 5		±							
1		ties by being able to compre	-		•		•		-						
	effective present					-	-								
PO 10	Understand and a	assess societal, environment	al, hea	ılth,	safe	ty, legal, and c	ultural issu	ues with	in lo	ocal and					
	-	and the consequential respor				-	*								
PO 11	Function effective environments.	ely as an individual and as a	ı mem	ber	or le	ader in diverse	e teams and	l in mul	tidis	sciplinary					
PO 12		opportunity and using innov	ation	to p	oursu	e that opportu	nity to crea	te value	e and	d wealth for					
		the individual and society a		-			-								
PO 13		dge of computing to create e			lesig	ns and solution	ns for com	plex pro	bler	ns.					
PO 14	To identify, analy	yse and synthesize scholarly	litera	ture	rela	ting to the field	d of Comp	uter Scie	ence	2					
PO 15	-	tific outlook that solves any	probl	em,	enco	ompassing the	expected a	spects o	of m	arket					
	demands.														

COs	COURSE OUTCOME							
CO 1	Understand the concepts of Compilers							
CO 2	To learn about context free grammars							
CO 3	o analyze the basics of syntax directed translations.							
CO 4	To implement lexical phase and syntactic phase concepts.							
CO 5	Design and establish the compiler optimization process.							
Pre-requisites	-							

]	Know	ledge	Level	S							
1.Reme	emberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	g	
		(3/2	/1 india	cates the		CO / PC			-	2-mediu	m, 1-we	ak)				
C	Ds	(0) =			KLs			011, 0 5	POs		, 1	((11))	K	Ls		
-									PO				1			
CC	CO 1				1				PO				2			
									PO	3			4	Ļ		
									PO				4			
CC	2				2				PO :				3			
									PO 6				3			
00	N 2		4					PO 7 PO 8				5 5				
CC) 3							PO 9					5			
								PO 10					4			
CC) 4		3						PO 1			4				
								PO 12				4				
								PO 13				4				
CC) 5		4					PO 14				4				
								PO 15					4			
		(0.12	/1 • •	, . . .			PO Ma				1	1 \				
		(3/2	/ I indic	cates the	e streng	-			-		m, 1-we	ak)				
COs	DO1	DOC	DOG	DC 4	DC 7	1	-	me Ou		1	DO11	DC 12	DC 12	DO14	DC 17	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13			
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

Jointent of the	Synabus												
	Introduction to Compliers	Periods	12										
	Compliers and Translator - Need of Translator - The structure of a Compl	lier - Lexical analy	ysis - Syntax										
I Late I	analysis - Intermediate code generation - Optimization - Code generation - Complier writing tools. Finite												
Unit - I	automata and lexical Analysis: The role of the lexical analysis - A simple approach to the design of lexical												
	analyzers- Regular expressions to finite automata - Minimizing the number of states of a DFA.												
	The Syntactic specification of programming languages	12											
Unit - II	Context free grammars -Derivations and parse trees - Capabilities of cont	ext free grammars	. Basic parsing										
Unit - II	techniques: Parsers - Shift reduce parsing - Operator precedence parsing - Top down parsing - Predictive												
	parsers.												
	Syntax directed translation	Periods	12										
	Intermediate code - Postfix notation - Parse trees and syntax trees - 3 add	ress code - Quadru	ples and triples										
Unit - III	-Boolean expressions - Statements that alter the flow of control. Symbol tables: The contents of a symbol												
	table - Data structures for symbol table - Representing scope												
	Run time storage administration	Periods	12										
Unit - IV	Implementation of a simple stack allocation scheme -Implementation of b	olock-structured la	nguages. Error										
Unit - I v	deduction and recovery: Errors - Lexical phase errors - Syntactic phase er	rors - Semantic er	rors.										
	Introduction of code optimization	Periods	12										
	The principle sources of optimization - Loop optimization - The DAG rep	presentation of bas	ic blocks										
Unit - V	-Global data flow analysis. Code generation: Object programs - Problems	in code generatio	n-A simple code										
	generator - Register allocation and assignment -Code generation from DAGâ€s-Peepholes optimization.												
	Total Periods		60										

Text Books	
1	Principles of Complier Design by Alfred V.Aho, Jeffrey D.Ullman, Narosa Publications House, 5th or
	later edition, 2002.
References	
1	Modern Compiler Design by David Galles, Fifth Edition 2012.
2	S.Godfrey Winster, S. Arunadevi, R.Sujatha, "Compiler Design," Yesdee Pub., 2016
3	Alfred V. Aho, Ravi Sethi, Jeffery D. Ullman, "Comp lier Principles Techniques and Tools", Pearson
	Education, 2008.
4	Kenneth C. Louden, "Compiler Construction, Principl es and Practice", Thomson Learning Inc, 2007.
E-References	
1	https://www.tutorialspoint.com/compiler_design/index.htm
2	https://www.javatpoint.com/compiler-tutorial
3	https://www.geeksforgeeks.org/introduction-of-compiler-design/
4	https://www.guru99.com/compiler-design-tutorial.html
5	www.youtube.com ‰ playlist

Signature of BOS Chairman



Elayampalayam, Tiruchengode-637 205. Programme M.Sc Programme Code PCS Regulations 2021-2022 **Computer Science** Semester 2 Department Periods Credit Maximum Marks Course Code Course Name per Week Т Р С CA ESE Total L 4 0 0 3 25 75 100 21P2CSE09 ADHOC SENSOR NETWORKS COURSE To study the protocols and the functionalities of Adhoc networks. To understanding the various applications **OBJECTIVES** developed based on Adhoc network. Identify and addressing issues and challenges created. To know about the challenges in establish infrastructure POs PROGRAMME OUTCOME PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements PO 2 Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. PO 3 Design and evaluate solutions for complex computing problems, and design and evaluatesystems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration PO 4 Use research-based knowledge and research methods including design of experiments, analysisand interpretation of data, and synthesis of the information to provide valid conclusions. PO 5 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of PO 6 professional computing practice PO 7 Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional Demonstrate knowledge and understanding of the computing and management principles and apply these to PO 8 one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. Communicate effectively with the computing community, and with society at large, about complex PO 9 computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for PO 12 the betterment of the individual and society at large. PO 13 To apply knowledge of computing to create effective designs and solutions for complex problems. PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of market demands.

