VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

M.Sc., (COMPUTER SCIENCE)

(Candidates admitted from 2022-2023 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

Attendance - 10 Marks
 Observation - 10 Marks
 Test - 20 Marks

Total = 40 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	M	ARKS
	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

External Evaluation (Theory)

Knowledge Level	Section	Marks	Description	Total
K1 ,K2,K3,K4	A (Answer All)	$20 \times 1 = 20 \text{ Marks}$	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	

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

2. 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 (2022-2023 Onwards)

CODE	~~~ <i>.</i>	COURE	OF COMI OTER SCIENCE - MISC(CS) CC			MARKS				
I	SEM		TITLE	CREDIT	HOUR	CIA	EE	TOTAL		
I		22P1CS01		4	4	25	75	100		
Python Programming		22P1CS02		4	4	25	75	100		
Part		22P1CS03		4	4	25	75	100		
22P1CS05		22P1CS04	Management Systems	4	4	25	75	100		
22P1CSP01 Core Course Practical - 1 - Advanced Database Management Systems lab 3 3 40 60 100	'	22P1CS05		4	4	25	75	100		
Database Management Systems lab 3 3 40 60 100		22P1CSE_	Elective I -	4	4	25	75	100		
III		22P1CSP01	Database Management Systems lab	3	3	40	60	100		
III		22P1CSP02	Analysis Using Python Programming	3	3	40	60	100		
III				30	30	230	570	800		
II		22P2CS06	Core Course – 6 – Al and Expert System	4	4	25	75	100		
III		22P2CS07		4	4	25	75	100		
22P3CSDS		22P2CS08		4	4	25	75	100		
22P2CSP03 Core Course Practical – 3- Advanced 3 4 40 60 100	"	22P3CS09	Core Course - 9 - Network Security	4	4	25	75	100		
Section Sect		22P2CSE_		4	4	25	75	100		
Total 25 30 230 570 800			Java Programming Lab							
III 22P3CS10 Core Course – 10-Soft Computing 4 4 25 75 100 22P3CS11 Core Course – 11-Web Technologies 4 4 25 75 100 22P3CS12 Core Course – 12 - Cloud computing 4 4 25 75 100 22P3CSE- Elective Course – IV 4 4 25 75 100 EDC - Resource Management 4 4 25 75 100 EDC - Resource Management 7 4 4 25 75 100 22P3CSP04 Core Course Practical – 4 – Web 3 4 40 60 100 40 40 40 40 40 40		22P2CSPR01								
III										
III										
III										
III										
22P3CSP04 Core Course Practical - 4 - Web 3 4 40 60 100		22P3U3E-	EDC - Resource Management							
V	"'	22P3CSP04	Core Course Practical – 4 – Web	3	4	40	60	100		
IV 22P4CSPR03 Project Lab Total 26 30 230 570 800 Total 12 - 50 150 200 Total 12 - 50 150 200		22P3CSPR02	Mini Project II	2	6	40	60	100		
IV 22P4CSPR03 Project Lab 12 - 50 150 200 Total 12 - 50 150 200			Human Rights	1	-	25	75	100		
Total 12 - 50 150 200			Total	26	30	230	570	800		
	IV	22P4CSPR03	Project Lab	12	-	50	150	200		
Grand Total 93 90 740 1860 2600			Total	12		50	150	200		
			Grand Total	93	90	740	1860	2600		

Elective I

	Course Code	Title
	22P1CSE01	Theory of Computation
Semester I	22P1CSE02	Mobile Communication
	22P1CSE03	Client Server Technology
		Internet of Things
	22P1CSE04	

Elective II

	Course Code	Title
	22P2CSE05	Big Data Analytics
Semester II	22P2CSE06	Wireless Application Protocol
	22P2CSE07	Ad-Hoc Sensor Network
	22P2CSE08	Embedded Systems

Elective III

	Course Code	Title
	22P3CSE09	Cyber Security and Computer Forensics
Semester III	22P3CSE10	Digital Image Processing
	22P3CSE11	Distributed Computing
	22P3CSE12	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 2022-23 and it passed in the academic year 2024-2025.



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



WOMEN EMPOWERMENT		Elayampalayam, T	iruchengo	de-6	37 205.			ib 31052/640/				
Programme	M.Sc	M.Sc Programme Code PCS Regulations										
Department	Con	nputer Science			Semester			1				
			Period	ls	Credit	Maxim	num Mark	.s				
Course Code	C	Course Name	per We	ek								
			L T	P	С	CA	ESE	Total				
22P1CS01	Advanced Con	cepts in Operating System	4 0	0	4	25	75	100				
COURSE	On successful co	ompletion of this course we l	earn the fu	ndaı	mentals of Ope	erating Sy	stems arc	hitecture,				
OBJECTIVES	Algorithms for I	mplementing DSM compone	ents and m	anag	gement aspects	of Real ti	me and M	Iobile				
	operating Systen	ns.										
POs		PROGRAMME OUTCOME										
PO 1	Apply knowledg	e of computing fundamenta	ls, comput	ing s	pecialization,	mathemat	ics, and d	omain				
	knowledge appro	opriate for the computing sp	ecializatio	ı to t	the abstraction	and conce	eptualizat	ion of				
	computing mode	els from defined problems ar	nd requiren	nents	S							
PO 2	Identify, formula	ate, research literature, and s	olve comp	lex c	computing pro	blems read	ching sub	stantiated				
	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 in	formation	to pr	ovide valid co	nclusions.						
PO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex											
		ties, with an understanding										
PO 6	Understand and	commit to professional ethic	s and cybe	r reg	gulations, resp	onsibilitie	s, and nor	rms of				
	professional com											
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a											
	computing profe											
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											
DO 10	effective presentations.											
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and											
DO 11	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											
DO 12	environments.											
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for											
DO 12	the betterment of the individual and society at large. To apply knowledge of computing to create effective designs and solutions for complex problems. To											
PO 13				_								
DO 14		and synthesize scholarly lite										
PO 14	demands.	ntific outlook that solves any	problem,	enco	mpassing the	expected a	ispecis of	market				
DO 15		a of computing fundamental	6. 00	na c	nagialization	mothomot	ios and d	omain				
PO 15		e of computing fundamental	_		=							
	knowledge appro	opriate for the computing spe	ecianzatioi	ı to t	ne adstraction	and conce	eptuanzat	1011 01				

	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

]	Know	ledge	Level	S						
1.Reme	emberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6	Synth	esizin	g
					(CO / PC) / KL]	Mappin	g						
		(3/2	/1 indic			gth of c	orrelati	on, 3-si		2-mediu	m, 1-we	eak)			
CO	Os				KLs				PO					Ls	
ac									PO					1	
CC) [1				PO PO					2 4	
									PO					+ 4	
CC	2				2				PO					3	
			_						PO					3	
							PO 7				5				
CC	3		4				PO 8				5				
							PO 9				5				
CC			_				PO 10 PO 11				4 4				
CC) 4		5				PO 12				4				
							PO 13				4				
CC) 5				6			PO 14				4			
								PO 15				4			
							PO Ma								
		(3/2	/1 indic	cates the	e streng					2-mediu	m, 1-we	eak)			
COs		1		· ·				ıme Ou					1		1
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PC
CO1	3	2	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	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO4	1	1	2	2	1	1	1	3	3	2	2	2	2	2	

CO5

Course Assessment Methods	
Direct	
1. Continuous Assessment Test I, II & Model	
2. Assignment	
3. End Semester Examinations	
Indirect	
1. Course End Delivery	

Overview: Introduction- Functions of operating systems - Design Approa									
overview. Introduction 1 unctions of operating systems Design ripprodu	ches - Types of A	dvanced							
Operating Systems. Synchronization Mechanisms: Introduction - Concept	of Process - Con	current Proces							
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 Condition							
for a Deadlock.									
Architectures of Distributed Systems	Periods	12							
$Architectures\ of\ Distributed\ Systems\colon Introduction\ -\ Motivation\ -\ System$	Architecture Typ	es - Distribute							
operating Systems - Issues in Distributed operating System - Communication Network - Communication									
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 System									
Architecture - Interconnection networks for Multiprocessor System - Caching - Hypercube Architecture.									
Multiprocessor Operating Systems: Introduction - Structures - Operating System Design Issues - Threads -									
Process Synchronization - Process Scheduling - Memory Management - Reliability/Fault Tolerance.									
Database Operating Systems	Periods	12							
Database Operating Systems: Introduction - Concurrency Control: Database Systems - Serializability									
Theory - Distributed database systems - Lock based and Timestamp based algorithm - Concurrency control									
algorithms.									
CASE STUDY	Periods	12							
CASE STUDY: Linux History- Design Principles-Kernel Modules- Process Management -Scheduling -									
Memory Management - File Systems- Input and Output - Interprocess Co	mmunication -Ne	twork Structu							
SecurityiOS: About iPhone iOS 4 App Development Essentials-The Anat	omy of an iPhone	4 - iOS 4							
Architecture and SDK Frameworks - iOS Media Layer									
	Models of Resources - A Graph-Theoretic Model of a System State - Necessary Distributed Systems Architectures of Distributed Systems: Introduction - Motivation - System operating Systems - Issues in Distributed operating System - Communicated Primitives. Distributed Shared Memory: Introduction - Architecture and Management of Multiprocessor System Architectures. Multiprocessor System Architectures: Introduction - Motivations - Basic of Architecture - Interconnection networks for Multiprocessor System - Cacle Multiprocessor Operating Systems: Introduction - Structures - Operating Systems: Process Synchronization - Process Scheduling - Memory Management - Resultabase Operating Systems: Introduction - Concurrency Control: Database Theory - Distributed database systems - Lock based and Timestamp based algorithms. CASE STUDY CASE STUDY: Linux History- Design Principles-Kernel Modules- Process Memory Management - File Systems- Input and Output - Interprocess Co SecurityiOS: About iPhone iOS 4 App Development Essentials-The Anatomic Concurrency Controls of Descriptions of the App Development Essentials-The Anatomic Concurrency Controls (Descriptions) (Descripti	Models of Resources - A Graph-Theoretic Model of a System State - Necessary and Suffici for a Deadlock. Architectures of Distributed Systems Architectures of Distributed Systems: Introduction - Motivation - System Architecture Typ operating Systems - Issues in Distributed operating System - Communication Network - Corprimitives. Distributed Shared Memory: Introduction - Architecture and Motivation - Algor Implementing DSM - Memory Coherence - Coherence Protocols - Design Issues. Multiprocessor System Architectures Periods Multiprocessor System Architectures: Introduction - Motivations - Basic Multiprocessor System Architecture - Interconnection networks for Multiprocessor System - Caching - Hypercube Multiprocessor Operating Systems: Introduction - Structures - Operating System Design Iss Process Synchronization - Process Scheduling - Memory Management - Reliability/Fault To Database Operating Systems Database Operating Systems: Introduction - Concurrency Control: Database Systems - Seria Theory - Distributed database systems - Lock based and Timestamp based algorithm - Concalgorithms. CASE STUDY Periods CASE STUDY: Linux History- Design Principles-Kernel Modules- Process Management - Memory Management - File Systems- Input and Output - Interprocess Communication - Ne SecurityiOS: About iPhone iOS 4 App Development Essentials-The Anatomy of an iPhone							

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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



WOMEN EMPOWERMENT		Elayampalayam, T		· ·									
Programme	M.Sc	Regula	tions	2022-2023									
Department	Computer Science Semester												
			Periods	Credit	Maxim	um Mark	S						
Course Code	C	Course Name	per Week										
			L T P	С	CA	ESE	Total						
22P1CS02	DESIGN AND ANALYSIS OF												
221 1 0 5 0 2	AI	LGORITHMS	4 0 0	4	25	75	100						
COURSE	To Know the Fu	ndamentals of the Analysis	of Algorithm E	fficiones Un	darstand the	a divida a	nd conquer						
OBJECTIVES		alysis search and boundary	•	inciency. One	ierstand in	e uiviue a	na conquei						
POs			OGRAMME OU	ITCOME									
PO 1	11.0	e of computing fundamenta		•									
	knowledge appropriate for the computing specialization to the abstraction and conceptualization of												
PO 2	computing models from defined problems and requirements												
102	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		sed knowledge and research			-	•	sis and						
	_	data, and synthesis of the in	_										
PO 5		lapt and apply appropriate to	=		dern comp	uting tool	s to complex						
PO 6		ties, with an understanding commit to professional ethic			onaihilitia		ma of						
PO 0		=	es and cyber reg	guiations, resp	onsidiffues	s, and nor	IIIS OI						
PO 7	professional computing practice. Recognize the need, and have the ability, to engage in independent learning for continual development as a												
	computing profe		. 6.6.		8		· · · · · · · · ·						
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		fectively with the computing	-				-						
	computing activities by being able to comprehend and write effective reports, design documentation, make												
PO 10	effective presentations. Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and												
1010	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 crea	ite value a	and wealth for						
		f the individual and society	=										
PO 13		dge of computing to create	_		_	_							
DO 11	-	and synthesize scholarly lit	_		_								
PO 14	To develop sciendemands.	tific outlook that solves any	y problem, enco	ompassing the	expected a	spects of	market						

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	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

]	Know	ledge	Level	S							
1.Rem	emberi	ng, 2.	Under	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinş	3	
		(2.12						Mappin	_			•				
C	Os	(3/2	/I indic		e streng KLs	gth of c	orrelatı	on, 3-st	rong, 2 PO	2-mediu	m, 1-we	eak)	· ·	Ls		
					KLS				PO					<u>Ls</u> 1		
C	O 1				1				PO					2		
ε.					•				PO					<u>-</u> 4		
									PO					4		
C) 2				2				PO	5			3	3		
									PO					3		
									PO					5		
C) 3		3					PO 8 PO 9					5 4			
									PO 1					1 4		
C	0 4		4					PO 11					4			
0.	,		'					PO 12					4			
									PO :	13	4					
CO	5		5					PO 14					4			
				PO 15 4							4					
		(0.15					PO Ma		_			• `				
		(3/2	/I indic	ates the	e streng					2-mediu	m, I-we	eak)				
COs	DO:	DOC	DOC	DO 4	DO 5			me Ou			DO11	DO 12	DO 12	DO14	DC:	
~~.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11			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	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	

	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

]	Know	ledge	Level	S							
1.Remen	nberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6	Synth	esizin	g	
						70 / PC	\									
		(3/2	/1 india	eates the				Mappin		2-mediu	m 1-we	ak)				
CO	s	(3/2	, i mar		KLs	, 01 0		011, 5 5	PO		111, 1 111	our,	K	Ls		
									PO	1				1		
CO	CO 1				1				PO	2			2	2		
									PO	3			4	4		
									PO					4		
CO	2				2				PO					3		
									PO					3		
CO	G0.2							PO			5					
CO	CO 3		3					PO PO			5 4					
									PO 1					* 4		
CO	CO 4							PO 11					4			
	•				4			PO 12					4			
								PO 13					4			
CO	5				5			PO 14					4			
									PO 1	15			4	4		
							PO Ma									
	1	(3/2	/1 indic	cates the	e streng					2-mediu	m, 1-we	eak)				
COs					1			me Ou								
	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

Course Assessment Methods
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	Periods	12								
	Notion of Algorithm - Fundamentals of Algorithmic Solving - Important I	Problem types - F	undamentals o								
Unit - I	the Analysis of Algorithm Efficiency - Analysis Framework - Asymptotic	Notations - and I	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 - Multiplication of large integers-										
Ullit - II	Strassen's matrix multiplication Greedy method - Prim's algorithm - Kruskal's algorithm -										
	Dijkstra's Algorithm										
	Transform and Conquer	Periods	12								
Unit - III	Balanced Search Tree - AVL Tree - Heaps and Heap Sort - Dynamic Programming - Computing a										
Omt - m	binomial coefficient - Warshall's and Floyd's algorithm.										
	Optimal binary search tree	Periods	12								
Unit - IV	Knapsack problem - Backtracking - N-Queens problem - Hamiltonian circuit problem - subset sum										
	problem.										
	Branch and bound	Periods	12								
Unit - V	Assignment problem - Knapsack problem - Traveling salesman problem.										
	Total Periods										

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 â€" 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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR

WOMEN (AUTONOMOUS)



MOMEN EMPOWERMENT		Elayampalayam,	Tiruche	ngo	de-6	37 205.						
Programme	M.Sc Programme Code PCS Regulations											
Department	Computer Science Semester											
			Per	riod	S	Credit	Maxim	num Mar	ks			
Course Code		Course Name	per	Wee	ek							
			L	Т	P	С	CA	ESE	3	Total		
22P1CS03		ANALYSIS USING N PROGRAMMING	4	0	0	4	25	75		100		
COURSE	Analyze the eff	iciency of algorithmic probl	em solv	ing '	Tech	niques.Acqui	re the mat	hematica	al fou	ındation		
OBJECTIVES												
	in analysis of algorithms. Understand different control logic in design strategies. Applydesign principles and concepts to write source code.											
POs		PRO	OGRAM	1ME	OU	TCOME						
PO 1	Apply knowled	ge of computing fundament	als, com	puti	ng s	pecialization,	mathemat	ics, and	dom	ain		
	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of											
	computing mod	els from defined problems a	ınd requ	irem	ents	i						
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 healt											
	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 ethi	cs and c	ybe	r reg	gulations, resp	onsibilitie	s, and no	orms	of		
	professional coi	nputing practice.				_						
PO 7	Recognize the n	need, and have the ability, to	engage	in iı	ndep	endent learnin	ng for cont	tinual de	velo	pment as		
PO 8			of the c	omp	outin	g and manage	ement prin	ciples an	ıd ap	ply these		
	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 e	ffectively with the computing	ng comn	nuni	ty, a	nd with socie	ty at large,	about c	omp	lex		
	computing activities by being able to comprehend and write effective reports, design documentation, make											
	effective presentations.											
PO 10		assess societal, environmentand the consequential response										
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	-	y opportunity and using inno of the individual and society		_	ırsue	that opportu	nity to crea	ite value	and	wealth fo		
PO 13	To apply knowledge of computing to create effective designs and solutions for complex problems. To											
		e and synthesize scholarly li			_			_				
PO 14		ntific outlook that solves an								rket		
PO 15	Apply knowleds	ge of computing fundaments	-	_		-						

	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.

