#### MCA-MASTER OF COMPUTER APPLICATIONS

(Candidates admitted from 2021-2022 onwards)

#### **College Vision & Mission**

#### 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 conducive environment to the students to acquire education.
- > To provide quality academic programs training activities and research facilities.
- > To facilitate industry-institute interaction.

#### **DEPARTMENT OF MCA**

#### Vision

> To generate groomed, technically competent and skilled intellectual professionals specifically from the rural area to meet the current challenges of the modern computing industry.

#### Mission

- > Enable the student's to solve software engineering problems independently.
- > To prepare the students for the diverse work place of the Global Environment
- > Empowering the youth in rural communities with computer education.
- Our efforts are to impart quality and value based education to raise satisfaction level of all stakeholders.

#### **Programme Educational Objectives**

- PEO 1: To develop the ability to plan, analyze, design, code, test, implement and maintain the software product for real time systems.
- PEO 2: To excel in problem solving and programming skills in computing fields of IT industries.

- PEO 3: To practice effectively as individuals and as team members in multidisciplinary projects involving technical, managerial, economical and social constraints.
- PEO 4: To prepare the students to pursue higher studies in computing and related fields and to work in the fields of teaching and research.

#### After completion of the program the Graduates will be able to

- PO1: An ability to use current techniques, skills, and modern tools necessary for computing practice.
- PO2: An ability to analyze a problem, and identify and formulate the computing requirements appropriate to its solution.
- PO3: An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- PO4: An ability to analyze the local and global impact of computing on individuals, organizations, and society.

### **REGULATIONS** I. SCOPE OF THE PROGRAMME

Master of Computer Applications can be considered to be one of the most prominent PG level programs in our country. It is also one of the professional degree. This program mainly deals with the development of computer applications for the purpose of updating computer programming languages. It also aims at creating strong knowledge of theoretical Computer Applications subjects who can be employed in software development and testing units of industries. The course has a time period of 2 years with 4 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 like M.Sc, 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 program is to provide advanced and in-depth knowledge of computer 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**

Candidates who have secured 55 % of marks or above in any one of the following or equivalent are eligible to apply.

> Bachelor's degree(under 10+2+3/4) in any subject with mathematics at +2 level

or

Bachelor's degree(under 10+2+3/4 or 10+3 year Diploma + 3 year later entry BE) in any subject with Mathematics / Business Mathematics / Statistics as one of the subjects.

#### **V. DURATION OF THE COURSE**

- 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 March.
- 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 with the approval of Periyar University.
- Each subject will have four to six hours of lecture per week apart from practical training at the end of each semester.

#### VI ASSESSMENT

Assessment of the students would be made through Continuous Internal Assessment (CIA) and External Assessment (EA) for passing each subject both theory and practical papers.

A candidate would be permitted to appear for the External Examination only on earning 75 % of attendance and only when her conduct has been satisfactory. It shall be open to grant exemption to a candidate for valid reasons subject to conditions prescribed.

#### A. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously by the teacher concern and the Internal Assessment Marks will be as follows:

Theory	Marks (25)	Practical	Marks (40)
Attendance	5	Attendance	10
CA Test I	2.5	Observation & Record	10
CA Test II	2.5	Model	20
Model	5		
Assignment	5		
Seminar	5	1	
Total	25		40

#### Distribution Of Continuous Assessment Marks (25/40)

#### Distribution of attendance mark

S. No.	Percentage	Marks				
		Theory	Practical			
1	76-80	1	2			
2	81-85	2	4			
3	86-90	3	6			
4	91-95	4	8			
5	96-100	5	10			

#### A. EXTERNAL ASSESSMENT (EA)

The performance of the students would be assessed by examination at the end of each semester with a written test for theory for three hours and practical examination at the end of even semesters for six hours. Question papers would be set by the selected external examiners in the prescribed format and valuated by the external examiners with the help of the teacher concern.

The pattern of assessment is as follows:

#### **Distribution Of Final Assessment Marks (75/60)**

Section	Theory	Theory Marks (75) Pract:				
А	One mark questions	20	Experiment I	25		
В	Five marks (Either or)	25	Experiment II	25		
С	Ten marks (any three)	30	Viva Voce	10		
	Total	75	Total	60		

#### VII. PASSING MINIMUM

#### INTERNAL

There is no passing minimum for CIA

#### EXTERNAL

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

#### VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied 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) All the remaining successful candidates shall be declared to have passed the examinations in third class.
- e) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for University rank.

#### 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 three/two(lateral entry) academic years comprising of six/four(lateral entry) 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 examination in the concerned subject in subsequent semesters and shall pass the examination.

#### XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2020-21 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2020-21 and thereafter.

#### XII. TRANSITORY PROVISIONS.

Candidates who have undergone the PG Course of study before 2021-22 shall be permitted to appear for the examinations under those regulations for a period of two years i.e., upto and inclusive of the examination of April/May 2022-2023. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

Supplementary examination will be conducted within a month. In case of failure she has to complete within 5 years. (2+5).

#### VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) DEPARTMENT OF MCA MCA CURRICULUM (For candidates admitted from 2021-2022 onwards)

SEM	COURSE	TITLE	HOURS CREDIT			MARKS				
SEIVI	CODE		HUUKS	CREDIT	CIA	EE	TOTAL			
	21P1CA01	Core Course- 1 Advanced Java Programming	4	4	25	75	100			
	21P1CA02	Core Course - 2 Web Application Development	4	4	25	75	100			
	21P1CA03	Core Course- 3 Design and Analysis of Algorithms	4	4	25	75	100			
I	21P1CA04	Core Course- 4 Advanced Operating System	4	4	25	75	100			
•	21P1CAE_	Elective I -	4	4	25	75	100			
	21P1CAP01	Core Course Practical - 1 Advanced Java Programming Lab	4	2	40	60	100			
	21P1CAP02	Core Course Practical - 2 Web Application Development Lab	4	2	40	60	100			
	21P1CAJ01	Advance Excel	2	2	25	75	100			
		Total	30	26	230	570	800			
	21P2CA05	Core Course - 5 .Net Programming	4	4	25	75	100			
21P2CA06		Core Course - 6 Python Programming	4	4	25	75	100			
	21P2CA07	Core Course - 7 Software Testing & Automation Tools	4	4	25	75	100			
П	21P3CA08	Core Course - 8 Android Application Development	4	4	25	75	100			
	21P2CAE_	Elective II –	4	2	25	75	100			
	21P2CAP03	Core Course Practical - 3 .Net Programming Lab	4	2	40	60	100			
	21P2CAP04	Core Course Practical - 4 Python Programming Lab	4	2	40	60	100			
	21P2CAPR01	Mini Project I	2	2	40	60	100			
		Total	30	24	245	555	800			
	21P3CA09	Core Course - 9 AngularJS	4	4	25	75	100			
	21P3CA10	Core Course - 10 Data Science	4	4	25	75	100			
	21P3CAE-	Elective Course – III	4	4	25	75	100			
	21P3CAE_	Elective IV-	4	4	25	75	100			
ш		EDC - Resource Management Techniques	4	2						
	21P3CAP05	Core Course Practical - 5 AngularJS Lab	5	2	40	60	100			
	21P3CAPR02	Mini Project II	5	2	40	60	100			
		Human Rights	-	1	25	75	100			
		Total	30	25	230	570	800			
IV	21P4CAPR03	Project Dissertation & Viva Voce	-	18	50	150	200			
		Total	0	18	50	150	200			

Grand Total	90	91	755	1845	2600	

Elective : I

	Course Code	Title				
Semester I	21P1CAE01	Digital Marketing				
	21P1CAE02	Block Chain Technologies				
	21P1CAE03	Business Intelligence				
	21P1CAE04	Multimedia Technologies				

#### **Elective II**

	Course Code	Title			
	21P2CAE05	Cloud Computing			
Semester II	21P2CAE06	Advanced Networks			
	21P2CAE07	Cryptography and Network Security			
	21P2CAE08	Cyber Security			

#### **Elective III**

	Course Code	Title							
	21P3CAE09 Soft Computing								
Semester III	21P3CAE10	Big Data Analysis							
	21P3CAE11	Internet of Things							
	21P3CAE12 Pervasive Computing								

#### **Elective IV**

	Course Code	Title
Semester III	21P3CAE13	Artificial Intelligence and Machine Learning
	21P3CAE14	Data Mining and Warehousing
	21P3CAE15	R Programming
	21P3CAE16	MongoDB



NOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.											
Programme	МСА	Programme Code		P	ons	2021-2022						
Department		M.C.A	Semester			1						
			Perio	ods	Credit	Maximu	m Marks	5				
Course Code	C	ourse Name	per W	eek								
			L T	Р	С	CA	ESE	Total				
21P1CA01	ADVANCED	JAVA PROGRAMMING	4 0	0	4	25	75	100				
COURSE OBJECTIVES		b impart the knowledge of core Java, To introduce advanced java concepts, To learn about basic concepts eb applications and To understand how to create, test, debug and deploy an web applications										
POs		PRO	GRAMN	IE OU	JTCOME							
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain snowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements										
PO 2	•	te, research literature, and so g fundamental principles of										
PO 3	components, or p	nate solutions for complex concesses that meet specified ocietal, and environmental				0	•					
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the in				-	s, analys	is and				
PO 5	Create, select, ad	apt and apply appropriate te ties, with an understanding	chniques	, reso	urces, and mo		ting tool	s to complex				
PO 6		commit to professional ethic				onsibilities,	and nor	ms of				
PO 7	1	eed, and have the ability, to e	engage ir	inde	pendent learni	ng for conti	nual dev	elopment as a				
PO 8	Demonstrate kno	wledge and understanding on a member and leader in a		-		-	-					
PO 9	computing activi	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, and give and understand										
PO 10		assess societal, environment and the consequential respor										
PO 11	Function effective environments.	rely as an individual and as a	a membe	r or le	ader in diverse	e teams and	in multi	disciplinary				
PO 12		opportunity and using innov the individual and society a		pursu	e that opportu	nity to creat	e value a	and wealth for				
PO 13	Identify a timely	opportunity and using innov the individual and society a	vation to	pursu	e that opportu	nity to creat	e value a	and wealth for				
PO 14		yse and synthesize scholarly	-	e rela	ting to the field	d of Compu	ter Scier	nce				
PO 15	To develop scien demands	tific outlook that solves any	problem	, enco	ompassing the	expected as	pectsof 1	market				

COs	COURSE OUTCOME
CO 1	To revisit the important concepts of Core Java Programming
CO 2	To understand the concepts of GUI programming in Java 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	

					]	Know	ledge	Level	s						
1.Reme	mberi	ng, 2.1	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	5
		(2.12				CO / PC			-						
	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)       COs     KLs     POs     KLs														
СО	S				KLs				POs PO						
СО	1				2				PO				2		
	1				2				PO				3		
									PO				2		
СО	2				3				PO	5			3		
									PO	6			3		
								PO 7				2			
СО	3				2			PO 8				1			
								PO 9 PO 10				2 3			
СО	4				3			PO 10				2			
	-				5			PO 12				3			
									PO 1				1		
CO	5				3				PO 1	4			2	2	
								PO 15				2			
		(2)					PO Ma		-			• `			
		(3/2/	1 indic	ates the	e streng				-	2-mediu	m, 1-we	eak)			
COs		DO2	DO2	DO 4	DOS	1	-	me Ou	-		DO11	DO12	DO12	DO14	DO15
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12			
CO1	3	3	2	3	2	2	1	2	3	2	3	2	2	3	3
CO2	2	2	3	2	3	3	2	1	2	3	2	3	1	2	2
CO3	3	3	2	3	2	2	1	2	3	2	3	2	2	3	3
CO4	2	2	3	2	3	3	2	1	2	3	2	3	1	2	2
CO5	2	2	3	2	3	3	2	1	2	3	2	3	1	2	2

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

г

1. Course End Delivery

	An Overview of Java:	Periods	12							
тт •/ т	Features of Java-Creating and executing simple Java programs-Classes and	d Objects: A Sim	ple Class and							
Unit - I	Declaring Objects, Methods - Examples - Constructors- Packages and Interfaces-Multithreaded									
	Programming									
	Exception Handling & AWT	Periods								
	Exception Handling: Fundamentals - Types - Using try and catch - Built i	n Exceptions - Th	rowing our ov							
Unit - II	Exception. The Applet Class- Event Handling-Introducing the AWT: Wor	rking with Window	ws, Graphics							
	and Text-Using AWT Controls, Layout Manager and Menus.									
	Networking,RMI & Swing	Periods	12							
	Networking: Networking Basics-Java and The Net-INetAddress Class-IN	etAddress Exampl	le-							
Unit - III	TCP/IP-DataGrams-A simple network communication using TCP/IP & UDP-A tour of SWING- Buliding									
	Ter in DataGrands it simple network communication using Ter in the C		nio- Dunum							
	GUI Application using SWING-RMI: An Overview of RMI-Building a St									
	GUI Application using SWING-RMI: An Overview of RMI-Building a St									
Unit IV	GUI Application using SWING-RMI: An Overview of RMI-Building a Stusing RMI	imple Client/Serve	er Application							
Unit - IV	GUI Application using SWING-RMI: An Overview of RMI-Building a Si using RMI Servlets	imple Client/Serve Periods 'he javax.servlet P	er Application 12 Package-Read							
Unit - IV	GUI Application using SWING-RMI: An Overview of RMI-Building a Sing RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T	imple Client/Serve Periods 'he javax.servlet P	er Application 12 Package-Read							
Unit - IV	GUI Application using SWING-RMI: An Overview of RMI-Building a Stusing RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Required	imple Client/Serve Periods 'he javax.servlet P	er Application 12 Package-Read							
Unit - IV	GUI Application using SWING-RMI: An Overview of RMI-Building a Sing RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Require Cookies-Session Tracking.	Periods Periods The javax.servlet P ests and Response Periods	er Application 12 Package-Read es-Using 12							
	GUI Application using SWING-RMI: An Overview of RMI-Building a Sing RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Requicokies-Session Tracking.         JSP	Periods Periods The javax.servlet P ests and Response Periods cs- Expressions, S	er Application 12 Package-Read es-Using 12 criptlets, and							
Unit - IV Unit - V	GUI Application using SWING-RMI: An Overview of RMI-Building a Sing RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Requice Cookies-Session Tracking.         JSP         JSP: Introduction to JSP- JSP - Elements of JSP-JSP Syntax and Semantice	Periods Periods The javax.servlet P ests and Response Periods cs- Expressions, S Tag Extensions: In	er Application 12 Package-Read es-Using 12 criptlets, and ntroduction to							
	GUI Application using SWING-RMI: An Overview of RMI-Building a Si- using RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Requine Cookies-Session Tracking.         JSP         JSP: Introduction to JSP- JSP - Elements of JSP-JSP Syntax and Semantic Declarations-Request Dispatching-Session and Thread Management-JSP	Periods The javax.servlet P ests and Response Periods cs- Expressions, S Tag Extensions: In BC-Overview of J	er Application 12 Package-Read es-Using 12 criptlets, and ntroduction to IDBC-JDBC							
	GUI Application using SWING-RMI: An Overview of RMI-Building a Si- using RMI         Servlets         Servlets: The Life Cycle of a Servlet-A Simple Servlet-The Servlet API-T Servlet Parameters- The javax.servlet.http Package-Handling HTTP Requine Cookies-Session Tracking.         JSP         JSP: Introduction to JSP- JSP - Elements of JSP-JSP Syntax and Semantic Declarations-Request Dispatching-Session and Thread Management-JSP Custom Tag-Developing your first Custom Tag-Database Access with JD	Periods The javax.servlet P ests and Response Periods cs- Expressions, S Tag Extensions: In BC-Overview of J	er Application 12 Package-Read es-Using 12 criptlets, and ntroduction to IDBC-JDBC							

Text Books	
1	H. Schildt, 2002, Java 2 Complete Reference, 5th Edition, Tata McGraw Hill, New Delhi.(Unit
	I,UnitII,Unit III,IV)
3	Phil Hanna ,JSP 2.0: The Complete Reference, Tata McGraw Hilll Edition,2003 New Delhi,(Unit V)
References	
1	Uttam K Roy Advanced Java Programming, OxFord University Press, 2015
2	Mahesh P.Matha JSP and Servlets - A Comprehensive Study, Prentice Hall India Pvt Limited, 2013.
3	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
4	www.geeksforgeeks.com
5	www.tutorialspoint.com

# NOVEN ENDONEMENT

## VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)



OMEN EMPOWERMEN		Elayampalayam, Ti	ruchengo	de-6	37 205.						
Programme	МСА	Programme Code		PCA Regulations							
Department	M.C.A Semester										
			Period	ls	Credit	Maxim	um Mark	S			
Course Code		Course Name	per We	ek							
			L T	P	С	CA	ESE	Total			
	WEB APPI IC										
21P1CA02		WEB APPLICATION DEVELOPMENT    4    0    0    4    25    75    10									
COURSE	Understanding the	he basic concepts of web des	sign with H	ITM	L and Cascad	ing Style S	heets, ïf	Exposure on			
OBJECTIVES	developing webs	sites for any domain using P	HP & MyS	SQL	Server Techno	ologies & l	Exposure	on designing			
	databases using	MySQL Server Technology									
POs		PRO	GRAMM		ITCOME						
105											
PO 1	110 0	ge of computing fundamental	· 1	U							
		opriate for the computing sp				and conce	eptualizat	tion of			
		els from defined problems ar	-								
PO 2	-	ate, research literature, and s	-				-				
	-	g fundamental principles of	mathemat	ics, c	computing scie	ences, and	relevant	domain			
	disciplines										
PO 3		uate solutions for complex c		-		-	•				
		processes that meet specified	l needs wi	th ap	propriate cons	sideration f	for public	health and			
	·	societal, and environmental									
PO 4		sed knowledge and research				-	•	sis and			
		data, and synthesis of the in		-							
PO 5	-	lapt and apply appropriate te	-			dern comp	uting too	ls to complex			
		ities, with an understanding					1				
PO 6		commit to professional ethic	s and cyb	er reg	gulations, resp	onsibilities	s, and not	rms of			
PO 7	professional con	eed, and have the ability, to		inda	nan dan tilaami	na for cont	inual dar	valormant og i			
PO /	computing profe	•	engage m	maej	pendent learni	ng for com	inuar dev	elopment as a			
PO 8		owledge and understanding of	of the com	nutir	a and manage	mont prin	ciples and	l apply these t			
108	-	as a member and leader in a		-		-	-				
	environments.	us a member and reader in a	team, to n	iiuiiu	ge projects and	a in manua	iiseipiina	l y			
PO 9		fectively with the computing	p commun	itv. a	and with socie	tv at large.	about co	mplex			
	1	ities by being able to compre									
		ations, and give and underst			e entre nep	0100, 00018					
PO 10	-	assess societal, environment		safe	ty, legal, and c	cultural iss	ues withi	n local and			
	-	and the consequential respon									
PO 11	-	vely as an individual and as a									
	environments.							1 2			
PO 12		opportunity and using inno	vation to p	ursu	e that opportu	nity to crea	ate value	and wealth fo			
		f the individual and society a	-			-					
PO 13		opportunity and using inno		ursu	e that opportu	nity to crea	ate value	and wealth fo			
		f the individual and society a	-		-						
PO 14		yse and synthesize scholarly		rela	ting to the fiel	d of Comp	uter Scie	nce			
PO 15	-	ntific outlook that solves any			-						
	demands										

COs	COURSE OUTCOME
CO 1	Understand the basics of web design using HTML and cascading stylesheets.
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	

					]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.1	Under	rstand	ling, 3	6.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	3
		(3/2)	/1 indic	ates the				Mappin	-	2-mediu	m 1-w	ak)			
COs		(3/2/			KLs			511, 5 50	POs			Juk)	KI	s	
	,								PO				2		
CO	1				2				PO				2		
									PO	3			2		
									PO	4			3	;	
CO	2				3				PO				3		
									PO				2		
	-				•			PO 7				1			
CO	3		2					PO 8 PO 9				2			
								PO 9 PO 10				2 3			
CO	4		3					PO 10				2			
								PO 12				3			
								PO 13				1			
CO	5		3					PO 14				2			
									PO 1	.5			2	2	
		(2)5					PO Ma		-			• `			
		(3/2/	1 indic	ates the	e streng					2-mediu	m, 1-we	eak)			
COs		201			200	i	-	me Ou	r		-		<b>DQ</b> (1)	-	<b>DO</b> 1-
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13		
C01	3	3	3	2	2	3	2	3	3	2	3	2	2	3	3
CO2	2	2	2	3	3	2	1	2	2	3	2	3	1	2	2
CO3	3	3	3	2	2	3	2	3	3	2	3	2	2	3	3
CO4	2	2	2	3	3	2	1	2	2	3	2	3	1	2	2
CO5	2	2	2	3	3	2	1	2	2	3	2	3	1	2	2