COs	COURSE OUTCOME
CO 1	Understand the concepts of Adhoc networks
CO 2	To learn about Routing protocols
CO 3	To analyze the basics of secure routing protocols.
CO 4	To compare sensor networks and networking sensors
CO 5	Design and Establish the topology control in networks
Pre-requisites	Computer Networks

]	Know	ledge	Level	s							
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizing	5	
		(3/2	/1 indic	ates the				Mappin on 3-st	-	-mediu	m, 1-we	eak)				
CC)s	(0, 2			KLs	,		011, 0 5	POs		, 1		K	Ls		
									PO				1			
CO	1				1				PO				2			
									PO	3			4	Ļ		
									PO				4			
CO	CO 2			2					PO				3			
									PO				3			
60	2		4					PO 7 PO 8				5				
CO	3		4						PO				5			
								PO 10				4				
CO	4		3					PO 11					4			
								PO 12				4				
								PO 13				4				
CO	5		4					PO 14				4				
								PO 15					4			
		(0.12	(1 · ··				PO Ma					1 \				
		(3/2	/ I indic	ates the	e streng						m, 1-we	eak)				
COs	Det	DCT	DCC	DC (D.C		-	me Ou			DOI	DOIG	DOIG	DOL	DGIT	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12				
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

- 1. Continuous Assessment Test I, II & Model
- 2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

ontent of the		1							
	Introduction And Mac Protocols	Periods	12						
	Cellular And Ad Hoc Networks - Issues in Ad hoc Networks - Design Issues and Design Goals of MAC								
Unit - I	protocol for Ad hoc Networks - Classification of MAC protocols - Conten	ntion Based Protoc	cols -						
Unit - I	Reservation and Scheduling Mechanisms - Other Protocols.								
	Routing Protocols	Periods	12						
Unit - II	Design Issues and Classifications of unicast and multicast Routing Protoc	ols - Proactive, R	eactive and						
Unit - II	Hybrid routing protocol - Tree based and Mesh based multicast protocols, Energy Efficient and QoS								
	guaranteed multicast protocols.								
	Transport Layer And Security Issues	Periods	12						
	Design Issues, Design Goals and Classifications of Transport layer protoc	cols - TCP over Ad	d Hoc - Securi						
Unit - III	in Adhoc Networks - Network Security Requirements - Network Security Attacks - Key Management -								
	Secure Routing in Ad hoc Networks								
	Sensor Networks And Networking Sensors	Periods	12						
Unit - IV	Unique Constraints and Challenges - Advantages and Applications - Collaborative Processing - Key								
Unit - IV	Definitions - Localization and Tracking - Networking Sensors - MAC - Geographic, Energy Aware and								
	Attribute based Routing.								
	Infrastructure Establishment And Network Database	Periods	12						
	Topology Control - Clustering - Time Synchronization - Localization and	Localization Serv	vices - Task						
Unit - V	Driven Sensing - Roles of Sensor Nodes and Utilities - Network Database								
	Total Periods		60						

Text Books	
1	C. Siva Ram Murthy and B.S. Manoj, "Ad Hoc Wireless Networks â€" Architectures and Protocols",
	Pearson Education, 2nd Edition, 2005.
2	Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks â€" An Information Processing Approach"
	Elsevier Publications, 2004.
References	
1	C.K.Toh, "Ad hoc Mobile Wireless Networks â€" Protocols and Systems", Pearson Education, 1st
	Edition, 2007.
2	George Aggelou, "Mobile Ad hoc Networks – From Wireless LANs to 4G Networks", Tata McGraw
	Hill, 2009.
3	Holger Karl and Andreas Willing, "Protocols and Architectures for Wireless Sensor Networks" Wiley
	Publications, 2005.
E-References	
1	https://nptel.ac.in/courses/106/105/106105160/
2	https://www.slideshare.net/ayyakathir/cs6003-ad-hoc-and-sensor-networks-63703390
3	https://www.corsi.univr.it/documenti/OccorrenzaIns/matdid/matdid473708.pdf
4	http://www.tfb.edu.mk/amarkoski/WSN/Kniga-w03.pdf
5	https://lewisgroup.uta.edu/ee5369/Karl%20slides/sensys-ch3-network-architecture.pdf



Elayampalayam, Tiruchengode-637 205. Programme M.Sc Programme Code PCS Regulations 2021-2022 Department **Computer Science** Semester 2 Periods Credit Maximum Marks Course Code Course Name per Week Т Р С CA ESE Total L OBJECT ORIENTED ANALYSIS AND 4 0 0 3 25 75 100 21P2CSE10 DESIGN COURSE To learn the basics of object oriented system development. To understand the OOAD methodologies. Apply **OBJECTIVES** UML Language. Understand different design strategies in OOAD5. Apply design principles and concepts to software designing. POs PROGRAMME OUTCOME PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements PO 2 Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. PO 3 Design and evaluate solutions for complex computing problems, and design and evaluatesystems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration PO 4 Use research-based knowledge and research methods including design of experiments, analysisand interpretation of data, and synthesis of the information to provide valid conclusions. PO 5 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. PO 6 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice PO 7 Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional PO 8 Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. Communicate effectively with the computing community, and with society at large, about complex PO 9 computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. PO 13 To apply knowledge of computing to create effective designs and solutions for complex problems. PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of market demands.

COs	COURSE OUTCOME
CO 1	Summarize the relevance of software project management
CO 2	Differentiate different software configuration and OOAD tools
CO 3	Apply UML language techniques.
CO 4	Analyze each and every design techniques
CO 5	Analyze a given software for its efficiency based on the object oriented design
Pre-requisites	Programming in C++

]	Know	ledge	Level	S						
1.Reme	mberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E ⁻	valuat	ing, 6.	Synth	esizin	5
		(3/2	/1 india	sates th				Mappin	-	2-mediu	m 1_we	ak)			
СО	S	(3/2			KLs			011, 5 5	PO:		III, I we	ur)	K	[.8	
	5								PO				1		
СО	1				1				PO				2		
									PO	3			4	ł	
									PO				4		-
CO	2				2				PO				3		
								PO 6				3			
CO	2		2					PO 7 PO 8				5			
CO	3		3					PO 8				5			
								PO 10				4			
СО	4		4					PO 11				4			
								PO 12				4			
								PO 13				4			
CO	5		4					PO 14				4			
						<u> </u>			PO 1	15			4	1	
		(2/)	/1 india	notae th	a strong		PO Ma		trong	2-mediu	m 1 w	nak)			
		(3/2		cates in	e sueng	-		ime Ou			III, 1-we	ak)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2													
			1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3