]	Know	ledge	Level	S						
1.Reme	mberi	ng, 2.	Unde	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g
								Mappin	_						
		(3/2	/1 indic			gth of c	orrelati	on, 3-si		2-mediu	m, 1-we	eak)			
СО	S				KLs				PO				K	Ls	
G O									PO					1	
CO	1				1				PO PO					2 4	
									PO						
СО	2.				2				PO			3			
	-		-					PO 6				3			
							PO 7				5				
CO	3		3					PO 8				5			
									PO	9		5			
								PO 10				4			
CO	4		4					PO 11				4			
								PO 12				4			
GO.	~				4			PO 13				4			
CO	5				4			PO 14 PO 15				4 4			
						CO /	PO Ma	nning	ru l	1.3				+	
		(3/2	/1 indic	ates the	e streng				trong. 2	2-mediu	m, 1-we	eak)			
		(2			ıme Ou			,				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13	PO14	PO
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

Course Assessment Methods	
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						
TT. W. 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 I	Functions - Flow o	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, if… Else,								
	If…Elif…Else & Nested statements - Iteration - Fruitful Functions - Sco	pe of Variable - C	lobal 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								
Cint 17	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)		1						
	Lookup, Inverting a Dictionary, Memorization(Memos) Files:	Periods	12						
Unit - V		rays - Data Typo - Indexing with	es for ndarra slices - Boo						

Text Books	
1	Dr. S. Suresh kumar Problem Solving and Python Programming Charulatha Publications 2018
2	Python for Data Analysis by Wes McKinne ,Released October 2012 ,Publisher(s): O'Reilly Media, Inc.
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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR





WOMEN EMPOWERMENT										
Programme	M.Sc	Programme Code		tions	2022-2023					
Department	Con		1							
Course Code	Periods Credit Maximum Marks Course Name per Week									
			L T	P	С	CA	ESE	Total		
22P1CS04	ADVANCED DATABASE MANAGEMENT SYSTEMS 4 0 0 4 25 75									
COURSE OBJECTIVES		ics of Data base managemen e the principles of web and r	•			nced and o	bject ori	ented database		
POs		PRO	GRAMMI	E OU	TCOME					
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 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, ac	lapt and apply appropriate te	chniques,	resou	irces, and mod		uting too	ls to complex		
PO 6		commit to professional ethic				onsibilities	s, and no	ms of		
PO 7		eed, and have the ability, to e	ngage in i	ndep	endent learnir	ng for cont	inual dev	relopment as a		
PO 8	Demonstrate kno	owledge and understanding of s a member and leader in a t		-	-	-	•			
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		vely as an individual and as a			-					
PO 12	Identify a timely	opportunity and using innover f the individual and society a		ursue	that opportur	nity to crea	te value	and wealth for		
PO 13	To apply knowle	dge of computing to create e	ffective d	_		_	_			
PO 14		ntific outlook that solves any								
PO 15		e of computing fundamental opriate for the computing spe	_							

	computing models from defined problems and requirements
COs	COURSE OUTCOME
CO 1	Summarize the basics of advance data modeling and Advance 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

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1.Reme	nberi	ng, 2.	Unde	rstand			ledge lying,			g, 5.E	valuat	ing, 6	Synth	esizin	g
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СО	_	(3/2	/1 indic		e streng KLs	gth of c	orrelati	on, 3-si	rong, 2 PO:	2-mediu	m, 1-we	eak)	T/	Ls	
	S			-	KLS				PO					Ls 1	
CO	1				1				PO					2	
20	•				1				PO					4	
									PO					4	
CO	2				2				PO	5		3			
								PO 6				3			
							PO 7				5				
CO	3		3					PO 8				5			
								PO 9 PO 10				4			
CO	1		4					PO 11						+ 4	
20	7		4					PO 12				4			
								PO 13				4			
CO	5				4			PO 14				4			
								PO 15					4	4	
							PO Ma								
	I	(3/2	/1 indic	cates the	e streng					2-mediu	m, 1-we	eak)			
COs		ı	ı				rogram						1		
	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

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									
	Relational Databases	Periods	12							
	Object oriented databases - Complex data types, Object-oriented data mo	Object oriented databases - Complex data types, Object-oriented data model, Object-oriented languages,								
Unit - I	Persistent programming languages - Object relational databases - Nested	relations, Comple	x 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									
Ullit - 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									
OIIIt - 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 queries, Indexing of									
OIIIt - 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									
Omi - v	fundamentals, URL, HTML, Client side scripting and Applets, Web serve	ers and sessions, Se	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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES

FORWOMEN (AUTONOMOUS)



MOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.										
Programme	M.Sc	Programme Code	I	PCS	Regulat	ions	2022-2023				
Department	Computer Science Semester										
Course Code	Course Name Periods Credit Maximum Marks per Week L T P C CA ESE Total										
22P1CSO5	SOFTWARE PROJECT MANAGEMENT AND QUALITY ASSURANCE L T P C CA ESE V CA ESE										
COURSE OBJECTIVES	Use of different Life cycle Model for software development. Have the mathematical foundation in finding of project cost of algorithms. Understand different algorithmic design strategies										
POs		PROC	GRAMME O	UTCOME							
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 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		commit to professional ethics			sponsibilities	, and nor	rms of				
PO 7		ed, and have the ability, to en	ngage in inde	pendent learr	ning for conti	nual dev	elopment as a				
PO 8	Demonstrate kno one own work, a	wledge and understanding o	-	•	-	•					
PO 9	environments. 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 a	assess societal, environmenta									
PO 11		rely as an individual and as a									
PO 12	1	opportunity and using innovation in the individual and society at	_	ie that opport	unity to crea	te value a	and wealth for				
PO 13	To apply knowle	dge of computing to create earth and synthesize scholarly lite	ffective design		_	_					
PO 14		tific outlook that solves any									
PO 15	Apply knowledg	e of computing fundamentals priate for the computing spe		•							

	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.Reme	mberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g
		(3/2	/1 indic	rates the				Mappin	-	2-mediu	m 1-we	vak)			
СО)s	(3/2	7 I mare		KLs	, 01 0		011, 5 5	PO		III, 1 W	ouk)	K	Ls	
									PO					1	
CO	1				1				PO					1	
									PO	3				1	
									PO					1	
CO	2				1			PO 5				1			
								PO 6				1			
90	2						PO 7				1				
CO	3		1				PO 8 PO 9				1				
								PO 10				1			
CO	4		1					PO 11				1			
	•		_					PO 12				1			
								PO 13				1			
CO	5		1					PO 14				1			
									PO 1	15			-	1	
							PO Ma								
	1	(3/2	/1 indic	eates the	e streng					2-mediu	m, 1-we	eak)			
COs		ı						me Ou							
	PO1	PO2	PO3		PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PO14	PO1:
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

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 —								
	Introduction	Periods	12						
TT T	Product Life cycle - Project life cycle models - Water fall model - Prototy	ping model - RAI	D model - Spiral						
Unit - I	Model - Process Models -The ISO-9001 Model-The Capability Maturity Maturity	Model- Metrics							
	Software Configuration Management Periods 12								
	Definitions and terminology - The processes and activities - Configuration	Audit - Metrics	-Tools and						
Unit - II	Automation- Software Quality Assurance - Define Quality - Quality Control	rol and Assurance	- SQA Analyst						
	Functions - QA Tools - Organizational Structures - Profile of a successfu	l SQA-Measures	of SQA success						
	Project Initiation	Periods	12						
Unit - III	Project Planning and Tracking - What, Cost, When and How - Organizational Processes - Assigning								
Omt - m	Resources - Activities to specific to Project Tracking - Project Closure - When and How.								
	Quality Management Periods								
Unit - IV	Software Quality, Software Quality Dilemma-Achieving Software Quality	y-Software Testin	g						
Ullit - I v	Strategies-Strategic Approach-Test Strategies for Conventional Software	and Object Orient	ed Software.						
	Project Management	Periods	12						
Unit - V	The People, The Product, The Process - Project Scheduling - Risk Management - Maintenance and								
Unit - V	Reengineering - Business Process Reengineering - Software Re Engineering	ing - Reverse Eng	ineering -						
	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/

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR **WOMEN (AUTONOMOUS)** Elayampalayam, Tiruchengode-637 205. **PCS** 2022-23 Programme M.Sc Programme Code Regulations M.Sc CS T Department Semester Periods Credit Maximum Marks Core Course Practical - 1 per Week 22P1CSP01 Advanced Database Management **System Lab** Τ P CA ESE C Total 0 0 3 3 40 60 100 COURSE To know the basic commands in SQL **OBJECTIVES** To understand the DML .DDL Statements 3. To familiarize in the Data Schemes 4. To understand and program in PL/SQL LIST OF PRACTICALS **Basic SQL Queries** i) DDL Statements ii) DML Statements 2 Simple Queries using built in functions 3 Simple Queries Using set operations 4 Database Schema for a customer-sale scenario Customer (Cust id: integer, cust_name: string) Item (item_id: integer, item_name: string, price: integer) Sale (bill no: integer, 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. 4. List the details of the customer who have bought a product which has a price>200 5 Database Schema for a Student Library scenario Student(<u>Stud_no:integer</u>, Stud_name: string) Membership (Mem_no: integer, Stud_no: integer) Book (book_no: integer, book_name:string, author: string) Iss_rec(iss_no:integer, iss_date: date, Mem_no: integer, book_no: 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 student names with their membership numbers 4. List all the issues for the current date with student and Book names 5. List the details of students who borrowed book whose author is CJDATE Database Schema for a Employee-pay scenario 6 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: 1. Create the tables with the appropriate integrity constraints 2. Insert around 10 records in each of the tables 3. List the employee details department wise 4. List all the employee names who joined after particular date

5. List the details of employees whose basic salary is between 10,000 and 20,000

6. 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

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205. M.Sc Programme Code PCS Regulations 2022-23 Programme **Computer Science** 1 Department Semester Periods 22P2CSP02 Credit Maximum Marks per Week **Core Course Practical – 4 DATA** ANALYSIS USING PYTHON Т Р L C CA ESE Total PROGRAMMING LAB 0 5 0 40 60 100 COURSE 1. Creating simple programs GCD **OBJECTIVES** 2. Implement a python program from files 3. Implement a python program using Pygame LIST OF PRACTICALS To compute the GCD of Two Numbers. 1 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. Find the Maximum of a list of Numbers. 6 7 Implementation Insertion Sort Remove all the duplicate elements in a list 8 9 Implement a python program find the most frequent words in a text read from a file Python program to demonstrate basic array characteristics using numpy. 10



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



WOMEN EMPOWERNEN		Elayampalayam, T	Tiruchengode-	637 205.						
Programme	M.Sc	Programme Code	P	CS	Regulatio	ons	2021-2022			
Department	Co	mputer Science		Semester			1			
			Periods	Credit	Maximun	n Marks	3			
Course Code		Course Name	per Week							
			L T P	С	CA	ESE	Total			
21P1CS03	WEB	WEB TECHNOLOGIES 4 0 0 4 25 75 100								
COURSE OBJECTIVES	developing web	Understanding the basic concepts of web design with HTML and Cascading Style Sheets. Exposure on developing websites for any domain using PHP & MySQL Server Technologies. Exposure on designing databases using MySQL Server Technology								
POs		PRO	OGRAMME O	UTCOME						
PO 1	knowledge appr	ge of computing fundament copriate for the computing sels from defined problems	pecialization to	the abstraction						
PO 2	Identify, formula	Computing models from defined problems and requirements 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 evalues systems, compositions	luate solutions for complex nents,or processes that meet ral,societal &environmenta	specified needs		•		public healt			
PO 4	Use research-ba	ased knowledge and research f data, and synthesis of the i	n methods inclu		•	, analysi	is and			
PO 5	Create, select, a	dapt and apply appropriate vities, with an understanding	techniques, reso	urces, and mo		ng tools	s to complex			
PO 6	Understand and	commit to professional ethi			oonsibilities, a	and norr	ns of			
PO 7	Recognize the r	professional computing practice. 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, environment and the consequential response								
PO 11		vely as an individual and as								
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 knowl	edge of computing to create and synthesize scholarly li	effective desig				ems. To			
PO 14		ntific outlook that solves an					market			
PO 15	Apply knowled	ge of computing fundamentary		•						

	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	-

					1	Know	lodge	Level	C.						
1.Remer	nberi	ng, 2.	Undei	rstand						g, 5.E	valuat	ing, 6.	Synth	esizin	g
								Mappin							
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)			
COs	8				KLs				PO				K	Ls	
									PO					1	
CO	1				1				PO					2	
									PO					4	
GO /	_								PO					4	
CO	2				1				PO			3			
								PO 6 PO 7				3 5			
CO	3		2					PO 8				5			
co.	3		2					PO 9				4			
								PO 10				4			
CO 4	4		3					PO 11						<u>.</u> 4	
								PO 12				4			
								PO 13				4			
CO:	5		4					PO 14				4			
									PO 1	15			4	4	
							PO Ma				•				
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)			
COs		Programme Outcome (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	3	2	1	1	1	1	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	1	2	2	2	3	3	1	1	2	2	2	2	2	2	2

CO5

Course Assessment Methods		
Direct		
1. Continuous Assessment Test I, II & Model		
2. Assignment		
3. End Semester Examinations		
ndirect		
1. Course End Delivery		

	HTML Basics	Periods	12				
	Understanding HTML - Formatting text by Using Tags - Creating Lists at	nd Backgrounds -	Creating				
Unit - I	Hyperlinks and Anchors. Creating Tables- Creating simple Forms. Style S	Sheets and Graphi	cs: Introduction				
	to Style Sheets - Cascading Style sheetsFormatting Text using Style She	eets - Formatting l	Paragraphs usin				
	Style Sheets.						
	Introducing PHP Periods 1						
Unit - II	Why PHP and MySQL-Server-Side Scripting Overview - Getting Started	with PHP - Learn	ing PHP Syntax				
Ullit - II	and Variables- PHP Control Structures and Functions.						
	Learning Passing Information with PHP Periods						
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 - Lear	rning PHP Types.	MySQL				
Unit - IV	Database Integration: Introducing Databases and MySQL						
	Learning Database Administration and Design Periods						
Unit - V	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	Converse, and soyee rank, rin o and mysQL Blote, whey rabinshing, me., 2010. (Cincs it, mi, rv & v)
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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES

FORWOMEN (AUTONOMOUS)



WOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.									
Programme	M.Sc	ions	2022-2023							
Department	Cor	nputer Science		Semester			1			
Course Code	(Course Name	Periods per Week L T P	Credit C	Maximu CA	m Marks	Total			
22P1CSO5		ROJECT MANAGEMENT ALITY ASSURANCE	4 0 0	4	25	75	100			
COURSE OBJECTIVES		Life cycle Model for softwar gorithms. Understand differen	•			Coundation	n in finding of			
POs		PRO	GRAMME OU	TCOME						
PO 1	knowledge appro	e of computing fundamental opriate for the computing spells from defined problems an	ecialization to the	he abstraction						
PO 2	Identify, formula	ate, research literature, and so g fundamental principles of	olve complex co	omputing prob		_				
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									
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. Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex									
PO 6	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 ne	eed, and have the ability, to e	ngage in indep	endent learning	g for contin	nual deve	lopment 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									
PO 9		fectively with the computing ties by being able to compre	•	•	•		•			
PO 10	Understand and	assess societal, environmenta and the consequential respon		_						
PO 11	T .	vely as an individual and as a		-						
PO 12	-	opportunity and using innov	=	that opportuni	ity to creat	e value ar	nd wealth for			
PO 13	To apply knowle	dge of computing to create e	effective design				ems. To			
PO 14		atific outlook that solves any					narket			
PO 15	Apply knowledg	e 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						

]	Know	ledge	Level	S							
1.Reme	mberi	ng, 2.	Unde	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g	
		(3/2	/1 indic	eates the				Mappin	-	2-mediu	m 1-we	vak)				
СО)s	(3/2	7 I mare		KLs	501 01 0		011, 5 5	PO		III, 1 W	ouk)	K	Ls		
									PO					1		
CO	1				1				PO 2			1				
									PO	3				1		
									PO					1		
CO	2				1			PO 5				1				
									PO				-			
90	2				1						1					
CO	3		1				PO 8 PO 9				1					
								PO 10 1								
CO	4				1			PO 11 1								
	•				-			PO 12					1			
								PO 13					1			
CO	5				1			PO 14 1				1				
									PO 1	15			-	1		
							PO Ma									
	1	(3/2	/1 indic	ates the	e streng					2-mediu	m, 1-we	eak)				
COs	ı						me Ou					I				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PO14	PO1:	
CO1	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	
CO2	3	3	3	3	3	3	1	1 3 3 3 3 3 3 3						3	3	
CO3	3	3	3	3	3	3	1	3	3	3	3	3 3 3				
CO4	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	

CO5

Course Assessment Methods	
Direct	
4. Continuous Assessment Test I, II & Model	
5. Assignment	
6. End Semester Examinations	
Indirect	
1. Course End Delivery	

Content of the	Syllabus —										
	Introduction	Periods	12								
TT '. 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 Model- Metrics										
	Software Configuration Management	Periods	12								
	Definitions and terminology - The processes and activities - Configuration	on 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 SQA-Measures of SQA succe										
	Project Initiation	Periods	12								
Unit - III	Project Planning and Tracking - What, Cost, When and How - Organizational Processes - Assigning										
Omt - m	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										
Omt - IV	Strategies-Strategic Approach-Test Strategies for Conventional Software and Object Oriented Software.										
	Project Management	Periods	12								
Unit - V	The People, The Product, The Process - Project Scheduling - Risk Management - Maintenance and										
Omt - v	Reengineering - Business Process Reengineering - Software Re Engineer	ring - Reverse Eng	ineering -								
	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
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1	Philip B Crosby, Quality is Free: The Art of Making Quality Certain MassMarket, 2004.
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	Company Ltd., New Delhi, 2002.
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4	www.slidegeeks.com
5	www.slideteam.net/

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR **WOMEN (AUTONOMOUS)** Elayampalayam, Tiruchengode-637 205. **PCS** 2022-23 Programme M.Sc Programme Code Regulations M.Sc CS T Department Semester Periods Credit Maximum Marks Core Course Practical - 1 per Week 20P1CSP01 Advanced Database Management **System Lab** Τ P CA ESE C Total 0 0 4 3 40 60 100 COURSE 5. To know the basic commands in SQL **OBJECTIVES** To understand the DML .DDL Statements 7. To familiarize in the Data Schemes 8. To understand and program in PL/SQL LIST OF PRACTICALS **Basic SQL Queries** i) DDL Statements ii) DML Statements 2 Simple Queries using built in functions 3 Simple Queries Using set operations 4 Database Schema for a customer-sale scenario Customer (Cust id: integer, cust_name: string) Item (item_id: integer, item_name: string, price: integer) Sale (bill no: integer, bill data: date, cust id: integer, item id: integer, qty_sold: integer) For the above schema, perform the following: 5. Create the tables with the appropriate integrity constraints 6. Insert around 10 records in each of the tables 7. List all the bills for the current date with the customer names and item numbers. 8. List the details of the customer who have bought a product which has a price>200 5 Database Schema for a Student Library scenario Student(<u>Stud_no:integer</u>, Stud_name: string) Membership (Mem_no: integer, Stud_no: integer) Book (book_no: integer, book_name:string, author: string) Iss_rec(iss_no:integer, iss_date: date, Mem_no: integer, book_no: integer) For the above schema, perform the following: 6. Create the tables with the appropriate integrity constraints 7. Insert around 10 records in each of the tables 8. List all the student names with their membership numbers 9. 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 Database Schema for a Employee-pay scenario 6 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: 7. Create the tables with the appropriate integrity constraints 8. Insert around 10 records in each of the tables 9. List the employee details department wise

List all the employee names who joined after particular date

List the details for an employee_id=5

List the details of employees whose basic salary is between 10,000 and 20,000

10.