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	HTML Basics	Periods	12								
	HTML Basics : Understanding HTML - Formatting text by Using Tags - Creating Lists and Backgrounds -										
Unit - I	Creating Hyperlinks and Anchors. Creating Tables- Creating simple Form	ns. Style Sheets ar	nd Graphics:								
	Introduction to Style Sheets - Cascading Style sheetsFormatting Text using Style Sheets - Formatting Style Shee										
	Paragraphs using Style Sheets.										
	Introducing PHP	Periods	12								
Unit - II	Introducing PHP: Why PHP and MySQL-Server-Side Scripting Overview	v - Getting Started	with PHP -								
Unit - II	Learning PHP Syntax and Variables- PHP Control Structures and Function	ons.									
	Introducing PHP	Periods	12								
Unit - III	Introducing PHP: Learning Passing Information with PHP- Learning PHF	String Handling	- Learning								
Unit - III	Arrays- Learning PHP Number Handling										
	More PHP	Periods	12								
Unit - IV	More PHP: Working with the File System -Working with Cookies and Se	ssions - Learning	PHP Types.								
Ollit - I v	MySQL Database Integration: Introducing Databases and MySQL.										
	Learning Database Administration and Design	Periods	12								
Unit - V	Learning Database Administration and Design - Integrating PHP and My	SQL Performing I	Database Queries								
Unit - v	- Integrating Web Forms and Databases-MySQL Gotchas. Developing a S	Simple Web Appli	ication.								
	Total Periods		60								

Text Books	
1	Microsoft Step by Step – HTML and XHTML", Faithe Wempen. PHI, 2009. (Unit I).
2	Steve Suehring, Tim Converse, and Joyce Park, "PHP6 and MySQL Bible", Wiley Publishing, Inc., 2010.
	(Units II, III, IV & V)
References	·
1	Steve PrettyMan Learn PHP7: Object Oriented Modular Programming using HTML5, CSS3, JavaScript,
	XML, JSON and MySQL, Apress, 2016.
2	W. Jason Gilmore, "Beginning PHP and MySQL from Novice to Professional", Apress, 4th Edition, 2010
3	Luke Welling, Laura Thomson, "PHP and MySQL® Web Development", Pearson Education, Inc., 4th
	Edition, 2009
E-References	·
1	www.w3schools.com
2	www.webopedia.org
3	https://www.guru99.com/php_tutorials.html
4	www.geeksforgeeks.com
5	www.tutorialspoint.com

Signature of BOS Chairman



WOMEN EMPOWERNENT		Elayampalayam, Tiruchengode-637 205.									
Programme	МСА	Programme Code		PO	tions	2021-2022					
Department	M.C.A Semester										
Course Code	C	ourse Name	Perio per W	'eek	Credit		um Mark				
			L T	Р	С	CA	ESE	Total			
21P1CA03	DESIGN A	75	100								
COURSE OBJECTIVES		o introduce general techniques for analyzing computer algorithms, To learn different algorithm design schniques & To understand the limitations of Algorithm power									
POs		PRO	GRAMM	1E OU	JTCOME						
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of omputing models from defined problems and requirements									
PO 2		Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain									
PO 3	components, or p	ate solutions for complex co processes that meet specified ocietal, and environmental				-	•				
PO 4	-	ed knowledge and research data, and synthesis of the int				-	ts, analy	sis and			
PO 5	-	apt and apply appropriate te ties, with an understanding	-			dern compu	uting too	ls to complex			
PO 6		commit to professional ethic				onsibilities	, and not	rms of			
PO 7	-	eed, and have the ability, to e	engage ir	n indep	pendent learnin	ng for conti	inual dev	velopment as a			
PO 8	Demonstrate kno	wledge and understanding o as a member and leader in a		-	• •	-	-				
PO 9	computing activi	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, and give and understand									
PO 10	-	assess societal, environment and the consequential respor									
PO 11	<b>e</b>	rely as an individual and as a			1	1	01				
PO 12		opportunity and using innov the individual and society a		pursu	e that opportu	nity to crea	te value	and wealth for			
PO 13		dge of computing to create e		desig	ns and solution	ns for comp	plex prob	olems			
PO 14	To identify, anal	yse and synthesize scholarly	literatur	e relat	ting to the field	d of Compu	uter Scie	nce			
PO 15	To develop scien demands	o identify, analyse and synthesize scholarly literature relating to the field of Computer Science o develop scientific outlook that solves any problem, encompassing the expected aspectsof market emands									

COs	COURSE OUTCOME
CO 1	Recognize general principles and good algorithm design techniques for developing efficient algorithms
CO 2	Estimate the time and space complexities of algorithms.
CO 3	Apply mathematical preliminaries to the analysis and design stages of different types of algorithms
CO 4	Compare the time and space complexities of different types of algorithms.
CO 5	Analysis the algorithms based on that which algorithm is an efficient one for specific input.
Pre-requisites	

					]	Know	ledge	Level	s						
1.Reme	mberi	ng, 2.	Under	stand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizing	5
		(3/2)	1 indic	ates the			) / KL N		-	2-mediu	m 1-we	eak)			
CO	s	(0/2/			KLs			<u>, , , , , , , , , , , , , , , , , , , </u>	POs			Juir)	KI	_s	
	~								PO				2		
CO	1				2				PO				3		
									PO	3			2	,	
									PO	4			2		
CO	2				3				PO				3		
									PO				3		
<b>CO</b>	2		2					PO 7				2			
CO	3							PO 8 PO 9				3 2			
								PO 10				1			
CO	4		3					PO 11				1			
								PO 12				1			
								PO 13				3			
CO	5		2					PO 14				1			
									PO 1	5			2	, ,	
		(2) (2)	(1 · 1·				PO Ma					1 \			
	1	(3/2/	1 indic	ates the	streng				-	2-mediu	m, 1-we	eak)			
COs		DOG	DOG	DO (	DOF		rogram		1	1	DOI	2012	DOID	DOI	D015
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		PO15
CO1	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3
CO2	2	3	2	2	3	3	2	3	2	1	1	1	3	1	2
CO3	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3
CO4	2	3	2	2	3	3	2	3	2	1	1	1	3	1	2
CO5	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus								
	Introduction	Periods	12						
	Introduction - Notion of Algorithm - Fundamentals of Algorithmic Solving - Important Problem t								
Unit - I	Fundamentals of the Analysis of Algorithm Efficiency - Analysis Framew	vork - Asymptotic	Notations - and						
	Mathematical Analysis of Recursive and Non-Recursive Algorithms.								
	Divide and conquer methodology	Periods	12						
	Divide and conquer methodology - Merge Sort - Quick Sort - Binary sear	ch - Binary Tree	Traversal -						
Unit - II	Multiplication of large integers- Strassen's matrix multiplication Gre	edy method - Prin	n's algorithr						
	- Kruskal's algorithm - Dijkstra's Algorithm.								
	Transform and Conquer	Periods	12						
Unit - III	Transform and Conquer - Presorting - Balanced Search Tree - AVL Tree	- Heaps and Hea	ap Sort -						
Unit - III	Dynamic Programming - Computing a binomial coefficient - Warshallât	€™s and Floydâ€	<sup>TM</sup> s algorithm.						
	Backtracking	Periods	12						
Unit - IV	Optimal binary - search tree - Knapsack problem - Backtracking - N-O	Queens problem -	Hamiltonian						
Unit - Iv	circuit problem - subset sum problem								
	Branch & Bound	Periods	12						
Unit - V	Branch and bound: Assignment problem - Knapsack problem - Traveling	salesman problen	1.						
	Total Periods		60						

Text Books	
1	Anany Levitin, "Introduction to the Design and Analysis of Algorithms", Pearson Publications, 3rd Edition, 2012.
References	
1	Horowitz Ellis, Sartaj Sahni and Sanguthevar Rajasekaran, †Fundamentals of Computer Algorithms', Second Edition Reprint 2012.
2	Vijayalakshmi Pai G.A, "Data Structures and Algorithms: Concepts, Techniques and Applications", Tata Mc Graw Hill. , 2009.
E-References	
1	https://www.cs.usfca.edu/~galles/visualization/Algorithms.html
2	https://onlinecourses.nptel.ac.in/noc16_cs04/preview
3	https://www.coursera.org/learn/introduction-to-algorithms
4	www.w3schools.com
5	www.tutorialspoint.com

Signature of BOS Chairman





MEN EMPOWERMEN		Elayampalayam, Ti	rucheng	ode-6	57 205.						
Programme	МСА	Programme Code		ations	2021-2022						
Department		M.C.A			Semester	•		1			
Course Code	(	Course Name	Perio per W	eek	Credit	Maximum Mar					
			L T	P	C	CA	ESE				
21P1CA04		ADVANCED OPERATING SYSTEM 4 0 0 4 25 75 100									
COURSE OBJECTIVES	management, me	verview of computer system emory management, storage h knowledge on Distributed of	managen	nent,	protection and	-	-				
POs		PRO	GRAMM	IE OU	JTCOME						
PO 1	knowledge appr	e of computing fundamental opriate for the computing sp els from defined problems ar	ecializatio	on to	the abstractior						
PO 2	-	ate, research literature, and s g fundamental principles of		-			-				
PO 3	Design and eval components, or	uate solutions for complex c processes that meet specified societal, and environmental		-		-	•				
PO 4		sed knowledge and research data, and synthesis of the in				-		ysis and			
PO 5	•	lapt and apply appropriate to titles, with an understanding	-			dern com	outing to	ols to complex			
PO 6	Understand and professional con	commit to professional ethic puting practice.	es and cyt	per re	gulations, resp	onsibilitie	es, and no	orms of			
PO 7	-	eed, and have the ability, to	engage in	inde	pendent learni	ng for con	tinual de	evelopment as a			
PO 8	Demonstrate kno	owledge and understanding o as a member and leader in a		-		-	-				
PO 9	computing activ	fectively with the computing ities by being able to compre- ations, and give and underst	ehend and	•		• •		-			
PO 10	1	assess societal, environment and the consequential respon									
PO 11	-	vely as an individual and as a			1						
PO 12	•	opportunity and using inno f the individual and society a		pursu	e that opportu	nity to cre	ate value	e and wealth for			
PO 13		edge of computing to create		desig	ns and solution	ns for com	plex pro	blems			
PO 14		yse and synthesize scholarly									
PO 15	To develop scien demands	ntific outlook that solves any	r problem	, enco	ompassing the	expected	aspectso	f market			

COs	COURSE OUTCOME
CO 1	After completion of the course the student will be able to use the system with knowledge of operating system.
CO 2	Able to recognize the process management.
CO 3	Able to understand building blocks operating system.
CO 4	Able to understand security issues of operating system.
CO 5	Able to utilize the languages in all the types of operating environment.
Pre-requisites	

## Knowledge Levels

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

						<u>'0 / PC</u>	) / KL N	Mannin	a						
		(3/2/	1 indic	ates the					-	2-mediu	m, 1-we	eak)			
COs	S			]	KLs				POs	3			KI	<b>_S</b>	
								PO 1				2			
CO	1		2					PO	2		3				
									PO	3			2		
									PO 4	4			2		
CO	CO 2				3				PO :	5			3		
									PO				3		
									PO ′				2		
CO	CO 3				2			PO 8				3			
								PO 9				2			
			2				PO 10				1				
CO	4		3					PO 1				1			
								PO 12 PO 13				1 3			
CO	5				2			PO 13 PO 14				1			
CO.	5		2				PO 14 PO 15				2				
						CO /	PO Ma	nning	101				2		
		(3/2/	1 indic	ates the	streng				rong. 2	2-mediu	m. 1-we	eak)			
		(2, 2,			~8		rogram		-		,				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
C01	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3
CO2	2	3	2	2	3	3	2	3	2	1	1	1	3	1	2
CO3	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3
CO4	2	3	2	2	3	3	2	3	2	1	1	1	3	1	2
CO5	3	2	3	3	2	2	1	2	3	2	2	2	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

г

1. Course End Delivery

	An Overview of Operating System and Its Structures	Periods	12							
	An Overview of Operating System and Its Structures: Introduction : Definition of OS- Operating System									
Unit - I	Structure-System Components-System Calls- Process- Concepts-Process Scheduling-Scheduling									
	Concepts-Criteria-Scheduling Algorithms.	C	C							
	Process Synchronization and Dead Locks	Periods	12							
	Process Synchronization and Dead Locks: Process Synchronization - Bac	kground, Critical								
Unit - II	Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical									
	Regions-Monitors-Deadlocks-System model, Characterization-Methods of Handling Deadlocks-Deadlock									
	Prevention-Avoidance-Detection-Deadlock Recovery.									
	Memory Management	Periods	12							
Unit - III	Memory Management : Background , Swapping ,Contiguous-Non Contig	uous Storage Allo	cation-Paging							
Unit - III	Segmentation - Segmentation with paging - Virtual Memory-Basic Concepts- Page Replacement									
	Methods-Allocation of frames-Thrashing.									
	I/O And File Systems	Periods	12							
	I/O And File Systems: File Concepts-File System Structure-Access Metho	ods-Directory								
Unit - IV	Structure-Protection-Directory Implementation- Distributed systems - Go	als, Software conc	epts - Netwo							
	Operating systems- True distributed systems - Multiprocessor, Time shari	ng system,- Distri	buted File							
	system design- system structure.									
	Distributed Operating Systems	Periods	12							
	Distributed Operating Systems: Issues in Distributed Operating System -Architecture. Linux System:									
Unit - V	Design Principles - Kernel Modules - Process Management Scheduling -	Memory Manage	ment							
	-Input-Output Management -File System - Inter process Communication	n. iOS and Andr	oid:							
	Architecture and SDK Framework -Media Layer -Services Layer.									

Text Books	
1	Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, (Asia) Pvt Ltd ,
	Tenth Edition, 2018
2	Andrew S. Tanenbaum, Distributed Operating System, 4th Edition, Pearsons Ltd, 2002.
3	Daniel P Bovet and Marco Cesati, "Understanding the Linux kernel", 3rd edition, O'Reilly, 2005
References	
1	H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002.
2	Ann Mclever McHoes, Understanding Operating Systems, Course Tecxhnology, Cengage Learning, 2011.
E-References	
1	https://technet.microsoft.com
2	www.webopedia.org
3	www.geeksforgeeks.com
4	www.w3schools.com
5	www.tutorialspoint.com



NOMEN EMPOWERNEN		Elayampalayam, Ti	ruchengo	ae-6	37 205.						
Programme	MCA	Programme Code		PO	CA	Regulat	tions	2021-2022			
Department		M.C.A			Semester			1			
Course Code	C	ourse Name	Period per We	ek	Credit		um Marl	1			
			L T	Р	C	CA	ESE	Total			
21P1CAJ01	ADV	ANCE EXCEL	4 0	0	4	25	75	100			
COURSE	To emulate stude	ents to the current needs of d	ata analys	sis an	d business inte	elligence fu	undamer	ntal applications			
OBJECTIVES	through advance	ugh advance excel.									
POs		PRO	GRAMM	E OU	JTCOME						
PO 1	Apply knowledge	e of computing fundamental	s, comput	ing s	pecialization,	mathemati	cs, and c	domain			
	knowledge appropriate for the computing specialization to the abstraction and conceptualization of										
	computing models from defined problems and requirements										
PO 2	Identify, formula	te, research literature, and se	olve comp	olex o	computing prol	blems reac	hing sut	ostantiated			
	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										
		•	needs wi	th ap	propriate cons	ideration f	or publi	c health and			
	-	ocietal, and environmental									
PO 4		ed knowledge and research			• •	-		ysis and			
	-	data, and synthesis of the int		-							
PO 5		apt and apply appropriate te				dern comp	uting too	ols to complex			
PO 6		ties, with an understanding of				angihilitiga	and no	and of			
PO 0	professional com	commit to professional ethic	s and cyb	erreg	gulations, resp	onsidinties	s, and no	DITIES OF			
PO 7	-	wed, and have the ability, to $\epsilon$	ngage in	inde	pendent learnir	ng for cont	inual de	velonment as a			
107	computing profe		Ingage III	muej		ig ioi com	inuar uc	velopment as a			
PO 8			of the com	nutir	o and manage	ment princ	rinles an	d apply these to			
100	Demonstrate knowledge and understanding of the computing and management principles and apply these to ones own work, as a member and leader in a team, to manage projects and in multidisciplinary										
	environments.		,		8- F- J		r				
PO 9		fectively with the computing	g commun	ity, a	and with societ	y at large,	about co	omplex			
		ties by being able to compre		-				-			
		ations, and give and understa				-					
PO 10	Understand and a	assess societal, environment	al, health,	safe	ty, legal, and c	ultural issu	ues with	in local and			
	global contexts, a	and the consequential respor	sibilities	relev	ant to professi	onal comp	uting pr	actice			
PO 11	Function effectiv	ely as an individual and as a	a member	or le	ader in diverse	e teams and	l in mult	tidisciplinary			
	environments.										
PO 12	Identify a timely	opportunity and using innov	vation to p	oursu	e that opportur	nity to crea	te value	and wealth for			
		the individual and society a	-								
PO 13		dge of computing to create e		-		-					
PO 14		yse and synthesize scholarly									
PO 15	To develop scien demands	tific outlook that solves any	problem,	enco	ompassing the	expected a	spectsof	fmarket			

COs	COURSE OUTCOME
CO 1	To understand the basics of Excel
CO 2	To explore the working of Data
CO 3	To acquire knowledge in creating & working with various charts
CO 4	To analyze data using Histograms & Distribution statistics.
CO 5	To apply Data using Pivot Tables
Pre-requisites	

					]	Know	ledge	Level	s							
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5	
		(3/2)	1 indic	ates the				Mappin	-	-mediu	m, 1-we	eak)				
СО	s	(0/=/			KLs				POs				KI	s		
	-								PO				2			
СО	CO 1				2				PO				3			
				-					PO	3			2	,		
									PO	4			2			
CO	2				3				PO				3			
									PO			2				
	2		2				PO 7				2					
CO	3			3				PO 8 PO 9				2				
								PO 10					1			
СО	4		3				PO 11				2					
								PO 12					1			
									PO 1	3		3				
CO	5		2					PO 14				1				
								PO 15					2			
							PO Ma		-							
		(3/2/	1 indic	ates the	e streng				-		m, 1-we	eak)				
COs								me Ou	1							
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13	PO14	PO15	
CO1	3	2	3	3	2	3	1	3	2	2	3	2	2	2	3	
CO2	CO2         2         3         2         2         3         3			2	2	1	1	2	1	3	1	2				
CO3	2	3	2	2	3	2	2	2	1	1	2	1	3	1	2	
CO4	2	3	2	2	3	2	2	2 2 1 1 2					3	1	2	
CO5	3	2	3	3	2	3	1	3	2	2	3	2	2	2	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus									
	Getting started With Excel	Periods	6							
Unit - I	Excel & Spreadsheets-Excel workbooks & worksheets-Printing from Excel-Saving your work-Excel									
	Add-Ins.									
	Working with Data	Periods	6							
Unit - II	Data Entry-Data Formats-Formulas and Functions-Cell Reference-Range Names-Sorting Data-Querying in									
Data-Importing Data from Files-Importing Data from databases.										
	Working with Charts	Periods	6							
Unit - III	Introducing Excel charts-Introducing scatter plots-Editing a chart-Identifying data points-Creating bubble									
Olint - III	plots-Breaking a Scatter plot into categories-Plotting several variables.									
	Describing your data	Periods	6							
Unit - IV	Variables and Descriptive Statistics-Frequency Tables-Working with Histograms-Working with Stem and									
Unit - I v	Leafplots-Distribution statistics.									
	Tables	Periods	6							
Unit - V	PivotTables-Two-way Tables-Computing Expected counts-Tables with O	rdinal Variables.								
	Total Periods		30							

Text Books	
1	Data Analysis with Microsoft Excel –Berk & Carey, Cengage Learning, Third Edition, 2010
References	
1	Microsoft Excel 2016 step by step –Curtis Fyre, Microsoft Press, 2015.
2	Microsoft Excel –Essential Hints & Tips-Diane Griffiths, 2015.
E-References	
1	www.techopedia.com
2	www.webopedia.org
3	www.geeksforgeeks.com
4	www.w3schools.com
5	www.tutorialspoint.com

Signature of BOS Chairman

	VIVEKANAI	ર	100 0002 2006							
Programme	MCA	ons	2020-21							
Department	M.C.A		Sem	ester					Ι	
20P1CAP01	Advanced Jav	va Programming Lab	Per per V	iods Weeł	<u> </u>	Credit	Maximu	m Marks	5	
				Т	Р	С	CA	ESE	Total	
				0	0	2	40	60	100	
COURSE OBJECTIVES	excep • Desig script • Desig	<ul> <li>Design &amp; develop core java applications such as packages, multithreading, exception handling, applets &amp; event handling</li> <li>Design and develop network communications, JDBC &amp; simple server side scripting programs using Servlets &amp; JSP</li> <li>Design and develop database connectivity and simple web applications</li> </ul>								
1	LIST OF PR	acticals	nt m	ark	list	using clas	ses and c	biects		
2		am to implement pack						5		
3	Write a Progr	ram to prepare a stude	nt m	ark	list	using swii	ng			
4	Write a Progr	ram to perform event h	nand	ling	in	Swing				
5	Write a Progr	ram to implement RM	Ι							
6	Write a HTM	L to Servlet Applicati	ons							
7	Write a Creat	e a simple servlet prog	gram	to	dis	play cookie	e's infor	mation	L	
8	Write a simpl	e program to impleme	ent tł	ne c	onc	cept of JDE	BC			
9	Write a progr	am to implement the	conc	ept	ofJ	IDBC & S	wing			
10	Write a progr	am for simple registra	tion	for	n i	n JSP				