Direct 1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

Syllabus							
An Overview of Object Oriented Systems Development	Periods	12					
Object Basics - object oriented systems development life cycle.	·						
Object Oriented Methodologies	Periods	12					
Introduction - Rumbaugh Object Modeling Technique - The Booch Meth	nodology - The Jac	obson					
Methodologies - Patterns - Frameworks - The Unified Approach.							
	-1						
Unified Modeling Language	Periods	12					
Introduction - static and dynamic models - why modeling? - UML diagra	ams - UML class di	agram -					
use-case diagram - UML dynamic modeling - UML extensibility.							
Object Analysis	Periods	12					
Classification - Introduction - Classification Theory - Approaches for Ide	entifying Classes -	Noun Phrase					
Approach - Common Class Patterns Approach - Use Case Driven Appro	ach - Classes, Resp	onsibilities And					
Collaborators - Naming Classes.							
Object Oriented Design Process and Design Axioms	Periods	12					
Introduction - The Object Oriented Design Process - Object oriented desi	ign axioms - coroll	aries - design					
patterns - Designing Classes: UML object constraints language - class visibility: designing well defined							
patterns - Designing Classes: UML object constraints language - class vi	sibility: designing	e					
patterns - Designing Classes: UML object constraints language - class vi public, private and protected protocols -designing classes: refining attribu-		e					
	An Overview of Object Oriented Systems Development Object Basics - object oriented systems development life cycle. Object Oriented Methodologies Introduction - Rumbaugh Object Modeling Technique - The Booch Methodologies - Patterns - Frameworks - The Unified Approach. Unified Modeling Language Introduction - static and dynamic models - why modeling? - UML diagrause-case diagram - UML dynamic modeling - UML extensibility. Object Analysis Classification - Introduction - Classification Theory - Approaches for Ida Approach - Common Class Patterns Approach - Use Case Driven ApproCollaborators - Naming Classes. Object Oriented Design Process and Design Axioms	An Overview of Object Oriented Systems Development Periods Object Basics - object oriented systems development life cycle. Periods Object Oriented Methodologies Periods Introduction - Rumbaugh Object Modeling Technique - The Booch Methodology - The Jaco Methodologies - Patterns - Frameworks - The Unified Approach. Unified Modeling Language Periods Introduction - static and dynamic models - why modeling? - UML diagrams - UML class di use-case diagram - UML dynamic modeling - UML extensibility. Object Analysis Periods Classification - Introduction - Classification Theory - Approaches for Identifying Classes - Approach - Common Class Patterns Approach - Use Case Driven Approach - Classes, Resp Collaborators - Naming Classes.					

Text Books	
1	Ali Bahrami, "Object Oriented Systems Devlopment", Tata McGRAW – Hill Editions, computer science series
References	
1	Grady Booch, Robert A. Maksimchuk, Michael W. Engel, and Bobbi J. Young, "Object-Oriented Analysis and Design with Applications", 3rd Edition
2	Simon Bennett, Steve McRobb, and Ray Farmer," Object-oriented Systems Analysis and Design Using UML".
E-References	
1	https://www.tutorialspoint.com/object_oriented_analysis_design/index.htm
2	https://www.geeksforgeeks.org/object-oriented-analysis-and-design/
3	https://nptel.ac.in/courses/106/105/106105153/
4	http://g.oswego.edu/dl/oosdw3/
5	https://www.umsl.edu/~sauterv/analysis/488_f01_papers/quillin.htm

Signature of BOS Chairman



WOMEN EMPOWERMENT		Elayampalayam, T	iruche	ngo	de-6	37 205.					
Programme	M.Sc	M.Sc Programme Code PCS Regulations									
Department	Con	nputer Science				Semester			2		
			Pe	eriod	ls	Credit	Maxim	um Mar	ks		
Course Code	C	Course Name	per	We	ek						
			L	Т	Р	С	CA	ESE	E Total		
21P2CSE11	EMBEI	EMBEDDED SYSTEMS 4 0 0 3 25 75									
COURSE OBJECTIVES	RTOS, EDLC. E	Inderstand Embedded Systems, Processor and memory organization, Software engineering practices, TOS, EDLC. Enable the students to understand embedded-system programming and apply that nowledge to design and develop embedded solutions.									
POs		PRC	GRAN	AME	E OU	TCOME					
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements									
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.										
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluatesystems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration										
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the ir	metho	ds ii	ncluc	ling design of	-	-	ysisand		
PO 5	Create, select, ad	lapt and apply appropriate to ties, with an understanding	echniq	ues,	reso	urces, and mo			ols to complex		
PO 6		commit to professional ethic					onsibilitie	s, andno	rms of		
PO 7	1	eed, and have the ability, to	engage	e in i	nder	oendent learni	ng for con	tinual de	velopment as a		
PO 8		weldge and understanding s a member and leader in a									
PO 9	Communicate ef	fectively with the computin ties by being able to compr	g com	nuni	ity, a	nd with socie	ty at large,	, about c	omplex		
PO 10		assess societal, environmen and the consequential respo									
PO 11	-	rely as an individual and as									
PO 12		opportunity and using inno the individual and society		-	ursu	e that opportu	nity to crea	ate value	e and wealth for		
PO 13		dge of computing to create			esigr	ns and solution	ns for com	plex pro	blems.		
PO 14	· ·	yse and synthesize scholarly				-	-				
PO 15	To develop scien demands.	tific outlook that solves any	y probl	em,	enco	mpassing the	expected a	aspects o	f market		

COs	COURSE OUTCOME
CO 1	Understand the concept of embedded system, microcontroller, different components of microcontroller and
	their interactions.
CO 2	Get familiar with Processor and Organization
CO 3	Acquire knowledge of Software Engineering practices in the Embedded software development
CO 4	Acquire knowledge about Real time operating system based on embedded system design
CO 5	Know the basic concepts of embedded system design with vx works and MicroC/OS-II RTOS
Pre-requisites	-

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

					(CO / PC) / KL]	Mappin	g						
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)			
C	Os			-	KLs				POs	S			KI	ĹS	
									PO	1			1		
CC	D 1				2				PO	2			2)	
									PO				4		
									PO				4		
CC	02				1				PO				3		
									PO				3		
									PO			5			
CC) 3				3			PO 8				5			
								PO 9				5			
00	2.4		3					PO 10 PO 11				4 4			
CC)4							PO 12				4			
								PO 12					4		
CO) 5		3					PO 14					4		
			C					PO 15				4			
						CO /	PO Ma	pping	-	-					
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)			
						Р	rogram	me Ou	tcome ((POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2
CO5	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2

Course Assessment Methods Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

ontent of the s									
	Introduction to Embedded Systems	Periods	12						
	Categories of embedded Systems-specialties of embedded systems- requirements of embedded systems								
Unit - I	-challenges and issues in embedded software development - recent trends	in embedded							
Unit - I	systems-Architecture of embedded systems: Hardware architecture - softw	vare architecture-a	application						
	software - Communication software -Embedded systems on a Chip (SoC)	and the use of VI	SI designed						
	circuits.								
	Processor and memory organization	Periods	12						
Unit - II	Devices and buses for Device Network Device drivers and Interrupt service	cing mechanism	program						
Unit - II	modeling concepts in single and multiprocessor systems software-develop	ment process.							
		D : 1	10						
	Software Engineering Practices in the Embedded software development	Periods	12						
	Inter-process communication and synchronization of process, tasks and th	reads- Hardware-	software						
Unit - III	co-design in an embedded system.								
		D : 1	10						
	Hardware software co-design and program modeling	Periods	12						
Unit - IV	Embedded hardware design and development-embedded firmware design	and development	Real-time						
	operating system (RTOS) based embedded system design-								
	Introduction to embedded system design with vx works and MicroC/OS	Periods	12						
	II RTOS- Integration and Testing of embedded hardware and firmware-en	nbedded system d	evelopment						
Unit - V	environment-embedded product development life cycle(EDLC)								
	Total Periods		60						