11. 12.

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

Signature of BOS Chairman

TO FAIR EMPONEMENT	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205.										
Programme	M.Sc Programme Code PCS Regulations									2022-23	
Department	Computer Science Semester								1		
22P2CSP02		Practical – 4 DATA JSING PYTHON		eriod We		Credit	Maximum Mai		ks		
	PROGRAMN	IING LAB	L	T	P	С	CA	ESI		Total	
			0	0	5	2	40	60)	100	
COURSE OBJECTIVES	 4. Creating simple programs GCD 5. Implement a python program from files 6. Implement a python program using Pygame 										
		LIS	T OF	PR	AC	TICALS					
1	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 Maxin	mum of a list of Numbe	rs.								
7	Implementation	n Insertion Sort									
8	Remove all the	e duplicate elements in a	a list								
9	Implement a p	ython program find the	most	freq	uen	t words in a	text read	l from	a fil	le	
10	Simulate bou	ncing ball using Pyga	me								

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

Signature of BOS Chairman





WOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	de-6	37 205.						
Programme	M.Sc	Programme Code		P	CS	Regulati	ions	2021-2022			
Department	Con		2								
			Period	ls	Credit	Maximu	ım Marl	ΚS			
Course Code		Course Name	per We	ek							
			L T	P	С	CA	ESE	Total			
21P2CS06	Advanced Cor	cepts in Operating System	4 0	0	4	25	75	100			
COURSE OBJECTIVES		ompletion of this course we lemplementing DSM components.			-						
POs		PROGRAMME OUTCOME									
PO 1	knowledge appr	ge of computing fundamental opriate for the computing speels from defined problems an	ecializatio	n to t	the abstraction						
PO 2	•	ate, research literature, and so g fundamental principles of			1 01		_				
PO 3	systems,compor	uate solutions for complex co ents,or processes that meet s ral,societal &environmental of	pecified n	eeds	•	-		or public health			
PO 4	Use research-ba	sed knowledge and research data, and synthesis of the int	methods in	ıcluc		-	s, analy	rsis and			
PO 5	Create, select, a	lapt and apply appropriate te ities, with an understanding of	chniques,	resoi	urces, and mod		ting too	ls to complex			
PO 6		commit to professional ethic				onsibilities,	and no	rms of			
PO 7	-	eed, and have the ability, to e	engage in i	ndep	endent learnin	g for conti	nual dev	velopment as a			
PO 8	Demonstrate know	owledge and understanding on a member and leader in a t									
PO 9		fectively with the computing ities by being able to compreations.		•		•		-			
PO 10		assess societal, environmenta and the consequential respon									
PO 11		vely as an individual and as a									
PO 12	Identify a timely	opportunity and using innover the individual and society a	_	ursu	e that opportun	nity to creat	e value	and wealth for			
PO 13	To apply knowle	edge of computing to create e	effective d	_		_	_				
PO 14	-	ntific outlook that solves any									
PO 15	Apply knowledg	e of computing fundamental opriate for the computing spe	-	-	-						

	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

]	Know	ledge	Level	S						
1.Reme	emberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6	Synth	esizin	g
					(CO / PC) / KL]	Mappin	g						
		(3/2	/1 indic			gth of c	orrelati	on, 3-si		2-mediu	m, 1-we	eak)			
CO	Os				KLs				PO					Ls	
ac									PO					1	
CC) [1				PO PO					2 4	
									PO					+ 4	
CC	2				2				PO			3			
			_					PO 6				3			
								PO 7				5			
CC	3		4				PO 8				5				
								PO 9				5			
CC			_					PO 10 PO 11				4			
CC) 4				5				PO 1			4			
								PO 12						* 4	
CC) 5		6					PO 14				4			
								PO 15				4			
							PO Ma								
		(3/2	/1 indic	cates the	e streng					2-mediu	m, 1-we	eak)			
COs		1		· ·				ıme Ou					1		1
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PC
CO1	3	2	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	
CO3	1	1	3	3	2	2	2	2	2	3	3	3	3	3	3
CO4	1	1	2	2	1	1	1	3	3	2	2	2	2	2	

CO5

Course Assessment Methods	
Direct	
4. Continuous Assessment Test I, II & Model	
5. Assignment	
6. End Semester Examinations	
Indirect	
1. Course End Delivery	

	Introduction to Operating System	Periods	12							
	Overview: Introduction- Functions of operating systems - Design Approa	ches - Types of A	dvanced							
TT'. T	Operating Systems. Synchronization Mechanisms: Introduction - Concep	t of Process - Con	current Proces							
Unit - I	The critical section Problem. Process Deadlocks: Introduction - Prelimina	aries - Models of I	Deadlocks -							
	Models of Resources - A Graph-Theoretic Model of a System State - Nec	essary and Suffici	ent Condition							
	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 - Communica	tion Network - Co	mmunication							
Omt - m	Primitives. Distributed Shared Memory: Introduction - Architecture and M	Motivation - Algo	rithms for							
	Implementing DSM - Memory Coherence - Coherence Protocols - Design	ı Issues.								
	Multiprocessor System Architectures	Periods	12							
	Multiprocessor System Architectures: Introduction - Motivations - Basic	Multiprocessor Sy	stem							
Unit - III	Architecture - Interconnection networks for Multiprocessor System - Caching - Hypercube Architecture.									
Omt - m	Multiprocessor Operating Systems: Introduction - Structures - Operating System Design Issues - Threads -									
	Process Synchronization - Process Scheduling - Memory Management - F	Reliability/Fault T	olerance.							
	Database Operating Systems	Periods	12							
Unit - IV	Database Operating Systems: Introduction - Concurrency Control: Database	ase Systems - Seri	alizability							
Omt - IV	Theory - Distributed database systems - Lock based and Timestamp based	d algorithm - Con	currency conti							
	algorithms.									
	CASE STUDY	Periods	12							
	CASE STUDY: Linux History- Design Principles-Kernel Modules- Process Management -Scheduling -									
	Memory Management - File Systems- Input and Output - Interprocess Communication -Network Structure									
Unit - V	Memory Management - File Systems- Input and Output - Interprocess Co	mmunication -Ne	twork Structu							
Unit - V	Memory Management - File Systems- Input and Output - Interprocess Co SecurityiOS: About iPhone iOS 4 App Development Essentials-The Anat									

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 EMPOWERMENT		Elayampalayam, T	iruchengo	de-6	37 205.			ID 3105478407		
Programme	M.Sc	Programme Code		P	CS	Regulat	ions	2021-2022		
Department	Cor	nputer Science			Semester			2		
			Perio	ds	Credit	Maxim	um Mai	rks		
Course Code	(Course Name	per We	1	C	C.A.	EGI	F		
21P2CS07	ADVANCED	JAVA PROGRAMMING	L T 4 0	P 0	C 4	25	ESI 75			
COURSE	To introduce adv	vanced java concepts .To lea	rn ahout h	asic	concents weh	annlication	s Tou	nderstandhow to		
OBJECTIVES	create, test, debu	nacistanano w to								
POs		PRO	GRAMM	E OU	JTCOME					
PO 1	knowledge appro	e of computing fundamental opriate for the computing spels from defined problems are	ecializatio	n to	the abstraction					
PO 2	-	ate, research literature, and s g fundamental principles of	_				_			
PO 3	systems,compon	uate solutions for complex c ents,or processes that meet s al,societal &environmental	specified r	eeds		_		for 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		lapt and apply appropriate te	_			dern compu	iting to	ols to complex		
PO 6		commit to professional ethic				onsibilities	, and no	orms of		
PO 7	1	eed, and have the ability, to	engage in	indep	endent learnir	ng for conti	nual de	evelopment as a		
PO 8	Demonstrate kno	owledge and understanding of 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, environment and the consequential respon								
PO 11	_	vely as an individual and as a								
PO 12	Identify a timely	opportunity and using innover fthe individual and society and soci	_	ursu	e that opportur	nity to creat	te value	e and wealth for		
PO 13	To apply knowle	edge of computing to create of and synthesize scholarly lite	effective d	_		-	•			
PO 14	-	ntific outlook that solves any								
PO 15	Apply knowledg knowledge appro	e of computing fundamental opriate for the computing spels from defined problems ar	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 / PO / KL Mapping

(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	3	PO 5	3
		PO 6	3
		PO 7	5
CO 3	2	PO 8	5
		PO 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO 8 PO 9 PO 10 PO 11 PO 12 PO 13 PO 14	5
		PO 10	4
CO 4	5	PO 11	4
		PO 12	4
		PO 13	4
CO 5	6	PO 14	4
		PO 15	4

CO / PO Mapping

(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)

COs		Programme Outcome (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

ourse Assessment Methods
irect
1. Continuous Assessment Test I, II & Model
2. Assignment
3. End Semester Examinations
ndirect
1. Course End Delivery

	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	JDP-A tour of SW	ING- Bulidin								
	GUI Application using SWING-RMI: An Overview of RMI-Building a S	Simple Client/Serv	er Applicatio								
	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										
Ullit - 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 Extensions	s: Introduction to	Custom								
Ullit - 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	ting to a								
Unit - V	Database with DriverManager-The Statement Interface-Result Sets-Using	Metadata-JSP and	d XML-JSP								
	Testing and Debugging-Deploying Web Applications.										

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





Elayampalayam, Tiruchengode-637 205.

Programme	M.Sc	Programme Code		2021-2022								
Department	Computer Science Semester											
Course Code	C	ourse Name		eriod: Wee		Credit	Maxim	um Mark	s			
			L	T	P	С	CA	ESE	Total			
21P2CS08	Data Mining and Warehousing 4 0 0 4 25 75 100											
COURSE OBJECTIVES	-	ts of database technology. Us of the data to be mined. To					_					
POs	PROGRAMME OUTCOME											
PO 1	knowledge appro	e of computing fundamental priate for the computing spe s from defined problems an	ecializ	ation	to t	he abstraction						
PO 2	•	te, research literature, and so g fundamental principles of		-				_				
PO 3	systems,compone	ate solutions for complex coents, or processes that meet sal, societal & environmental of	pecifi	ed ne	eds		_		r public heal			
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		apt and apply appropriate te	-				dern comp	uting tool	ls to complex			
PO 6	Understand and comprofessional com	ommit to professional ethic puting practice.	s and	cybe	reg	ulations, resp	onsibilities	s, and nor	ms of			
PO 7	*	ed, and have the ability, to e	engage	in ir	ndep	endent learni	ng for cont	inual dev	elopment as			
PO 8	Demonstrate kno	wledge and understanding of a member and leader in a t		-		-	-	-				
PO 9		ectively with the computing ties by being able to compressions.			•				-			
PO 10		ssess societal, environmentand the consequential respor										
PO 11	Function effective environments.	ely as an individual and as a	mem	ber o	r lea	der in divers	e teams and	d in multi	disciplinary			
PO 12	Identify a timely	opportunity and using innov the individual and society a			rsue	that opportu	nity to crea	te value a	and wealth fo			
PO 13	To apply knowle	lge of computing to create eand synthesize scholarly lite	effecti	ve de	_		_	_				
PO 14	•	tific outlook that solves any										

	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

						Know	ledge	Level	S						
1.Remer	nberi	ng, 2.	Undei	rstand						g, 5.E	valuat	ing, 6.	Synth	esizin	g
								Mappin	-						
COs		(3/2	/1 indic		e streng KLs	gth of c	orrelati	on, 3-si	rong, 2 PO:	2-mediu	m, 1-we	eak)	V	Ls	
	S				KLS				PO					Ls 1	
СО	1				1				PO						
CO	1				1			PO 3				2 4 4			
									PO						
CO	2				2				PO	5		3			
	CO 2							PO 6				3			
								PO 7				5			
CO	3		4					PO 8				5			
								PO 9				5			
GO.								PO 10 PO 11				4			
CO	4				3										
								PO 12 PO 13					4		
CO	5				5			PO 14				4			
			3						PO 1					4	
						CO /	PO Ma	pping			L				
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)			
COs						P	rogram	ıme Ou	tcome ((POs)					
COS	PO1	PO2	PO3	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

2

Course Assessment Methods	
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 Data Mining	Periods	12										
	Introduction: Data Mining - Data Mining Functionalities - Kinds of Patter	rns can be Mined	- Classification										
Unit - I	Data Mining Task Primitives - Major Issues. Data pre-processing: Descri	ptive Data Summa	rization - 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										
Onit - II	Warehouse Architecture - Data Warehouse Implementation - From data v	varehouse to data	nining.										
	Mining Frequent Patterns, Associations, and Correlations	Periods	12										
	Mining Frequent Patterns, Associations, and Correlations: Basic Concepts - Efficient and Scalable Freque												
Unit - III	Itemset Mining Methods - Mining various kinds of Association Rules- From Association Mining to												
Ullit - 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	of Major Clusterin	g Methods -										
Unit - IV	Partitioning Methods - Hierarchical Methods - Density Based Methods -	Grid Based Meth	ods - Model										
	Based Clustering Methods - Outlier Analysis - Mining Time-Series Data	- Mining Sequence	e Patterns in										
	Biological Data.												
	Spatial Data Mining, Applications and Trends in Data Mining	Periods	12										
	Spatial Data Mining - Multimedia Data Mining - Text Mining - Mining the	e World Wide We	b. Application										
Unit - V	and Trends in Data Mining: Applications - Data Mining System Products	and Research Pro	totypes -										
	Additional Themes on Data Mining - Social Impacts of Data Mining - Trends in Data mini												
	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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR

WOMEN (AUTONOMOUS)



Elayampalayam, Tiruchengode-637 205.

WOMEN EMPOWERMENT		Elayampalayam, T	`iruche	ngode-	637 205.								
Programme	M.Sc	Programme Code	ions	2021-2022									
Department	Computer Science Semester												
Course Code		Course Name		riods Week	Credit	Maximu	ım Mark	T.S.					
			L	T P	С	CA	ESE	Total					
21P2CS09	NETWORK SECURITY 4 0 0 4 25 75 100 To learn about the Security architecture security types and security mechanismsTo learn about the												
COURSE OBJECTIVES	Network securi	the Security architecture security has four objectives: conficulties of Securing inform											
POs	PROGRAMME OUTCOME												
PO 1	knowledge appr	ge of computing fundamental copriate for the computing spels from defined problems a	ecializa	ation to	the abstraction								
PO 2		ate, research literature, and ang fundamental principles of											
PO 3	systems,compo	uate solutions for complex of ments, or processes that meet ral, societal & environmental	specifie	d need		_		or public heal					
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, a	dapt and apply appropriate t	echniqu	es, reso	ources, and mo		iting too	ls to complex					
PO 6	Understand and	commit to professional ethin				onsibilities,	, and nor	rms of					
PO 7		eed, and have the ability, to	engage	in inde	pendent learni	ng for conti	nual dev	relopment as					
PO 8		owledge and understanding as a member and leader in a		-	-	-	•						
PO 9		ffectively with the computing ities by being able to computations.	-	•				•					
PO 10		assess societal, environmen and the consequential respo											
PO 11	Function effects environments.	vely as an individual and as	a memb	er or le	eader in divers	e teams and	in multi	disciplinary					
PO 12		y opportunity and using inno of the individual and society		_	e that opportu	nity to creat	te value a	and wealth fo					
PO 13		edge of computing to create e and synthesize scholarly li		_		_	_						
PO 14	To develop scie demands.	ntific outlook that solves an	y proble	m, enc	ompassing the	expected as	spects of	market					
PO 15		ge of computing fundamenta copriate for the computing sp			-								

	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

						Know	ledge	Level	S							
1.Remer	nberi	ng, 2.	Unde	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g	
		(3/2	/1 indic	eates the				Mappin		2-mediu	m 1_we	ak)				
COs	S	(3/2	7 I marc		KLs	5111 01 0	Officiali	011, 5 31	PO		III, 1 WC	uk)	K	Ls		
									PO					1		
CO	CO 1				1				PO	2				2		
									PO	3			4	4		
									PO					4		
CO	CO 2				2				PO			3				
									PO					3		
GO.	2		3					PO 7				5				
CO	3							PO 8 PO 9				5				
								PO 10				4				
CO	4		4					PO 11						* 4		
60.	•				7			PO 12				4				
								PO 13						4		
CO	5				6				PO 1				4	4		
									PO 1	15			4	4		
							PO Ma				•					
		(3/2	/1 indic	cates the	e streng					2-mediu	m, 1-we	eak)				
COs						P		me Ou	tcome (
203	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

Course Assessment Methods	
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-										
	Security Mechanisms- Model for Network Security - Symmetric Encrypti	•									
Unit - I	Symmetric Encryption Principles - Symmetric Block Encryption Algorith	•	_								
	Cipher Block Modes of Operations - Location of Encryption Devices-Key	Distribution.									
	Public Key Cryptography and Message Authentication	Periods	12								
	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: Kerb	eros - X.509 Auth	nentication								
	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										
Unit - III	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										
Ullit - IV	(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. Firewalls	s: Firewall								
	Design Principles - Trusted Systems - Common Criteria for IT Security E	valuation.									
	Total Periods		60								

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 â€" 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/

MODEN ENDOWERSEL

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



Elayampalayam, Tiruchengode-637 205.