Autor Concernant	VIVEKANAI	TOURINERS and a second									
Programme	МСА	2020-21									
Department	M.C.A	M.C.A Semester I									
20P1CAP02	Web Applica Lab	tion Development		riods Wee		Credit	Maxim	um Mark	S		
	Lab				L T P C		СА	ESE	Total		
			4	0	0	2	40	60	100		
						1	I	ł			
COURSE OBJECTIVES	Creating simple web pages, forms & CSS										
	• Implement working with cookies and sessions in PHP										
	• Connecting PHP and MySQL in real time applications										
	LIST OF PR	RACTICALS									
1	To create a si	mple web page for y	our d	epa	rtm	ent					
2	To create sim	ple forms using HTM	ML								
3	To create a si	mple web page using	g Cas	cadi	ng	Style She	ets				
4	Implementati	on of cookies									
5	Implementati	on of Students Feedl	backs	Sys	ten	n using Pl	HP and N	MySQL			
6	Implementati	on of online registrat	tion f	orm	usi	ing PHP a	and MyS	QL			
7	Implementati	on of Library Manag	gemer	nt Sy	yste	em using l	PHP and	MySQ	L		
8	Implementati	on of Banking Trans	actio	n Sy	vste	m using I	PHP and	MySQ	L		
9	Webpage Kit	Counters using Sess	ion ti	rack	ing						
10	To create Sin	nple Shopping Appli	cation	1							



NOMEN EMPOWERNEN		Elayampalayam, Tiruchengode-637 205.										
Programme	MCA	Programme Code		PC	CA	Regulat	tions	2021-2022				
Department	M.C.A Semester 2											
Course Code	C	Periods     Credit     Maximum Marks       Course Name     per Week     Course Course										
21P2CA05	.NET F	L         T         P         C         CA         ESE         Total           .NET PROGRAMMING         4         0         0         4         25         75         100										
COURSE	To emulate stude	ents to the current needs of a	application of	leve	elopment throu	igh variou	s .net te	chnologies				
OBJECTIVES POs			GRAMME			<u> </u>		0				
PO 1 PO 2	knowledge appro	e of computing fundamenta opriate for the computing sp ls from defined problems an te, research literature, and s	ecialization	to t ents	the abstraction	and conce	eptualiz	ation of				
PO 2		g fundamental principles of										
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental											
PO 4		ed knowledge and research data, and synthesis of the in				-		ysis and				
PO 5		apt and apply appropriate to ties, with an understanding				dern comp	uting to	ools to complex				
PO 6	Understand and or professional com	commit to professional ethic puting practice.	es and cyber	reg	gulations, resp	onsibilities	s, and n	orms of				
PO 7	Recognize the ne computing profe	eed, and have the ability, to ssional.	engage in in	ndep	oendent learnir	ng for cont	inual de	evelopment as a				
PO 8		wledge and understanding on a member and leader in a										
PO 9	computing activi	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, and give and understand										
PO 10		assess societal, environment and the consequential respo										
PO 11	-	rely as an individual and as			-	-						
PO 12		opportunity and using inno the individual and society	-	rsu	e that opportur	nity to crea	ate valu	e and wealth for				
PO 13		dge of computing to create	-	sigr	ns and solution	s for com	plex pro	oblems				
PO 14		yse and synthesize scholarly		-								
PO 15	To develop scien demands	tific outlook that solves any	<sup>,</sup> problem, e	nco	ompassing the	expected a	spectso	of market				

COs	COURSE OUTCOME
CO 1	Understand the fundamentals of VB.Net
CO 2	Recognize the various windows controls
CO 3	Apply the database concepts to the application using ADO.Net
CO 4	Implement and apply the ASP.Net for web application development
CO 5	Implement and apply ASP.Net with database
Pre-requisites	

					]	Know	ledge	Level	s							
1.Remer	nberi	ng, 2.1	Unde	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinş	5	
		(3/2)	1 india	ates the				Mappin	-	2-mediu	m 1 w	aak)				
COs	3	(3/2/			KLs			511, 5-31	POs		<u> </u>	<i>a</i> k <i>)</i>	KI	s		
	,				IXL3				PO				2			
CO	1				2				PO				1			
	-				_				PO				3			
									PO	4			1			
CO	2				3				PO				2			
								PO 6				2				
			2					PO 7				3				
CO	3							PO 8 PO 9				1 2				
								PO 9 PO 10				2				
CO	4		2					PO 10				1				
00	т		2					PO 12				2				
									PO 13				3			
CO	5		3					PO 14				1				
								PO 15				2				
							PO Ma									
		(3/2/	1 indic	ates the	streng				-	2-mediu	m, 1-we	eak)				
COs			1	1			-	me Ou			1	1				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		PO15	
CO1	3	2	2	2	3	3	2	2	3	3	2	3	2	2	3	
CO2	2	1	3	1	2	2	1	1	2	2	1	2	3	1	2	
CO3	3	2	2	2	3	3	2	2	3	3	2	3	2	2	3	
CO4	3	2	2	2	3	3	2	2	3	3	2	3	2	2	3	
CO5	2	1	3	1	2	2	1	1	2	2	1	2	3	1	2	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Getting Started With VB.NET	Periods	12							
	Getting Started With VB.NET: The Integrated Development Environment	t-IDE Component	s-Environme							
Unit - I	Options.Visual Basic: The Language Variables-Constants-Arrays - Variab	oles as Objects-Flo	ow Control							
	Statements.Working with forms: The appearance of Forms-Loading and S	Showing Forms-D	esigning Mer							
	Basic Windows Controls	Periods	12							
	Textbox Control- ListBox, CheckedListBox-Scrollbar and TrackBar Cont	trols-More Windo	ws Control-T							
Unit - II	common Dialog Controls-The Rich TextBox Control - Handling Strings, characters and Dates. The									
	TreeView and ListView Controls: Examining the Advanced Controls.									
	Databases	Periods	12							
Unit - III	The Multiple Document Interface-Databases: Architecture and Basic Concepts-Building Database									
Unit - III	Application with ADO.NET-Programming with ADO.NET.									
	ASP.NET	Periods	12							
Unit - IV	Goal of ASP.NET -ASP.NET Web Server Control-Validation Server Con	trols-Themes and	Skins -Conte							
	Page Holder, ASP. NET - Web Forms, MVC, Core.									
	Data Binding in ASP.Net	Periods	12							
Unit - V	Data source Controls - Configuring data source control caching - storing connection information-Using									
Unit - v	Bound list controls with Data Source Controls - Other Data bound Controls-Data Management with									
	ADO.Net and Working with databases.									
	Total Periods		60							

Text Books	
1	EvangelosPetroutsos, Mastering Visual Basic.Net, BPB Publications, New Delhi,2002.
2	Bill Evjen, Scott Hanselman, Devin Rader, Farhan Muhammad and S.Srinivasa Sivakumar (2006),
	Professional ASP.net 2.0, Special Edition
References	
1	Dave Mercer, ASP.Net Beginnerâ€ <sup>™</sup> s Gudie (2003), 2nd Edition McGraw Hill, New Delhi.
2	Duncan Mackenzie Kent Sharkey (2006), Sams Teach yourself Visual Basic.JNet, 1stEdtion, McGraw Hill,
	NewDelhi
3	Shirish Chavan. (2007), Visual Basic.Net, 1st Edition, Pearson Education, New Delhi.
4	Beginning ASP.NET 2.0 in C# 2005: From Novice to Professional (Beginning: From Novice to
	Professional). Matthew MacDonald (Author) publication: APress 2005.
E-References	
1	www.microsoft.com/NET/
2	www.en.wikipedia.org/wiki/.net
3	www.w3schools.com
4	www.tutorialspoint.com



NOMEN EMPOWERMENT		Elayampalayam, T	iruchenge	ode-6	37 205.						
Programme	МСА	Programme Code	PCA Regulations 2021-2022								
Department	M.C.A Semester 2										
Course Code	С	Periods     Credit     Maximum Marks       Course Name     per Week									
21P2CA06	PYTHON	LTPCCAESETotalPYTHON PROGRAMMING40042575100									
COURSE	To emulate stude	ents to the current needs of a	application	n deve	elopment throu	ugh various	s .net te	chnologies			
OBJECTIVES POs			GRAMM			<u> </u>					
PO 1	knowledge appro	pply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of omputing models from defined problems and requirements									
PO 2		te, research literature, and s g fundamental principles of									
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental										
PO 4		ed knowledge and research data, and synthesis of the ir			• •	-		ysis and			
PO 5		apt and apply appropriate to ties, with an understanding				dern comp	uting to	ols to complex			
PO 6		commit to professional ethic				onsibilities	s, and n	orms of			
PO 7	Recognize the ne computing profe	ed, and have the ability, to ssional.	engage in	indep	pendent learnin	ng for cont	inual de	evelopment as a			
PO 8		wledge and understanding as a member and leader in a									
PO 9	computing activi	fectively with the computin ties by being able to compr ations, and give and underst	ehend and	•		•		-			
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 the individual and society		pursu	e that opportu	nity to crea	te valu	e and wealth for			
PO 13		dge of computing to create		desig	ns and solutior	ns for comp	plex pro	oblems			
PO 14	To identify, anal	yse and synthesize scholarly	/ literature	e relat	ing to the field	d of Comp	uter Sci	ence			
PO 15	To develop scien demands	tific outlook that solves any	problem	, enco	ompassing the	expected a	spectso	f market			

COs	COURSE OUTCOME
CO 1	To acquire knowledge about overview of Python
CO 2	Recognize the various concepts such as functions, modules & control statements
CO 3	Apply the concepts of Strings & Text files
CO 4	Implement and apply List & Dictionaries
CO 5	Design applications with Graphical User Interface.
Pre-requisites	

					]	Know	ledge	Level	S						
1.Reme	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esiziną	5
		(3/2)	/1 indic	ates the		CO / PC			-	2-mediu	m 1-w	ak)			
СО	s	(3/2/			KLs			511, 5 50	POs		<u> </u>	Juny	KI	s	
	5								PO				2		
СО	1				2				PO				1		
									PO	3			2	2	
									PO	4			1		
CO	2				3				PO				3		
								PO 6				1			
СО	2		2					PO 7 PO 8				2 3			
0	5		2					PO 9				2			
								PO 10				2			
CO	4		2					PO 11				1			
								PO 12				2			
								PO 13				3			
CO	5				3			PO 14				1			
						CO	PO Ma	nnina	PO 1	5			2		
		(3/2)	1 indic	ates the	streng				rong (	2-mediu	m 1-w	ak)			
		(3/2/	1 maie	ates the	streng				tcome (		111, 1 vvv	Juk)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	3	2	2	2	1	2	3	3	2	3	2	2	3
CO2	2	1	2	1	3	1	2	3	2	2	1	2	3	1	2
CO3							1	2	3	3	2	3	2	2	3
CO4	3	2	3	2	2	2	1	2	3	3	2	3	2	2	3
CO5	2	2     1     2     1     3     1     2     3     2     2     1     2     3     1     2										2			

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Python Overview, Data Types, Expressions	Periods	12							
	Python programming - variable, Datatype, Keywords, Literals, Operator, Expression, type conversion,									
Unit - I	Comments, input and output, Strings, Assignment and Comments - Numeric Data Types and Character									
	Sets, Expressions.	ine zana rypes an								
	Functions, Modules and Control Statements	Periods	12							
	Functions and Modules- Calling Functions, The math Module, The Main	Module, Program	Format and							
II II	Structure and Running a Script from a Terminal Command Prompt - Itera	ation - for loop - S	election -							
Unit - II	Boolean Type, Comparisons, and Boolean Expressions, if-else Statements, One-Way Selection Statements									
	Multi-way if Statements, Logical Operators and Compound Boolean Expressions, Short- Circuit Evaluation									
	and Testing Selection Statements - Conditional Iteration - while loop.									
	Strings and Text Files	Periods	12							
	Strings-Accessing Characters and Substrings in Strings - Data Encryption	1 - Strings and Nur	mber Systems							
Unit - III	and String Methods- Text Files-Text Files and Format - Writing Text to a File - Writing Numbers to a File									
	Reading Text from a File - Reading Numbers from a File and Accessing and Manipulating Files and									
	Directories on Disk.									
	Lists and Dictionaries	Periods	12							
	Lists- List Literals and Basic Operators, Replacing an Element in a List, List Methods for Inserting and									
	Removing Elements, Searching and Sorting a List, Mutator Methods and the Value None, Aliasing and Sid									
Unit - IV	Effects, Equality and Tuples - Defining Simple Functions - Syntax, Parameters and Arguments, return									
	Statement, Boolean Functions and main function, Dictionaries-Dictionary Literals - Adding Keys and									
	Replacing Values - Accessing Values, Removing Keys and Traversing a Dictionary.									
	Design with Functions and Classes, Graphical User Interface	Periods	12							
	Design with Functions and Design with Classes - Functions as Abstraction Mechanisms- Design with									
Unit - V	Recursive Functions and Managing a Programâ€ <sup>™</sup> s Namespace - Data Modeling and Structuring Classes									
Chit y	with Inheritance and Polymorphism - Behavior of terminal based program									
	Coding simple GUI based programs- Other useful GUI resources- Case S	tudy: GUI based A	ATM.							
	Total Periods 60									

Text Books	
1	Kenneth A. Lambert, Martin Osborne, "Fundamentals of Python: First Programs, Cengage Learning",
	second edition, 2018.
2	Paul Barry, "Head First Python 2e", Oâ€ <sup>2</sup> Reilly, 2nd Revised edition, 2016
References	
1	Michal Jaworski, TarekZiade, "Expert Python Programming ", Packt Publishing, Second Revised edition,
	2016.
2	Sam Washington, Dr. M. O. FaruqueSarker, "Learning Python Network Programming", Packt Publishing
	Limited, 2015.
3	Rick van Hattem, "Mastering Python", Packt Publishing, Second Edition, 2016
E-References	
1	www.python.org/about/gettingstarted/
2	www.realpython.com/python-beginner-tips/

3	www.w3schools.com
4	www.tutorialspoint.com/python/index.htm

Signature of BOS Chairman



WOMEN EMPOWERMENT		Elayampalayam, Tiruchengode-637 205.										
Programme	МСА	Programme Code		PO	tions	2021-2022						
Department		M.C.A Semester										
Course Code	С	ourse Name		iods Week	Credit	Maxim	um Mark	CS				
			L	T P	C	CA	ESE	Total				
21P2CA07		SOFTWARE TESTING &AUTOMATION TOOLS404257510										
COURSE OBJECTIVES	To learn about so automation testir	oftware testing core concepts	s and u	nderstar	nd the various	software to	esting too	ols especially				
POs		PRO	GRAM	ME OU	JTCOME							
PO 1	knowledge appro	e of computing fundamental opriate for the computing spe ls from defined problems an	ecializa	tion 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 evalu	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, and environmental										
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the in				-	-	sis and				
PO 5	Create, select, ad	apt and apply appropriate te ties, with an understanding	chniqu	es, reso	urces, and mo			ls to complex				
PO 6		commit to professional ethic				onsibilitie	s, and not	rms of				
PO 7	Recognize the ne	ed, and have the ability, to essional.	engage	in inde	pendent learni	ng for con	tinual dev	velopment as a				
PO 8		wledge and understanding on a member and leader in a										
PO 9	computing activi	fectively with the computing ties by being able to compre- ations, and give and underst	hend a	•		•		-				
PO 10	Understand and a	assess societal, environment and the consequential respon	al, heal									
PO 11	-	ely as an individual and as a										
PO 12	Identify a timely	opportunity and using innovithe individual and society a		o pursu	e that opportu	nity to crea	ate value	and wealth for				
PO 13		dge of computing to create		e desig	ns and solution	ns for com	plex prob	olems				
PO 14 PO 15		yse and synthesize scholarly			-	_						
r U 13	To develop scientific outlook that solves any problem, encompassing the expected aspectsof market demands											

COs	COURSE OUTCOME					
CO 1	Identify the Models in Software Life Cycle					
CO 2	Clarify the Testing Methods					
CO 3	Understand the concepts of System, Acceptance, Performance testing and its Practices					
CO 4	Acquire knowledge about testing tools					
CO 5	Learn about software testing automation tools					
Pre-requisites						

					]	Know	ledge	Level	S							
1.Remen	nberi	ng, 2.1	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esiziną	5	
		(3/2/	/1 indic	ates the		CO / PC			-	2-mediu	m, 1-we	eak)				
CO	s	(2, 2,			KLs	,		,	POs			)	KI	_s		
	-							PO 1				2				
СО	CO 1			2				PO 2				1				
								PO 3				2				
								PO 4				3				
CO	2		1						PO				2			
								PO 6				3				
	~							PO 7				2				
CO	CO 3			2				PO 8 PO 9				3				
								PO 10				2				
CO	CO 4		3					PO 10				1				
	0.0 4			5				PO 12				2				
								PO 13				3				
CO	CO 5			2				PO 14				1				
									PO 15				2			
		(a.)=					PO Ma		-							
	1	(3/2/	1 indic	ates the	e streng				-		m, 1-we	eak)				
COs		201			200	1	-	me Ou			DO4:		<b>DQ</b> 4 -	-	<b>PQ</b> 4 -	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		PO15	
C01	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3	
CO2	2	3	2	1	2	1	2	1	2	2	3	2	1	3	2	
CO3	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3	
CO4	2	1	2	3	2	3	2	3	2	2	1	2	3	1	2	
CO5	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Software Development Lifecycle Models	Periods	12						
Unit - I	Phases of Software Project - Life Cycle Models -Testing Concepts, Issues	s, and Techniques:	Purposes,						
	Activities, Processes, and Context -Questions about Testing - Functional vs. Structural Testing-Coverage								
	Based vs. Usage Based Testing - Test Activities, Management, and Automation: Test Planning and								
	Preparation - Test Execution, Result Checking, and Measurement - Analysis and Follow up-Activities,								
	People, and Management - Test Automation								
Unit - II	White Box Testing	Periods	12						
	Meaning - Static Testing - Structural Testing - Challenges - Black Box Testing: Meaning - When & How t								
Unit - II	do Black Box Testing - Integration Testing: Meaning -Integration Testing as type of Testing - As a Phase of								
	Testing - Scenario Testing - Defect Bash								
	System and Acceptance Testing	Periods	12						
	Overview - Functional vs. Non-Functional Testing - Functional System Testing - Non-Functional Testing								
Unit - III	Acceptance Testing - Summary of Testing Phases - Performance Testing: Introduction - Factors Governing								
	Performance Testing - Methodology - Tools - Process - Regression Testing: Meaning - Types - When &								
	How to do Regression - Testing - Best Practices								
	Software Testing Tools	Periods	12						
Unit - IV	A Classification Scheme Scripting Tools -CppTest -SilkTest- Record-and-Replay Tools -TestComplete								
	-Selenium IDE -Performance-Testing Tools -LoadRunner - Grinder -QF-Test - Appvance								
	PerformanceCloud - JMeter .								
Unit - V	INTRODUCTION TO AUTOMATION TESTING– SELENIUM	Periods	12						
	Software TestAutomation: Fundamentals of Test Automation, Manual Testing Vs TestAutomation.								
	Introduction to Selenium, Installation and configuration of Eclipse, Java and Selenium Learning,								
	Introduction to Webdriver, How to run tests in IE, Firefox and Google Chrome. Introduction to Locators and								
	object finding:Importance of Locator Identifiers in Selenium, Identifying locators(ID, Name,ClassName,								
	LinkText). Overview of other automation Tools.								