Text Books	
1	Rajkamal, Embedded Systems Architecture, Programming and Design, TATA McGraw-Hill, Twelfth
	Reprint 2007. (Unit- I: Chapter 1, Unit –II: Chapter 2,3,4 &6, Unit- III: Chapter 7,8 &12)
2	Introduction to Embedded systems – SHIBU K V TATA McGraw- Hill 2009(Unit – IV: Chapter
	8,9&10, Unit-V: Chapter 11,12,13 & 15)
References	
1	Embedded system design, ARNOLD S.BERGER ,south Asian edition –2005
2	Embedded system design ,Frank Vahid/Tony givargis-reprint-2009
E-References	
1	https://en.wikipedia.org/wiki/Embedded_system
2	https://en.wikibooks.org/wiki/Embedded_Systems/Atmel_AVR
3	https://internetofthingsagenda.techtarget.com/definition/embedded-system
4	https://www.tutorialspoint.com/embedded_systems/es_overview.htm
5	https://www.codrey.com/embedded-systems/embedded-systems-introduction/

Signature of BOS Chairman



Elayampalayam, Tiruchengode-637 205. Programme M.Sc Programme Code PCS Regulations 2021-2022 Department **Computer Science** Semester 2 Periods Credit Maximum Marks Course Code Course Name per Week Т Р С CA ESE Total L WIRELESS APPLICATION PROTOCOL 4 0 0 3 25 75 100 21P2CSE12 COURSE To understand fundamental trends of technological evolution of Wireless technology. Have hands-on **OBJECTIVES** knowledge in developing simple and comprehensive Wireless WAP contents. Be able to plan, design, and develop WAP pages and contents. POs PROGRAMME OUTCOME PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements **PO 2** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines. PO 3 Design and evaluate solutions for complex computing problems, and design and evaluatesystems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration PO 4 Use research-based knowledge and research methods including design of experiments, analysisand interpretation of data, and synthesis of the information to provide valid conclusions. PO 5 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations. PO 6 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice PO 7 Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional PO 8 Demonstrate knowledge and understanding of the computing and management principles and apply these to one own work, as a member and leader in a team, to manage projects and in multidisciplinaryenvironments. PO 9 Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments. PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. PO 13 To apply knowledge of computing to create effective designs and solutions for complex problems. PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of market demands.

COs	COURSE OUTCOME
CO 1	To understand the concept of security and Encryption algorithms
CO 2	To analyze public key cryptography and Message Authentication algorithms
CO 3	To Describe and learn about the Electronic mail Security concepts
CO 4	To demonstrate about the web security considerations
CO 5	To learn about the intruders and virus protections
Pre-requisites	-

]	Know	ledge	Level	S							
1.Remo	emberi	ng, 2.	Unde	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5	
		(3/2	/1 india	cates the				Mappin on 3-si	-	2-mediu	m, 1-we	eak)				
C	Os	(0/2			KLs	<u>, , , , , , , , , , , , , , , , , , , </u>		011, 0 0	POs		, 1		K	Ls		
-									PO				 [
CC) 1				1				PO				2			
									PO	3		4				
									PO	4		4				
CC) 2				2				PO				3			
									PO			3				
00	N 2				2			PO 7 PO 8					5			
CC) 3		3					PO 9								
									PO 1			5 4				
CO)4				4				PO 1			4				
								PO 12					4	ļ		
								PO 13					4	ļ		
CC) 5			4 PO 14 4					PO 14							
									PO 1	5			4	1		
		(2)	/1 · 1·				PO Ma					1 \				
		(3/2	/1 indic	cates the	e streng						m, 1-we	eak)				
COs	DO1	DOG	DOG	DO 4	D07		-	me Ou			DO11	DO 10	DO 14	DO14	DO15	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12				
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct 1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

ontent of the	Syllabus										
	Introduction	Periods	12								
	Key Services for the Mobile Internet - Business Opportunities. Making th	e Internet "Mo	bile―:								
IL 1 I	Challenges and Pitfalls - The Origins of WAP - WAP Architecture - Components of the WAP Standard -										
Unit - I	Network Infrastructure services Supporting WAP Clients.										
	The Wireless Markup Language	Periods	12								
Unit - II	Overview - The WML Document Model - WML Authoring - URLs Ident	ify Content - Mar	kup Basics -								
Unit - II	WML Basics - Basic Content - Events, Tasks and Bindings - Variables - Other Contents - Controls -										
	Miscellaneous Markup - Sending Information - Application Security - Document Type Declaration - Errors										
	and Browser Limitations.										
	User Interface Design	Periods	12								
	Making wireless Application easy to use: Web Site Design: Computer Ter	rminals versus Mo	bile Terminal								
Unit - III	Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines.										
		1									
	Tailoring Content to the Client-Push Messaging	Periods	12								
Unit - IV	Overview of WAP Push - Push Access Protocol - WAP Push Addressing - Push Message - MIME media										
	types for Push -Messages - Push Proxy Gateway - Push Over - the - Air Protocol - Push Initiator										
	Authentication and Trusted Content.										
	Wireless Telephony Applications	Periods	12								
Unit - V	Overview of the WTA Architecture - The WTA Client Framework - Design	gn Considerations	•								
	Total Periods		60								

Text Books	
1	Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Daniel Mauney, Jari Alvinen, David Bevis, Jim Chan., "The Wireless Application Protocol â€" Writing Application for the mobile internet ", Pearson Education, 2010. (UNIT-I :Chapter - 1 to 6, UNIT-II :Chapter - 7, UNIT-III :Chapter - 10, UNIT-IV:
	Chapter - 11&12, UNIT-V :Chapter - 13 to 15).
References	
1	Charless Arehare, Nirmal Chidambaram, and others, "Professional WAP", Wrox Press Ltd., Shroff publ.
	And Dist – Pvt. Ltd., 2001.
2	Ryan Sean Younger, "WAP & WML : Designing Usable Mobile Sites", 2011.
E-References	
1	www.//en.wikipedia.org/wiki/Wireless_Application_Protocol
2	www.readorrefer.in/article/Wireless-Application-Protocol-Overview
3	https://www.slideshare.net/OECLIBOdishaElectron/wireless-application-protocol-ppt-79474516
4	https://slideplayer.com/slide/3754972/
5	www.//en.wikipedia.org/wiki/Wireless_Application_Protocol