Programme MSc	WOMEN EMPOWERMEN		Elayampalayam, I	Tiruche	engo	de-63	37 205.			
21P2CSP03 ADVANCED JAVA PROGRAMMING LAB Periods per Week Periods	Programme	MSc	Programme Code			PC	CS	Regula	tions	2020-21
ADVANCED JAVA PROGRAMMING LAB Design & develop core java applications such as packages, multithreading, exception handling, applets & event handling 2. Design and develop network communications, JDBC & simple server side scriptin programs using Servlets & JSP 3. Design and develop database connectivity and simple web applications LIST OF PRACTICALS	Department		M.Sc CS				II			
COURSE OBJECTIVES 1. Design & develop core java applications such as packages, multithreading, exception handling, applets & event handling 2. Design and develop network communications, JDBC & simple server side scriptin programs using Servlets & JSP 3. Design and develop database connectivity and simple web applications LIST OF PRACTICALS 1 Write a Program to prepare a student mark list using swing 2 Write a Program to perform event handling in Swing 3 Write a Program to implement RMI 4 Write a HTML to Servlet Applications 5 Write a Create a simple servlet program to display cookie's information 6 Write a program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing	21P2CSP03						Credit	Maxim	um Mark	S
COURSE OBJECTIVES 1. Design & develop core java applications such as packages, multithreading, exception handling, applets & event handling 2. Design and develop network communications, JDBC & simple server side scriptin programs using Servlets & JSP 3. Design and develop database connectivity and simple web applications LIST OF PRACTICALS 1 Write a Program to prepare a student mark list using swing 2 Write a Program to perform event handling in Swing 3 Write a Program to implement RMI 4 Write a HTML to Servlet Applications 5 Write a Create a simple servlet program to display cookie's information 6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing		PROGRAMIN	IING LAB	L	Т	P	С	CA	ESE	Total
OBJECTIVES 1. Design act develop cere java applications such as packages, inditidine acception handling, applets & exception handling. 2. Design and develop network communications, JDBC & simple server side scriptin programs using Servlets & JSP 3. Design and develop database connectivity and simple web applications LIST OF PRACTICALS 1. Write a Program to prepare a student mark list using swing 2. Write a Program to perform event handling in Swing 3. Write a Program to implement RMI 4. Write a HTML to Servlet Applications 5. Write a Create a simple servlet program to display cookie's information 6. Write a simple program to implement the concept of JDBC 7. Write a program to implement the concept of JDBC & Swing				0	0	4	2	40	60	100
2 Write a Program to perform event handling in Swing 3 Write a Program to implement RMI 4 Write a HTML to Servlet Applications 5 Write a Create a simple servlet program to display cookie's information 6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing		except 2. Design progra	tion handling, applets & n and develop network arms using Servlets & Jan and develop database	& ever comm SP conne	nt ha	andli icatio	ng ons, JDBC	& simple	server s	-
3 Write a Program to implement RMI 4 Write a HTML to Servlet Applications 5 Write a Create a simple servlet program to display cookie's information 6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing	1	Write a Progra	am to prepare a student	mark	list	usin	g swing			
4 Write a HTML to Servlet Applications 5 Write a Create a simple servlet program to display cookie's information 6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing	2	Write a Progra	am to perform event ha	ndling	in S	Swin	g			
5 Write a Create a simple servlet program to display cookie's information 6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing	3	Write a Progra	am to implement RMI							
6 Write a simple program to implement the concept of JDBC 7 Write a program to implement the concept of JDBC & Swing	4	Write a HTMI	L to Servlet Application	ıs						
7 Write a program to implement the concept of JDBC & Swing	5	Write a Create	e a simple servlet progra	am to	disp	olay c	cookie's inf	formation		
	6	Write a simple	e program to implement	the co	onc	ept o	f JDBC			
8 Write a program for simple registration form in JSP	7	Write a progra	um to implement the co	ncept	of J	DBC	C & Swing			
	8	Write a progra	m for simple registration	on for	n ir	ı JSP)			

Signature of BOS Chairman

Subject Title	MINI PROJECT-DOMAIN STUDY	Semester	II
Subject Code	21P2CSPR01	Specialization	NA
Type	Mini Project - 1	L:T:P:C	2:0:2:0

Total Marks: 40 Marks

The Passing minimum shall be 40% out of 60 marks (24 Marks)

FIRST REVIEW: (15 Marks)

- 1. Project Title
- 2. Project Platform
- 3. Details of Guide
- 4. Problem Description / Modules
- 5. Presentation (PPT)

FINAL REVIEW: (25 Marks)

- 1. Documentation
- 2. Screens Shots
- 3. DFD / ERD / System Flow Diagram (Whichever Applicable)
- 4. Presentation (PPT)
- 5. Final Project Report (with executable format including complete source code)

Signature of BOS Chairman





Elayampalayam, Tiruchengode-637 205.

WOMEN EMPOWERNENT		Elayampalayam, 7	Tirucheng	ode-6	37 205.										
Programme	M.Sc	Programme Code		PC	CS	Regula	tions	2021-2022							
Department	Cor	nputer Science			Semester			3							
			Perio	ods	Credit	Maxim	um Mark	zs.							
Course Code	(Course Name	per W	e k											
			L T		С	CA	ESE	Total							
21P3CS10	SOF	T COMPUTING	4 (0	4	25	75	100							
COURSE	To familiarize w	rith neural network concept	s To intro	duce 1	the ideas of Ne	ural Netw	orks fuz	zy logicand							
OBJECTIVES		based on human experienc													
		oft computing using			•										
POs		DD	YERAMA	Æ OL	TCOME										
	A 1 . 1 1 . 1 .	PROGRAMME OUTCOME													
PO 1	11 0	pply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of													
						and conce	piuanzai	ion or							
PO 2		imputing models from defined problems and requirements entify, formulate, research literature, and solve complex computing problems reaching substantiated													
		g fundamental principles o		•	1 01		_								
	disciplines.														
PO 3	_	uate solutions for complex		_	_										
		ents,or processes that meet			with appropria	ite conside	eration fo	or public heal							
PO 4	•	ral,societal &environmental sed knowledge and research			ling design of a	experimen	te analy	sis and							
101		data, and synthesis of the i					us, anary	oro una							
PO 5	-	dapt and apply appropriate		_			uting too	ls to complex							
		ities, with an understanding													
PO 6		commit to professional ethi	cs and cyl	oer reg	gulations, respo	onsibilities	s, and not	rms of							
PO 7	professional con	nputing practice. eed, and have the ability, to	angaga in	inder	andant laarnin	a for cont	inual das	velonment as s							
107	computing profe		cligage in	mucp	chacht icariiii	g for com	iliuai ucv	ciopinent as a							
PO 8		owledge and understanding	of the cor	nputir	g and manage	ment princ	ciples and	d apply these							
		as a member and leader in a		-		-	-								
	environments.														
PO 9	Communicate effectively with the computing community, and with society at large, about complex														
		ities by being able to comp	rehend and	l write	effective repo	rts, design	docume	entation, make							
PO 10	effective present	ations. assess societal, environmer	utal haalth	cafat	v logal and ci	iltural icci	ioc within	n local and							
1010		and the consequential response													
PO 11	_	vely as an individual and as			-	-									
	environments.	-						1 7							
PO 12	Identify a timely	opportunity and using inno	ovation to	pursu	e that opportun	ity to crea	te value	and wealth fo							
_		f the individual and society	_					_							
PO 13		edge of computing to create					_								
PO 14		and synthesize scholarly li		_		_									
F U 14	demands.	ntific outlook that solves an	y problem	i, cheo	mpassing the e	Apecieu a	specis 01	mai ket							
PO 15		e of computing fundamenta	als, compu	iting s	pecialization, r	nathemati	cs, and d	omain							
		opriate for the computing sp	-	•											

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

]	Know	ledge	Level	S						
1.Remer	nberi	ng, 2.	Unde	rstand						g, 5.E	valuat	ing, 6.	Synth	esizin	g
								Mappin	_						
		(3/2	/1 indic			gth of c	orrelati	on, 3-s		2-mediu	m, 1-we	eak)			
COs	S				KLs				PO					Ls	
CO	1				1				PO PO					<u>1</u> 2	
CO	CO 1				1		-		PO		+			<u> </u>	
									PO					* 4	
CO	2				2				PO					3	
									PO	6			(3	
								PO 7					4	5	
CO	3		3					PO 8					5		
								PO 9						5	
CO	4				4				PO 1					4	
CO	4				4				PO 1			4			
								PO 12					4		
CO	5				4				PO 1					<u>.</u> 4	
									PO 1					4	
			I			CO /	PO Ma	pping							
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-w	eak)			
COs						P	rogram	nme Ou	tcome ((POs)					
203	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

Course Assessment Methods	
Direct	
1. Continuous Assessment Test I, II & Model	
2. Assignment	
3. End Semester Examinations	
Indirect	
1. Course End Delivery	

	Fundamentals of Neural Networks	Periods	12							
Unit - I Characteristics of Neural Networks - Learning Methods - Taxonomy of History of Neural Network Research - Early Neural Network Architecture Backpropagation Networks Architecture of Backpropagation Network - Backpropagation Learning of Tuning Parameters of the Backpropagation Neural Network - Selecti Backpropagation Neural Network - Variations of Standard Backpropagation Neural Network - Variations of Standard Backpropagation Neural Network - Simplified ART Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture - Special Features - Special Features - ART1 Algorithm - ART2 - Architecture - Special Features - Special Features - ART1 Algorithm - ART2 - Architecture - Special Features - Special Fe										
Unit - I										
	History of Neural Network Research - Early Neural Network Architectures - Some Applic Backpropagation Networks Periods Architecture of Backpropagation Network - Backpropagation Learning - Illustrations - Ap of Tuning Parameters of the Backpropagation Neural Network - Selection of various Param Backpropagation Neural Network - Variations of Standard Backpropagation Algorithms. Adaptive Resonance Theory (ART): Periods Introduction - Classical ART networks - Simplified ART Architecture - ART1 - Architect Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture of ART2 - Algorithms. Fuzzy Set Theory: Periods Fuzzy Sets - Fuzzy Relations. Fuzzy Systems: Fuzzy Logic - Fuzzy Rule based system - D Methods - Applications. Fuzzy Backpropagation Networks: LR-type Fuzzy Numbers - Fu Fuzzy Backpropagation Architecture. Fundaments of Genetic algorithms: Periods Basic Concepts - Creation of Offsprings - Encoding - Reproduction, Genetic Modeling: Creations.									
	Backpropagation Networks	Periods	12							
	Architecture of Backpropagation Network - Backpropagation Learning - l	Illustrations - App	lications - Eff							
Unit - II	of Tuning Parameters of the Backpropagation Neural Network - Selection of various Parameters in									
	Backpropagation Neural Network - Variations of Standard Backpropagati	on Algorithms.								
	Adaptive Resonance Theory (ART):	Periods	12							
Ilmit 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									
	Fundamentals of Neural Networks Basic Concepts of Neural Network-Model of an Artificial Neuron - Neural Network Architectures of Neural Networks - Learning Methods - Taxonomy of Neural Network Architectures - Some Applications - Early Neural Network Architectures - Some Applications - Applications - Resonance Theory (ART): Periods Architecture of Backpropagation Network - Backpropagation Learning - Illustrations - Applications - Applications - Neural Network - Selection of various Paral Backpropagation Neural Network - Variations of Standard Backpropagation Algorithms. Adaptive Resonance Theory (ART): Periods Introduction - Classical ART networks - Simplified ART Architecture - ART1 - Architect Special Features of ART1 Models - ART1 Algorithm - ART2 - Architecture of ART2 - Algorithms. Fuzzy Set Theory: Periods Fuzzy Sets - Fuzzy Relations. Fuzzy Systems: Fuzzy Logic - Fuzzy Rule based system - D Methods - Applications. Fuzzy Backpropagation Networks: LR-type Fuzzy Numbers - Fuzzy Backpropagation Architecture. Fundaments of Genetic algorithms: Periods Basic Concepts - Creation of Offsprings - Encoding - Reproduction. Genetic Modeling: Calinversion and Deletion - Mutation Operator - Bit Wise Operators.									
	Fuzzy Set Theory:	Periods	12							
11:4 137	Fuzzy Sets - Fuzzy Relations. Fuzzy Systems: Fuzzy Logic - Fuzzy Rule b	ased system - De	fuzzification							
Unit - IV	Methods - Applications. Fuzzy Backpropagation Networks: LR-type Fuzz	zy Numbers - Fuz	zy Neuron -							
	Fuzzy Backpropagation Architecture.									
	Fundaments of Genetic algorithms:	Periods	12							
TT '. T7	Basic Concepts - Creation of Offsprings - Encoding - Reproduction. Gene	tic Modeling: Cro	oss Over -							
Unit - V	Inversion and Deletion - Mutation Operator - Bit Wise Operators.									
			60							

m	
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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR

WOMEN (AUTONOMOUS)



Elavampalavam, Tiruchengode-637 205.

OMEN EMPOWERMEN		Elayampalayam, T	iruch	engo	de-6	37 205.								
Programme	M.Sc	Programme Code			PO	CS	Regula	tions	2021-2022					
Department	Cor	nputer Science				Semester			3					
			P	eriod	s	Credit	Maxim	ximum Marks						
Course Code	(Course Name	pe	r Wee	ek									
			L	T	P	C	CA	imum Marks ESE 75 athematical f pplydesign p atics, and dornceptualization aching substand relevant do evaluate ideration for ments, analysisms. Inputing tools inciples and a disciplinary ge, about combined inciples and a disciplinary ge, about combined in multidistreate value and in multidistreate value and mplex proble ter Science. If aspects of intatics, and dornatics, and dornatics.	Total					
21P3CS11	PYTHO	N PROGRAMMING	4	0	0	4	25	75	100					
COURSE OBJECTIVES	in analysis of alg	ciency of algorithmic proble gorithms.Understand different write source code.		_										
POs	PROGRAMME OUTCOME													
PO 1	knowledge appro	ge of computing fundamental opriate for the computing spels from defined problems are	ecializ	zatior	to t	he abstraction								
PO 2	computing models from defined problems and requirements 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 evalusystems, component	uate solutions for complex c ents,or processes that meet s ral,societal &environmental	specifi	ied ne	eds		_		r public healt					
PO 4		sed knowledge and research data, and synthesis of the in					_	-	is and					
PO 5	Create, select, ac	lapt and apply appropriate te	chniq	ues, 1	esou	irces, and mo			s to complex					
PO 6		commit to professional ethic					onsibilities	s, and nor	ms of					
PO 7	Recognize the no	eed, and have the ability, to	engage	e in i	ndep	endent learnii	ng for cont	inual deve	elopment as					
PO 8		owledge and understanding on a member and leader in a second		-			-	-						
PO 9		fectively with the computing ities by being able to compresations.	-		•				-					
PO 10		assess societal, environment and the consequential respon												
PO 11		vely as an individual and as a					_							
PO 12	-	opportunity and using innot f the individual and society a		_	ırsue	that opportu	nity to crea	te value a	nd wealth fo					
PO 13		edge of computing to create of and synthesize scholarly lite							lems. To					
PO 14		ntific outlook that solves any							market					
PO 15	11.0	e of computing fundamental		-										

	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.

]	Know	ledge	Level	S							
1.Reme	mberi	ng, 2.	Unde	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g	
								Mappin	_							
		(3/2	/1 indic			gth of c	orrelati	on, 3-si		2-mediu	m, 1-we	eak)				
СО	S				KLs				PO				K	Ls		
G O	CO.1								PO					1		
CO	CO 1				1				PO PO					2 4		
									PO					4 4		
СО	2.				2				PO					+ 3		
60	CO 2				_				PO					3		
								PO 7						5		
CO	3				3			PO 8					5			
									PO	9			4	5		
								PO 10					2	4		
CO	4				4			PO 11						4		
									PO 1					4		
GO.	~				4				PO 1					4		
CO	5				4				PO 1					4 4		
						CO /	PO Ma	nning	ru l	1.3				+		
		(3/2	/1 indic	ates the	e streng				trong. 2	2-mediu	m, 1-we	eak)				
		(2			ıme Ou			,					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13	PO14	PO	
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

Course Assessment Methods	
Direct	
4. Continuous Assessment Test I, II & Model	
5. Assignment	
6. End Semester Examinations	
Indirect	
1. Course End Delivery	

Content of the	Syllabus							
	Python:	Periods	12					
	Introduction - Python interpreter and interactive mode - Values & Types - Variable - Expre							
TTte T	Statements - Assigning Values in Python, Variable Declaration, Multiple	Assignment - Ope	erators - Types					
Unit - I	of Operators, Operator Precedence - Modules and Functions: Modules, Fu	inction Definition	and Use,					
	Defining a Function, Calling Function, Uses of Function, Advantages of Function,	Functions - Flow o	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 - Deci-	sion Making - if, i	if… Else,					
	If‡Elif‡ Else & Nested statements - Iteration - Fruitful Functions - Sco	pe of Variable - C	lobal and Loca					
	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, Dele	ete Tuple Element	s, Tuple					
Unit - IV	Assignment, Tuple Methods, Other Tuple Operations, Tuples As Return V	Values, Built-in F	unctions with					
Omt - I v	Tuple, Variable Length Arguments Tuples - Dictionaries: Built-in Dictionary Functions and Methods,							
	Iterating through,	Reverse						
	Lookup, Inverting a Dictionary, Memorization(Memos)							
	Files:	Periods	12					
Unit - V	Reading and Writing, Format Operator, Command Line Arguments - Erro	ors and Exceptions	: Errors,					
Omt - v	Exceptions. Modules: Writing Modules, Locating Modules. Packages: Ste	eps to create a Pytl	non Package.					
	Total Periods		60					

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

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES

FORWOMEN (AUTONOMOUS)



WOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.							
Programme	M.Sc	Programme Code	PCS Regulations					2021-2022
Department	Com	puter Science	Semester					3
	Periods Credit Maximum Marks							KS
Course Code	C	ourse Name	per W	eek				
			L T	P	С	CA	ESE	Total
21P3CS12	CLOU	D COMPUTING	4 0	0	4	25	75	100
COURSE	To know the basi	cs of Cloud Computing.Und	erstand t	he M	odels and Serv	rices of Clo	oud Con	nputing.
OBJECTIVES	Identify the purpo	ose of Cloud Storage Evalu	ate clou	d serv	rices with com	panys.		
POs		PROC	GRAMM	E OU	TCOME			
PO 1	Apply knowledge	e of computing fundamentals	s, compu	ing s	pecialization, i	mathemati	cs, and d	lomain
	11.	priate for the computing spe		_				
	computing model	ls from defined problems and	d require	ments	3			
PO 2	•	te, research literature, and so	-				_	
		g fundamental principles of r	nathema	ics, c	omputing scie	nces, and i	relevant	domain
	disciplines.						_	
PO 3	_	ate solutions for complex co		-	•	-		
	-	ents,or processes that meet spal,societal &environmental c			with appropria	ate conside	eration ic	or public nealth
PO 4	•	ed knowledge and research i			ling design of	evnerimer	nte anals	veic and
104		data, and synthesis of the inf						sis and
PO 5	-	apt and apply appropriate tec						ls to complex
		ties, with an understanding of	_			•		•
PO 6	Understand and c	ommit to professional ethics	and cyb	er reg	gulations, respo	onsibilities	s, and no	rms of
	professional com							
PO 7	_	ed, and have the ability, to e	ngage in	indep	endent learnin	g for cont	inual dev	velopment as a
DO 9	computing profes		C .1		1	, .		1 1 1
PO 8		wledge and understanding o		_		_	_	
	environments.	s a member and leader in a to	eam, to m	ianag	e projects and	III IIIuItiai	scipiinai	У
PO 9		ectively with the computing	commu	nity. a	nd with societ	v at large.	about co	omplex
		ties by being able to comprel		•				-
	effective presenta				•			
PO 10	Understand and a	ssess societal, environmenta	l, health	safet	y, legal, and c	ultural issu	ies withi	n local and
		and the consequential respon						
PO 11		ely as an individual and as a	member	or le	ader in diverse	teams and	l in mult	idisciplinary
PO 10	environments.				4	•• •		1 1.1 2
PO 12		opportunity and using innov the individual and society at	_	oursu	that opportun	nty to crea	te value	and wealth for
PO 13		dge of computing to create e		lecim	ne and colution	s for com	nlev nrol	nlems To
1013		and synthesize scholarly lite						
PO 14		tific outlook that solves any						
	demands.		· '	_				
PO 15	Apply knowledge	e of computing fundamentals	s, compu	ing s	pecialization, 1	mathemati	cs, and d	lomain
		priate for the computing spe				and conce	eptualiza	tion of
	computing model	s from defined problems and	d require	ments	3			

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

CO / PO / KL Mapping

(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)

(6) =	, i more are sure in sure in sure or corre	Tudion, o strong, 2 metrum, 1 m	
COs	KLs	POs	KLs
		PO 1	1
CO 1	1	PO 2	1
		PO 3	1
		PO 4	1
CO 2	1	PO 5	1
		PO 6	1
	1	PO 7	1
CO 3		PO 8	1
		PO 9	1
		PO 10	1
CO 4	1	PO 11	1
		PO 12	1
		PO 13	1
CO 5	1	PO 14	1
		PO 15	1

CO / PO Mapping

(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)

COs		Programme Outcome (POs)													
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

Course Assessment Methods
Direct
1. Continuous Assessment Test I, II & Model
2. Assignment
3. End Semester Examinations
Indirect
1. Course End Delivery

	Cloud Computing Basics:	Periods	12			
Unit - I	Cloud Computing Overview-Applications-Intranets and the Cloud. Your	Organization and	Cloud			
Ullit - I	Computing: When you can use Cloud computing-Benefits-Limitations-Se	ecurity Concerns.				
	Cloud Computing Technology:	Periods	12			
Unit - II	Cloud Hardware and Infrastructure-Clients-Security-Network-Services. A	Accessing the Clou	d:			
Onit - 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	12			
Unit - IV	Overview-Driving forces-Company offerings-Industries. Software plus Se	ervices: Overview	-Mobile Devi			
Omt - IV	Integration-Providers-Microsoft Online.					
	Local Clouds and Thin Clients:	Periods	12			
Unit - V	Virtualization in Your Organization-Server Solutions-Thin Clients. Migra	ating to the Cloud:	Cloud Service			
UIIIt - V	for Individuals-Enterprise-Class Cloud Offerings-Migration.					