Text Books						
1 Srinivasan Desikan and Gopalaswamy Ramesh, Software Testing Principles and Practices, Pears						
	Education, 2007					
2	Software testing Concepts and Operations – Ali Mili & Fairouz Tchier , Wiley Publications, 2015.					
References						
1	Software Test Automation Effective use of test execution tools- Mark Fewster & Dorathy Graham ,					
	Addision –Welsky Publication,					
2	Software Testing – A CraftMan's Approach – Paul C. Jorenson, CRC Press, Fourth Edition, 20					
E-References						
1	https://www.javatpoint.com/software-testing-tutorial					
2	https://www.softwaretestingmaterial.com/software-testing/					
3	https://www.softwaretestinghelp.com					
4	https://www.testingxperts.com/blog/software-testing-tools-lis					
5	https://www.selenium.dev/					



WEN EMPOWERME		Liayampalayam, 11	luchen	igoue-o	57 203.	-							
Programme	MCA	Programme Code		PO	CA	Regulat	ions	20	021-2022				
Department		M.C.A			Semester				2				
			Per	iods	Credit	Maxim	ım Marl	ks					
Course Code	c c	ourse Name	per V	Week									
			L	T P	C	CA	ESE	1	Total				
21P2CA08		DD APPLICATION											
	DE'	VELOPMENT	4	0 0	4	25	75		100				
COURSE	To learn about va	arious concepts of android a	pplicati	on deve	elopment								
OBJECTIVES POs		PROGRAMME OUTCOME											
PO 1	Apply knowledge	e of computing fundamental	s, com	puting s	pecialization,	mathemati	cs, and (	doma	ain				
		priate for the computing spe				and conce	ptualiza	ition	of				
		ls from defined problems an											
PO 2		te, research literature, and so											
	disciplines	g fundamental principles of	mathen	natics, c	computing scie	ences, and i	elevant	dom	lain				
PO 3	-	ate solutions for complex contracts	omputi	ng prob	lems, and desi	gn and eva	luate sv	stem	18.				
	-	processes that meet specified	-	• •		-	•						
	safety, cultural, s	ocietal, and environmental		_									
PO 4		ed knowledge and research				-	ts, analy	ysis a	and				
	-	data, and synthesis of the in					<u> </u>						
PO 5		apt and apply appropriate te ties, with an understanding of	-			dern compu	iting too	ols to	complex				
PO 6		commit to professional ethic				onsibilities	and no	orms	of				
100	professional com	-	s una e	<i>Jeer 10</i>	Summons, resp	onoronneo	, una no	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	01				
PO 7	-	ed, and have the ability, to e	engage	in inde	pendent learnin	ng for conti	inual de	velo	pment as a				
	computing profes	ssional.											
PO 8		wledge and understanding of		-		-	-	-	ply these to				
		as a member and leader in a	team, t	o mana	ge projects and	d in multidi	isciplina	ıry					
PO 9	environments.	fectively with the computing	t comm	unity (	and with societ	v at large	about c	omn	lov				
		ties by being able to compre	-	•		• •		-					
		ations, and give and understa			r	,8			,				
PO 10	Understand and a	assess societal, environment	al, heal	th, safe	ty, legal, and c	ultural issu	ies with	in lo	cal and				
	-	and the consequential respon											
PO 11		ely as an individual and as a	a memb	er or le	ader in diverse	e teams and	in mult	tidiso	ciplinary				
PO 12	environments.	opportunity and using innor	untion t		a that ann anti-	nites to amon	to voluo	and	waalth for				
PO 12		opportunity and using innov the individual and society a		o pursu	e that opportu	inty to crea	te value	and	wealth for				
PO 13		dge of computing to create e		e desig	ns and solution	ns for comp	olex pro	blem	15				
PO 14		yse and synthesize scholarly		-		-	-						
PO 15		tific outlook that solves any											
	demands												

COs	COURSE OUTCOME
CO 1	To acquire knowledge about basics of android programming
CO 2	Recognize Activities ,Fragments and Intents
CO 3	Understand Designing User Interface with Views
CO 4	Implement Data Persistence
CO 5	Gain knowledge about Location Based Services
Pre-requisites	

					]	Know	ledge	Level	S						
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinş	5
		(3/2/	/1 indic	ates the		CO / PC			-	2-mediu	m. 1-we	eak)			
СО	s	(2, 2,			KLs			,	POs			)	KI	LS	
									PO				2		
СО	1				2				PO				1		
									PO	3			2		
	PO 4 3														
CO	2		1 PO 5 2												
				PO 6 3											
	2		PO 7									2 3			
CO	3				2				PO P			2			
									PO 1			2			
СО	4				3				PO 1			1			
									PO 1	2		2			
									PO 1	3		3			
CO	5				2				PO 1				1		
									PO 1	5			2	,	
		(2)2					PO Ma		_		1	1 \			
		(3/2/	1 indic	ates the	e streng				-	2-mediu	m, 1-we	eak)			
COs		DO2	DO2	DO 4	DO7		-		tcome (	-	DO11	DO12	DO12	DO14	DO15
									PO12	PO13		PO15			
CO1	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3
CO2	2	3	2	1	2	1	2	1	2	2	3	2	1	3	2
CO3	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3
CO4	2	1	2	3	2	3	2	3	2	2	1	2	3	1	2
CO5	3	2	3	2	3	2	1	2	3	3	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	Getting Started With Android Programming	Periods	12								
II: A	What is Android? Obtaining the Required Tools - Launching your first Android Application - Using										
Unit - I	Android Studio for Android Development - Exploring the IDE - Using Co	ode Completion -	Debugging your								
	Application - Publishing your Application.										
	Activities ,Fragments and Intents	Periods	12								
	Understanding Activities -Linking Activities using Intents - Fragments - I	Displaying Notific	ation -Getting to								
Unit - II	know Android Users Interface : Understanding the Components of a Scre	en - Managing Ch	anges to screen								
	orientation - Creating user Interface Programmatically - Listening for UI	Notification.									
	Designing User Interface with Views	Periods	12								
Unit - III	Using Basic Views - Using Picker View - Using List View - Displaying F	Picture and Menus	with Views								
Unit - III	Using Image View to Display Picture -Using Menus with Views - Using V	Web View.									
	Data Persistence	Periods	12								
Unit - IV	Saving and Loading user Preference -Persisting Data to files -Creating an	d Using Database	s - Messaging:								
Unit - I v	SMS - Messaging -Sending Email.										
	Location Based Services	Periods	12								
Unit - V	Displaying Maps - Getting Location Data - Monitoring a Location -Devel	oping Android Se	rvices -Creating								
	your own Services.										
	Total Periods		60								

Text Books	
1	Beginning Android Programming with Android Studio – J.F.DiMarzio, Wrox , 2017
References	
1	Introduction to Android Application Development – Developer's Library, Joseph Annuzi, Jr. Lauren
	Darcy & Shane Conder, Addision-Wesley, Fourth Edition
2	Prasanna Kumar Dixit, "Android", Vikas Publishing House Private Ltd., Noida, 2014.
3	Head First Android Development A Brain Friendly Guide – Dawn Griffiths & David Griffiths,
	O'Rielly Publications, Second Edition
E-References	
1	https://developer.android.com/guide
2	https://www.tutorialspoint.com/android/index.htm
3	https://www.udemy.com/course/learn-android-application-development-y/
4	https://www.javatpoint.com/android-tutorial

	VIVEKANA	R	TOURnershard COMPARED Weekswam Discontage										
Programme	MCA	Programme Code	PC	A			Regulati	ions	2020-21				
Department	M.C.A	M.C.A Semester II											
20P2CAP03	.Net Program	nming Lab		riods Wee		Credit	Maximu	ım Mark	s				
		L	Т	Р	С	СА	ESE	Total					
		4 0 0 2 40 60											
COURSE OBJECTIVES	<ul> <li>Desig</li> <li>Desig</li> <li>ASP.2</li> </ul>	gn & develop .net bas gn and develop web s gn and develop databa Net RACTICALS	ervic	es u	sing		mple we	b appli	ications using				
1	Write a Prog	ram to perform vario	us sti	ing	ma	nipulation	function	S					
2	Using windo	ws application form,	creat	e a f	forr	n, place co	ontrols ar	nd man	nipulate data				
3	Write a prog	ram to create invento	ry co	ntro	l us	sing class	library						
4	Write a prog	ram to create Web Se	ervice	s Us	sing	g VB.Net.							
5	Write a prog	ram to create a screer	ı save	er us	ing	controls							
6	Create an Ac	tiveX program with	simpl	e ex	am	ple.							
7	-	ws Application: Desi checked list box.	gn E	mple	oye	e Details,	use SQL	Serve	r as back end				
8	Write a prog	ram to create an on-li	ine qu	ıiz u	sin	g content	page hole	der					
9	Write a prog	ram to retrieve Cook	ies in	forn	nati	on.							
10	Write a prog	ram for database con	nectiv	vity	to r	etrieve stu	udent info	ormatio	on				

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Programme	MCA	Programme Code	PC	A			Regulati	ons	2020-21					
Department	M.C.A	I.C.A Semester												
20P1CAP04	Python Progr	amming Lab		riods Weel	¢.	Credit	Maximu	m Mark	s					
			L	Т Р С		С	CA	ESE	Total					
			4	0	0	2	40	60	100					
COURSE OBJECTIVES	• Desig	<ul> <li>Design &amp; develop basic programs in Python</li> <li>Design and develop Synchronization, GUI Programs</li> </ul>												
	-	Design and develop classes and objects and simple applications in Python     LIST OF PRACTICALS												
1	Write a pytho	on program using Cor	ntrol	state	eme	ents								
2	Write a pytho	on program using Fur	nctior	ns ar	nd S	String Op	erations							
3	Write a pytho	on program using Lis	t, Tuj	ples	ano	d List con	nprehensi	ons						
4	Write a pytho	on program using Inh	eritai	nce										
5	Write a pytho	on program using Syr	nchro	niza	tio	n								
6	Write a pytho	on program using Tex	t Fil	es										
7	Write a pytho	on program using Gra	phic	al us	ser	Interfaces	5							
8	Write a pytho	on program using Exc	ceptio	onal	На	ndling								
9	Write a pytho	on program using Cla	sses	and	Ob	jects								
10	Write a pytho	on program using Cha	at Ap	plic	atic	ons								

A CONTRACT OF	VIVEKAN	ANDHA COLLEGE O	F ARTS A	ND SCIEN	CES FO	R	(A) 150 80012008						
0+3		WOMEN (AUT	ONOMOU	S)			CONTINUED WWW.bycomm						
NOWEN ENDOWERNES	*	Elayampalayam, Tiru	ichengode-63	7 205.	-								
Programm	ne MCA	Programme Code	P	CA	Regulat	tions	2020-21						
Departmer	nt	M.C.A		Semester			III						
			Periods	Credit	Maxim	um Ma	ırks						
20P2CAPH	R01 Miniproject I		per Week										
			L T P 5 0 0	C 2	CA 40	ESI 60							
COURSE OBJECTIV	• 10 de	velop simple application	n projects										
OBJECTIV	• To une	derstand the importance											
	To gather knowledge about various UML diagrams     LIST OF PRACTICALS												
		LIST	OF PRACE	TICALS									
FIRST R	REVIEW: (10 Marks)												
					,		,						
	oblem Identificati	on											
	oblem definition	reat											
	oject Title & Abst esentation	Tact											
	<b>REVIEW:</b>				(10 M	[arks]	)						
							, ,						
	oject Analysis	. <i>.</i> .											
2. De	esign & Module de	escription											
THIRD F	REVIEW:				(10 M	[arks]	)						
							ź						
	atabase & Code D	e											
-	stem Testing & In	-	( 117		1. 1.1	`							
3. DI	FD / Use Case Dia	gram/ System Flow Di	agram ( WI	nichever Aj	pplicable	e)							
FINAL R	EVIEW:				(10 M	arks	)						
	ocumentation												
-	esentation	(	at in -1- 1'	· · · · 1 ·		· - 1 `							
3. Fi	nai Project Report	( with executable form	at includin	g complete	source	code)							
Ex	ternal Marks Th	e Passing minimum sl	hall be 50%	% out of 60	marks	(30 N	(larks)						



NOMEN EMPOWERNEN		Elayampalayam, T	irucheng	ode-6	37 205.			
Programme	МСА	Programme Code		PC	CA	Regulat	tions	2021-2022
Department		M.C.A			Semester			3
Course Code	C	ourse Name	Perio per W	eek	Credit	Maxim		I
	A		L T 4 0	P	C	CA 25	ESH 75	
21P3CA09	A	NGULARJS	4 0	0	4	25	75	100
COURSE	To learn about v	arious concepts of AngularJ	S					
OBJECTIVES POs		PRC	GRAMM	IE OL	JTCOME			
PO 1		e of computing fundamenta opriate for the computing sp	-	-	-			
		ls from defined problems a					1	
PO 2		te, research literature, and s g fundamental principles of		•	1 01		0	
PO 3	components, or p	ate solutions for complex correspondences of the specifies of the specifie		-		-	•	
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the ir			• •	-		ysis and
PO 5	Create, select, ad	apt and apply appropriate tites, with an understanding	echniques	, reso	urces, and mo			ols to complex
PO 6		commit to professional ethic				onsibilities	s, and n	orms of
PO 7	Recognize the ne computing profe	ed, and have the ability, to ssional.	engage in	inde	pendent learnin	ng for cont	tinual de	evelopment as a
PO 8		wledge and understanding as a member and leader in a						
PO 9	computing activi	fectively with the computin ties by being able to compr ations, and give and unders	ehend and	•		• •		-
PO 10		assess societal, environmen and the consequential respo						
PO 11	-	rely as an individual and as			=			
PO 12	Identify a timely	opportunity and using inno the individual and society		pursu	e that opportu	nity to crea	ate valu	e and wealth for
PO 13		dge of computing to create		desig	ns and solutior	ns for com	plex pro	blems
PO 14		yse and synthesize scholarly		-				
PO 15	To develop scier demands	tific outlook that solves any	y problem	, enco	ompassing the	expected a	spectso	f market

COs	COURSE OUTCOME
CO 1	To acquire knowledge about Javascript and Angular JS
CO 2	To Learn about MVC
CO 3	Understand Directives and HTML Forms
CO 4	Recognize about services
CO 5	Gain knowledge about AngularJS animation
Pre-requisites	

					]	Know	ledge	Level	S						
1.Remer	nberi	ng, 2.1	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	5
		(3/2/	1 indic	ates the		CO / PC			-	2-mediu	m. 1-we	eak)			
CO	s	(2, 2,			KLs			,	POs			)	KI	Ls	
									PO				2		
СО	1				2				PO				1		
									PO	3			1	_	
	PO 4 2														
CO	2			1 PO 5 3											
				PO 6 1											
	2		PO 7         2           3         PO 8         3												
CO	3				3				PO P			2			
									PO 1				2		
СО	4				2				PO 1			1			
									PO 1	2		2			
									PO 1	3		3			
CO	5				2				PO 1				1		
									PO 1	5			2	2	
		(2)	(1 . 1	1	. 4		PO Ma			1.	1	1.)			
		(3/2/	1 indic	ates the	streng				-	2-mediu	m, 1-we	еак)			
COs		DO2	DO2	DO 4	DC7		-	me Ou			DO11	DO12	DC12	DO14	DO17
									PO12	PO13		PO15			
CO1	3	2	2	3	2	2	1	2	3	3	2	3	2	2	3
CO2	2	3	3	2	1	3	2	1	2	2	3	2	1	3	2
CO3	2	1	1	2	3	1	2	3	2	2	1	2	3	1	2
CO4	3	2	2	3	2	2	1	2	3	3	2	3	2	2	3
CO5	3	2	2	3	2	2	1	2	3	3	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

#### Indirect

1. Course End Delivery

	Introduction	Periods	12								
	JavaScript Introduction, The Basics of AngularJS Framework?, Download	ling and Installing	g AngularJS,								
	Browser pplication, Declarative vs. Procedural Programming, Directives a	and Expressions I	Directive?, What								
Unit - I	Are Expressions ? JavaScript Primer - Including Scripts on a Page, Statements, Functions, Parameters and										
	Return Values, Types and Variables, Primitive Types and Null, JavaScript Operators, Equality vs. Ide										
	Pre Objects - Creating Objects, Reading and Modifying an Objects Proper	rties, Adding M C	bjects,								
	Enumerating PropertiesArrays - Array Literals, Enumerating and Modifyi	ng Array Values,	Callbacks,								
	JSON										
	Introduction to MVC	Periods	12								
Unit - II	Design Patterns, Model View Controller Separation of Concerns, Why M	VC Matters, MVC	the AngularJ								
Unit - II	Way Introduction to Filters, Built-in Filters, The Number Filter AngularJS	S Modules - What	Is a Module?								
	Directives	Periods	12								
	Directives - The Basics of Directives, Using Directives, Built ngInclude, r	ngShow and ngHi	de, ngRepeat,								
Unit - III	Event Documentation, Creating a Custom Directive link Option, Build Ar	ngular Forms, Cor	trollers and								
Unit - III	Directives, filters, and scopes-time and run-time errors-Working with For	ms - HTML Form	s Overview, T								
	form Element submit, text, checkbox, password, radio Element, Model Bi	nding, AngularJS	Forms,								
	Validating Forms.										
	Server Communication	Periods	12								
	Services and Server Communication Service, The \$document Service, Wh	ny Use Services?	Communication								
Unit - IV	Handling Returned Data Organizing Views - Installing the ngRoute Modu	lle, Using URL R	outes								
	Parameters, Eager vs. Conservative Routes, Route Configuration Options										
	AngularJS Animation	Periods	12								
Unit - V	AngularJS Animation - Installing the Transforms, Transitions, Applying A	AnimationsTesting	g, Error								
Unit - v	Handling, Hide Unprocessed Templates, Minification and Bundling, Man	aginthe Build Pro	cess,								
	Deployment										
	Total Periods		60								

Text Books	
1	AngularJS Essentials- Rodrigo Branas, Packt Publishing Ltd Open Source, 2010
References	
1	Learn AngularJS Learn in 24 Hours – Alex Nordeen, 2020.
E-References	
1	https://www.tutorialspoint.com
2	https://www.javatpoint.com
3	www.w3schools.com



NOMEN EMPOWERMENT		Elayampalayam, 'I	l'irucheng	ode-6	37 205.			
Programme	МСА	Programme Code		PO	CA	Regulat	tions	2021-2022
Department		M.C.A			Semester	•		3
Course Code	(	Course Name	Peric per W	eek	Credit		um Mark	1
			L T	Р	С	CA	ESE	Total
21P3CA10	DA	ATA SCIENCE	4 0	0	4	25	75	100
COURSE	To learn and und	lerstand about the various c	concepts of	f data	science			
OBJECTIVES POs		PRO	OGRAMM	1E OL	JTCOME			
PO 1	Apply knowledg	e of computing fundament	als, compu	iting s	pecialization,	mathemati	cs, and d	omain
	knowledge appro	opriate for the computing sp	pecializati	on to	the abstraction	and conce	eptualizat	tion of
	computing mode	els from defined problems a	and require	ement	5			
PO 2	Identify, formula	ate, research literature, and	solve com	plex o	computing pro	blems reac	hing sub	stantiated
	conclusions usin	g fundamental principles o	f mathema	atics, c	computing scie	ences, and	relevant	domain
	disciplines							
PO 3	Design and eval	uate solutions for complex	computing	g prob	lems, and desi	gn and eva	luate sys	stems,
	components, or	processes that meet specifie	ed needs w	ith ap	propriate cons	sideration f	or public	health and
	safety, cultural,	societal, and environmental	l					
PO 4	Use research-bas	sed knowledge and research	n methods	inclu	ling design of	experimen	its, analy	sis and
	interpretation of	data, and synthesis of the i	nformation	n to pi	ovide valid co	onclusions.		
PO 5	Create, select, ad	lapt and apply appropriate	techniques	s, reso	urces, and mo	dern comp	uting too	ls to complex
	computing activ	ities, with an understanding	g of the lin	nitatio	ns			
PO 6		commit to professional ethic	ics and cyl	ber reg	gulations, resp	onsibilities	s, and not	rms of
	professional con							
PO 7	-	eed, and have the ability, to	engage in	inder	pendent learning	ng for cont	inual dev	velopment as a
	computing profe							
PO 8		owledge and understanding						
		as a member and leader in	a team, to	mana	ge projects and	d in multid	isciplina	ry
	environments.							
PO 9		fectively with the computing	•	•		•		-
		ities by being able to comp		1 write	e effective rep	orts, desigi	n docume	entation, make
	-	ations, and give and unders						
PO 10		assess societal, environmer						
	-	and the consequential respo			-	*	• •	
PO 11		vely as an individual and as	a member	r or le	ader in diverse	e teams and	d in mult	idisciplinary
	environments.				_			
PO 12		opportunity and using inno		pursu	e that opportu	nity to crea	te value	and wealth for
		f the individual and society	-					
PO 13		edge of computing to create		-				
PO 14	-	yse and synthesize scholar	-		-	-		
PO 15		ntific outlook that solves an	y problem	, enco	ompassing the	expected a	spectsof	market
	demands							

COs	COURSE OUTCOME
CO 1	To acquire knowledge about the basics of data science
CO 2	Recognize The data science process
CO 3	Learn about the fundamental components
CO 4	Implement Extracting Information
CO 5	To gain knowledge about Network Theory
Pre-requisites	