Signature of BOS Chairman



Suntonal Institutes	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR											
		WOMEN (AU	TON	NON	AO	US)			CERTIFIED Www.tuv.com ID 9105078407			
WOMEN EMPOWERNENT		Elayampalayam, Ti	ruche	engo	de-6	37 205.						
Programme	M.Sc	Programme Code			PO	CS	Regula	tions	2021-2022			
Department	Con	nputer Science				Semester			2			
			Pe	eriod	s	Credit	Maxim	um Mark	S			
Course Code	C	ourse Name	per	We	ek							
			L	Т	Р	С	CA	ESE	Total			
21P2CSE13	CYBER SECURITY AND COMPUTER40042575FORENSICS40042575								100			
COURSE	To create a secu	re cyber ecosystem in the co	ountry	.То с	creat	te an assurance	e framewor	k for desi	ign of security			
OBJECTIVES		igthen the Regulatory frame	-									
	-	preserve, and analyze data.				0	J	5				
POs		PROGRAMME OUTCOME										
PO 1	Apply knowledge	e of computing fundamental	s, con	nputi	ing s	pecialization,	mathemati	cs, and do	omain			
	knowledge appro	priate for the computing spe	ecializ	ation	1 to t	the abstraction	and conce	eptualizati	ion of			
	computing models from defined problems and requirements											
PO 2		te, research literature, and se										
		g fundamental principles of	mathe	emati	cs, c	computing scie	ences, and	relevant d	lomain			
	disciplines.											
PO 3		ate solutions for complex co										
	=	components, or processes the		-			appropriate	e considei	ation for			
PO 4	-	l safety,cultural,societal & e ed knowledge and research					experimer	te analve	isand			
104		data, and synthesis of the in:					-	-	isana			
PO 5	-	apt and apply appropriate te			_				s to complex			
		ties, with an understanding of	-				1	0	1			
PO 6		commit to professional ethic					onsibilities	s, andnorr	ns of			
	professional com	puting practice										
PO 7	-	ed, and have the ability, to e	engage	e in i	nder	pendent learni	ng for cont	inual dev	elopment as a			
	computing profes											
PO 8		wledge and understanding of										
		s a member and leader in a t			-	1 0		1 1				
PO 9		fectively with the computing	-		•		•		-			
	effective presenta	ties by being able to compre	hend	and	write	e effective rep	orts, desigi	1 docume	ntation,make			
PO 10		assess societal, environment	al ha	lth	cafat	ty legal and o	ultural ice	Los withir	local and			
1010		and the consequential respor										
PO 11	-	ely as an individual and as a										
	environments.	,							1			
PO 12	Identify a timely	opportunity and using innov	vation	to p	ursu	e that opportu	nity to crea	te value a	and wealth for			
	the betterment of	the individual and society a	t larg	e.								
PO 13		dge of computing to create e										
PO 14		yse and synthesize scholarly				-						
PO 15	-	tific outlook that solves any	probl	em,	enco	ompassing the	expected a	spects of	market			
	demands.											

COs	COURSE OUTCOME
CO 1	Understand the basic concepts of Computer Security and cryptography
CO 2	To know the types of attacks occur in user or website data
CO 3	Explore networking in cyber forensics
CO 4	Understand about the computer investigation in forensics
CO 5	Be familiar with forensic tools and case studies
Pre-requisites	Computer Networks

]	Know	ledge	Level	s						
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	5
		(3/2	/1 india	eates the				Mappin	-	-mediu	m 1_we	ak)			
(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs KLs									[.s						
	.5								PO				1		
CO	1				1				PO				2		
									PO	3		4			
									PO				4		
CO	2				2				PO				3		
							PO 6 3								
CO	2			2 PO 7 5 2 PO 8 5											
tu	3				2		-		PO				5		
									PO 1			4			
CO	4				2				PO 1				4		
								PO 12					4	1	
								PO 13					4		
CO	5			3 PO 14 4											
						00 /		•	PO 1	5			4	1	
		(3/7	/1 india	patas th	a strong		PO Ma		rong	2-mediu	m 1 w	art)			
		(3/2)		ales un	e su eng			me Ou	-		III, 1-we	<i>a</i> K)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO3	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO4	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1
CO5	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2

Direct

- 1. Continuous Assessment Test I, II & Model
- 2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction	Periods	10							
	What is Computer Security? - Threats -Harm - Vulnerabilities - Controls. T	ool box Authent	ication - Acco							
Unit - I	Control and Cryptography: Authentication - Access Control-Cryptography.									
	The Web—User Side	Periods	10							
Unit - II	Browser Attacks - Web Attacks Targeting Users - Obtaining User or Webs	ite Data - Email	Attacks.							
Unit - II	Operating System: Security in Operating Systems - Security in the Design	of Operating Sys	tems - Rootki							
	Networks	Periods	13							
	Network Concepts - Threats to Network Communications - Wireless Network	ork Security - De	nial-of-Servi							
Unit - III	- Distributed Denial-of-Service. Legal Issues and Ethics: Protecting Programs and Data - Information and									
	the law - Rights of Employees and Employers - Redress for Software Failures - Computer Crime - Ethical									
	issues in Computer Security - Incident Analysis with Ethics.									
	Computer Forensics and Investigations as a Profession	Periods	13							
Unit - IV	Understanding Computer Forensics - Preparing for Computer Investigation	i - Maintaining P	rofessional							
Unit - I v	Conduct. Understanding Computer Investigations: Preparing a Computer In	nvestigation - Ta	king a							
	Systematic Approach - Procedures for Corporate High-Tech Investigation -	Understanding	Data Recover							
	Workstations and Software - Conducting an Investigation - Completing the	case.								
	Data Acquisition	Periods	14							
	Understanding Storage Formats for Digital Evidence - Determining the Ber	st Acquisition M	ethod -							
Unit - V	Contingency Planning for Image Acquisitions - Using Acquisitions tools - Validating Data Acquisitions -									
enne i	Performing RAID Data Acquisitions. Current Computer Forensics Tool: Evaluating Computer Forensics									
	Performing RAID Data Acquisitions. Current Computer Forensics 1001: E	valuating Compt	ter Forensics							
	Tool Needs - Computer Forensics Software Tools - Computer Forensics Ha									

Text Books	
1	Charles P.Pfleeger, Shari Lawrence Pfleeger & Jonathan Margulies, "Security in Computing", 5th
	Edition, Prentice Hall, 2015.
2	Bill Nelson, Amelia Phillips & Christopher Steuart, "Guide to Computer Forensics and Investigations",
	3rd Edition,2010, Course Technology.
References	
1	Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Nina
	Godbole and Sunit Belpure, Publication Wiley.
2	Cory Altheide, Harlan Carvey, Digital Forensics with Open Source Tools, Syngress imprint of Elsevier.
3	Angus M.Marshall,"Digital Forensics: Digital evidence in criminal investigation", John-Wiley and Sons,
	2008.
E-References	
1	https://www.edureka.co ‰ blog ‰ what-is-cybersecurity
2	https://www.helpnetsecurity.com/2020/04/07/threats-web-security/
3	https://www.bestcomputersciencedegrees.com/lists/5-legal-and-ethical-issues-in-it/
4	https://slideplayer.com/slide/8300584/
5	https://www.gmercyu.edu/academics/learn/computer-forensics-career-guide