Text Books	
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

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR **WOMEN (AUTONOMOUS)** Elayampalayam, Tiruchengode-637 205. Programme M.Sc PCS Regulations 2022-23 Programme Code **Computer Science** 1 Department Semester Periods 22P2CSP02 Maximum Marks Credit **Core Course Practical – 4 DATA** per Week ANALYSIS USING PYTHON P Τ L C CA ESE Total PROGRAMMING LAB 0 0 5 2 40 60 100 COURSE 7. Creating simple programs GCD **OBJECTIVES** 8. Implement a python program from files 9. Implement a python program using Pygame LIST OF PRACTICALS 1 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 python program find the most frequent words in a text read from a file 10 Simulate bouncing ball using Pygame

Subject Title	MINI PROJECT - II	Semester	III
Subject Code	21P3CSPR02	Specialization	NA
Type	Mini Project - II	L:T:P:C	0:0:3:5

Total Marks: 40 Marks

The Passing minimum shall be 40% out of 60 marks (24 Marks)

FIRST REVIEW: (15 Marks)

- 6. Project Title
- 7. Project Platform
- 8. Details of Guide
- 9. Problem Description / Modules
- 10. Presentation (PPT)

FINAL REVIEW: (25 Marks)

- 6. Documentation
- 7. Screens Shots
- 8. DFD / ERD / System Flow Diagram (Whichever Applicable)
- 9. Presentation (PPT)
- 10. Final Project Report (with executable format including complete source code)

Signature of BOS Chairman

Subject Title	Major Project	Semester	IV
Subject Code	21P4CSPR03	Specialization	NA
Type	Major Project	L:T:P:C	0:0:0:9

FIRST REVIEW: (10 Marks)

- 1. Problem Identification
- 2. Problem definition
- 3. Presentation

SECOND REVIEW:

(10 Marks)

- 1. Project Analysis
- 2. Design & Module description

FINAL REVIEW: (20 Marks)

- 1. DFD / ERD / System Flow Diagram (Whichever Applicable)
- 2. Coding and Implementation
- 3. Presentation
- 4. Final Project Report (with executable format including complete source code)

The Passing minimum shall be 40% out of 60 marks (24 Marks)

Signature of BOS Chairman





Elayampalayam, Tiruchengode-637 205.

Programme	M.Sc	Programme Code	P	2021-2022						
Department	Cor	nputer Science		Semester			1			
			Periods	Credit	Maximum					
Course Code	C	Course Name	per Week							
			L T P	С	CA	ESE	Total			
21P1CSE01	THEORY OF COMPUTATION 2 0 0 4 25 75 100									
COURSE OBJECTIVES	gives an understa	nowledge on Learning about anding of the power of Turing ds and applications	_	_	-		_			
POs		PRO	GRAMME O	UTCOME						
PO 1	knowledge appro	e of computing fundamenta opriate for the computing sp lls from defined problems ar	ecialization to	the abstraction						
PO 2	=	ate, research literature, and s g fundamental principles of	_							
PO 3	Design and evalues systems, component	nate solutions for complex c ents,or processes that meet s al,societal &environmental	specified need		•		public health			
PO 4	Use research-bas	sed knowledge and research data, and synthesis of the in	methods inclu		_	nalysis	s and			
PO 5		lapt and apply appropriate to ties, with an understanding	•		dern computing	tools	to complex			
PO 6	Understand and opposessional com	commit to professional ethic	es and cyber re	gulations, resp	onsibilities, an	d norm	ns of			
PO 7	•	eed, and have the ability, to	engage in inde	pendent learni	ng for continua	devel	lopment as a			
PO 8	Demonstrate kno	owledge and understanding of s a member and leader in a	•				apply these to			
PO 9		fectively with the computing ties by being able to compre ations.	•				•			
PO 10		assess societal, environment and the consequential respon								
PO 11		vely as an individual and as a								
PO 12		opportunity and using innot f the individual and society a	•	e that opportu	nity to create va	lue an	nd wealth for			
PO 13		dge of computing to create	_	ns and solution	ns for complex	proble	ems.			
PO 14	To identify, anal	yse and synthesize scholarly	literature rela	ting to the field	d of Computer	Scienc	ee			
PO 15	To develop scier demands.	ntific outlook that solves any	problem, enc	ompassing the	expected aspec	ts of n	narket			

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

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)

CO			
COs	KLs	POs	KLs
		PO 1	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	3	PO 8	5
		PO 9	5
		PO 10	4
CO 4	4	PO 11	4
		PO 12	4
		PO 13	4
CO 5	4	PO 14	4
		PO 15	4

CO / PO Mapping

(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)

COs		Programme Outcome (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	

Course Assessment Methods	
Direct	
1. Continuous Assessment Test I, II & Model	
2. Assignment	
3. End Semester Examinations	
Indirect	
1. Course End Delivery	

	Regular Languages	Periods	12								
	Finite Automata (FA) - Deterministic Finite Automata (DFA) - Non-deter	ministic Finite A	ıtomata (NFA)								
Unit - I	Finite Automata with Epsilon transitions - Regular Expression - FA and F	Regular Expression	ns - Pumping								
	lemma for Regular languages - Equivalence and minimization of Finite A	utomata.									
	Context Free Languages Periods										
	Context-Free Grammar (CFG) - Parse Trees - Ambiguity in grammars and	d languages - Equ	ivalence of Par								
Unit - II	trees and derivation - Normal forms for CFG - Definition of the Pushdown automata - Languages of a										
	Pushdown Automata - Equivalence of Pushdown automata and CFG - Pushdown	mping 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								
Unit - IV	A language that is not Recursively Enumerable (RE) - An undecidable problem that is RE - Undecidable										
Omt - IV	problems about Turing Machine - Rice theorem for Recursive and Recursively enumerable languages -										
	Post's Correspondence Problem										
	Recent Trends & Applications	Periods	12								
Unit - V	Matrix grammar - Programmed grammar - Random context grammar - Regular Control grammar -										
Omt - V	Lindenmayer systems - A glance on DNA computing and Membrane com	iputing.									
	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/





Elayampalayam, Tiruchengode-637 205.

EMPOWER		Elayampalayam, 1		uc-u					
Programme	M.Sc	Programme Code		2021-2022					
Department	Con	nputer Science			Semester			1	
			Period	ls	Credit	Maxim	um Marl	XS .	
Course Code	C	Course Name	per We	ek					
			L T	P	С	CA	ESE	Total	
21P1CSE02	MOBILE COMMUNICATION 2 0 0 4 25 75								
COURSE OBJECTIVES		s familier with fundamental CDMA) according to the co			•	•		•	
POs		PRO	GRAMM	E OU	JTCOME				
PO 1	knowledge appro	e of computing fundamenta opriate for the computing sp ls from defined problems ar	ecializatio	n to	the abstraction				
PO 2	=	te, research literature, and s g fundamental principles of	_				_		
PO 3	Design and evalusystems,compon	nate solutions for complex c ents,or processes that meet s al,societal &environmental	specified n	eeds		_		or public health	
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the in	methods is	nclud		-	•	sis and	
PO 5		apt and apply appropriate to ties, with an understanding	_			dern comp	uting too	ls to complex	
PO 6	Understand and opposessional com	commit to professional ethic	s and cybe	er reg	gulations, resp	onsibilities	s, and no	rms of	
PO 7	•	ed, and have the ability, to	engage in i	ndep	endent learnir	ng for cont	inual dev	velopment as a	
PO 8	Demonstrate kno	whedge and understanding of a member and leader in a		-	-	-	-		
PO 9		fectively with the computing ties by being able to compressions.		•				-	
PO 10		assess societal, environment and the consequential respo							
PO 11		rely as an individual and as							
PO 12	Identify a timely	opportunity and using inno	_	ursu	e that opportur	nity to crea	te value	and wealth for	
PO 13		dge of computing to create		esigr	ns and solution	s for comp	olex prob	lems.	
PO 14	To identify, anal	yse and synthesize scholarly	literature	relat	ing to the field	l of Compi	uter Scie	nce.	
PO 15	To develop sciendemands.	tific outlook that solves any	problem,	enco	ompassing the	expected a	spects of	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	-

]	Know	ledge	Level	s							
1.Remen	nberi	ng, 2.1	Undei	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g	
								Mappin	-							
		(3/2	/1 indic			gth of c	orrelati	on, 3-s		2-mediu	m, 1-we	eak)		-		
COs					KLs				PO					Ls		
CO 1	İ				1				PO PO					<u>1</u> 2		
COT	L				1				PO					4		
									PO					4		
CO 2	2				2				PO			3				
			_					PO 6				3				
								PO 7				5				
CO 3	3		2					PO 8				5				
								PO 9					5			
			4					PO 10				4				
CO 4	}							PO 11				4				
								PO 12 PO 13				4 4				
CO 5	5		2					PO 13				4 4				
203	,				2			PO 15				4				
						CO /	PO Ma	pping								
		(3/2	/1 indic	ates the	e streng				trong, 2	2-mediu	m, 1-we	eak)				
00						P	rogram	ıme Ou	tcome	(POs)						
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	O7 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	
			3	3	2	2	2	2	2	3	3	3	3	3	3	

CO5

Course	Course Assessment Methods							
Direct								
1.	1. Continuous Assessment Test I, II & Model							
2.	Assignment							
3.	End Semester Examinations							
Indirec	t							
1. 0	Course End Delivery							

	Tutural actions	D 1.	10							
	Introduction	Periods	12							
	Applications - A Short history of wireless communication - A market for	mobile communic	ation - A short							
Unit - I	history of wireless communication - Some open research topics - A simpl	ified reference mo	del. Wireless							
	transmission: Frequencies for radio transmission - Signals - Antennas - Signals - Signals - Signals - Signals - 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-200	00								
	Satellite systems	Periods	12							
Unit - III	History - Applications - Basics - Routing - Localization - Handover - Examples. Broadcast systems -									
Omt - m	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 - HIPERL	AN - Bluetoo							
	Mobile Network Layer	Periods	12							
Unit V	Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc network	ks. Mobile Transp	ort 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





Elavampalavam, Tiruchengode-637 205.

WOMEN EMPOWERMENT		Elayampalayam, Ti	rucheng	ode-6	37 205.				
Programme	M.Sc	Programme Code		P	ions	2021-2022			
Department	Con	nputer Science		1					
			Perio	ds	Credit	Maximu	ım Marl	ks	
Course Code	C	Course Name	per W	eek					
			L T	P	С	CA	ESE	Total	
21P1CSE02	MOBILE COMMUNICATION 2 0 0 4 25 75 100								
COURSE		s familier with fundamentals				-		•	
OBJECTIVES	(TDMA/FDMA/properties etc.	CDMA) according to the co	mplexity,	insta	llation cost, sp	peed of tran	smissio	n, channel	
POs		PRO	GRAMM	ΕOU	JTCOME				
PO 1	knowledge appro	e of computing fundamental opriate for the computing spe ls from defined problems an	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, ad	lapt and apply appropriate te	chniques,	reso	urces, and mod		iting too	ols to complex	
PO 6		commit to professional ethic				onsibilities,	, and no	rms of	
PO 7	Recognize the ne	eed, and have the ability, to e	engage in	indep	endent learnir	ng for conti	nual dev	velopment 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		assess societal, environment and the consequential respor							
PO 11	-	rely as an individual and as a							
PO 12	Identify a timely	opportunity and using innover the individual and society a	_	oursu	e that opportur	nity to creat	te value	and wealth for	
PO 13		dge of computing to create e		lesigi	ns and solution	s for comp	lex prob	olems.	
PO 14		yse and synthesize scholarly			_				
PO 15	To develop sciendemands.	tific outlook that solves any	problem,	enco	ompassing the	expected as	spects o	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	-

]	Know	ledge	Level	s							
1.Remen	nberi	ng, 2.1	Undei	stand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	g	
								Mappin	_							
		(3/2	/1 indic			gth of c	orrelati	on, 3-s		2-mediu	m, 1-we	eak)	***	-		
COs				:	KLs				PO					Ls		
CO 1					1				PO PO					<u>1</u> 2		
COT	L				1				PO					4		
							_		PO					* 4		
CO 2	CO 2 2				PO 5					3						
								PO 6					3			
							PO 7				5					
CO 3	3		2					PO 8					5			
								PO 9					5			
								PO 1			4					
CO 4	ļ		4					PO 11 PO 12					4			
CO 5	5		2				PO 13 PO 14					4				
203	,		2					PO 15					4			
						CO /	PO Ma	pping								
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)				
GO						P	rogran	nme 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	2	3	1	1	2	2	1	1	1	1	1	1	1	1	1	
			3	3	2	2	2	2	2	3	3	3	3	3	3	

CO5

urse Assessment Methods			
rect			
1. Continuous Assessment Test I, II & Model			
2. Assignment			
3. End Semester Examinations			
lirect			
1. Course End Delivery			

ontent of the	Syllabus									
	Introduction	Periods	12							
	Applications - A Short history of wireless communication - A market for mobile communication - A short									
Unit - I	history of wireless communication - Some open research topics - A simplified reference model. Wireless									
	transmission: Frequencies for radio transmission - Signals - Antennas - Signal 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.									
Onit - II	Telecommunications systems: GSM-DECT-TETRA-UMTS and IMT-2000									
	Satellite systems	Periods	12							
Unit - III	History - Applications - Basics - Routing - Localization - Handover - Examples. Broadcast systems -									
Omt - m	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 - HIPERL	AN - Bluetooth							
	Mobile Network Layer	Periods	12							
Unit - V	Mobile IP - Dynamic host configuration protocol - Mobile ad-hoc networks. Mobile Transport Layer:									
Onit - 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 FORW MEN ISO SOOT 2008

(AUTONOMOUS)



WOMEN EMPOWERMENT		Elayampalayam, T	Tirucheng	ode-6	37 205.							
Programme	M.Sc	tions	2021-2022									
Department	Computer Science Semester											
			Peri	ods	Credit	Maxim	um Mar	ks				
Course Code		Course Name	per W	eek								
			L		С	CA	ESE	Total				
21P1CSE03	CLIENT / SI	ERVER TECHNOLOGY	2	0	4	25	75	100				
COURSE	Know the basics	s of client /server technology	v. Unders	and th	e client serve	r hardware	and soft	ware				
OBJECTIVES		alyze the impact of client/se										
POs		PRO	OGRAMN	IE OU	TCOME							
PO 1	Apply knowledg	ge of computing fundamenta	ıls, comp	iting s	pecialization,	mathemati	ics, and o	lomain				
		opriate for the computing sp				n and conce	eptualiza	tion 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 evaluate											
	systems, components, or processes that meet specified needs with appropriate consideration for public healt											
	and safety,cultural,societal &environmental consideration Use research-based knowledge and research methods including design of experiments, analysis and											
PO 4												
DO 5	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			_			dem comp	uting too	ors to complex				
PO 6	computing activities, with an understanding of the limitations. Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of											
100	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		owledge and understanding	of the co	nputin	g and manage	ement princ	ciples an	d apply these t				
	one own work, as a member and leader in a team, to manage projects and in multidisciplinary											
	environments.											
PO 9	Communicate et	ffectively with the computing	ıg commu	nity, a	nd with socie	ty at large,	about co	omplex				
	computing activities by being able to comprehend and write effective reports, design documentation, make											
	effective present	tations.										
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		vely as an individual and as	a membe	or le	ader in divers	e teams and	d in mult	idisciplinary				
	environments.											
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for											
		of the individual and society										
PO 13		edge of computing to create		_		-	_					
PO 14		lyse and synthesize scholarl										
PO 15	To develop sciendemands.	ntific outlook that solves an	y problen	, enco	mpassing the	expected a	ispects o	f market				

COs	COURSE OUTCOME
CO 1	Understand 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

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	4	PO 8	5
		PO 9	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

CO / PO Mapping

COs	Programme Outcome (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	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

Course Assessment Methods	
Direct	
1. Continuous Assessment Test I, II & Model	
2. Assignment	
3. End Semester Examinations	
Indirect	
1. Course End Delivery	

	Introduction to Client Server Computing	Periods	12
	Benefits of Client Server Computing-Hardware Trends-Components of C	lient Server	
Unit - I	Applications-Categories of Client Server Applications-Dispelling the My	ths-Obstacles-Upf	ront and
	Hidden-Open Systems and Standards-Setting Organization-Factors for Su	iccess.	
	Client Hardware and Software	Periods	12
Unit - II	Client Components-Client Operating System-GUI-X Window Vs Window	ving-Database Ac	cess-Applicati
OIII - II	Logic-Client Server Products-Requirements-GUI Design Standards-Open	GUI Standards.	
	Server Hardware	Periods	12
	Benchmarks-Categories of Server-Features of Server Machines-Classes o	f Server Machines	s-Server
	Environment-Eight layers of Software-Network Management Environment	nt-Network Comp	uting
Unit - III	Environment-Server Requirements-Platform Independence-Transaction P	rocessing-Connec	tivity-Intellig
	Database-Stored Procedures-Triggers-Load Leveling-Optimizer-Testing a	and Diagnostic	
	Tools-Reliability-Backup and Recovery Mechanisms- Server Data Manag	gements and Acces	ss Tools.
	Overview of Networking	Periods	12
Unit - IV	Layers, Interfaces and protocols-Standard Architectures-Network Charact	eristics-Network l	Management
Ullit - 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-Application	on Development T	ools-Managii
OIIIt - 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, Novell'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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR

WOMEN (AUTONOMOUS)