I.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesize           CO / PO / KL Mapping           CO / PO / KL Mapping           (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)           CO s         KLs           PO / KL Mapping           CO / PO / KL Mapping           CO s         KLs           PO 1         2           CO 1         2         PO 1         2           CO 2         1         PO 5         3           PO 6         1           PO 7         2           PO 10         2           PO 10         2         PO 10         2           PO 13         3         PO 12	ng
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	
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CO 1         2         PO 2         1           PO 3         1         PO 3         1           PO 4         2         2         1         PO 4         2           CO 2         1         PO 5         3         3         PO 6         1           PO 3         1         PO 5         3         3         1	
$\begin{array}{c c} & & & & & & & & & & & & & & & & & & &$	
CO 2         1         PO 5         3           PO 6         1           PO 6         1           PO 7         2           PO 8         3           PO 9         2           PO 9         2           PO 10         2           PO 11         1           PO 12         2           PO 13         3           CO 5         2	
PO 6         1           PO 7         2           PO 8         3           PO 9         2           PO 9         2           PO 10         2           PO 11         1           PO 12         2           PO 13         3           CO 5         2	
CO 3         3         PO 7         2           CO 3         3         PO 8         3           PO 9         2           PO 10         2           PO 10         2           PO 11         1           PO 12         2           PO 13         3           CO 5         2         PO 14	
CO 3         3         PO 8         3           PO 9         2           PO 9         2           PO 10         2           PO 11         1           PO 12         2           PO 13         3           CO 5         2	
PO 9         2           CO 4         2         PO 10         2           PO 11         1         1           PO 12         2         2           CO 5         2         PO 13         3	
CO 4         2         PO 10         2           PO 11         1         1           PO 12         2           PO 13         3           CO 5         2         PO 14         1	
CO 4         2         PO 11         1           PO 12         2         2           PO 13         3         3           CO 5         2         PO 14         1	
PO 13         3           CO 5         2         PO 14         1	
CO 5 2 PO 14 1	
PO 15 2	
CO / PO Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)	
Programme Outcome (POs)	
COs PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO	4 PO15
CO1         3         2         2         3         2         2         1         2         3         3         2         3         2	3
CO2         2         3         3         2         1         3         2         1         2         2         3         2         1	2
CO3         2         1         1         2         3         1         2         3         2         2         1         2         3	2
CO4         3         2         2         3         2         2         1         2         3         3         2         3         2         1	3
CO5     3     2     2     3     2     2     1     2     3     3     2     3     2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	Introduction	Periods	12								
I locit I	Data science in a big data world- Benefits and uses of data science and big	g data-Facets of d	ata - Structured								
Unit - I	data- Unstructured data-Natural language-Machine-generated data-Graph-	-based or network	data-Audio,								
	image, and video Streaming data.										
	The data science process	Periods	12								
Unit - II	Setting the research goal -Retrieving data -Data preparation -Data explora	tion -Data modeli	ng or model								
Unit - II	building -Presentation and automation - Cleansing, integrating, and transf	orming data - Exp	loratory data								
	analysis.										
	The Very Beginning: Got Math?	Periods	12								
	Exponentials, Logarithms, and Compounding- Normal Distribution -Poiss	son Distribution -	Moments of a								
Unit - III	continuous random variable - Combining random variables - Vector Alge	bra - Statistical Re	egression -								
	Diversification - Matrix Calculus - Matrix Equations.										
	Extracting Information	Periods	12								
Unit - IV	Framework - Algorithms - Extracting Data from Web Sources using APIs	- Text Classificat	tion								
	Network Theory	Periods	12								
Unit - V	Overview-Graph Theory -Features of Graphs -Searching Graphs - Strong	ly Connected Con	ponents-								
Unit - v	Dijkstraâ€ <sup>™</sup> s Shortest Path Algorithm - Degree Distribution - Network M	Aodels of System	ic Risk								
	Total Periods		60								

Text Books	
1	Davy Cielen, Arno D.B. Meysman, Mohamed Ali, "Introducing Data Science", Manning Publications, 2016
2	Sanjiv Ranjan Das, "Data Science: Theories, Models, Algorithms and Analytics", 2016.
References	
1	Avrim Blum, John Hopcroft, and Ravindran Kannan, "Foundations of Data Science", 2018
2	Joel Grus, "Data Science from Scratch", O'Reilly, 2015
E-References	
1	https://www.tutorialspoint.com
2	https://www.javatpoint.com
3	www.w3schools.com

Market and	VIVEKANA	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205.												
Programme	MCA	Programme Code	PC	A			Regulatio	ons	2021-22					
Department	M.C.A Semester II													
20P3CAP05	AngularJS La	ab		riods Weel	5	Credit	Maximur	n Mark	s					
				L T P		С	CA	ESE	Total					
			4	0	0	2	40	60	100					
1	LIST OF PR						, 11							
	LIST OF PR	RACTICALS												
1	Write a simp	le program using Ang	ular.	JS n	nod	ules and c	controllers	5						
2	Create a page	e using AngularJS that	t wil	l ad	d tv	vo numbe	rs							
3	Write a progr	am to perform arithm	etic	ope	rati	ons using	AngularJ	S exp	ressions					
4	Create an aut	omatic counter using	Ang	ular	JS									
5	Create a simp	ble calculator in Angu	larJS	5										
6	Implement T	ODO list using Angul	arJS											
7	Create a simp	ble pages or tabs using	g An	gula	rJS	9								
8	Create a Stud	ent Information form	with	n sul	omi	it and rese	t function	ality						
9	Implement C	lient side validation ir	n An	gula	ırJS	5								
10	Implement si	mple routing in Angu	larJS	S apj	plic	ation								

States and States	VIVEKAN	ANDHA COLLEGE O	F ARTS A	ND SCIEN	CES FO	R	60 8001 2008				
0+3		WOMEN (AUT	ONOMOU	S)			CERTIFIED Werestownerty Distonomenty				
WOWEN EMPOWER		Elayampalayam, Tiru	chengode-63	7 205.							
Program	me MCA	Programme Code	P	Regula							
Departme	ent	M.C.A		Semester			III				
			Periods	Credit	Maxim	um Ma	urks				
20P3CAP	PR02 Miniproject II				~ .						
			L T P 5 0 0								
WOMEN (AUTONOMOUS)     Image: Constraint of the sector of th											
OBJECTI	• To un	1									
To gather knowledge about various UML diagrams											
LIST OF PRACTICALS											
FIRST F	REVIEW:				(10 M	larks	)				
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		on									
		troot									
	-	llaci									
<ol> <li>Project Title &amp; Abstract</li> <li>Presentation</li> </ol>											
	•										
2. D	Design & Module d	escription									
THIRD	<b>REVIEW:</b>				(10 M	larks	)				
							-				
		e									
		-		hiaharran Ar		~)					
3. D	JFD / Use Case Dia	agram/ System Flow DI	agrani ( wi	nichevel Aj	ppiicable	e)					
FINAL I	<b>REVIEW:</b>				(10 M	larks	)				
	Documentation										
-	resentation	t ( with avagutable form	at includin	a complete	CO11#202	ooda)					
<b>3.</b> F	паг гтојест керог	t ( with executable form	at motuum	g complete	source	coue)					
E	xternal Marks Th	e Passing minimum sl	nall be 50%	% out of 60	marks	(30 N	(larks)				

	E	VIVEKAN	ANDHA COLLEGE O WOMEN (AUT			CES FC	DR	ISO SOCI 2006 TOVRAvirand COTTAILO			
POWEN ENPO	OWERNEN		Elayampalayam, Tiru	ichengode-6	37 205.						
Progra	amme	MCA	Programme Code	-	PCA	Regula	tions	2020-21			
Depar	tment		M.C.A		Semester	r		IV			
20P4C	APR03	Core Course P Dissertation an		Periods per Week	Credit	Maxim	um Ma	ırks			
						CA	ESI				
				0 0 0	18	50	15	0 200			
COURSE OBJECTIVES       • To develop simple application projects • To understand the importance of documentation • To gather knowledge about various UML diagrams											
			LIST	OF PRAC	CTICALS						
FIRST	F REV	IEW:				(10 N	larks	)			
1. 2. 3. 4.	Proble	em Identification em definition et Title & Abst ntation	-								
SECO	ND RI	EVIEW:				(10 M	larks	)			
1. 2.	•	et Analysis n & Module de	escription								
THIR	D REV	TEW:				(10 M	larks	)			
1. 2. 3.	System	-	esign nplementation 1gram/ System Flow Di	agram ( V	Vhichever A	pplicabl	e)				
FINA	L REV	IEW:				(20 M	larks	)			
	Preser		( with executable form	nat includi	ng complete	e source	code)				
]	Extern	al Marks The	Passing minimum sh	all be 509	% out of 150	0 marks	(75 N	Marks)			



NOMEN EMPOWERMEN		Elayampalayam, T	irucheng	gode-6	37 205.			
Programme	МСА	Programme Code		PO	CA	Regula	tions	2021-2022
Department		M.C.A			Semester			3
Course Code	C	Course Name	Peri per W	/eek	Credit		um Mar	
			L T		C	CA	ESE	
21P1CAE01	DIGIT	AL MARKETING	4	0 0	4	25	75	100
COURSE	To learn about co	oncepts and strategies of va	rious soc	ial me	dia marketing.			
OBJECTIVES POs		PRC	GRAM	ME OU	JTCOME			
PO 1	knowledge appro	e of computing fundamenta opriate for the computing sp ls from defined problems a	ecializat	ion to	the abstraction			
PO 2	Identify, formula	te, research literature, and a g fundamental principles of	solve con	nplex o	computing pro		0	
PO 3	components, or p	ate solutions for complex or processes that meet specifie ocietal, and environmental	-	<b>U</b> I		e	•	
PO 4		ed knowledge and research data, and synthesis of the ir			• •	-		ysis and
PO 5	Create, select, ad	apt and apply appropriate t ties, with an understanding	echnique	s, reso	urces, and mo			ols to complex
PO 6		commit to professional ethi				onsibilities	s, and no	orms of
PO 7		eed, and have the ability, to	engage i	n indej	pendent learnin	ng for cont	tinual de	evelopment as a
PO 8	-	wledge and understanding as a member and leader in a		-		-	-	
PO 9	computing activi	fectively with the computin ties by being able to compr ations, and give and unders	ehend an					
PO 10	-	assess societal, environmen and the consequential respo						
PO 11	-	rely as an individual and as						
PO 12	1	opportunity and using inno the individual and society		pursu	e that opportu	nity to crea	ate value	e and wealth for
PO 13	To apply knowle	dge of computing to create	effective	desig	ns and solution	ns for com	plex pro	blems
PO 14	To identify, anal	yse and synthesize scholarl	y literatu	re rela	ting to the field	d of Comp	uter Sci	ence
PO 15	To develop scien demands	tific outlook that solves an	y problen	n, enco	ompassing the	expected a	spectso	f market

COs	COURSE OUTCOME
CO 1	To acquire knowledge Marketing in the Digital World
CO 2	Recognize Operational Digital Marketing
CO 3	To gain knowledge about ecommerce applications
CO 4	Implement Advertising Online
CO 5	Understand Marketing on Social Media
Pre-requisites	

					J	Know	ledge	Level	S						
1.Reme	nberi	ng, 2.1	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E <sup>-</sup>	valuat	ing, 6.	Synth	esizinĮ	5
		(3/2/	1 indic	ates the		CO / PC			-	2-mediu	m 1-we	eak)			
СО	s	(0/2/			KLs			511, 5 50	POs			Juity	KI	Ls	
	5								PO				2		
CO	1				2				PO				1		
									PO	3			2	2	
									PO				2		
CO	2				1				PO				3		
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	-								PO				3		
CO	3		3				PO 8 PO 9				2				
								PO 10					3		
CO	4				2				PO 1				1		
									PO 1				2		
									PO 1	3			3	}	
CO	5				2				PO 1				1		
									PO 1	5			2	2	
		(2)2	(1 • 1•	1			PO Ma				1	1 \			
		(3/2/	1 indic	ates the	e streng				-	2-mediu	m, 1-we	eak)			
COs	PO1	PO2	PO3	PO4	DOS	1	PO7	me Ou PO8			PO11	PO12	PO13	PO14	DO15
001					PO5	PO6			PO9	PO10					PO15
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO2	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2
CO3	2	1	2	2	3	2	1	3	2	3	1	2	3	1	2
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus										
	Marketing in the Digital World	Periods	12								
	Introduction-Digital Transformation-Programmatic Marketing-Artificial Intelligence. Digital										
Unit - I	Customers:Introduction-Online Buying Behaviour-Privacy. Marketing go	es Digital: Person	alization-Viral								
	Marketing-Content Marketing-Influencers-Affiliate Marketing-Startegic I	Digital Marketing	-Digital								
	Marketing Objectives.										
	Search Engine Optimization	Periods	12								
	Introduction-How search engine works-Keyword selection-Onsite optimiz	zation-Off-site									
Unit - II	optimization-Strategic Search Engine Optimization-Third party search En	gine Ranking. We	ebsite								
	Development: The Basics-Content Development -B2B Website-The Glob	al Web Presence.									
	E-Commerce Periods										
Unit - III	Introduction-Multichannel retailing-Fulfillment-Comparison shopping en	gines, e-market pl	aces, third-party								
Unit - III	shopping websites-Third party websites.										
	Advertising Online	Periods	12								
	Introduction-Programmatic advertising-Objectives and management-onlir	ne and formats-sea	arch								
Unit - IV	advertising-network advertising-Landing pages. Email Marketing: Email	is a direct mediun	n for marketing-								
	Email is a direct medium for marketing messages-Email newsletters.										
	Marketing on Social Media	Periods	12								
	Introduction-Blogging-Consumer Reviews and Rating-Social Networking	g-Social Sharing-S	Social Media								
Unit - V	Service and Support-Strategic Marketing on social media-Measure and M	onitor. Metrics ar	d Analytics:								
	Introduction-How analytics presented and used.										
	Total Periods		60								

Text Books	
1	Digital Marketing – A Practical Approach , Alan Charlesworth, Third Edition,2018
References	
1	Understanding Digital Marketing Marketing strategies for engaging the digital generation-Damian Ryan &
	Calvin Jones, 2009
2	Digital Marketing Strategy, Implementation & Practices-Dave Chaffey & Fiona Ellis-Chadwick, Pearson
	Edition, 2016.
E-References	
1	https://www.tutorialspoint.com
2	https://www.javatpoint.com
3	www.w3schools.com



NOMEN EMPOWERMENT		Elayampalayam, T	irucheng	ode-6	37 205.											
Programme	MCA         Programme Code         PCA         Regulations															
Department		M.C.A			Semester	•		1								
Course Code	(	Course Name	Perio per W		Credit		um Mar									
21P1CAE02	BLOCK CH	AIN TECHNOLOGIES	L T 4 0		C 4	CA 25	ESE 75	E Total								
COURSE	To learn about th	ne various concepts of block	chain tec	hnolo	gies and unde	rstand the	cryptoci	urrency								
OBJECTIVES POs		PROGRAMME OUTCOME														
PO 1 PO 2	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														
	-	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	components, or j	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, and environmental														
PO 4	Use research-bas	ed knowledge and research data, and synthesis of the ir			• •	-		ysis and								
PO 5	Create, select, ac	lapt and apply appropriate to ties, with an understanding	echniques	, reso	urces, and mo			ols to complex								
PO 6		commit to professional ethic				onsibilities	s, and no	orms of								
PO 7	-	eed, and have the ability, to	engage in	inde	pendent learnin	ng for cont	tinual de	evelopment as a								
PO 8		Demonstrate knowledge and understanding of the computing and management principles and apply these to ones own work, as a member and leader in a team, to manage projects and in multidisciplinary														
PO 9	computing activity	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, and give and understand														
PO 10		assess societal, environment and the consequential respo														
PO 11	-	vely as an individual and as			-	1										
PO 12		opportunity and using inno f the individual and society		pursu	e that opportu	nity to crea	ate value	e and wealth for								
PO 13	To apply knowle	dge of computing to create	effective	desig	ns and solution	ns for com	plex pro	blems								
PO 14	-				-											
PO 15	To develop scier demands	tific outlook that solves any	/ problem	, enco	ompassing the	expected a	spectso	To identify, analyse and synthesize scholarly literature relating to the field of Computer Science To develop scientific outlook that solves any problem, encompassing the expected aspectsof market demands								

COs	COURSE OUTCOME
CO 1	To acquire knowledge introduction to cryptography and cryptocurrencies
CO 2	Recognize Bit coin Achieves Decentralization
CO 3	Apply Mechanics of Bit coin
CO 4	Understand How to Store and Use Bit coins
CO 5	To Learn about Community, Politics, and Regulation
Pre-requisites	

					]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5
		(3/2)	/1 indic	ates the				Mappin	-	-mediu	m, 1-we	ak)			
CO	s	(3/2/			KLs			511, 5 51	POs		<u> </u>	Juk)	KI	s	
	5								PO				2		
СО	1				2				PO				1		
									PO				2		
									PO	4			3		
CO	2				1				PO :				2		
									PO			3			
~~	-							PO 7				1			
CO	3		2					PO 8 PO 9				2			
								PO 10				3			
CO	4		3					PO 11					2		
	-							PO 12				2			
								PO 13				3			
CO	5		2					PO 14				2			
				PO 15 2							2				
		(2)					PO Ma		-						
	1	(3/2/	1 indic	ates the	e streng						m, 1-we	eak)			
COs		DCT	DCC	DC /	<b>D</b> C 7	1		me Ou	-		DOIL	DOIT	DOIT	DCII	DC 1-
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		PO15
CO1	3	2	3	2	3	2	2	3	2	2	3	3	2	3	3
CO2	2	3	2	1	2	1	1	2	3	1	2	2	1	2	2
CO3	3	2	3	2	3	2	2	3	2	2	3	3	2	3	3
CO4	2	1	2	3	2	3	1	2	1	3	2	2	3	2	2
CO5	3	2	3	2	3	2	2	3	2	2	3	3	2	3	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus									
	Introduction to Cryptography & Crypto currencies	Periods	12							
II:4 I	Cryptographic Hash Functions- Hash Pointers and Data Structures - Digital Signatures - Public Keys a									
Unit - I	Identities -A Simple Crypto currency.									
	How Bit coin Achieves Decentralization	Periods	12							
Unit - II	Centralization vs. Decentralization Distributed consensus - Consensus with	thout identity usin	ig a block							
Unit - II	chain-Incentives and proof of work.									
	Mechanics of Bit coin Periods 12									
Unit - III	Bit coin transactions - Bit coin Scripts - Applications of Bitcoin scripts - I	Bit coin blocks -T	he Bit coin							
Unit - III	network-Limitations and improvements.									
	How to Store and Use Bit coins	Periods	12							
Unit - IV	Simple Local Storage - Hot and Cold Storage -Splitting and Sharing Keys	s - Online Wallets	and Exchanges							
Unit - I v	Payment Services - Transaction Fees - Currency Exchange Markets.									
	Community, Politics, and Regulation	Periods	12							
Unit - V	Consensus in Bit coin - Bitcoin Core Software - Stakeholders: Whos in C	harge? - Roots of	Bitcoin -							
Unit - V	Governments Notice Bitcoin - Anti Money―Laundering - Regulation -	New Yorks Bit Li	cense Proposal							
	Total Periods		60							

Text Books	
1	Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder, Bitcoin and
	cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016.
References	
1	PEDRO FRANCO, Understanding Bitcoin - Cryptography, engineering, and economics, First Edition, John
	Wiley & Sons Ltd, United Kingdom, 2015.
2	Tiana Laurence, Blockchain For Dummies, John Wiley & Sons, Inc., Hoboken, New Jersey, 2017
3	BikramadityaSinghal, GautamDhameja, PriyansuSekhar Panda, Beginning Blockchain-A Beginners Guide
	to Building Blockchain Solutions, Apress Media, LLC, New York, 2018
E-References	
1	https://www.edureka.co/blog/blockchain-tutorial/
2	https://blockgeeks.com/guides/what-is-blockchain-technology/
3	https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology



NOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	ae-o	37 205.						
Programme	MCA	MCA Programme Code PCA Regulations 2021-2									
Department		M.C.A			Semester			1			
			Perio	ls	Credit	Maxim	um Mark	TS			
Course Code	C	ourse Name	per We	ek							
			L T	Р	С	CA	ESE	Total			
21P1CAE03	BUSINES	SS INTELLIGENCE	4 0	0	4	25	75	100			
COURSE	To learn about th	e various concepts of busin	ess intellig	gence	e such as proje	ct planning	g, data ex	traction,			
OBJECTIVES	transformation, e	nterprise reporting etc.		-			-				
POs		PROGRAMME OUTCOME									
PO 1	Apply knowledg	e of computing fundamental	ls, comput	ing s	pecialization,	mathemati	ics, and d	lomain			
	knowledge appro	priate for the computing spe	ecializatio	n to	the abstraction	and conce	eptualiza	tion of			
		ls from defined problems ar									
PO 2	•	te, research literature, and s									
		g fundamental principles of	mathemat	ics, c	computing scie	ences, and	relevant	domain			
	disciplines			1		1	1				
PO 3	-	ate solutions for complex c		-		-	•				
		processes that meet specified	l needs wi	th ap	propriate cons	ideration f	or public	c health and			
PO 4	-	ocietal, and environmental	methods	nelu	ding design of	avnarimar	te analy	sis and			
104		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		-				ls to complex			
		ties, with an understanding	-			ľ	8	I			
PO 6		commit to professional ethic				onsibilities	s, and no	rms of			
	professional com	puting practice.									
PO 7	Recognize the ne	ed, and have the ability, to	engage in	inde	pendent learnin	ng for cont	tinual dev	velopment as a			
	computing profe										
PO 8		wledge and understanding of		-		-	-				
		as a member and leader in a	team, to r	nana	ge projects and	l in multid	lisciplina	ry			
<b></b>	environments.						-				
PO 9		fectively with the computing									
		ties by being able to compre-		write	e effective repo	orts, desigi	n docume	entation, make			
PO 10	-	ations, and give and underst assess societal, environment		sofo	ty logal and a	ulturalica	uge withi	n local and			
FO 10		and the consequential response									
PO 11	-	rely as an individual and as a									
1011	environments.	ery us an marriadar and us t		01 10		counts un	a ili iliait	i diserprinary			
PO 12		opportunity and using inno-	vation to r	oursu	e that opportu	nity to crea	ate value	and wealth for			
		the individual and society a			11						
PO 13		dge of computing to create	-	lesig	ns and solutior	ns for com	plex prob	olems			
PO 14	To identify, anal	yse and synthesize scholarly	literature	relat	ting to the field	d of Comp	uter Scie	nce			
PO 15	To develop scien demands	tific outlook that solves any	problem,	enco	ompassing the	expected a	spectsof	market			