Contraction of the second seco



HOMEN EMPOWERNENT		Elayampalayam, T	Tiruche	engo	de-6.	37 205.							
Programme	M.Sc	Programme Code			PC	CS	Regula	tions	2021-2022				
Department	Con	nputer Science				Semester	r		2				
			Pe	eriod	um Mar	`ks							
Course Code	C	Course Name	per	We	ek								
			L	Т	Р	С	CA	ESE	E Total				
21P2CSE14	DIGITAL I	MAGE PROCESSING	4	0	0	4	25	75	100				
COURSE OBJECTIVES		erience with using compute tal image processing. To fo	-			-		-	-				
POs	PROGRAMME OUTCOME												
PO 1	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of												
PO 2		computing models from defined problems and requirements											
FO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.												
PO 3	-	ate solutions for complex	comput	ing	probl	ems,and desi	gn and						
	•	components, or processes the		-			appropriat	e consid	eration for				
DO 4	-	l safety,cultural,societal &					c :	. 1	· ,				
PO 4		sed knowledge and research data, and synthesis of the i							ysisand				
PO 5	-	lapt and apply appropriate			-				ols to complex				
		ties, with an understanding											
PO 6		commit to professional ethi	ics and	cybe	er reg	gulations, resp	ponsibilitie	s, andno	orms of				
PO 7	professional com	eed, and have the ability, to	Angag	a in i	ndon	andant laarn	ing for con	tinual de	welonment as a				
107	computing profe	•	ongag		nacp		ing for con	unuaruc	velopment as a				
PO 8		wledge and understanding	of the	com	putin	g and manag	ement prin	ciples ar	nd apply these to				
		s a member and leader in a			-	1 0		-					
PO 9	Communicate effectively with the computing community, and with society at large, about complex												
		ties by being able to comparisons	rehend	and	write	effective rep	orts, desig	n docum	ientation,make				
PO 10	effective present	assess societal, environmer	ntal he	alth	safet	v legal and	cultural iss	ues with	in local and				
1010		and the consequential respo											
PO 11	-	vely as an individual and as											
	environments.												
PO 12		opportunity and using inne			ursue	e that opportu	unity to cre	ate value	e and wealth for				
PO 13		f the individual and society dge of computing to create			acian	e and colution	me for com	nlov m	blems				
PO 13 PO 14		yse and synthesize scholarl			-								
PO 15	-	tific outlook that solves an	-			-							
-	demands.			7		1 8	1	1					

COs	COURSE OUTCOME								
CO 1	Understand the concept of Digital Image Processing								
CO 2	Learn arithmetic and logic operations on images.								
CO 3	Learn about image restoration and color processing								
CO 4	Identify object recognition concepts								
CO 5	Learn about the Wireless Telephony System								
Pre-requisites	-								

]	Know	ledge	Level	S							
1.Remen	nberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizing	5	
		(3/2	/1 indic	rates the		CO / PC			-	-mediu	m, 1-we	eak)				
CO	s	(3/2			KLs	sui oi e		011, 5 5	PO		, 1	(uit)	K	Ls		
	-			PO 1								1				
СО	1				1				PO				2			
									PO	3			4	ļ		
									PO				4			
CO	2				2				PO				3			
									PO				3			
СО	2				3			PO 7 PO 8				5				
0	3				3				PO				5			
									PO 1			4				
CO	4				4				PO 1				4			
									PO 1	2			4	ļ		
									PO 1				4			
CO	5								PO 14							
						<u> </u>			PO 1	5			4	1		
		(2 2)	/1 india	otog th	o atrona		PO Ma		rong	madiu	m, 1-we	alc)				
		(3/2		ales in	e su eng			me Ou	-		III, 1-we	ак)				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	3	2	1	1	1 0 0 0	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct 1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

Jointeint of the	Synabus									
	Introduction	Periods	12							
	What is Digital Image Processing? - Examples of Fields that Use Digital	Image Processing	- Fundamental							
TT.: 4 T	Steps in Digital Image Processing - Components of an Image Processing System - Digital Image									
Unit - I	Fundamentals: Elements of Visual Perception - Light and Electro Magnetic Spectrum - Image Sensing and									
	Acquisition - Image Sampling and Quantization - Some Basic Relationsh	ips between Pixels	5.							
	Image Enhancement in the Spatial Domain	Periods	12							
TT '/ TT	Background. Some Basic Gray Level Transformations - Histogram Proce	ssing- Enhanceme	ent Using							
Unit - II	Arithmetic/Logic Operations- Basics of Spatial Filtering- Smoothing Spa	tial Filters. Image	Enhancement in							
	the Frequency: Background - Introduction to the Fourier Transform and t	he Frequency Dor	nain- Smoothing							
	Frequency-Domain Filters- Sharpening Frequency Domain Filters- Homo	omorphism Filterii	ng-							
	Implementation.									
	Image Restoration	Periods	12							
	A Model of the Image Degradation / Restoration Process- Noise Models- Restoration in the Presence of									
Unit - III	Noise Only-Spatial Filtering - Estimating the Degradation Function- Inverse Filtering- Minimum Mean									
	quare Error (Wiener) Filtering. Color Image Processing: Color Fundamentals- Color Models- Pseudo color									
	Image Processing- Basics of Full-Color Image Processing- Color Transfo	rmations- Smooth	ing and							
	Sharpening- Image Segmentation Based on Color - Noise in Color Image	s- Color Image Co	mpression.							
	Object Recognition	Periods	12							
Unit - IV	Knowledge Representation - Statistical Pattern Recognition - Neural Nets - Syntactic Pattern Recognition -									
Unit - I v	Optimization Techniques - Fuzzy Systems - Mathematical Morphology - Basic Morphological Concepts -									
	Binary Dilation and Erosion.	•								
	Image Data Compression	Periods	12							
	Image Data Properties - Discrete Image Transforms in Image Data Comp	ression - Predictiv	e Compression							
Unit - V	Methods - Vector Quantization - Hierarchal and Progressive Compression	n Methods - Comp	parison of							
	Compression Methods - Coding - JPEG and MPEG Image Compression	- Texture								
	Total Periods		60							