WOMEN EMPOWERMENT		Elayampalayam, Ti	rucheng	ode-6	37 205.				
Programme	M.Sc	M.Sc Programme Code PCS Regulations							
Department	Com	puter Science			Semester	r			1
			ods	Credit	Maxim	Maximum Marks			
Course Code	C	ourse Name	per W	eek					
			LT	P	С	CA	ESE	Ξ	Total
21P1CSE04	INTERI	NET OF THINGS	2	0	4	25	75		100
COURSE OBJECTIVES		damentals, characteristics of plementing IoT in whether for			-			_	nercial
POs		PROG	GRAMN	IE OU	JTCOME				
PO 1	knowledge appro	e of computing fundamentals priate for the computing spe s from defined problems and	cializati	on to	the abstraction				
PO 2	Identify, formula	te, research literature, and so	lve con	plex	computing pro		-		
PO 3	Design and evalu systems,compone	ate solutions for complex conts, or processes that meet spans, societal &environmental control of the societal control of the	pecified	needs		•		or pu	blic healtl
PO 4	Use research-base	ed knowledge and research relata, and synthesis of the inf	nethods	inclu		_	ts, analy	ysis ar	nd
PO 5	Create, select, ad	apt and apply appropriate tecies, with an understanding o	hnique	, reso	urces, and mo		iting too	ols to	complex
PO 6		ommit to professional ethics				oonsibilities	, and no	orms c	of
PO 7		ed, and have the ability, to e	ngage ir	inde	endent learni	ng for conti	inual de	velop	ment as a
PO 8	Demonstrate kno	wledge and understanding o a member and leader in a to		-	-	-	-		ly these to
PO 9		ectively with the computing ies by being able to comprel tions.		•				-	
PO 10	Understand and a	ssess societal, environmentand the consequential respon							
PO 11		ely as an individual and as a					<u> </u>		
PO 12	Identify a timely	opportunity and using innov the individual and society at		pursu	e that opportu	inity to creat	te value	and v	wealth for
PO 13		lge of computing to create e		desig	ns and solutio	ns for comp	lex prol	blems	
PO 14	To identify, analy	se and synthesize scholarly	literatuı	e rela	ing to the fiel	d of Compu	ıter Scie	ence.	
PO 15	To develop scient demands.	tific outlook that solves any	problen	, enco	mpassing the	expected as	spects o	f mar	ket

COs	COURSE OUTCOME
CO 1	Knowledge on IoT
CO 2	Understand 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	-

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	3	PO 8	5
		PO 9	5
		PO 10	4
CO 4	4	PO 11	4
		PO 12	4
		PO 13	4
CO 5	4	PO 14	4
		PO 15	4

CO / PO Mapping

COs						P	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

Course Assessment Methods	
Direct	
1. Continuous Assessment Test I, II & Model	
2. Assignment	
3. End Semester Examinations	
Indirect	
1. Course End Delivery	

	Introduction	Periods	12			
Unit - I	Introduction to Internet of Things - Defintion & Characteristics of IoT - T	hings in IoT - IoT	Protocols -			
UIIIt - I	Logical Design of IoT: IoT functional Blocks - IoT Communication Mod	els - IoT Commun	ication APIs.			
	IoT Enabling Technologies	Periods	12			
Unit - II	Wireless Sensor Networks - Cloud computing - Bigdata Analytics - Com	nunication Protoc	ols - Embedd			
Ullit - II	Systems. Domain Specific IoTs: Home Automation - cities - Retail - Heal	th & Monitoring.				
	Developing IoT	Periods	12			
Unit - III	Introduction - IoT Design Methodology - Case Study on IoT System for V	Study on IoT System for Weather Monitoring.				
	IoT and M2M	Periods	12			
Unit - IV	Introduction - M2M - Difference between IoT and M2M - SDN and NFV	for IoT: Software	defined			
Ullit - 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: Introduc	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

Signature of BOS Chairman





Elayampalayam, Tiruchengode-637 205.												
M.Sc	Programme Code		PCS Regulations									
Computer Science Semester												
		Perio	ds	Credit	Maxim	ım Maı	·ks					
C	ourse Name	per W	eek									
				С	CA	ESI	E Total					
BIG DA	TA ANALYTICS	4 0	0	3	25	75	100					
Understand the Big Data Platform and its Use cases. Provide an overview of Mining Data StreamTo learn												
the concept of Ha												
	PRO	GRAMM	E OU	JTCOME								
Apply knowledge	of computing fundamental	s, compu	ting s	pecialization,	mathemati	cs, and	domain					
0 11					and conce	ptualiza	ation of					
	*											
conclusions using disciplines.	g fundamental principles of	mathema	tics, c	computing scie	nces, and r	elevant	domain					
•	•		-	•	_							
-	=	_		with appropria	ate conside	ration f	for public health					
	•				-	ts, analy	ysis and					
						iting to	ols to complay					
		_			icin compt	iting to	ois to complex					
					onsibilities	and no	orms of					
	=			,, <u>r</u>		,						
Recognize the ne	ed, and have the ability, to e	ngage in	indep	endent learnin	g for conti	nual de	velopment as a					
computing profes	sional.											
Demonstrate kno	wledge and understanding o	of the con	nputir	ng and manage	ment princ	iples ar	nd apply these to					
one own work, as	a member and leader in a t	eam, to r	nanag	e projects and	in multidis	sciplina	ry					
environments.												
			•				-					
		hend and	write	effective repo	orts, design	docum	entation, make					
		al baalth	cofor	v logal and a	ulturol iccu	og with	in local and					
	ery as an marvidual and as a	member	OI IC	ader in diverse	teams and	iii iiiui	traiscipiinar y					
	opportunity and using innov	ation to	oursu	e that opportun	nity to creat	te value	and wealth for					
•		-		11	•							
			lesign	ns and solution	s for comp	lex pro	blems.					
To identify, analy	se and synthesize scholarly	literature	relat	ing to the field	of Compu	ter Scie	ence.					
To develop scien demands.	tific outlook that solves any	problem	, enco	ompassing the	expected as	spects o	of market					
	Apply knowledge knowledge approcomputing model Identify, formulate conclusions using disciplines. Design and evaluate systems, compone and safety, culturate Use research-base interpretation of a Create, select, addicomputing activite Understand and computing professional computing professional computing professional computing professional computing activite Computing activite Effective presentate Understand and a global contexts, a Function effective presentate Understand and a global contexts, a Function effective presentate Understand and a global contexts, a Function effective presentate Understand and a global contexts, a Function effective presentate Understand and a global contexts, a Function effective presentate Understand and a global contexts, a Function effective environments. Identify a timely of the betterment of To apply knowledge To identify, analy	Course Name BIG DATA ANALYTICS Understand the Big Data Platform and its Use the concept of Hadoop. PRO Apply knowledge of computing fundamental knowledge appropriate for the computing specomputing models from defined problems an Identify, formulate, research literature, and seconclusions using fundamental principles of disciplines. Design and evaluate solutions for complex consystems, components, or processes that meet seand safety, cultural, societal & environmental of Use research-based knowledge and research interpretation of data, and synthesis of the information of data, and synthesis of the information of data, and apply appropriate the computing activities, with an understanding of Understand and commit to professional ethic professional computing practice. Recognize the need, and have the ability, to ecomputing professional. Demonstrate knowledge and understanding one own work, as a member and leader in a tenvironments. Communicate effectively with the computing computing activities by being able to compreeffective presentations. Understand and assess societal, environments global contexts, and the consequential resport Function effectively as an individual and as a environments. Identify a timely opportunity and using innovente betterment of the individual and society a To apply knowledge of computing to create et To identify, analyse and synthesize scholarly To develop scientific outlook that solves any	Computer Science Course Name Perio Course Name Perio Der W. L T BIG DATA ANALYTICS PROGRAMM Apply knowledge of computing fundamentals, computation and its Use cases. Perio Concept of Hadoop. PROGRAMM Apply knowledge of computing fundamentals, computation models from defined problems and required Identify, formulate, research literature, and solve compound in succept and safety, cultural, societal & environmental consideration of data, and synthesis of the information Create, select, adapt and apply appropriate techniques, computing activities, with an understanding of the limulation Understand and commit to professional ethics and cyb professional computing practice. Recognize the need, and have the ability, to engage in computing professional. Demonstrate knowledge and understanding of the computing professional computing activities by being able to comprehend and effective presentations. Understand and assess societal, environmental, health, global contexts, and the consequential responsibilities Function effectively as an individual and as a member environments. Identify a timely opportunity and using innovation to professional profes	Course Name Course Name Periods per Week L T P BIG DATA ANALYTICS PROGRAMME OU Understand the Big Data Platform and its Use cases. Provide the concept of Hadoop. PROGRAMME OU Apply knowledge of computing fundamentals, computing so knowledge appropriate for the computing specialization to the computing models from defined problems and requirements. Identify, formulate, research literature, and solve complex of conclusions using fundamental principles of mathematics, of disciplines. Design and evaluate solutions for complex computing probicts and safety, cultural, societal &environmental consideration. Use research-based knowledge and research methods includinterpretation of data, and synthesis of the information to proceate, select, adapt and apply appropriate techniques, resonate the select, adapt and apply appropriate techniques, resonate the select, and have the ability, to engage in indeptomputing professional computing practice. Recognize the need, and have the ability, to engage in indeptomputing professional. Demonstrate knowledge and understanding of the computing one own work, as a member and leader in a team, to manage environments. Communicate effectively with the computing community, a computing activities by being able to comprehend and write effective presentations. Understand and assess societal, environmental, health, safet global contexts, and the consequential responsibilities releve Function effectively as an individual and as a member or lesenvironments. Identify a timely opportunity and using innovation to pursuate the betterment of the individual and society at large. To apply knowledge of computing to create effective design To identify, analyse and synthesize scholarly literature related To develop scientific outlook that solves any problem, enco	Computer Science	Computer Science	Computer Science Periods Credit Maximum Marger Week L T P C CA ESI					

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	-

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)

(e/a) I measure the shortest of estimating a strong, a measure, I wently											
COs	KLs	POs	KLs								
		PO 1	1								
CO 1	2	PO 2	2								
		PO 3	4								
		PO 4	4								
CO 2	3	PO 5	3								
		PO 6	3								
		PO 7	5								
CO 3	3	PO 8	5								
		PO 9	5								
		PO 10	4								
CO 4	4	PO 11	4								
		PO 12	4								
		PO 13	4								
CO 5	6	PO 14	4								
		PO 15	4								

CO / PO Mapping

COs		Programme Outcome (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	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

Course Assessment Methods						
Direct						
1. Continuous Assessment Test I, II & Model						
2. Assignment						
3. End Semester Examinations						
ndirect						
1. Course End Delivery						

ntent of the	Syllabus									
	Introduction To Big Data	Periods	12							
	Introduction to Big Data Platform - Challenges of Conventional Systems	- Intelligent data a	nalysis - Natuı							
Unit - I	nit - I of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic T									
	Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - I	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 Str	ream - Estimating	Moments -							
Omt - H	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 o	f Hadoop- Analyz	ing the Data							
Unit - III	with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS-									
Omt - m	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 Installation - Hadoop									
Omt - IV	Configuration-Security in Hadoop - Administering Hadoop - HDFS - Monitoring-Maintenance 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 - HiveQI							
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 Press,
	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



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR

WOMEN (AUTONOMOUS)



MEN EMPOWERMEN		Elayampalayam, T	iruchengode-6	537 205.	·								
Programme	M.Sc Programme Code PCS Regulations												
Department	Computer Science Semester												
Course Code	(Course Name	Periods per Week	Credit	Maximum Ma								
21P2CSE06	L T P C CA ESE Total MULTIMEDIA AND VIRTUAL REALITY 4 0 0 3 25 75 100												
COURSE OBJECTIVES	Γο understand fundamental trends and evolution of Multimedia Technology. Have handson knowledge in developing simple Audio and Video technology. Be able to plan, design, and develop Multimedia devices. To learn about multimedia skills & 3D modeling.												
POs		PRC	GRAMME OU	JTCOME									
PO 1	knowledge appr	ge of computing fundamenta opriate for the computing sp els from defined problems a	ecialization to	the abstraction									
PO 2	Identify, formula	ate, research literature, and s	solve complex	computing pro	_								
PO 3	Design and eval	uate solutions for complex c ents,or processes that meet a ral,societal & environmental	specified needs		•	for public healtl							
PO 4	Use research-ba	sed knowledge and research data, and synthesis of the in	methods inclu		•	lysis and							
PO 5		dapt and apply appropriate to	=		dern computing to	ools to complex							
PO 6		commit to professional ethic			onsibilities, and n	orms of							
PO 7	*	eed, and have the ability, to	engage in indep	pendent learning	ng for continual d	evelopment as a							
PO 8	Demonstrate know	owledge and understanding as a member and leader in a	•	-									
PO 9		fectively with the computinities by being able to compresations.	•			-							
PO 10		assess societal, environment and the consequential respo		-									
PO 11	·	vely as an individual and as											
PO 12	Identify a timely	opportunity and using inno f the individual and society	=	e that opportu	nity to create valu	e and wealth for							
PO 13		edge of computing to create		ns and solution	ns for complex pro	oblems.							
PO 14		yse and synthesize scholarly											
PO 15	-	ntific outlook that solves any											

COs	COURSE OUTCOME
CO 1	To understand the concept of Multimedia skills
CO 2	To 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	-

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)

(3/2/1 indicates the strength of correlation, 3-strong, 2-incurtain, 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 5	3								
		PO 6	3								
		PO 7	5								
CO 3	3	PO 8	5								
		PO 9	5								
		PO 10	4								
CO 4	4	PO 11	4								
		PO 12	4								
		PO 13	4								
CO 5	4	PO 14	4								
		PO 15	4								

CO / PO Mapping

COs		Programme Outcome (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

Course Assessment Methods			
Direct			
1. Continuous Assessment Test I, II & Model			
2. Assignment			
3. End Semester Examinations			
Indirect			
1. Course End Delivery			

	Introduction	Periods	12			
Unit - I what is multimedia - making multimedia - multimedia skills - Text.						
	Sound	Periods	12			
Unit - II	Digital Audio-MIDI-Music CDs. Images: Making Still Images-Color-Ima	ge File Formats.				
	Animation-Video.					
	Hardware	Periods	12			
11 III	Macintosh versus Windows-Networking-Connections-Memory and Storage devices-Input devices- Output					
Unit - III	Hardware- Communication Devices.					
	Basic Software Tools	Periods	12			
	Text Editing and Word Processing Tools - OCR Software - Painting and I	Orawing Tools. 3I	Modeling a			
Limit IXI		Animation Tools - Image Editing Tools - Animation, Video and Digital Movie Tools - Multimedia				
Unit - IV	Animation Tools - Image Editing Tools - Animation, Video and Digital M	Iovie Tools - Mul	timedia			
Unit - IV	Animation Tools - Image Editing Tools - Animation, Video and Digital M Authoring Tools.	Iovie Tools - Mul	timedia			
Unit - IV		Iovie Tools - Mul Periods	timedia 12			
Unit - IV	Authoring Tools.	Periods	12			
Unit - IV Unit - V	Authoring Tools. Virtual Reality	Periods gy-Modes Of Inte	12 raction-VR			
	Authoring Tools. Virtual Reality Introduction - A Generic VR System: VirtualEnvironment -VR Technology	Periods gy-Modes Of Inte	12 raction-VR			

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	2 Simoin j., Gibbs, Dionysios C and Tsichriziz, Multimedia Programming, Addison Wesley, 2010.				
3	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	3 www.slideshare.net/saishanesarikar				
4	www.slideserve.com/cana/multimedia-and-virtual-reality				
5	slideplayer.com/slide/12781832/				





WOMEN EMPOWERMENT		Elayampalayam, Ti	iruchengode-6	37 205.					
Programme	M.Sc Programme Code PCS Regulations						2021-2022		
Department	Con	Computer Science Semester					2		
			Periods	Credit	Maximu	m Mark	S		
Course Code	Course Name per Week								
			L T P	С	CA	ESE	Total		
21P2CSE07		INTELLIGENCE AND			ı				
	EXP.	ERT SYSTEMS	4 0 0	3	25	75	100		
COURSE	To introduce the	basic principles, techniques	and application	ons of AI.To ir	npart basic	proficier	ncy in		
OBJECTIVES		icult real life problems in a			•	-	•		
	techniques like s	earching and game playing.							
POs		PRO	GRAMME OU	JTCOME					
PO 1	Apply knowledg	e of computing fundamental	ls, computing s	pecialization,	mathematic	s, and do	omain		
		opriate for the computing spo			and concep	tualizati	on of		
		ls from defined problems ar	_						
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	disciplines Design and evaluation	ate solutions for complex c	omputing prob	lems and desig	n and evalu	ıate			
103	_	•		-			r public healt		
	systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal & environmental consideration								
PO 4	-	sed knowledge and research		ding design of	experiments	s, analys	is		
	andinterpretation of data, and synthesis of the information to provide valid conclusions								
PO 5		lapt and apply appropriate to	_		dern compu	ting tool	s to complex		
DO 6		ties, with an understanding			** ***	1			
PO 6		commit to professional ethic omputing practice	es and cyber reg	gulations, resp	onsibilities,	andnorn	ns		
PO 7	_	eed, and have the ability, to	engage in inder	endent learnir	ng for contin	nual deve	elonment as a		
10,	computing profe		ongage in mae _l		ig for contin	iraar ac v	oropinent us e		
PO 8		owledge and understanding of	of the computir	ng and manage	ment princi	ples and	apply these t		
	one own work, a	s a member and leader in a t	team, to manag	e projects and	in multidisc	ciplinary	environment		
PO 9		fectively with the computing	•				•		
	computing activities by being able to comprehend and write effective reports, design documentation,make								
DO 10	effective present		-1 1 - 1/1 C-	111.	14		1 1 1		
PO 10		assess societal, environment and the consequential respon							
PO 11		vely as an individual and as a							
1011	environments	ory as an marvicual and as t	a member of ic	ader in diverse	teams and	III IIIGICIC	anserprinar y		
PO 12		opportunity and using innov	vation to pursu	e that opportur	nity to create	e value a	nd wealth for		
		f the individual and society a	=						
PO 13	** *	dge of computing to create							
PO 14	=	yse and synthesize scholarly							
PO 15	=	tific outlook that solves any	problem, enco	ompassing the	expected as	pects 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	-

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	1
CO 1	2	PO 2	2
		PO 3	4
		PO 4	4
CO 2	3	PO 5	3
		PO 6	3
		PO 7	5
CO 3	2	PO 8	5
		PO 9	5
		PO 10	4
CO 4	6	PO 11	4
		PO 12	4
		PO 13	4
CO 5	6	PO 14	4
		PO 15	4

CO / PO Mapping

COs	Programme Outcome (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	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	1	1	1	1	1	1
CO5	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1