COs	COURSE OUTCOME						
CO 1	Describe the steps and stages involved in Business Intelligence Solutions						
CO 2	Identify business requirements and develop project management plan for BI Projects.						
CO 3	Identify and apply suitable analytical techniques to design business problems.						
CO 4	Apply the concepts of Data Extraction, Transformation and loading for Data Integration						
CO 5	Describe Balanced Scorecard, Enterprise Dash Board and Enterprise Reporting Techniques						
Pre-requisites							

					]	Know	ledge	Level	S														
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E <sup>.</sup>	valuat	ing, 6.	Synth	esizinį	5								
		(3/2)	1 indic	ates the				Mappin	-	2-mediu	m 1-we	eak)											
СО	s	(0, 2,			KLs				POs				KI	Ls									
									PO				2										
СО	1				2				PO				1										
									PO	3			2	2									
									PO				2										
CO	2				1				PO				3										
									PO			2											
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CO	3		3					PO 8 PO 9				3 2											
								PO 10				3											
CO	4		2					PO 10				1											
			_					PO 12				2											
								PO 13				3											
CO	5		2					PO 14				1											
								PO 15				2											
							PO Ma																
		(3/2/	1 indic	ates the	streng				-	2-mediu	m, 1-we	eak)											
COs		I		1		r		me Ou	-	. ,		1		1	1								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13										
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3								
CO2	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2								
CO3	2	1	2	2	3	2	1	3	2	3	1	2	3	1	2								
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3								
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3								
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Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	INTRODUCTION TO BUSINESS INTELLIGENCE	Periods	12									
	Business Intelligence Definition- BI Decision Support Initiatives- Development Approaches: Traditional											
TT. 1 T	Development Approach, Cross Organizational Development Approach - r	igineering Stages	and the									
Unit - I	Development Steps - Parallel Development Tracks - BI Project Team Stru	cture. Business C	Case Assessment									
	Business Justification Business Drivers- Business Analysis Issues- Cost-E	Benefit Analysis-	Risk									
	Assessment- Business Case Assessment Activities- Deliverables											
	BI PROJECT PLANNING AND REQUIREMENTS DEFINITION	Periods	12									
	Project Planning: Managing the BI Project-Defining the BI Project-Planni	ng the BI Project	-Project									
Unit - II	Planning Activities-Deliverables - Roles. Project Requirements Definition	: General Busines	ss Requirements									
	Project Specific Requirements - Project Requirements Definition Activitie	es - Deliverables-	Roles									
	DATA ANALYSIS AND APPLICATION PROTOTYPING	Periods	12									
	Data Analysis: Business Focused Data Analysis - Top-Down Logical Data Modeling- Bottom Up Source											
Unit - III	Data Analysis- Data Cleansing- Data Analysis Activities Application Prototyping: Purposes of Prototyping											
	Best Practices for Prototyping- Types of Prototypes- Building Successful Prototypes- Application											
	Prototyping Activities											
	EXTRACT/TRANSFORM/LOAD DESIGN AND DEVELOPMEN	Periods	12									
	ETL Design: Implementation Strategies- Preparing for the ETL Process- I	Designing the Ext	ract Programs -									
Unit - IV	Designing the Transformation Programs- Designing the Load Programs-D	Designing the ETL	Process Flow-									
Unit - I v	Evaluating ETL Tools- ETL Design ActivitiesETL Development: Source Data Transformation -											
	Reconciliation- Peer Reviews- ETL Testing- Formal Test Plan ETL Deve	lopment Activitie										
EASURES, ME	TRICS, KPIs PERFORMANCE MANAGEMENT AND ENTERPRISE R	EPO <b>R</b> THINGS IN B	I 12									
	Understanding Measures and Performance-Terminologies-Attributes of ge	ood metrics-SMA	RT test-Supply									
	Chain Associated with metrics-"Fact-Based Decision Making" and KPIs-J	KPI Usage-Source	es of Business									
Unit V	Metrics and KPIs-Connecting the Dots: Measures to Business Decisions Enterprise Reporting Perspectives											
Unit - V	Metrics and KPIs-Connecting the Dots: Measures to Business Decisions H	Enterprise Reporti										
Unit - V	Metrics and KPIs-Connecting the Dots: Measures to Business Decisions E -Common Report Layout Types-Balanced Scorecard-Dashboard- Balance	1 1	0 1									

Text Books	
1	Larissa Terpeluk Moss, S. Atre, "Business Intelligence Roadmap: The Complete Project Lifecycle for
	Decision-support Applications", Addison-Wesley Professional, 2003.
2	RN Prasad and Seema Acharya ,"Fundamentals of Business Analytics", Second Edition, Wiley India ,2016.
References	
1	David Loshin, "Business Intelligence", Second Edition, Elsevier Science and Technology, 2012.
2	Mike Biere, "Business Intelligence for the Enterprise", Pearson, 2010
E-References	
1	https://www.tutorialspoint.com
2	https://www.javatpoint.com
3	www.w3schools.com



WOMEN EMPOWERMENT	Elayampalayam, Tiruchengode-637 205.												
Programme	МСА	Programme Code		PC	CA	Regulat	ions	2021-2022					
Department		M.C.A			Semester			1					
Course Code	C	Periods     Credit     Maximum Marks       Course Name     per Week     Image: Course Name       L     T     P     C     CA     ESE     Total											
21P1CAE04	LIICCALSLIotaMULTIMEDIA TECHNOLOGIES40042575100												
COURSE	To learn about va	arious multimedia technolog	gies										
OBJECTIVES POs		PRO	GRAMMI	EOU	JTCOME								
PO 1	knowledge appro	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain nowledge appropriate for the computing specialization to the abstraction and conceptualization of omputing models from defined problems and requirements											
PO 2		te, research literature, and s g fundamental principles of	-				-						
PO 3	components, or p	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, and environmental											
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 to ties, with an understanding	-			dern compu	uting too	ols to complex					
PO 6	Understand and or professional com	commit to professional ethic puting practice.	s and cybe	er reg	gulations, resp	onsibilities	, and no	orms of					
PO 7	Recognize the ne computing profe	eed, and have the ability, to ssional.	engage in i	ndej	pendent learnin	ng for cont	inual de	evelopment as a					
PO 8	Demonstrate kno	wledge and understanding on a member and leader in a			0	-	-	11.0					
PO 9	computing activi	fectively with the computing ties by being able to compre- ations, and give and underst	ehend and	•		•		-					
PO 10	1	assess societal, environment and the consequential respon											
PO 11	-	rely as an individual and as			=								
PO 12		opportunity and using inno the individual and society a	-	ursu	e that opportu	nity to crea	te value	e and wealth for					
PO 13	To apply knowle	dge of computing to create	effective d	esigi	ns and solution	ns for comp	olex pro	blems					
PO 14 PO 15		yse and synthesize scholarly tific outlook that solves any			-								
	demands		r.coloni,		pussing uit	peoloa u							

COs	COURSE OUTCOME
CO 1	To acquire knowledge Digital Multimedia
CO 2	Recognize Mobile Multimedia Communications
CO 3	Learn about Third Generation (3G) Cellular Mobile Networks
CO 4	Gain knowledge in Discovering Multimedia Services and Contents in Mobile Environments
CO 5	Analyze Current Status of Mobile Wireless Technology and Digital Multimedia Broadcasting
Pre-requisites	

					]	Know	ledge	Level	s						
1.Remer	nberi	ng, 2.1	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5
		(3/2)	1 indic	ates the				Mappin	-	2-mediu	m 1-w	ak)			
COs		(3/2/			KLs			511, 5 51	POs		<u> </u>	Juk)	KI	s	
	,				1125				PO				2		
CO	1				2				PO				1		
									PO				2		
									PO	4			2	2	
CO	2				1				PO :				3		
								PO 6				2			
	-							PO 7				3			
CO	3		3					PO 8 PO 9				3			
					PO 9 PO 10						3				
CO	4		2					PO 11					1		
									PO 1				2		
								PO 13					3	;	
CO	5		2					PO 14				1			
								PO 15				2			
				_			PO Ma								
		(3/2/	1 indic	ates the	e streng					2-mediu	m, 1-we	eak)			
COs	L						-	me Ou		1					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13		PO15
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO2	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2
CO3	2	1	2	2	3	2	1	3	2	3	1	2	3	1	2
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Digital Multimedia	Periods	12									
	Indexing and retrieval of Multimedia - Delivery of Multimedia - Streaming Multimedia - Archiving of											
Unit - I	Multimedia. Multimedia Instruction: Multimedia Instruction Design Method - conduct task analysis -											
	Conduct Information analysis - Select Media - Media Selection Guideline	s -Design the Pre	sentation -									
	Future trends.											
	Introduction to Mobile Multimedia Communications	Periods	12									
Unit - II	Generations of Mobile Multimedia Networks- First Generation (1G) Cellular Mobile											
Unit - II	Networks-AMPS-TACS-NMT- Second Generation (2G) Cellular Mobile	networks-GSM-I	DAMPS-PDC									
	3G Networks	Periods	12									
	Third Generation (3G) Cellular Mobile Networks- HCS- Global Roaming	-Radio Spectrum	- FMC- Sales									
Unit - III	Force Automation-VoIP Mobile-Mobile TV-Video Calling- Fourth Gener	ration (4G) Cellul	ar Mobile									
	Networks-Key Challenges of Mobile Terminals-Key Challenges of a Network System-Key Challenges of											
	Mobile Services											
	Discovering Multimedia Services and Contents in Mobile Environments	Periods	12									
	Discovering Mobile Multimedia Services and Contents in Infrastructure Based Environments - Centralized											
Unit - IV	Service Directory Model- SLP- JINI- INS- Distributed Service Directories Model - other Issues in service											
Unit - I v	discovery- Asynchronous Service Discovery- Semantic Service Discovery- Discovering Multimedia											
	Services and Contents in Ad Hoc Environments- Broadcast-based approaches - Geographic Service											
	Location approaches - Cluster based Solutions - Scalability Issue in Service Location.											
Cu	rrent Status of Mobile Wireless Technology and Digital Multimedia Broadca	stingPeriods	12									
Unit - V	Wireless Mobile Technologies: Current Status and Concepts- Digital Mul	timedia Broadcas	ting: Current									
	Status And Concepts											

Text Books	
1	Syed Mahbubur Rahman, "Multimedia Technologies: Concepts, Methodologies, Tools, and Applications",
	Vol.1, IGI Global-InformatIon ScIence 2008
References	
1	Ze-Nian Li and Mark S. Drew, "Fundamentals of Multimedia", Pearson Education International 2004
2	Margherita Pagani, "Encyclopedia of Multimedia Technology and Networking", Second Edition,
	Information Science reference, 2009.
E-References	
1	https://www.tutorialspoint.com
2	https://www.javatpoint.com
3	www.w3schools.com





NOMEN EMPOWERMEN		Elayampalayam, Ti	ruchengo	)de-6	57 205.							
Programme	MCA	Programme Code		Р	CA	Regula	tions	2021-2022				
Department		M.C.A			Semester			3				
	Periods Credit Maximum Marks											
Course Code	C	course Name	per We	eek								
			LT	P	С	CA	ESE	Total				
	Clo											
21P2CAE05	Cloud Computing         4         0         0         4         25         75         100											
COURSE	To understanding	g cloud computing and a sys	tematic k	nowl	edge of the fur	ndamental						
OBJECTIVES	technologies,arch	nitecture, and security and to	o learn ho	w to	use Cloud Serv	vices.						
POs		DDO	CDAMM	ΕOI	JTCOME							
POS												
PO 1		e of computing fundamental	· •	U	• ·							
	-	ge appropriate for the compu				traction ar	nd concep	tualization of				
		ls from defined problems an										
PO 2		te, research literature, and s	-	-			-	1 1 /				
	-	clusions using fundamental	principles	s of n	hathematics, co	omputing s	sciences, a	and relevant				
PO 3	domaindisciplines Design and evaluate solutions for complex computing problems, and design and evaluate											
FO 5	e e		1 0			0		or public health				
	systems, components, or processes that meet specified needs with appropriate consideration for pul andsafety, cultural, societal, and environmental											
PO 4	Use research-based knowledge and research methods including design of experiments, analysis											
-	and and interpretation of data, and synthesis of the information to provide valid conclusions.											
PO 5	_	apt and apply appropriate te			-			ls to complex				
	computing activi	ties, with an understanding	of the lim	itatio	ns							
PO 6	Understand and o	commit to professional ethic	s and cyb	er re	gulations, resp	onsibilitie	s, and nor	ms				
	-	omputing practice.										
PO 7		ed, and have the ability, to	engage in	inde	pendent learnii	ng for cont	tinual dev	elopment as a				
	computing profes											
PO 8		wledge and understanding of		-	• •	-	-	l apply these to				
	one $\tilde{A}$ ¢ $\hat{a}$ , $\neg \hat{a}$ ,,¢s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.											
PO 9	1 7				and with sociat	tu at larga	about					
FO 9	Communicate effectively with the computing community, and with society at large, about complexcomputing activities by being able to comprehend and write effective reports, design											
	documentation, makeeffective presentations											
PO 10		assess societal, environment	al, health	safe	ty, legal, and c	ultural iss	ues withii	n local and				
1010	-	and the consequential respon										
PO 11	-	rely as an individual and as a										
	multidisciplinary	-										
PO 12	Identify a timely	opportunity and using inno-	vation to	pursu	e that opportu	nity to crea	ate value	and wealth for				
	the betterment of	the individual and society a	at large.									
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 a	spects of					
	marketdemands.											

COs	COURSE OUTCOME
CO 1	Introduce the broad perceptive of cloud architecture and model
CO 2	Cloud computing fundamental issues, technologies, applications and implementations
CO 3	Understanding the key dimensions of the challenge of Cloud Computing
CO 4	Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft
	Azure and Amazon Web Services and other businesses cloud applications
CO 5	Provide sufficient knowledge foundation to enable further study and research
Pre-requisites	

# Knowledge Levels

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

	Aappin m. 3-st	-						
		rong, 2	e-mediu	m, 1-we	eak)			
	POs				KLs			
		PO	1			2	,	
		PO	2			4		
		PO 3	3			3		
		PO 4	1			3		
		PO S	5			2		
	PO 8				2			
	nning	101	5			5		
-		rong 2	-mediu	m 1-we	eak)			
				, 1	uir)			
PO7				PO11	PO12	PO13	PO14	PO15
2	3	2	2	3	2	2	3	2
1	2	3	3	2	3	3	2	3
1	2	3	3	2	3	3	2	3
2	3	2	2	3	2	2	3	2
1	2	3	3	2	3	3	2	3
n C	relation pgramm PO7 2 1 1 2 2	Operative Out           PO7         PO8           2         3           1         2           1         2           2         3	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PO 9           PO 10           PO 11           PO 12           PO 13           PO 14           PO 15           O Mapping           relation, 3-strong, 2-medium           ogramme Outcome (POs)           PO7         PO8         PO9         PO10           2         3         2         2           1         2         3         3           2         3         2         2	$\begin{tabular}{ c c c c c } \hline PO 2 & & & PO 3 & & PO 4 & & PO 5 & & PO 6 & & PO 7 & & PO 8 & & PO 9 & & PO 9 & & PO 10 & & PO 11 & & PO 11 & & PO 12 & & PO 11 & & PO 12 & & & PO 13 & & & PO 14 & & & PO 15 & & & & \\ \hline PO 10 & & PO 11 & & & PO 12 & & & & & & \\ \hline PO 12 & & PO 13 & & & & & & & & \\ \hline PO 13 & & PO 14 & & & & & & & & \\ \hline PO 15 & & & & & & & & & & \\ \hline O Mapping & relation, 3-strong, 2-medium, 1-we obgramme Outcome (POs) & & & & & & & \\ \hline PO7 & PO8 & PO9 & PO10 & PO11 & & & & & \\ \hline 2 & 3 & 2 & 2 & 3 & & & & \\ \hline 1 & 2 & 3 & 3 & 2 & & & & \\ \hline 1 & 2 & 3 & 2 & 2 & & & & & \\ \hline 2 & 3 & 2 & 2 & & & & & & \\ \hline \end{array}$	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 15         O           Mapping         relation, 3-strong, 2-medium, 1-weak)           ogramme Outcome (POs)         PO11           PO7         PO 8           PO7         PO 13           PO 14         PO 15           O Mapping         relation, 3-strong, 2-medium, 1-weak)           ogramme Outcome (POs)         PO11           PO7         PO8         PO9         PO10           PO1         PO11         PO12         3           2         3         2         3         2           1         2         3         2         3           2         3         2         3         2	PO 2         4           PO 3         3           PO 4         3           PO 5         2           PO 6         2           PO 7         3           PO 9         3           PO 10         3           PO 11         2           PO 12         3           PO 13         3           PO 14         2           PO 15         3           O Mapping         2           PO7         PO8           PO9         3           Q         PO13           Q         PO14           PO 15         3           O Mapping         2           relation, 3-strong, 2-medium, 1-weak)         2           O mapping         2           Q         Q         PO10           PO7         PO8         PO9           PO10         PO11         PO12           PO13         2         3         2           Q         Q         Q         Q           PO7         PO8         PO9         PO10           PO11         PO12         PO13           Q	$\begin{tabular}{ c c c c c c } \hline PO 2 & 4 \\ \hline PO 3 & 3 \\ \hline PO 3 & 3 \\ \hline PO 3 & 3 \\ \hline PO 4 & 3 \\ \hline PO 5 & 2 \\ \hline PO 5 & 2 \\ \hline PO 6 & 2 \\ \hline PO 6 & 2 \\ \hline PO 6 & 2 \\ \hline PO 7 & 3 \\ \hline PO 8 & 2 \\ \hline PO 9 & 3 \\ \hline PO 10 & 3 \\ \hline PO 11 & 2 \\ \hline PO 12 & 3 \\ \hline PO 12 & 3 \\ \hline PO 12 & 3 \\ \hline PO 13 & 3 \\ \hline PO 14 & 2 \\ \hline PO 15 & 3 \\ \hline PO 15 & 3 \\ \hline O Mapping \\ relation, 3-strong, 2-medium, 1-weak) \\ \hline ogramme Outcome (POs) \\ \hline PO7 & PO8 & PO9 & PO10 & PO11 & PO12 & PO13 & PO14 \\ \hline 2 & 3 & 2 & 2 & 3 & 2 & 2 \\ \hline PO7 & PO8 & PO9 & PO10 & PO11 & PO12 & PO13 & PO14 \\ \hline 2 & 3 & 2 & 2 & 3 & 2 & 2 & 3 \\ \hline 1 & 2 & 3 & 3 & 2 & 3 & 3 & 2 \\ \hline 1 & 2 & 3 & 3 & 2 & 3 & 3 & 2 \\ \hline 2 & 3 & 2 & 2 & 3 & 2 & 2 & 3 \\ \hline \end{tabular}$

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Introduction	Periods	12									
TT . T	Defining cloud computing-Characteristics cloud model - cloud services - examples- cloud based services											
Unit - I	and applications - cloud concepts and technologies - Benefits - Limitations .											
	Cloud services and platforms	Periods	12									
Unit - II	Cloud services and platforms - Compute services - storage services - data	base services - ap	plication									
Unit - II	services - content delivery services - analytic services- cloud application of	lesign.										
	Cloud storage Periods											
Unit - III	Cloud storage - overview- Cloud storage provider - standards- applications - client- infrastructures -											
	services - challenges before native file system - storage types - popular cloud storage for developers -											
	popular general purpose cloud storages											
	Software as a service	Periods	12									
Unit - IV	Software as a service - overview- driving forces - company offering - industries software plus services -											
Unit - I v	overview - mobile device integration - providers - Microsoft online.											
	Security issues	Periods	12									
	Security issues - cloud security - threats to cloud security - infrastructure security - information security											
Unit - V	cloud security design -principles - cloud security management framework	s - security as a se	ervice - priva									
	and compliance issues - popular cloud services - google cloud - mobile cloud computing - The Internet of											
	and compliance issues - popular cloud services - google cloud - mobile cl	oud companing										
	Things.	oud tomputing										

Text Books	
1	Arshdeep Bahga, Vijay Madisetti "Cloud Computing A Hands-on Approach", university press, 2014.
2	Anthony T.Velte Toby J.Velte, Robert Elsenpeter, "Cloud Computing A Practical Approach", Mc Graw
	Hill Education, reprint 2016
3	Sandeep Bhowmik,"Cloud Computing", Cambridge University press, 2017
References	
1	Barrie Sosinsky "Cloud Computing Bible ", Wiley Publications, 2015 Reprint .
2	Ricardo Puttini, Thomas Erl, and Zaigham Mahmood, "Cloud Computing: Concepts, Technology &
	Architecture", Prentice-Hall, 2013
E-References	
1	www.sciencedirect.com
2	www.springer.com
3	www.webopedia.in
4	www.tutorialspoint.com
5	www.w3schools.com



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MCA PCA 2021-2022 Programme Programme Code Regulations Department M.C.A Semester 2 Periods Credit Maximum Marks Course Code Course Name per Week Т Р С L CA ESE Total 4 4 100 Advanced Networks 0 0 25 75 21P2CAE06 COURSE The objective of this course is to introduce students to a set of advanced topics in networking and lead them **OBJECTIVES** to the understanding of the networking research with a target of accomplishing a research paper of their own. PROGRAMME OUTCOME POs PO 1 Apply knowledge of computing fundamentals, computing specialization, mathematics, and domainknowledge 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 domaindisciplines. 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 andsafety, cultural, societal, and environmental consi 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 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms PO 6 ofprofessional computing practice. PO 7 Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional. PO 8 Demonstrate knowledge and understanding of the computing and management principles and apply these to one  $\tilde{A}$ ¢ $\hat{a}$ ,  $\neg \hat{a}$ ,  $\varphi s$  own work, as a member and leader in a team, to manage projects and in multidisciplinaryenvironments PO 9 Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, makeeffective presentations. PO 10 Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice. PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinaryenvironments PO 12 Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large. To apply knowledge of computing to create effective designs and solutions for complex problems. PO 13 PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science. PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of marketdemands.