Text Books	
1	Rafael C. Gonzalez, Richard E. Woods, "Digital Image Processing", Prentice Hall, Third Edition, 2008.
	(Unit I to III : Chapter-1,2,3,4,5&6)
2	Sonka, Hlavac, Boyle, "Digital Image Processing and Computer Vision", Cengage Learning, Fourth
	Indian Reprint 2011. (Unit-IV:Chapters: 9&13,Unit-V:Chapters: 14&15)
References	
1	Anil.K.Jain, "Fundamentals of Digital Image Processing ", Prentice Hall, 1989.
2	Chanda & Majumdar, "Digital Image Processing and Analysis", Prentice Hall 3rd Edition.
E-References	
1	www.nptel.ac.in
2	www.imageprocessingplace.com/
3	https://www.slideshare.net/sahilbiswas/image-processing-27960248
4	https://slideplayer.com/slide/6920911/
5	https://www.seminarstopics.com/seminar/5804/digital-image-processing-seminar-ppt

Strong Control All Martines	VIVEKAN	NANDHA COLLEGE (WOMEN (AU				NCES FO	OR	TÜVRheinland CERTIFIED				
HOMEN EMPOWERNELL	Elayampalayam, Tiruchengode-637 205.											
Programme	M.Sc Programme Code PCS Regulations											
Department	Computer ScienceSemester2											
			Credit	Maxim	um Mar	ks						
Course Code		Course Name	-	Week								
				T P	C	CA 25	ESE					
21P2CSE15	DISTRIBUTE	ED COMPUTING	4	0 0	4	25	75	100				
COURSE	This course prov	vides an introduction to the fu	ındame	entals of	f distributed co	omputer sv	stems, a	ssuming the				
OBJECTIVES	-							-				
	availability of facilities for data transmission. The structure of distributed systems using multiple levels of software is emphasized.											
POs	PROGRAMME OUTCOME											
PO 1												
101	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of											
	computing models from defined problems and requirements											
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated											
102	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain											
	disciplines.											
PO 3	Design and evaluate solutions for complex computing problems, and design and											
	evaluatesystems, components, or processes that meet specified needs with appropriate consideration for											
	-	d safety,cultural,societal & er		-								
PO 4	Use research-ba	sed knowledge and research	method	ls inclu	ding design of	experimen	its, analy	sisand				
	interpretation of	data, and synthesis of the inf	formati	on to p	ovide valid co	onclusions.						
PO 5	Create, select, a	dapt and apply appropriate te	chniqu	es, reso	urces, and mo	dern comp	uting too	ols to complex				
		ities, with an understanding of										
PO 6		commit to professional ethic	s and c	yber reg	gulations, resp	onsibilities	s, andnoi	rms of				
	professional con	1 01				6						
PO 7	-	eed, and have the ability, to e	ngage	in indep	pendent learning	ng for cont	inual de	velopment as a				
	computing profe		6.1		1		• 1	1 1 1 1				
PO 8		owledge and understanding o		-		-	-					
PO 9	one own work, as a member and leader in a team, to manage projects and in multidisciplinary communicate affectively with the commuting community, and with society at large about complex.											
109	Communicate effectively with the computing community, and with society at large, about complex											
	computing activities by being able to comprehend and write effective reports, design documentation,make effective presentations											
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and											
		and the consequential respon										
PO 11	-	vely as an individual and as a										
	environments.							- •				
PO 12	Identify a timely	opportunity and using innov	vation t	o pursu	e that opportu	nity to crea	ate value	and wealth for				
	the betterment of	f the individual and society a	t large									
PO 13	To apply knowle	edge of computing to create e	effectiv	e desig	ns and solution	ns for com	plex pro	blems.				
PO 14		lyse and synthesize scholarly			-	1						
PO 15	-	ntific outlook that solves any	proble	m, enco	ompassing the	expected a	spects o	f market				
	demands.											

COs	COURSE OUTCOME
CO 1	Demonstrate knowledge of the basic elements and concepts related to distributed system technologies.
CO 2	Demonstrate knowledge of the core architectural aspects of distributed systems
CO 3	Design and implement distributed applications
CO 4	Demonstrate knowledge of details the main underlying components of distributed systems (such as RPC, file systems)
CO 5	Use and apply important methods in distributed systems to support scalability and fault tolerance
Pre-requisites	-

Knowledge Levels

1. Remembering, 2. Understanding, 3. Applying, 4. Analyzing, 5. Evaluating, 6. Synthesizing

								Mappin	-							
		(3/2	/1 indic		-	gth of c	orrelati	on, 3-st	-	2-mediu	m, 1-we	eak)				
C	Os				KLs				POs				K	Ls		
									PO				1			
CO	D 1				1				PO				2			
									PO				4			
									PO				4	ŀ		
CO	02				2				PO				3			
									PO				3			
									PO				5			
CO	D 3				3				PO			5				
								PO 9				5				
								PO 10				4				
CO	D 4		4				PO 11				4					
				PO 12							4					
								PO 13				4				
CO	05		4					PO 14					4			
			PO 15 4													
							PO Ma									
		(3/2	/1 indic	ates the	e streng	-			-	2-mediu	m, 1-we	eak)				
COs			1			Р	-	me Ou	tcome ((POs)		1	1			
005	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO4	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction	Periods	12							
	Definition Of distributed system- goals - Types of Distributed Systems A	rchitectures: Arch	itectural Style							
TT '/ T	System Architectures - Architectures Vs Middleware - Self-Management	in Distributed Syst	ems. Process							
Unit - I	Threads - Virtualization - Clients Servers - Code Migration.									
	Communication	Periods	12							
Unit - II	Fundamentals - Remote Procedure Call - Message-Oriented Communicat	ion - Stream-Orien	nted							
Unit - II	Communications - Multicast Communication. Naming: Names, Identifiers and Addresses - Flat Naming -									
	Structured Naming - Attribute-Based Naming.									
	Synchronization:	Periods	12							
	Clock Synchronization - Logical Clocks - Mutual Exclusion -Global Positioning of Nodes - Election									
Unit - III	Algorithms. Consistency and Replication: Introduction - Data-Centric Consistency Models - Client-Centr									
	Consistency Models-Replica Management - Consistency Protocols.									
	Fault Tolerance	Periods	12							
Unit - IV	Introduction to Fault Tolerance - Process Resilience - Reliable Client-Server Communication - Reliable									
Unit - IV	Group Communication - Distributed Commit- Recovery. Security: Introduction to Security - Secure									
	Channels - Access Control -Security Management.									
	Distributed Object-Based Systems	Periods	12							
	Architecture - Processes - Communication - Naming - Synchronization - C	Consistency and R	eplication - F							
Unit - V	Tolerance -Security. Distributed file system: Architecture									
Unit - V	-Processes-communication-Naming-Synchronization-Consistency and Replication - Fault Tolerance -									
Unit - V	-Processes-communication-Naming-Synchronization-Consistency and Re	plication - Fault T	olerance -							
Unit - V	-Processes-communication-Naming-Synchronization-Consistency and Re Security - Distributed Web-Based Systems.	plication - Fault T	olerance -							