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						
	Introduction to AI	Periods	12				
Unit - I	What is AI - Foundations of AI - History of AI - The State of the art. Solv Problem Solving Agents - Example Problems - Searching for Solution - Uniformed Search Strategies - Heuristics Functions - Beyond Classical Sear optimization problems - Local Search in continuous spaces - Searching w Searching with Partial Observations	Jninformed Search rch: Local search	h Strategies - algorithms and				
	Logical Agents	Periods	12				
Unit - II	Knowledge based Agents - Logic - Propositional Logic - Propositional The Propositional model checking - Constraint Satisfaction problems (CSP): I Propagation - Backtracking Search for CSPs - Local Search for CSPs - Fi Semantics - Using First order Logic - Knowledge Engineering - Inference and Lifting - Forward Chaining - Backward Chaining - Resolution	Defining CSP- Co rst Order Logic: S	nstraint Syntax and				
	Knowledge Representation	Periods	12				
Unit - III	Ontological Engineering - Categories and Objects - Events - Reasoning S with Default Information. Quantifying Uncertainty: Acting under Uncerta Bayes' Rule. Probabilistic Reasoning: Representing Knowledge in an Semantics of Bayesian Networks - Exact Inference in Bayesian Networks Bayesian Networks - First order Probability Models	inty - Basic Proba Uncertain Domai	ability Notation in -The				
	Making Simple Decisions	Periods	12				
Unit - IV	The Basis of Utility Theory - Utility Functions - Decision Networks - Dec Making Complex Decision: Game theory. Learning from Examples: Forn Learning - Decision Trees - Regression and Classification with Linear Mo Learning - Practical Machine Learning.	ns of Learning - S	upervised				
	Expert System	Periods	12				
Unit - V	Definition - Features of an expert system - Organization - Characteristics Representation in expert systems - Expert system tools - MYCIN - EMYCIN		owledge				
	Total Periods	Total Periods 60					

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





NOMEN EMPOWERMENT						
Programme	2021-2022					
Department	2					
	TS .					
Course Code	1					
	Total					
21P2CSE08	100					
	he knowledge					
BJECTIVES	eration, and use					
POs						
PO 1	omain					
	ion of					
DO 2						
	stantiated Iomain					
	iomam					
PO 3						
	ration for					
PO 4	sisand					
	interpretation of data, and synthesis of the information to provide valid conclusions.					
	ls to complex					
70.1						
	ms of					
PO 7	relopment as a					
107	ciopinent as a					
	l apply these to					
	venvironments.					
	mplex					
	ntation,make					
	n local and					
	disciplinary					
	11.1					
	and wealth for					
	lems					
1013	market					
PO 11 PO 12 PO 13 PO 14 PO 15	ctice. discip					

COs	COURSE OUTCOME		
CO 1	Understand the concepts of Compilers		
CO 2	To learn about context free grammars		
CO 3	Γο 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	-		

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	4	PO 8	5
		PO 9	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

CO / PO Mapping

COs		Programme Outcome (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	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

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

	Introduction to Compliers	Periods	12								
	Compliers and Translator - Need of Translator - The structure of a Complier - Lexical analysis - Syntax										
Unit - I	analysis - Intermediate code generation -Optimization - Code generation	- Complier writing	g tools. Finite								
UIIIt - I	automata and lexical Analysis: The role of the lexical analysis - A simple	approach to the de	esign of lexical								
	analyzers- Regular expressions to finite automata - Minimizing the number of states of a DFA.										
	The Syntactic specification of programming languages	Periods	12								
Unit - II	Context free grammars -Derivations and parse trees - Capabilities of context	ext free grammars	. Basic parsing								
Onit - II	techniques: Parsers - Shift reduce parsing - Operator precedence parsing -	- Top down parsin	g - Predictive								
	parsers.										
	Syntax directed translation	Periods	12								
	Intermediate code - Postfix notation - Parse trees and syntax trees - 3 addr	rees - 3 address code - Quadruples and triples									
Unit - III	-Boolean expressions - Statements that alter the flow of control. Symbol t	ables: The content	ts 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	lock-structured la	nguages. Error								
Omt - IV	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 DA	AGâ€~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





WOMEN EMPOWERMENT		Elayampalayam, Tiruchengode-637 205.										
Programme	M.Sc	Programme Code		tions	2021-2022							
Department	Cor	nputer Science		2								
Course Code	C	Periods Credit Maximum Marks Course Name per Week										
			L T	P	С	CA	ESI					
21P2CSE09	ADHOC SENSOR NETWORKS 4 0 0 3 25 75 100											
COURSE OBJECTIVES	developed based	tocols and the functionalities on Adhoc network. Identify establish infrastructure				_						
POs		PRO	GRAMM	E OU	JTCOME							
PO 1	knowledge appro	e of computing fundamental opriate for the computing spoke is from defined problems ar	ecializatio	n to	the abstraction							
PO 2	-	tte, research literature, and s g fundamental principles of		-			-					
PO 3	evaluatesystems,	nate solutions for complex components, or processes the safety, cultural, societal & e	at meet sp	ecific	ed needs with a		consid	eration for				
PO 4	Use research-bas	public health and safety, cultural, societal & environmental consideration 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, ac	lapt and apply appropriate te	chniques,	, reso	urces, and mod		ating to	ols to complex				
PO 6		commit to professional ethic				onsibilities	, andno	rms of				
PO 7	-	eed, and have the ability, to	engage in	indep	pendent learnin	g for conti	inual de	velopment as a				
PO 8	Demonstrate kno	wledge and understanding on a member and leader in a t		_	-	_	_					
PO 9	Communicate ef	fectively with the computing ties by being able to compre	g commui	nity, a	and with societ	y at large,	about c	omplex				
PO 10		assess societal, environment and the consequential respon										
PO 11		vely as an individual and as a										
PO 12	Identify a timely	opportunity and using innover the individual and society and socie	_	oursu	e that opportun	nity to crea	te value	and wealth for				
PO 13		dge of computing to create		desig	ns and solution	s for comp	olex pro	blems.				
PO 14 PO 15		yse and synthesize scholarly tific outlook that solves any										
	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

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	4	PO 8	5
		PO 9	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

CO / PO Mapping

COs						P	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	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

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 And Mac Protocols	Periods	12								
	Cellular And Ad Hoc Networks - Issues in Ad hoc Networks - Design Iss	ues and Design G	oals of MAC								
Unit - I	protocol for Ad hoc Networks - Classification of MAC protocols - Contention Based Protocols -										
Omt - 1	Reservation and Scheduling Mechanisms - Other Protocols.										
	Routing Protocols	Periods	12								
Unit - II	Design Issues and Classifications of unicast and multicast Routing Protoc	ols - Proactive, Re	eactive and								
OIIIt - 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	ols - TCP over Ac	Hoc - Securit								
Unit - III	in Adhoc Networks - Network Security Requirements - Network Security	Attacks - Key Ma	anagement -								
	Secure Routing in Ad hoc Networks										
	Sensor Networks And Networking Sensors	Periods	12								
11:4 137	Unique Constraints and Challenges - Advantages and Applications - Colla	borative Processi	ng - Key								
Unit - IV	Definitions - Localization and Tracking - Networking Sensors - MAC - G	eographic, Energy	Aware and								
	Attribute based Routing.										
	Infrastructure Establishment And Network Database	Periods	12								
	Topology Control - Clustering - Time Synchronization - Localization and	Localization Serv	ices - 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 â€" 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





WOMEN EMPOWERMENT		Elayampalayam, Tiruchengode-637 205.										
Programme	M.Sc	Programme Code			itions	2021-2022						
Department	Computer Science Semester 2											
Course Code	Periods Credit Maximum Marks Course Name per Week											
			L	T	P	C	CA	ESE				
21P2CSE10	OBJECT ORIENTED ANALYSIS AND 4 0 0 3 25 75 100 DESIGN											
COURSE OBJECTIVES		ics of object oriented systen Understand different design ng.		-								
POs		PRO	GRAN	/ME	E OU	TCOME						
PO 1	knowledge appro	e of computing fundamental opriate for the computing spe Is from defined problems ar	ecializa	atior	ı to t	he abstraction						
PO 2		te, research literature, and s g fundamental principles of										
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, ad	apt and apply appropriate te	chniqu	ies,	resoi	urces, and mo			ols to complex			
PO 6		commit to professional ethic					onsibilitie	s, andnoi	rms of			
PO 7	-	ed, and have the ability, to	engage	in i	ndep	endent learni	ng for cont	tinual de	velopment as a			
PO 8	Demonstrate kno	wledge and understanding of a member and leader in a t		-		-	-	-				
PO 9	Communicate ef	fectively with the computing ties by being able to compre	g comn	nuni	ty, a	nd with socie	ty at large,	about co	omplex			
PO 10	Understand and a	assess societal, environment and the consequential respon										
PO 11	_	rely as an individual and as a										
PO 12	Identify a timely	opportunity and using innov			ırsue	e that opportu	nity to crea	ite value	and wealth for			
PO 13		dge of computing to create of			esigr	ns and solution	ns for com	plex prob	olems.			
PO 14 PO 15		yse and synthesize scholarly tific outlook that solves any										
	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++							

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	3	PO 8	5
		PO 9	5
		PO 10	4
CO 4	4	PO 11	4
		PO 12	4
		PO 13	4
CO 5	4	PO 14	4
		PO 15	4

CO / PO Mapping

COs		Programme Outcome (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

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 An Overview of Object Oriented Systems Development Periods 12 Unit - I Object Basics - object oriented systems development life cycle. Object Oriented Methodologies Periods 12 Introduction - Rumbaugh Object Modeling Technique - The Booch Methodology - The Jacobson Unit - II Methodologies - Patterns - Frameworks - The Unified Approach. Unified Modeling Language Periods 12 Introduction - static and dynamic models - why modeling? - UML diagrams - UML class diagram -Unit - III use-case diagram - UML dynamic modeling - UML extensibility. Object Analysis Periods 12 Classification - Introduction - Classification Theory - Approaches for Identifying Classes - Noun Phrase Unit - IV Approach - Common Class Patterns Approach - Use Case Driven Approach - Classes, Responsibilities And Collaborators - Naming Classes. Object Oriented Design Process and Design Axioms Periods

Text Books	
1	Ali Bahrami, "Object Oriented Systems Devlopment", Tata McGRAW â€" 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

public, private and protected protocols -designing classes: refining attributes.

Total Periods

Introduction - The Object Oriented Design Process - Object oriented design axioms - corollaries - design patterns - Designing Classes: UML object constraints language - class visibility: designing well defined

Unit - V

60



VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elavampalayam, Tiruchengode-637 205.



WOMEN EMPOWERMENT		Elayampalayam, T	iruchengo	de-6	37 205.						
Programme	M.Sc	Programme Code		PCS Regulations							
Department	Computer Science Semester										
			Period	S							
Course Code		Course Name	per We	eek							
			L T	P	С	CA	ESE	Total			
21P2CSE11	EMBEDDED SYSTEMS 4 0 0 3 25 75 100										
COURSE OBJECTIVES	RTOS, EDLC. I	bedded Systems, Processor a	stand embe	ddec		_					
POs	knowledge to de	esign and develop embedded	I solutions.		ITCOME						
PO 1		ge of computing fundamenta	-	_	•						
		opriate for the computing spels from defined problems a				and conce	eptualizat	10n of			
PO 2		ate, research literature, and s				blems reac	thing subs	stantiated			
102	=	ng fundamental principles of	_				_				
	disciplines.	.g .uuum.pp.vo o.		200,	ompaning sere	, and s					
PO 3	-	uate solutions for complex of	computing	prob	lems,and desig	gn and					
	evaluatesystems	s,components,or processes th	at meet sp	ecifie	ed needs with a	appropriate	e conside	ration for			
	public health an	d safety,cultural,societal & e	environmer	ntal c	onsideration						
PO 4	Use research-ba	sed knowledge and research	methods i	nclud	ling design of	experimen	its, analys	sisand			
		f data, and synthesis of the in									
PO 5		dapt and apply appropriate to	_			dern comp	uting tool	ls to complex			
		rities, with an understanding									
PO 6		commit to professional ethic	es and cybe	er reg	gulations, resp	onsibilitie	s, andnori	ms of			
DO 7		nputing practice			1 .1 .						
PO 7	_	eed, and have the ability, to	engage in i	ındep	endent learnir	ng for cont	inual dev	elopment as a			
DO 9	Computing profe		of the com			mont main	aimlaa amd	l ammler thans t			
PO 8		owledge and understanding as a member and leader in a		_	-	_	_				
PO 9	•	ffectively with the computing			1 0						
10)		rities by being able to compre	-	-		-		=			
	effective presen				r	,					
PO 10	_	assess societal, environment	tal, health,	safet	y, legal, and c	ultural issi	ues withir	n local and			
		and the consequential respo									
PO 11	_	vely as an individual and as									
	environments.										
PO 12	Identify a timely	y opportunity and using inno	vation to p	ursu	e that opportur	nity to crea	ite value a	and wealth for			
	the betterment of	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	y problem,	enco	mpassing the	expected a	spects of	market			
	demands.										

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	-

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)

(3/2	(3/2/1 indicates the strength of correlation, 3-strong, 2-incurain, 1-weak)										
COs	KLs	POs	KLs								
		PO 1	1								
CO 1	2	PO 2	2								
		PO 3	4								
		PO 4	4								
CO 2	1	PO 5	3								
		PO 6	3								
		PO 7	5								
CO 3	3	PO 8	5								
		PO 9	5								
		PO 10	4								
CO 4	3	PO 11	4								
		PO 12	4								
		PO 13	4								
CO 5	3	PO 14	4								
		PO 15	4								

CO / PO Mapping

COs	Programme Outcome (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

	Introduction to Embedded Systems	Periods	12
	Categories of embedded Systems-specialties of embedded systems-requir	ements of embedo	led systems
TTT	-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	LSI designed
	circuits.		
	Processor and memory organization	Periods	12
Unit - II	Devices and buses for Device Network Device drivers and Interrupt service	cing mechanism	program
Omt - m	modeling concepts in single and multiprocessor systems software-develop	ment process.	
	Software Engineering Practices in the Embedded software development	Periods	12
	Inter-process communication and synchronization of process, tasks and the	reads- Hardware-s	software
Unit - III	co-design in an embedded system.		
	Hardware software co-design and program modeling	Periods	12
Unit - IV	Embedded hardware design and development-embedded firmware design	and development-	Real-time
Omt - IV	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 â€" SHIBU K V TATA McGraw- Hill 2009(Unit â€" 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/





WOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	de-6	37 205.				
Programme	M.Sc	Programme Code		2021-2	022				
Department	Cor	nputer Science	Semester						
			Period	ls	Credit	Maximu	ım Mar	ks	
Course Code		Course Name	per Week						
			LT	P	С	CA	ESE	То	tal
21P2CSE12	WIRELESS AF	PLICATION PROTOCOL	4 0	0	3	25	75	10	00
COURSE	To understand fu	indamental trends of technol	logical evo	lutic	on of Wireless	technology	. Have	hands-on	
OBJECTIVES		veloping simple and compre	•			•••			and
	_	ages and contents.					•		
POs		PRO	GRAMMI	E OU	TCOME				
PO 1	Apply knowledg	e of computing fundamental	s, computi	ng s	pecialization, 1	mathematic	s, and o	lomain	
	knowledge appro	opriate for the computing spe	ecialization	ı to t	he abstraction	and concep	otualiza	tion of	
		ls from defined problems ar							
PO 2		te, research literature, and s	_				_		
		g fundamental principles of	mathemati	cs, c	omputing scie	nces, and re	elevant	domain	
	disciplines.								
PO 3	_	ate solutions for complex c			_				
	· ·	components, or processes the	-			ppropriate	conside	eration for	
DO 1	•	l safety,cultural,societal & e					1		
PO 4		ed knowledge and research				_	s, analy	sisand	
PO 5	_	data, and synthesis of the in lapt and apply appropriate te					ting to	la to come	nlow
FO 3		ties, with an understanding	_			iem compu	ting too	ors to comp	piex
PO 6		commit to professional ethic				onsihilities	andno	rms of	
100	professional con	=	s and cyse	1 102	,uiuiioiis, iesp	,	ununo	1115 01	
PO 7		eed, and have the ability, to	engage in i	ndep	endent learnin	g for conti	nual de	velopment	t as a
	computing profe	•				C		•	
PO 8	Demonstrate kno	wledge and understanding of	of the comp	outin	g and manage	ment princi	iples an	d apply the	ese t
	one own work, a	s a member and leader in a t	eam, to ma	anag	e projects and	in multidise	ciplinar	yenvironn	nent
PO 9	Communicate ef	fectively with the computing	g commun	ity, a	nd with societ	y at large, a	about c	omplex	
	computing activi	ties by being able to compre	hend and	write	effective repo	rts, design	docum	entation,m	iake
	effective present								
PO 10		assess societal, environment							d
	•	and the consequential respon			*				
PO 11		vely as an individual and as a	n member (or lea	ader in diverse	teams and	in mult	idisciplina	ıry
DO 12	environments.				. 45 . 4	• • • • •	1	1 1	1. C
PO 12		opportunity and using innov	_	ursue	e ınat opportun	nty to creat	e value	and wealt	n to
PO 13		f the individual and society added of computing to create of		seinr	is and solution	s for comp	lev prol	nlems	
PO 13		yse and synthesize scholarly							
PO 15	-	tific outlook that solves any							
1 0 10	demands.	any	Problem,	-1100	passing the t	pooted as	. r - c . s 0	- 1111111Ct	

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	-

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	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	PO 5	3
		PO 6	3
		PO 7	5
CO 3	3	PO 8	5
		PO 9	5
		PO 10	4
CO 4	4	PO 11	4
		PO 12	4
		PO 13	4
CO 5	4	PO 14	4
		PO 15	4

CO / PO Mapping

COs	Programme Outcome (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

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

Introduction	Content of the S	byllabus											
Challenges and Pitfalls - The Origins of WAP - WAP Architecture - Components of the WAP Standard - Network Infrastructure services Supporting WAP Clients. The Wireless Markup Language Periods 12 Overview - The WML Document Model - WML Authoring - URLs Identify Content - Markup Basics - 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 Terminals versus Mobile Terminals Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. Tailoring Content to the Client-Push Messaging Periods 12 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 Considerations.		Introduction	Periods	12									
Unit - II Network Infrastructure services Supporting WAP Clients. The Wireless Markup Language Periods 12 Overview - The WML Document Model - WML Authoring - URLs Identify Content - Markup Basics - 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 Terminals versus Mobile Terminals Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. 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 Considerations.		Key Services for the Mobile Internet - Business Opportunities. Making the	e Internet "Mo	oile―:									
Network Infrastructure services Supporting WAP Clients.	TT '. T	Challenges and Pitfalls - The Origins of WAP - WAP Architecture - Com	ponents of the WA	AP Standard -									
Unit - II Overview - The WML Document Model - WML Authoring - URLs Identify Content - Markup Basics - 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 Terminals versus Mobile Terminals Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. Tailoring Content to the Client-Push Messaging Periods 12 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 Considerations.	Unit - I	Network Infrastructure services Supporting WAP Clients.											
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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 Terminals versus Mobile Terminals Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. Tailoring Content to the Client-Push Messaging Periods 12 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 Considerations.	Unit II	Overview - The WML Document Model - WML Authoring - URLs Ident	ify Content - Mar	kup Basics -									
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Unit - III Unit - III Unit - III Unit - III Unit - IV Unit -		Miscellaneous Markup - Sending Information - Application Security - Document Type Declaration - Errors											
Making wireless Application easy to use: Web Site Design: Computer Terminals versus Mobile Terminals Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. Tailoring Content to the Client-Push Messaging Periods 12 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 Considerations.		and Browser Limitations.											
Unit - III Designing a usable WAP Site - Structured Usability Methods - User Interface Design Guidelines. Tailoring Content to the Client-Push Messaging Periods 12 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 Considerations.		User Interface Design	Periods	12									
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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 Considerations.													
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 Considerations.		Tailoring Content to the Client-Push Messaging	Periods	12									
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 Considerations.	Linit IV	Overview of WAP Push - Push Access Protocol - WAP Push Addressing	- Push Message -	MIME media									
Wireless Telephony Applications Periods 12 Unit - V Overview of the WTA Architecture - The WTA Client Framework - Design Considerations.	Unit - IV	types for Push -Messages - Push Proxy Gateway - Push Over - the - Air Protocol - Push Initiator											
Unit - V Overview of the WTA Architecture - The WTA Client Framework - Design Considerations.		Authentication and Trusted Content.											
		Wireless Telephony Applications	Periods	12									
Total Periods 60	Unit - V	Overview of the WTA Architecture - The WTA Client Framework - Design	gn Considerations	•									
Total Periods 60													
l l		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