COs	COURSE OUTCOME
CO 1	Able to Understand the concepts of network and data link
	layerAbletorealizetherevolutionofInternetinMobileDevices,Cloud&SensorNetworks•Able to understand
	building blocks of Internet of Things and characteristics
CO 2	Able to understand the network layer and unicast routing
CO 3	Able to understand Transport and Application Layer
CO 4	Able to understand the High Speed Networks and Congestion Control.
CO 5	Able to understand TCP and ATM Congestion Control.
Pre-requisites	

# **Knowledge Levels**

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

		(3/2/	1 indic	ates the				Mappin on 3-st	-	?-mediu	m 1-we	eak)					
COs	3	(0) =			KLs			POs				KLs					
									PO	1			1				
CO	1				2				PO	2			2				
									PO	3			3				
									PO 4	4			4				
CO	2				3				PO				2				
									PO				3				
									PO ′				4				
CO	CO 3				1				POS			3					
								PO 9				1					
										PO 10				2			
CO	4		4					PO 11				3					
								PO 12				4					
<b>CO</b>	-		2					PO 13 PO 14					1				
CO	5							PO 14 PO 15				2 4					
						<u> </u>	PO Ma	nning	PUI	3			4				
		(3/2)	1 indic	ates the	streng				rong 7	2-mediu	$m 1_w$	ak)					
		(3/2/	1 maie		streng				tcome (		iii, i we	ur)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15		
CO1	2	3	2	1	3	2	107	2	2	3	2	1	2	3	1		
															-		
CO2	1	2	3	2	2	3	2	3	1	2	3	2	1	2	2		
CO3	3	2	1	1	2	1	1	1	3	2	1	1	3	2	1		
CO4	1	1	2	3	1	2	1	2	1	1	2	3	1	1	3		
CO5	2	3	2	1	3	2	1	2	2	3	2	1	2	3	1		

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

content of the	Syllabus											
	Networks:	Periods	12									
	Standards and Administration - Protocol Layering - OSI model -TCP/IP protocol suite. Transmission Media											
Unit - I	- Guided Media - Unguided Media. Data Link Layer: Introduction - Link Layer Addressing-Error Detection											
Unit - I	and Correction - Introduction - Types of Errors - Redundancy - Detection Vs Correction - Coding. DLC											
	services - Framing - Flow Control and Error control - Connectionless and Connection Oriented											
	Network Layer	Periods	12									
Unit - II	Network Layer Services - Packet Switching - Network Layer Performance- Internet Protocol (IP) -											
Unit - II	Datagram Format - Fragmentation - Options - Security of IPv4 Datagrams- Unicast Routing : Introduction -											
	Routing Algorithms.											
	Transport and Application Layer	Periods	12									
Unit - III	Introduction to Transport Layer - Transport-Layer Protocols - Introduction to Application Layer - Standard											
	Client-Server Protocols											
	Speed Networks and Congestion Control	Periods	12									
	Frame Relay Networks - Asynchronous transfer mode - ATM Protocol Architecture, ATM Logical											
Unit - IV	Connections, ATM Cells - ATM Service Categories - AAL - High Speed LAN's: Fast Ethernet, Gigabit											
	Ethernet, Fiber Channel - Wireless LANs - Queuing Analysis- Queuing Models - Single Server Queues.											
	TCP and ATM Congestion Control	Periods	12									
	TCP Flow control - TCP Congestion Control - Retransmission Timer Management - Window management											
Unit - V	- Performance of TCP over ATM. Traffic and Congestion control in ATM - Requirements - Attributes -											
	Traffic Management Frame work - Traffic Control - ABR traffic Management.											
	Total Periods		60									

Text Books	
1	Behrouz A. Forouzan, "Data Communication and Networking", 5th Edition, Tata McGraw Hill, 2013.
2	Stallings, William., "High Speed Networks and Internets: Performance and QoS", Second Edition, Pearson
	Education, 2002
References	
1	Andrew S. Tanenbaum and David J. Wetherall, "Computer Networks", 5th Edition, Pearson Education,
	2011
2	Larry L. Peterson and Peter S. Davie, "Computer Networks", 5th Edition, Elsevier, 2012.
3	Tanenbaum Andrew S., "Computer Networks", 5th Edition, Prentice Hall of India, New Delhi, 2013.
E-References	
1	http://developer.android.com/develop/index.html
2	https://docs.docker.com
3	www.microchip.com
4	www.sanfoundry.com
5	www.oxfordreference.com



WOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	ode-6	37 205.								
Programme	МСА	Programme Code		tions	2021-2022								
Department		M.C.A			Semester			3					
			Perio	ds	Credit	Maxim	um Mark	rks					
Course Code		Course Name	per We	per Week									
			L T	Р	С	CA	ESE	Total					
21P2CAE07	Cryptography and Network Security40042575												
COURSE OBJECTIVES	To provide the overview of computer system and the various network topologies and security measures for secured access of our data.												
POs	PROGRAMME OUTCOME												
PO 1	Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements												
PO 2	Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines												
PO 3	Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental												
PO 4	Use research-based knowledge and research methods including design of experiments, analysisand interpretation of data, and synthesis of the information to provide valid conclusions												
PO 5	Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations												
PO 6		commit to professional ethic				onsibilities	s, and not	rmsof					
PO 7	Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.												
PO 8	•	wledge and understanding on a member and leader in a		-		-	-						
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, and give and understand												
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.												
PO 11	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.												
PO 12	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large												
PO 13		dge of computing to create		desig	ns and solution	ns for comp	plex prob	olems					
PO 14 PO 15	To identify, analyse and synthesize scholarly literature relating to the field of Computer Science To develop scientific outlook that solves any problem, encompassing the expected aspects												
	ofmarketdemands												

COs	COURSE OUTCOME
CO 1	After completion of the course the student will be able to understand the Physical Medium of network with topologies.
CO 2	Abletorecognizetransformation techniques in images
CO 3	AbletounderstandbuildingblocksInternet Protocols and its usage
CO 4	Able to understand various encryption and decryption techniques.
CO 5	Able to know about firewall and intrusion concepts
Pre-requisites	

# Knowledge Levels

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

	(3/2/	1 indic	ates the			) / KL N orrelatio		-	2-mediu	m, 1-we	eak)				
COs	/1 indicates the strength of correls KLs					POs				KLs					
							PO 1					2			
CO 1	CO 1		3					PO	2		3				
							PO 3					2			
							PO 4				4				
CO 2		3					PO 5				3				
							PO 6				3				
		2					PO 7				2				
CO 3							PO 8				3				
							PO 9				4				
							PO 10				3				
CO 4		4				PO 11				4					
							PO 12 PO 13				2 3				
CO 5		2					PO 13 PO 14				4				
05							PO 14 PO 15				3				
CO / PO Mapping															
	(3/2/	1 indic	ates the	streng				rong. 2	2-mediu	m. 1-we	eak)				
	(0, 2,			8		rogram		-							
COs PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1 2	3	2	2	3	3	2	3	2	3	2	2	3	2	3	
CO2 2	3	2	2	3	3	2	3	2	3	2	2	3	2	3	
CO3 3	2	3	1	2	2	1	2	1	2	1	3	2	1	2	
CO4 1	2	1	3	2	2	1	2	3	2	3	1	2	3	2	
CO5 3	2	3	1	2	2	1	2	1	2	1	3 2 1 2				

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Networking	Periods	12							
		Types of Physical Medium - Topologies - Wireless Networking: Wireless Protocols. Data Link Layer:								
Unit - I	Layered Data Link Protocols - SLIP and PPP-MAC and ARP. Network Layer: Routing									
	Risks-Addressing-Fragmentation-Security.									
	Internet Protocol	Periods	12							
	IP Addressing-ICMP-Security options. Transport Layer: Common Protoc	ols-Transport Lay	er							
Unit - II	Functions-Gateways. TCP: Connection Oriented Protocols-TCP Connecti	ons-UDP. Session	h Layer: Sessi							
Unit - II	State Machine-Session and Stacks. SSL: SSL Functionality-Certificates. S	SSH: SSH and Sec	curity-SSH							
	Protocols. STMP: Email Goals- Common Servers. HTTP: HTTP Goals-U	JRL.								
	Security	Periods	12							
	Importance-Threat Models-Concepts-Common Mitigation Methods. Network theory: Standards									
Unit - III	Bodies-Network Stacks-Multiple Stacks-Layers and Protocols-Common Tools. Cryptography: Securing									
	Information-Necessary Elements-Authentication and Keys-Cryptography and									
	Randomness-Hashes-Ciphers-Encryption-Steganography.									
	Data Encryption	Periods	12							
Unit - IV	Classical Encryption Techniques-Block Ciphers and the Data Encryption	Standards- Symm	etric Ciphers.							
Unit - I v	Principles of Public Key Cryptosystems and RSA Algorithm-Key Manage	ement.								
	Authentication	Periods	12							
Unit - V	Message Authentication and Hash Function-Digital Signatures and Authe	ntication Protocol	s-Email							
Unit - v	Securityâ€"Web Security-Intrusion-Firewall.									
	Total Periods		60							

Text Books	
1	Neal Krawetz, Introduction Network Security, India Edition, Thomson Delmar
	Learning.2007(Unit-I:5.1,5.4,7.2,8.3,9,10,11.2,11.3,11.5,11.9,
	unit-II:12.1,12.2,12.4,14.1,14.2,14.3,15.1,15.2,15.7,16.2,16.3, 19.2,19.3,20.1, 20.2,22.2, 23.1,23.2,
	UnitIII:1.1,1.2,1.3,1.4,3.1,3.2,3.3,3.4,3.5,4.1,4.2,4.3,4.4,4.5,4.6,4.7,4.8).
2	William Stallings, Cryptography and Network Security, Prentice-Hall of India,4th edition,2007, (Unit-IV:
	2,3,6,9,10, Unit-V: 11,13,15,17,18,20).
References	
1	K.Pachghare, Cryptography and Information Security, PHI Learning Private Limited 2009.
2	Andrew S. Tanenbaum, Computer Networks, PHI 4th edition . 2009.
E-References	
1	williamstallings.com
2	www.sanfoundry.com
3	www.amazon.in
4	www.uptu.ac.in
5	www.ibm.com



NOMEN EMPOWERMEN	Elayampalayam, Tiruchengode-637 205.										
Programme	МСА	Programme Code	Р	CA	Regulatio	ons	2021-2022				
Department		M.C.A Semester 2									
Course Code	Periods     Credit     Maximum Marks       Course Name     per Week     L     T     P     C     CA     ESE     To										
21P2CAE08	СҮВ	LTPCCAESETotalCYBER SECURITY40042575100									
COURSE	To learn and und	erstand about Cyber Secur	ity core concep	ots							
OBJECTIVES POs		PRO	GRAMME O	UTCOME							
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	conclusions usin disciplines	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	components, or p	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, and environmental									
PO 4		ed knowledge and research data, and synthesis of the in		• •	-	s, analy	vsis and				
PO 5	1	apt and apply appropriate to ties, with an understanding			dern comput	ting too	ols to complex				
PO 6		commit to professional ethic			oonsibilities,	and no	orms of				
PO 7	Recognize the ne computing profe	eed, and have the ability, to ssional.	engage in inde	pendent learni	ng for contir	nual de	velopment as a				
PO 8		wledge and understanding on a member and leader in a									
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, and give and understand										
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 the individual and society	-	e that opportu	nity to create	e value	and wealth for				
PO 13		dge of computing to create	-	ns and solution	ns for compl	ex pro	blems				
PO 14	To identify, anal	yse and synthesize scholarly	v literature rela	ting to the fiel	d of Comput	ter Scie	ence				
PO 15	To develop scier demands	tific outlook that solves any	problem, enc	ompassing the	expected asj	pectsof	market				

COs	COURSE OUTCOME							
CO 1	acquire knowledge Cyber security Fundamentals							
CO 2	Recognize Attackers Techniques and Motivations							
CO 3	Apply Malicious Code							
CO 4	Implement Malicious Code							
CO 5	To gain knowledge about Defense and Analysis Techniques							
Pre-requisites								

					]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.1	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E <sup>.</sup>	valuat	ing, 6.	Synth	esizing	5
		(3/2)	1 indic	ates the		CO / PC				2-mediu	m 1-we	eak)			
CO	s	(0, 2,			KLs			, 0 50	POs				KI	_s	
	~								PO				2		
СО	1				2				PO				1		
									PO	3			2	2	
									PO				2		
CO	2				1				PO				3		
									PO				2		
CO	2			-				PO 7 PO 8				3 3			
0	3		3					PO 9				2			
								PO 10				3			
CO	4		2					PO 11					1		
								PO 12				2			
									PO 1				3		
CO	5		2					PO 14				1			
						<u> </u>			PO 1	5			2	2	
		(3/2)	1 india	atas the	otrono		PO Ma		rong	2-mediu	m 1 w	aak)			
		(3/2/	1 maie		streng			me Ou	-		111, 1-wv	<i>.a</i> к <i>)</i>			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO1	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2
CO2	2	1	2	2	3	2	1	3	2	3	1	2	3	1	2
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Cyber security Fundamentals	Periods	12
	Networks and Security Concepts - Basic Cryptography -Symmetric Encry	ption - Public key	Encryption -
Unit - I	The Domain Name System(DNS) - Firewalls- Virtualization -Radio -Freq	uency Identificati	on - Microsoft
	Windows Security Principals - Windows Tokens - Window Messaging - V	Windows Firewall	ls.
	Attackers Techniques and Motivations	Periods	12
Unit - II	How Attackers cover their Tracks - Tunneling Techniques - Fraud Techni	ques - Thread Inf	rastructure
	Malicious Code	Periods	12
Unit - III	Self - Replication Malicious Code - Evading and Eliminating Privilege -	Root kits -Spywa	res
	Malicious Code	Periods	12
Unit - IV	Token Kidnapping - Virtual Machine Detection - Stealing Information and	d Exploitation.	
	Defense and Analysis Techniques	Periods	12
Unit - V	Memory Forensics -Honey pots - Malicious Coding Name - Automated N	Ialicious Code Ar	alysis System
Unit - V	Intrusion Detection System.		
	Total Periods		60

Text Books	
1	Cyber Security Essentials ,James Araham ,Richard Haward , Ryan dson – CRC Press 2011
References	
1	Rick Howard, "Cyber Security Essentials", Auerbach Publications, 2011.
2	Richard A, Clarke, Robert Knake, "Cyber war: The Next Threat to National Security & What to Do About
	It", Ecco, 2010
3	Dan Shoemaker, "Cyber security The Essential Body Of Knowledge", First Edition, Cengage Learning,
	2011.
E-References	
1	https://digitalguardian.com/blog/what-cyber-security
2	https://www.edureka.co/blog/cybersecurity-fundamentals-introduction-to-cybersecurity/
3	https://www.jigsawacademy.com/blogs/cyber-security/cyber-security-basics/
4	. https://www.udemy.com/course/certified-secure-netizen/





MOMEN EMPOWERNER		Elayampalayam, T	irucher	igoc	1e-0.	57 205.					
Programme	МСА	Programme Code	PCA Regulations 2021							2022	
Department		M.C.A	Semester 3								
			Pei	riods	s	Credit	Maximum Marks				
Course Code	С	ourse Name	per	Wee	ek						
			-	Т	Р	С	CA	ESE	Тс	otal	
21P3CAE09	D         I										
COURSE	To understand an	d brings the view of funda	nentals	of N	Neur	al Networks, b	back propa	agation n	etworks,		
OBJECTIVES		ce theory, fuzzy logic and g					1 1	C	,		
POs		PRC	GRAM	IME	E OU	TCOME					
PO 1	Apply knowledge	e of computing fundamenta	ls, com	puti	ng s	pecialization,	mathemat	ics, and			
	domainknowledg	e appropriate for the comp	uting sp	ecia	aliza	tion to the abs	traction ar	nd conce	ptualizati	on of	
	computing mode	ls from defined problems a	nd requi	irem	nents	3					
PO 2	-	te, research literature, and s		-				-		d	
		g fundamental principles of	mather	nati	cs, c	omputing scie	nces, and	relevant	domain		
	disciplines										
PO 3	•	ate solutions for complex c	-				-			1 1.1	
	•	ents, or processes that meet	-	ed n	eeds	s with appropri	ate consid	leration f	for public	c health	
PO 4	-	al, societal, and environmer ed knowledge and research		la in	aluc	ling design of	avnarima	ata			
r04		pretation of data, and synthe				• •	-		ne		
PO 5		ed knowledge and research				-			<u>, , , , , , , , , , , , , , , , , , , </u>		
100		pretation of data, and synthe				• •	-		ons.		
PO 6		commit to professional ethic				=					
	normsofprofessio	onal computing practice.									
PO 7	Recognize the ne	ed, and have the ability, to	engage	in i	nder	endent learnir	ng for con	tinual de	velopmer	nt as	
	acomputing profe	essional.									
PO 8		wledge and understanding		-			-	ciples an	d apply tl	hese	
		, as a member and leader ir	a team	, to	man	age projects a	nd in				
<b>DO</b> 0	multidisciplinary										
PO 9		fectively with the computin	-		-						
		ng activities by being able t	-				ctive repor	ts, desig	n		
PO 10		nakeeffective presentations assess societal, environment	-				ulturalies	upe with	in local		
1010		ts, and the consequential re									
PO 11	-	ely as an individual and as	-						5 pruetiee		
1011	multidisciplinary							<i>a</i>			
PO 12	1 7	opportunity and using inno	vation t	to pi	ursu	e that opportur	nity to crea	ate value	and wea	lth	
		t of the individual and socie		-		**	-				
PO 13					esigr	ns and solution	is for com	plex prol	blems		
	To apply knowledge of computing to create effective designs and solutions for complex problems To identify, analyse and synthesize scholarly literature relating to the field of Computer Science										
PO 14	To develop scientific outlook that solves any problem, encompassing the expected aspectsof market demands										

COs	COURSE OUTCOME
CO 1	After completion of the course the student will get the knowledge about the fundamentals of Neural
	Networks.
CO 2	Able to realize the back propagation networks.
CO 3	Able to understand adaptive resonance theory
CO 4	Able to understand fuzzy logic concepts.
CO 5	Able to understand genetic algorithms concepts.
Pre-requisites	Basic Knowledge about Network and Computer Security.