Text Books	
1	Andrew S.Tanenbaum, Maarten Van Steen, "Distributed Systems" Principles and Paradigms. Second
	Edition, PHI Publications, New Delhi -2008.
References	
1	Birman, Kenneth P, "Reliable Distributed Systems - Technologies, Web Services, and Applications",
	Springer Publications, 2005
2	G.coulouris, Jean Dollimore & Tim Kindberg, Distributed Systems: Concepts and Design (4th Edition)
	Addison Wesley Publications, 2005 Edition.
E-References	
1	www.dezyre.com
2	www.techtarget.com
3	https://slideplayer.com/slide/6189779/
4	https://www.powershow.com/viewht/75c10a-ODdjM/DISTRIBUTED_COMPUTING_powerpoint_ppt_
	presentation
5	https://www.powershow.com/viewht/75c10a-ODdjM/DISTRIBUTED_COMPUTING_powerpoint_ppt_
	presentation



WOMEN EMPOWERNENT		Elayampalayam, 7	Firuche	engo	de-6.	37 205.						
Programme	M.Sc	Programme Code			PC	CS	Regula	tions	2021-2022			
Department	Computer Science Semester											
			Pe	eriod	ls	Credit	Maxim	um Mar	ks			
Course Code	C	Course Name	per	We	ek							
			L	Т	Р	С	CA	ESE	E Total			
21P2CSE16	PROFESSIONAL ETHICS40042575											
COURSE OBJECTIVES		hilosophical foundation of the students in professiona		-				-				
POs	PROGRAMME OUTCOME											
PO 1	Apply knowledg	e of computing fundament	als, con	nputi	ing sj	pecialization,	mathemat	ics, and	domain			
	knowledge appropriate for the computing specialization to the abstraction and conceptualization of											
DO 2	computing models from defined problems and requirements											
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain											
	disciplines.											
PO 3	Design and evaluate solutions for complex computing problems, and design and											
	evaluatesystems, components, or processes that meet specified needs with appropriate consideration for											
	public health and safety, cultural, societal & environmental consideration											
PO 4		sed knowledge and researcl data, and synthesis of the i					-		ysisand			
PO 5	-	lapt and apply appropriate							ols to complex			
	computing activi	ities, with an understanding	g of the	limi	tatior	ıs.						
PO 6		commit to professional eth	ics and	cybe	er reg	gulations, resp	oonsibilitie	s, andno	rms of			
	professional con											
PO 7	-	eed, and have the ability, to	engag	e in i	indep	endent learni	ing for con	tinual de	evelopment as a			
	computing profe		of 11 a	~ ~ ~ ~ ~ ~		~ ~ ~ d ~ ~ ~ ~ ~			. d 1			
PO 8		owledge and understanding as a member and leader in a		-	-		-	-				
PO 9					0	1 5		-	7			
10)	Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make											
	effective presentations											
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and											
	global contexts,	and the consequential resp	onsibili	ties 1	eleva	ant to profess	ional comp	outing pr	actice.			
PO 11	Function effective	vely as an individual and as	s a mem	ber	or lea	ader in divers	e teams an	d in mul	tidisciplinary			
	environments.											
PO 12		opportunity and using inn		-	ursue	e that opportu	inity to crea	ate value	e and wealth fo			
		f the individual and society										
PO 13		edge of computing to create			-							
PO 14		yse and synthesize scholar										
PO 15	To develop scientific outlook that solves any problem, encompassing the expected aspects of market											
	demands.											

COs	COURSE OUTCOME						
CO 1	Know the Nature and Scope of Business Ethics						
CO 2	Understanding Professional ethics						
CO 3	To analyze the basics of Corporate Social Responsibility						
CO 4	To apply Ethical values in India						
CO 5	Design and Establish the dimension of ethics.						
Pre-requisites	-						

]	Know	ledge	Level	S							
1.Remei	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5	
		(3/2	/1 indic	ates the				Mappin on. 3-st	-	2-mediu	m, 1-we	ak)				
СО	s	(KLs				PO		,	. ,	K	Ls		
									PO				1			
СО	1				1				PO	2			2	2		
									PO	3			4	ļ		
									PO				4			
CO	2				2				PO				3			
									PO			3				
СО	2		4					PO 7 PO 8				5				
0	3							PO 9					5			
								PO 10					4			
СО	4		3					PO 11					4	Ļ		
									PO 1	2			4	4		
									PO 1				4	-		
CO	5		4					PO 14					4			
						<u> </u>		PO 15 4								
		(2 2)	/1 india	otos th	actron		PO Ma		rong	madiu	m, 1-we	alc)				
		(3/2	/ I muic	ales in	e sueng	-		me Ou	-		III, 1-we	ak)				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	
CO4	1	2	2	2	3	3	1	1	1	2	2	2	2	2	2	
CO5	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3	

Direct

- 1. Continuous Assessment Test I, II & Model
- 2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the Syllabus

ontent of the	Syllabus									
	Nature and Scope of Business Ethics	Periods	12							
	Introduction - Scope of Business Ethics - Religion and Ethics - Types of Ethics - Sources of Business Ethics									
Unit - I	- Factors Influencing Business Ethics - Importance of Business Ethics.									
	Professional Ethics	Periods	12							
	Introduction - professional ethics - ethical problems faced by managers - r	new skill required	for managers -							
Unit - II	managing ethical conduct in modern times.									
		-								
	Corporate Governance and CSR	Periods	12							
	Principles of corporate governance - issues involved in corporate governa	nce - theories of c	orporate							
Unit - III	governance - CSR - introduction - Various dimensions - argument for and	l against CSR.								
	Ethics in India	Periods	12							
	Religious foundations of ethics - Hinduism - Buddhism - Jainism - Ethica	l Values of Gandh	i, Vivekananda							
Unit - IV	Aurobindo and Tagore.									
	Dimensions of Ethics	Periods	12							
	Personal ethics - marketing ethics - technology ethics - environmental ethic	ics.	•							
Unit - V										
	Total Periods		60							

Text Books	
1	R.Nandagopal, Ajithsankar.R.N, "Indian Ethos and Values in Management", Tata Mac Graw Hill
	education Private Ltd, New Delhi, 2011.
2	S.Prabakaran, "Business Ethics and Corporate Governance", Excel books (2010), First Edition.
References	
1	Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
2	Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics â€" Concepts and
	Cases", Cengage Learning, 2009.
3	John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
4	Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers" Oxford
	University Press, Oxford, 2001.
5	Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and
	Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi 2013.
E-References	3
1	www.onlineethics.org
2	www.nspe.org
3	www.globalethics.org
4	www.ethics.org
5	https://www.slideshare.net/SethuramanPlayMankatha/professional-ethics-15084927