NOMEN EMPOWERMENT		Elayampalayam, Tiruchengode-637 205.												
Programme	M.Sc	Programme Code			P	CS	Regula	itions	2021-2022					
Department	Cor	nputer Science				Semester			2					
Course Code	(Course Name		eriod We		Credit	Maxim	num Marl	ks					
			L	T	P	С	CA	ESE	Total					
21P2CSE13		RITY AND COMPUTER ORENSICS	4	0	0	4	25	75	100					
COURSE OBJECTIVES	policies. To strei	re cyber ecosystem in the congthen the Regulatory frame preserve, and analyze data.												
POs		PRO	GRAN	ИМΙ	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	•	tte, research literature, and so g fundamental principles of		-				-						
PO 3	evaluatesystems	nate solutions for complex cocomponents, or processes that safety, cultural, societal & e.	at mee	t spe	ecifie	ed needs with	_	e conside	eration for					
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the in	metho	ds iı	nclud	ling design of	-	•	sisand					
PO 5	Create, select, ac	lapt and apply appropriate te	chniqu	ues,	resoi	arces, and mo			ls to complex					
PO 6		commit to professional ethic					onsibilitie	s, andnor	rms of					
PO 7	-	eed, and have the ability, to e	engage	in i	ndep	endent learni	ng for con	tinual dev	velopment as a					
PO 8	Demonstrate kno	owledge and understanding of s a member and leader in a t												
PO 9	Communicate ef	fectively with the computing ties by being able to compre	comr	nuni	ty, a	nd with socie	ty at large,	about co	omplex					
PO 10	Understand and	assess societal, environmenta												
PO 11	_	vely as an individual and as a												
PO 12		opportunity and using innover the individual and society a			ursue	that opportu	nity to crea	ate value	and wealth for					
PO 13	To apply knowle	dge of computing to create e	ffecti	ve d	esigr	s and solution	ns for com	plex prob	olems.					
PO 14	To identify, anal	yse and synthesize scholarly	litera	ture	relat	ing to the field	d of Comp	uter Scie	nce					
PO 15	To develop scier demands.	tific outlook that solves any	probl	em,	enco	mpassing the	expected a	aspects of	f market					

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

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)

			(cuk)					
COs	KLs	POs	KLs					
		PO 1	1					
CO 1	1	PO 2	2					
		PO 3	4					
		PO 4	4					
CO 2	2	PO 5 3						
		PO 6	3					
		PO 7	5					
CO 3	2	PO 8 5						
		PO 9	5					
		PO 10	4					
CO 4	2	PO 11	4					
		PO 12	4					
		PO 13	4					
CO 5	3	PO 14	4					
		PO 15	4					

CO / PO Mapping

COs	Programme Outcome (POs)														
COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	3 PO14 1 1 1 1	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

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 Introduction Periods 10 What is Computer Security? - Threats -Harm - Vulnerabilities - Controls. Tool box Authentication - Access Control and Cryptography: Authentication - Access Control-Cryptography. Unit - I The Webâ€"User Side Periods 10 Browser Attacks - Web Attacks Targeting Users - Obtaining User or Website Data - Email Attacks. Unit - II Operating System: Security in Operating Systems - Security in the Design of Operating Systems - Rootkit. Networks Periods 13 Network Concepts - Threats to Network Communications - Wireless Network Security - Denial-of-Service 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 Understanding Computer Forensics - Preparing for Computer Investigation - Maintaining Professional Unit - IV Conduct. Understanding Computer Investigations: Preparing a Computer Investigation - Taking a Systematic Approach - Procedures for Corporate High-Tech Investigation - Understanding Data Recovery Workstations and Software - Conducting an Investigation - Completing the case.

Data Acquisition

Total Periods

Unit - V

Testing Forensics Software.

Understanding Storage Formats for Digital Evidence - Determining the Best Acquisition Method -

Contingency Planning for Image Acquisitions - Using Acquisitions tools -Validating Data Acquisitions - Performing RAID Data Acquisitions. Current Computer Forensics Tool: Evaluating Computer Forensics Tool Needs - Computer Forensics Software Tools - Computer Forensics Hardware Tools - Validating and

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

14

60

Periods





WOMEN EMPOWERMENT		Elayampalayam, Tiruchengode-637 205.												
Programme	M.Sc	Programme Code		P	CS	Regula	tions	2021-2022						
Department	Con	nputer Science			Semester			2						
			Perio	ds	Credit	Maxim	um Mar	ks						
Course Code	C	ourse Name	per W	eek										
			LT	P	С	CA	ESE	E Total						
	DIGITAL II	MAGE PROCESSING	4 0	0	4	25	75	100						
21P2CSE14					<u> </u>									
COURSE	To develop expe	erience with using computer	rs to proce	ess in	nages.To under	stand the b	oasic pri	nciples and						
OBJECTIVES	methods of digital image processing. To formulate solutions to general image processing problems.													
POs	PROGRAMME OUTCOME													
PO 1		e of computing fundamenta	-	_	•									
		knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements												
PO 2		•	-			-1ama #aaa	hina aul	notantiated						
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	disciplines. 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	_	ed knowledge and research				experimen	ts, analy	sisand						
	interpretation of	data, and synthesis of the in	formation	to pr	ovide valid co	nclusions.								
PO 5	Create, select, ad	apt and apply appropriate to	echniques,	reso	urces, and mod	lern compi	uting too	ols to complex						
		ties, with an understanding												
PO 6		commit to professional ethic	es and cyb	er reg	gulations, respo	onsibilities	s, andno	rms of						
DO #	professional com				1 .1 .									
PO 7	_	ed, and have the ability, to	engage in	ındep	endent learnin	ig for cont	inual de	velopment as a						
PO 8	Computing profes	ssional wledge and understanding	of the com	mutin	a and managa	mont princ	inlac on	d apply those to						
100		s a member and leader in a		-	-	-	-							
PO 9		fectively with the computin			2 0			•						
		ties by being able to compre	_	-				•						
	effective presenta					, 8		,						
PO 10	Understand and a	assess societal, environment	al, health,	safet	ty, legal, and c	ultural issu	ies with	in local and						
	global contexts, a	and the consequential respon	nsibilities	relev	ant to profession	onal comp	uting pr	actice.						
PO 11	Function effective	rely as an individual and as	a member	or le	ader in diverse	teams and	l in mul	tidisciplinary						
	environments.													
PO 12	Ī	opportunity and using inno	_	oursu	e that opportun	ity to crea	te value	and wealth for						
P.C. 1.2		the individual and society				-								
PO 13		dge of computing to create												
PO 14 PO 15		yse and synthesize scholarly												
1013	demands.	tific outlook that solves any	problem,	CHCO	mpassing tile (capecieu a	specis 0	ı market						
	ucmanus.													

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	-

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)

(27-	T indicates the strength of com-	ration, c strong, z metrum, r v	- Curry
COs	KLs	POs	KLs
		PO 1	1
CO 1	1	PO 2	2
		PO 3	4
		PO 4	4
CO 2	2	3	
		PO 6	3
		PO 7	5
CO 3	3	PO 8	5
		PO 9	5
		PO 10	4
CO 4	4	PO 11	4
		PO 12	4
		PO 13	4
CO 5	4	PO 14	4
		PO 15	4

CO / PO Mapping

COs	Programme Outcome (POs)														
COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	3 PO14 1 1 2 3	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

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

Content of the S	Syllabus										
	Introduction	Periods	12								
	What is Digital Image Processing? - Examples of Fields that Use Digital	Image Processing	- Fundamental								
Unit - I	Steps in Digital Image Processing - Components of an Image Processing System - Digital Image										
UIIIt - I	Fundamentals: Elements of Visual Perception - Light and Electro Magnetic Spectrum - Image Sensing and										
	Acquisition - Image Sampling and Quantization - Some Basic Relationship	ips between Pixels	i .								
	Image Enhancement in the Spatial Domain Periods 12										
II:4 II	Background. Some Basic Gray Level Transformations - Histogram Proce	essing- 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 the Frequency Domain- Smoothing										
	Frequency-Domain Filters- Sharpening Frequency Domain Filters- Homo	omorphism Filterin	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- Investigation	erse Filtering- Min	imum Mean								
	Square Error (Wiener) Filtering. Color Image Processing: Color Fundame	entals- Color Mode	els- Pseudo color								
	Image Processing- Basics of Full-Color Image Processing- Color Transfer	ormations- Smooth	ing and								
	Sharpening- Image Segmentation Based on Color - Noise in Color Image	s- Color Image Co	empression.								
	Object Recognition	Periods	12								
Unit - IV	Knowledge Representation - Statistical Pattern Recognition - Neural Nets	-	_								
Cint 1v	Optimization Techniques - Fuzzy Systems - Mathematical Morphology -	Basic Morpholog	ical Concepts -								
	Binary Dilation and Erosion.	1									
	Image Data Compression	Periods	12								
	Image Data Properties - Discrete Image Transforms in Image Data Compr		-								
Unit - V	Methods - Vector Quantization - Hierarchal and Progressive Compression	_	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





WOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	de-6	37 205.								
Programme	M.Sc	M.Sc Programme Code PCS Regulations											
Department	Computer Science Semester												
Course Code		Course Name	Period per We		Credit	Maxim	um Mark	Marks					
			L T	P	С	CA	ESE	Total 100					
21P2CSE15	DISTRIBUT	4 0 0 4 25 75 DISTRIBUTED COMPUTING											
COURSE OBJECTIVES	availability of f	his course provides an introduction to the fundamentals of distributed computer systems, assuming the vailability of facilities for data transmission. The structure of distributed systems using multiple levels of offtware is emphasized.											
POs		PRO	GRAMM	E OU	JTCOME								
PO 1	knowledge appr	ge of computing fundamental ropriate for the computing speeds from defined problems ar	ecializatio	n to t	he abstraction								
PO 2	-	late, research literature, and song fundamental principles of	_				_						
PO 3	evaluatesystem	luate solutions for complex cos, components, or processes that safety, cultural, societal & e	at meet sp	ecifie	ed needs with a		e conside	ration for					
PO 4	Use research-ba	ased knowledge and research f data, and synthesis of the in	methods i	nclud	ling design of	_	ts, analys	sisand					
PO 5	Create, select, a	dapt and apply appropriate te	chniques,	reso	urces, and mod		uting too	ls to complex					
PO 6	Understand and	commit to professional ethic				onsibilities	s, andnor	ms of					
PO 7	-	need, and have the ability, to e	engage in i	indep	endent learnin	g for cont	inual dev	relopment as a					
PO 8	Demonstrate kr	nowledge and understanding of as a member and leader in a t		-	-	-	•						
PO 9	Communicate e	ffectively with the computing vities by being able to compre	g commun	ity, a	and with societ	y at large,	about co	mplex					
PO 10	Understand and	assess societal, environment, and the consequential respon											
PO 11	Function effect environments.	ively as an individual and as a	member	or le	ader in diverse	teams and	l in multi	disciplinary					
PO 12	Identify a timel	y opportunity and using innov of the individual and society a	_	ursu	e that opportun	nity to crea	te value a	and wealth for					
PO 13		edge of computing to create 6		lesigi	ns and solution	s for comp	olex prob	lems.					
PO 14	To identify, and	alyse and synthesize scholarly	literature	relat	ing to the field	l of Compu	ıter Sciei	nce					
PO 15	To develop scie demands.	entific outlook that solves any	problem,	enco	ompassing the o	expected a	spects of	market					

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	-

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	1				
CO 1	1	PO 2	2				
		PO 3	4				
		PO 4	4				
CO 2	2	PO 5	3				
		PO 6	3				
		PO 7	5				
CO 3	3						
		PO 9	5				
		PO 10	4				
CO 4	4	PO 11	4				
		PO 12	4				
		PO 13	4				
CO 5	4	PO 14	4				
		PO 15	4				

CO / PO Mapping

COs		Programme Outcome (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

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

content of the S	synabus		
	Introduction	Periods	12
	Definition Of distributed system- goals - Types of Distributed Systems A	rchitectures: Arch	itectural Styles -
TT'. T	System Architectures - Architectures Vs Middleware - Self-Management	in Distributed Sys	tems. Processes:
Unit - I	Threads - Virtualization - Clients Servers - Code Migration.		
	Communication	Periods	12
Unit - II	Fundamentals - Remote Procedure Call - Message-Oriented Communicat	ion - Stream-Orie	nted
Omt - H	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 Posit	ioning of Nodes -	Election
Unit - III	Algorithms. Consistency and Replication: Introduction - Data-Centric Co	nsistency Models	- Client-Centric
	Consistency Models-Replica Management - Consistency Protocols.		
	Fault Tolerance	Periods	12
Unit - IV	Introduction to Fault Tolerance - Process Resilience - Reliable Client-Serv	er Communication	on - Reliable
Ollit - IV	Group Communication - Distributed Commit- Recovery. Security: Introd	uction to Security	- Secure
	Channels - Access Control -Security Management.		
	Distributed Object-Based Systems	Periods	12
	Architecture - Processes - Communication - Naming - Synchronization - C	Consistency and R	eplication - Fault
Unit - V	Tolerance -Security. Distributed file system: Architecture		
	-Processes-communication-Naming-Synchronization-Consistency and Rep	olication - Fault T	olerance -
	Security - Distributed Web-Based Systems.		
	Total Periods		60

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 EMPOWERMENT		Elayampalayam, Ti	ruche	ngo	de-6	37 205.							
Programme	M.Sc Programme Code PCS Regulations												
Department	Computer Science Semester												
			Pe	riod	S	Credit	Maxim	um Marl	ks				
Course Code		Course Name	per	We	ek								
			L	T	P	С	CA	ESE		Total			
21P2CSE16	PROFE	SSIONAL ETHICS	4	0	0	4	25	75		100			
COURSE	To provide the p	hilosophical foundation of e	thics.T	o pr	ovid	le Values based	d decision	making	and				
OBJECTIVES	To provide the philosophical foundation of ethics. To provide Values based decision making and behavior. To aid the students in professional code of ethics. To understand how to apply them in their own												
	work place.												
POs		PRO	GRAM	1ME	OU	TCOME							
PO 1	Apply knowledg	e of computing fundamental	s, com	puti	ng s	pecialization, r	nathemati	cs, and d	lomain				
	knowledge appro	opriate for the computing spe	ecializ	atior	to t	the abstraction	and conce	eptualiza	tion of				
		ls from defined problems an											
PO 2	-	ate, research literature, and so		_									
		g fundamental principles of	mathe	mati	cs, c	computing scie	nces, and	relevant	domaiı	n			
	disciplines.												
PO 3	_	uate solutions for complex co	-			_							
		components, or processes that					ppropriate	e conside	eration	for			
DO 4	public health and safety,cultural,societal & environmental consideration Use research-based knowledge and research methods including design of experiments, analysisand												
PO 4		=					_	its, analy	sisand				
PO 5	_	data, and synthesis of the intallapt and apply appropriate te						uting too	la to ac	mnlar			
FO 3		ties, with an understanding of	_				em comp	uting too	ois to cc	шрієх			
PO 6		commit to professional ethic					ncihilities	andnor	ms of				
100	professional com	=	s and c	y oc.	i ice	guiations, respe	msiomics	, andnor	1113 01				
PO 7		eed, and have the ability, to e	ngage	in iı	nder	endent learnin	g for cont	inual dev	velonm	ent as			
	computing profe	· · · · · · · · · · · · · · · · · · ·	66-		F		8		F				
PO 8		owledge and understanding of	of the c	omp	outin	g and manage	ment princ	ciples an	d apply	these			
		s a member and leader in a t		_			_	_					
PO 9	Communicate ef	fectively with the computing	g comr	nuni	ty, a	and with societ	y at large,	about co	mplex				
	computing activities by being able to comprehend and write effective reports, design documentation, make												
	effective present	ations											
PO 10	Understand and	assess societal, environmenta	al, hea	lth, s	safet	y, legal, and co	ıltural issu	ies withi	n local	and			
	global contexts,	and the consequential respor	sibilit	ies r	elev	ant to profession	onal comp	uting pra	actice.				
PO 11	Function effective	vely as an individual and as a	meml	er c	or lea	ader in diverse	teams and	l in mult	idiscipl	linary			
	environments.												
PO 12		opportunity and using innov		_	ırsu	e that opportun	ity to crea	te value	and we	ealth fo			
		f the individual and society a											
PO 13		dge of computing to create e											
PO 14	·	yse and synthesize scholarly											
PO 15	To develop scier demands.	ntific outlook that solves any	proble	em, e	enco	mpassing the e	expected a	spects of	f marke	et			

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	-

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)

(3/2/1 indicates the strength of correlation, 3-strong, 2-incurdin, 1-weak)									
COs	KLs	POs	KLs						
		PO 1	1						
CO 1	1	1 PO 2							
		PO 3	4						
		PO 4	4						
CO 2	2	PO 5	3						
		PO 6	3						
		PO 7	5						
CO 3	4	PO 8	5						
		PO 9	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						

CO / PO Mapping

COs		Programme Outcome (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	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

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				
	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	
TI II	Introduction - professional ethics - ethical problems faced by managers - new skill required for managers -			
Unit - II	managing ethical conduct in modern times.			
		1		
	Corporate Governance and CSR	Periods	12	
	Principles of corporate governance - issues involved in corporate governance - theories of corporate			
Unit - III	governance - CSR - introduction - Various dimensions - argument for and against CSR.			
	Ethics in India	Periods	12	
Unit - IV	Religious foundations of ethics - Hinduism - Buddhism - Jainism - Ethical Values of Gandhi, Vivekananda,			
	Aurobindo and Tagore.			
	Dimensions of Ethics	Periods	12	
	Personal ethics - marketing ethics - technology ethics - environmental ethi	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		
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	