# Knowledge Levels

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

		(3/2/	1 indic	ates the			) / KL N orrelatio		-	2-mediu	m, 1-we	eak)			
COs	5				KLs				POs			KLs			
									PO	1			3		
CO	1				2				PO	2			3		
									PO	3			4	-	
									PO 4	4			4		
CO	2				2				PO :	5			2		
									PO				3		
									PO '				2		
COS	3				3				PO			4			
								PO 9				2			
			3					PO 10				3			
CO 4	4							PO 11				3			
								PO 12 PO 13				4 4			
CO	5		4					PO 13 PO 14				2			
	5							PO 14 PO 15				3			
						<u>CO /</u>	PO Ma	nning	101	5			J		
		(3/2/	1 indic	ates the	streng				rong. 2	2-mediu	m. 1-we	eak)			
		(0, 1,			~8		rogram		-		,	)			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	1	1	3	2	1	1	3	2	2	1	1	3	2
CO2	2	2	1	1	3	2	1	1	3	2	2	1	1	3	2
CO3	3	3	2	2	2	3	2	2	2	3	3	2	2	2	3
CO4	3	3	2	2	2	3	2	2	2	3	3	2	2	2	3
CO5	2	2	3	3	1	2	1	3	1	2	2	3	3	1	2

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

content of the	Syllabus		
	Fundamentals of Neural Networks	Periods	12
	Basic Concepts of Neural Network-Model of an Artificial Neuron-Neural	Network	
Unit - I	Architectures-Characteristics of Neural Networks-Learning Methods-Tax	onomy of Neural	Network
	Architectures-History of Neural Network Research-Early Neural Network	Architectures-so	me applications
	domain.		
	Backpropagation Networks	Periods	12
	Architecture of Backpropagation Network-Backpropagation Learning -ill	ustrations-applica	tions-Effect of
Unit - II	Tuning Parameters of the Backpropagation Neural Network-Selection of	various parameter	s in
	Backpropagation rk-Variations of Standard Backpropagation algorithms.		
	Adaptive Resonance Theory	Periods	12
Unit - III	Introduction-classical ART networks-simplified ART architecture- ART1	- Architecture of	ART1-special
Unit - III	features of ART1-ART1 algorithm.ART2- Architecture of ART2- ART2	algorithmAppli	cations.
	Fuzzy logic	Periods	12
	Fuzzy Set Theory- Fuzzy Sets-Fuzzy Relations. Fuzzy Systems: Fuzzy Lo	ogic-Fuzzy Rule b	ased system -
Unit - IV	Defuzzification Methods-Applications. Fuzzy Backpropagation Networks	: LR-Type Fuzzy	Numbers-Fuzzy
	Neuron-Fuzzy Backpropagation Architecture.		
	Genetic algorithms	Periods	12
Unit - V	Fundaments of Genetic algorithms-Basic concepts-creation of Offsprings-	-encoding-reprodu	ction. Genetic
Unit - v	modeling: Cross Over-Inversion and Deletion-Mutation Operator-Bit Wis	e Operators - PSC	): Particle Swam
	Optimization.		
	Total Periods		60

Text Books	
1	Rajasekaran. S and Vijayalakshmi Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, New
	Delhi-2005.
References	
1	Fakhreddine O. Karray, Clarence De Silva, Soft Computing and Intelligent Systems Design, Pearson, 2009.
2	Sivanandam. S. N and Deepa S. N, Principles of Soft Computing, Wiley India, 2008.
E-References	
1	www.myreaders.info
2	www.springer.com
3	www.sciencedirect.com
4	www.elsevier.com
5	www.cs.berkeley.edu



NOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	de-6	37 205.				
Programme	МСА	Programme Code		PO	CA	Regulati	ions	20	)21-2022
Department		M.C.A			Semester	-			3
	Periods Credit Maximum Mar								
Course Code	с с	ourse Name	per We	ek					
			L T	Р	С	CA	ESE	2	Total
21P3CAE10	BIG DA	ATA ANALYSIS	4 0	0	4	25	75		100
COURSE	To provide grou	nding in basic and advanced	methods	o big	g data technolo	ogy and too	ls, inclu	ıding	5
OBJECTIVES	MapReduce and	Hadoop			-			-	
POs		PRO	GRAMM	E OL	JTCOME				
PO 1	Apply knowledg	e of computing fundamental	s, comput	ing s	pecialization,	mathematic	cs, and		
	domainknowledg	ge appropriate for the compu	ting speci	aliza	tion to the abs	traction and	d conce	ptual	ization of
		ls from defined problems an	-						
PO 2		te, research literature, and se	-				-		
		clusions using fundamental	principles	of n	athematics, co	omputing sc	ciences,	and	relevant
	-	maindisciplines							
PO 3		sign and evaluate solutions for complex computing problems, and design and evaluate							
		ystems, components, or processes that meet specified needs with appropriate consideration for public health							
PO 4	-	dsafety, cultural, societal, and environmental se research-based knowledge and research methods including design of experiments, analysis							
104		indinterpretation of data, and synthesis of the information to provide valid conclusions							
PO 5	-	apt and apply appropriate te			-			ols to	complex
		ties, with an understanding	-			<b>I</b> .	0		I.
PO 6		commit to professional ethic				onsibilities,	, and no	orms	
	ofprofessional co	omputing practice	-						
PO 7	Recognize the ne	ed, and have the ability, to e	engage in	inde	pendent learnin	ng for conti	nual de	velop	pment as a
	computing profe	ssional.							
PO 8		wledge and understanding of		-		-	-	id apj	ply these to
		wn work, as a member and l	eader in a	team	n, to manage p	rojects and	in		
	multidisciplinary								
PO 9		fectively with the computing		-					
		ng activities by being able to		end	and write effect	ctive report	s, desig	n	
<b>DO 10</b>		nakeeffective presentations.			. 1 1 1	1, 1.	•.1	• 1	1 1
PO 10		assess societal, environment							
PO 11		and the consequential respor rely as an individual and as a						actic	e.
	multidisciplinary	•	i member	or ie		ceants and	111		
PO 12	· ·	opportunity and using innov	vation to r	lirsu	e that opportui	nity to creat	te value	and	wealth for
1012		the individual and society a	-	arbu	e and opportu		ie varde	, und	<b>cu</b> ith 101
PO 13		dge of computing to create e		esig	ns and solutior	ns for comp	lex pro	blem	S
PO 14		yse and synthesize scholarly		-					
PO 15		tific outlook that solves any							
	marketdemands.								
	•								

COs	COURSE OUTCOME
CO 1	Able to understand building blocks of Internet of Things and characteristics
CO 2	Able to understand the introduction of Hadoop
CO 3	Able to understand the concepts of Hadoop architecture
CO 4	Able to understand Hadoop Ecosystem and YARN
CO 5	Able to understand HIVE and HIVEQL.
Pre-requisites	

					]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5
		(3/2/	1 indic	ates the				Mappin	-	?-mediu	m, 1-we	eak)			
COs	5	(0, 2,			KLs				POs				KI	JS	
	-								PO				2		
CO	1				4				PO				2		
									PO	3			2	,	
									PO				3		
CO	2				2				PO				3		
									PO				4		
	2						PO 7 PO 8				2 3				
CO	3		2						PO P				3		
									PO 1				4		
CO	4		1					PO 11					3		
								PO 12				4			
									PO 1	3			1		
CO	5		3					PO 14				2			
									PO 1	5			4	-	
		(2) (2)					PO Ma								
		(3/2/	1 indic	ates the	e streng				-		m, 1-we	eak)			
COs						r		me Ou	1	. ,					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13	PO14	PO15
CO1	1	1	1	2	2	3	1	2	2	3	2	3	1	1	3
CO2	3	3	3	2	2	1	1	2	2	1	2	1	2	3	1
CO3	3	3	3	2	2	1	1	2	2	1	2	1	2	3	1
CO4	2	2	2	1	1	1	2	1	1	1	1	1	3	2	1
CO5	2	2	2	3	3	2	2	3	3	2	3	2	1	2	2

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

Г

1. Course End Delivery

	INTRODUCTION TO BIG DATA	Periods	12						
Unit - I	Introduction - distributed file system - Big Data and its importance, Four Vs, Drivers for Big data, Big data								
Unit - I	analytics, Big data applications. Algorithms using map reduce, Matrix-Ve	ctor Multiplicatio	n by Map						
	Reduce.								
	INTRODUCTION HADOP	Periods	12						
Unit - II	Big Data - Apache Hadoop & Hadoop EcoSystem - Moving Data in and o	out of Hadoop - U	nderstanding						
Unit - II	inputs and outputs of MapReduce - Data Serialization.								
	HADOOPP ARCHITECTURE	Periods	12						
	Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write								
Unit - III	and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and								
	Reduce tasks, Job, Task trackers - Cluster Setup - SSH & Hadoop Configuration - HDFS Administering								
	-Monitoring & Maintenance								
	HADOOP ECOSYSTEM AND YARN	Periods	12						
Unit - IV	Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features- NameNode								
	High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in Y	ARN.							
	HIVE AND HIVEQL, HB	Periods	12						
	Hive Architecture and Installation, Comparison with Traditional Database	e, HiveQL - Query	ving Data -						
Unit - V	Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage,								
	Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in mo	nitoring a cluster,	HBase uses						
	Zookeeper and how to Build Applications with Zookeeper.								
	Total Periods		60						

Text Books	
1	Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN:
	9788126551071, 2015.
2	Chris Eaton, Dirk deroos et al., "Understanding Big data ", McGraw Hill, 2012
3	Tom White, "HADOOP: The definitive Guide", O Reilly 2012
References	
1	Vignesh Prajapati, "Big Data Analytics with R and Haoop", Packet Publishing 2013
2	Tom Plunkett, Brian Macdonald et al, "Oracle Big Data Handbook", Oracle Press, 2014.
3	Jy Liebowitz, "Big Data and Business analytics", CRC press, 2013
E-References	
1	http://www.bigdatauniversity.com

Signature of BOS Chairman

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<ul> <li>complexcomputing activities by being able to comprehend and write effective reports, design documentation, makeeffective presentations.</li> <li>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.</li> <li>PO 11 Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinaryenvironments</li> <li>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.</li> <li>PO 13 To apply knowledge of computing to create effective designs and solutions for complex problems.</li> <li>PO 14 To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.</li> <li>PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of</li> </ul>		1 2								
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PO 12Identify 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 13To apply knowledge of computing to create effective designs and solutions for complex problems.PO 14To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.PO 15To develop scientific outlook that solves any problem, encompassing the expected aspects of	POTI	-		a member	or le	ader in diverse	e teams and	1 111		
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PO 14To identify, analyse and synthesize scholarly literature relating to the field of Computer Science.PO 15To develop scientific outlook that solves any problem, encompassing the expected aspects of	PO 13		•		desig	ns and solutior	ns for com	plex pro	blem	IS.
PO 15 To develop scientific outlook that solves any problem, encompassing the expected aspects of					-					
		_				-				
		-				-				

COs	COURSE OUTCOME
CO 1	Able to understand the application areas of IOT
CO 2	Able to realize the revolution of Internet in Mobile Devices, Cloud & SensorNetworks
CO 3	Able to understand building blocks of Internet of Things and characteristics
CO 4	Able to understand data analytics for IoT.
CO 5	Able to learn IoT by case studies.
Pre-requisites	

	Knowledge Levels														
1.Remer	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	Ş
		(3/2)	1 indic	ates the				Mappin	-	2-mediu	m 1-we	ak)			
CO	s	(3/2/			KLs			511, 5 50	POs			uix)	KI	s	
	5								PO				4		
СО	1				2				PO				2		
			-						PO				2	2	
									PO	4			3	5	
CO	2				2				PO				3		
									PO				4		
	2		3				PO 7 PO 8				3				
CO	3							PO P				3 4			
								PO 10					3		
СО	4		3					PO 1				4			
									PO 1	2			4	ļ	
									PO 1				2		
CO	5				4				PO 1				2		
						<u> </u>		•	PO 1	.5			3	5	
		(2/2)	1 india	atas the	otrono		PO Ma		rong	2-mediu	m 1 <del>u</del>	ark)			
		(3/2/	1 maie		sucing			me Ou	-		III, 1-we	<i>ak)</i>			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	1	3	3	2	2	1	2	2	1	2	1	1	3	3	2
CO2	1	3	3	2	2	1	2	2	1	2	1	1	3	3	2
CO2	2	2	2	3	3	2	1	3	2	3	2	2	2	2	3
CO4	2	2	2	3	3	2	1	3	2	3	2	2	2	2	3
CO5	3	1	1	2	2	3	2	2 2 3 2 3 1 1 2							

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						
Unit - I	Introduction to Internet of Things, Physical design of IoT, Logical Design	of IoT, IoT enab	ling						
Unit - I	Technologies Domain Specifics of IoT, home automation, cities, Enviro	onment, Energy, F	Retails, Logistic						
	Agriculture, Industry, Health and Life style								
	IoT and M2M	Periods	12						
Unit - II	IoT and M2M - Difference between IoT and M2M,SDN and NFV for IOT	Γ. IOT System m	anagement wit						
Unit - II	NETCONF-YANG-Need for IOT system management, SNMP, Network operator environment,								
	NETCONF, YANG								
	Developing Internet of Things	Periods	12						
	IOT Platforms design methodology, Introduction, IOT Design methodology, Case study on IoT System on								
Unit - III	weather monitoring. IoT Systems logical design using Python, Introduction, Installing python, Python data								
	types and data structures, Control flow. Functions, Modules.								
	Packages	Periods	12						
	Packages, File handling, Date time operations, classes, Python packages of	of interest for IoT.	IoT physical						
Unit - IV	devices and end points, what is an IoT Device, Exemplary device: Raspberry PI, about the board, Linux on								
	Raspberry PI, Raspberry PI interfaces, Other IoT devices.								
	Data analytics for IoT-Introduction	Periods	12						
Unit - V	Data analytics for IoT-Introduction, Apache Hadoop, Using Hadoop map	reduce for batch	lata analysis.						
Unit - v	Case studies- Illustrating IoT design-Introduction, Home automation, cities, environment, agriculture.								
	Total Periods 60								

Text Books	
1	Internet of Things - A Hands on Approach, Arsdeep Bahga & Vijay Mandisetti, 2014
2	Building the Internet of Things: Implement New Business Models, Disrupt, Maciej Kranz, Willey
	Publications, 2016
3	5. Designing the Internet of Things By Adrian McEwen, Hakim Cassimally, Willey Publications 2015.
References	
1	Internet of Things: Principles and Paradigmsby Rajkumar Buyya, Amir Vahid Dastjerdi morgan Kaufmann
	2014.
E-References	
1	http://internetofthingsagenda.techtarget.com
2	http://www.businessinsider.com/what-is-the-internet-of-things



NOMEN EMPOWERMEN		Elayampalayam, Ti	ruchengo	de-6	37 205.				
Programme	МСА	Programme Code		PO	CA	Regulati	ions	2021-2022	
Department		M.C.A			Semester			3	
			ls	Credit	Maximu	ım Mark	XS		
Course Code	C	ourse Name	per We	ek					
			L T	Р	С	CA	ESE	Total	
21P3CAE12	PERVAS	SIVE COMPUTING	4 0	0	4	25	75	100	
COURSE	Students gain the	skills to exploit the capabil	ities of in	form	ation security a	and Unders	tand wit	th modern	
OBJECTIVES	•	gies such as firewalls, VPN			•				
POs		PRO	GRAMM	E OL	JTCOME				
PO 1	Apply knowledg	e of computing fundamental	ls, comput	ing s	pecialization,	mathematic	cs, and d	lomain	
	knowledge appro	priate for the computing sp	ecializatio	n to	the abstraction	and concept	ptualiza	tion of	
	computing mode	ls from defined problems ar	nd require	nent	8				
PO 2	Identify, formula	te, research literature, and s	olve comp	olex o	computing pro	blems reach	ning sub	stantiated	
	conclusions usin	g fundamental principles of	mathemat	ics, c	computing scie	ences, and re	elevant	domain	
	disciplines								
PO 3	Design and evalu	esign and evaluate solutions for complex computing problems, and design and evaluate systems,							
		omponents, or processes that meet specified needs with appropriate consideration for public health and							
	-	afety, cultural, societal, and environmental							
PO 4		Jse research-based knowledge and research methods including design of experiments, analysis and							
	-	data, and synthesis of the in							
PO 5		apt and apply appropriate te				dern compu	iting too	ols to complex	
DO (		ties, with an understanding							
PO 6	professional com	commit to professional ethic	s and cyb	erreg	gulations, resp	onsidinties,	, and no		
PO 7	-	ed, and have the ability, to e	angage in	indo	andant laarnii	ng for conti	nual das	valonment as a	
107	computing profe	•	ingage m	muej		ing for contra	iiuai uc	velopment as a	
PO 8		wledge and understanding of	of the com	nutir	og and manage	ment princi	inles and	d apply these to	
		as a member and leader in a		•	0 0	-			
	environments.		,		015		1	5	
PO 9		fectively with the computing	g commun	ity, a	and with societ	ty at large, a	about co	omplex	
		ties by being able to compre							
	effective present	ations, and give and underst	and						
PO 10	Understand and a	assess societal, environment	al, health,	safe	ty, legal, and c	ultural issu	es withi	n local and	
	global contexts, a	and the consequential respon	nsibilities	relev	ant to professi	onal compu	uting pra	actice	
PO 11	Function effectiv	ely as an individual and as a	a member	or le	ader in diverse	e teams and	in mult	idisciplinary	
	environments.								
PO 12		opportunity and using inno-		oursu	e that opportui	nity to creat	te value	and wealth for	
		the individual and society a	-			C	1 -	1	
PO 13		dge of computing to create		-		-	-		
PO 14		yse and synthesize scholarly							
PO 15	To develop scien demands	tific outlook that solves any	problem,	enco	ompassing the	expected as	spectsof	market	

COs	COURSE OUTCOME					
CO 1	Explain the various principles and services.					
CO 2	Illustrate the various protocols and its functions					
CO 3	Describe the various technologies of past and present in pervasive					
CO 4	Describe the various technologies of past and present in pervasive computing					
CO 5	Discuss the various applications based on pervasive computing					
Pre-requisites						

					]	Know	ledge	Level	s							
1.Reme	mberi	ng, 2.	Under	stand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizin	5	
		(3/2	/1 india	atos the				Mappin	-	2-mediu	m 1 w	aak)				
СО	s	(3/2/			KLs			<i>J</i> <b>I</b> , <i>J</i> - <i>S</i> <b>I</b>	POs		<u>111, 1-w</u>	<i>.a</i> к <i>)</i>	KI	s		
	5				<b>KL</b> 5				PO				2			
СО	CO 1				2				PO				1			
									PO				2			
									PO	4			2			
CO	2				1				PO				3			
								PO 6					2			
	_				_		PO 7					3				
CO	3				3				PO P			3 2				
									PO 1			3				
CO	4		2					PO 11					1			
					_				PO 1			2				
									PO 1	.3		3				
CO	5		2					PO 14				1				
									PO 1	5		2				
							PO Ma		-			• `				
		(3/2/	1 indic	ates the	e streng					2-mediu	m, 1-we	eak)				
COs					205		-	me Ou			-		<b>DQ</b> 4 -			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9		PO11	PO12	PO13		PO15	
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3	
CO2	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2	
CO3	2	1	2	2	3	2	1	3	2	3	1	2	3	1	2	
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3	
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Principle and Services	Periods	12							
	Pervasive Computing- Principles, Characteristics- interaction transparenc	y, context aware,	automated							
Unit - I	experience capture. Architecture for pervasive computing- Pervasive devices-embedded controls smart									
	sensors and actuators -Context communication and access services									
	Protocols	Periods	12							
Umit II	Open protocols- Service discovery technologies- SDP, JINI, SLP, UpnP p	orotocols-data syn	chronization-							
Unit - II SyncML framework - Context aware mobile services - Context aware sensor networks, addressing										
	communications- Context aware security.									
	Technologies	Periods	12							
Unit - III	Past, Present and Future-Device Technology-Device Connectivity-Web application Concepts-WAP and									
Unit - III	Beyond-Voice Technologies-Personal Digital Assistants.									
	Architecture	Periods	12							
Unit - IV	Server side programming in Java-Pervasive Web application Architecture-Example-Application- Access vi									
Unit - I v	PCs-Access via WAP-Access via PDA and Voice.									
	Applications	Periods	12							
Unit - V	Smart Tokens, Heating Ventilation and Air Conditioning, Set Top Boxes,	Appliances and H	Iome							
Unit - V	Networking, Residential Gateway, Automotive Computing, On Board Co	mputing Systems,	In Vehicle							
	networks, Entertainment Systems									
	Total Periods		60							

Text Books	
1	Seng Loke, Context-Aware Computing Pervasive Systems, Auerbach Pub., New York, 2007.
2	Jochen Burkhardt, , Stefan Hepper, Klaus Rindtorff, Thomas Schaeck ‖Pervasive
	Computing-Technology and Architecture of Mobile Internet Application‖,Pearson Education,sixth
	Edition 2009.
References	
1	Uwe Hansmann etl , Pervasive Computing, Springer, New York, 2001
E-References	
1	https://onlinecourses.nptel.ac.in/noc15_cs03
2	www.w3schools.com
3	www.tutorialspoint.com



HOMEN EMPOWERMENT		Elayampalayam, Ti	ruchen	gode-6	37 205.							
Programme	MCA	Programme Code		PO	CA	Regulat	ions	2021-2022				
Department		M.C.A			Semester			3				
			Peri	ods	Credit	Maximu	ım Mark	S				
Course Code	C	Course Name	per V	Veek								
			L 1	P	С	CA	ESE	Total				
21P3CAE13		. INTELLIGENCE AND IINE LEARNING	4	0 0	4	25	75	100				
COURSE OBJECTIVES	•	n the knowledge of problem resentation Issues, Predicate					-					
POs		PRO	GRAM	ME OU	JTCOME							
PO 1	Apply knowledg	e of computing fundamental	ls, comp	uting s	pecialization,	mathemati	cs, and d	omain				
		opriate for the computing sp				and conce	ptualizat	tion of				
20.0		els from defined problems ar	-									
PO 2	•	te, research literature, and s		-			-					
	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines											
DO 2	*	unto collutions for complay of	omantin	a nuch	lama and dagi	an and area	luoto ava	tama				
PO 3	•	ate solutions for complex c	-			-	•					
		processes that meet specified	i needs v	with ap	propriate cons	sideration f	or public	health and				
		societal, and environmental	.1 1	• 1	1. 1		. 1	• •				
PO 4		sed knowledge and research				-	ts, analy	sis and				
PO 5		data, and synthesis of the in lapt and apply appropriate to		-			iting too	ls to complay				
FO 5		ties, with an understanding	-			dern compt	uting too	is to complex				
PO 6		commit to professional ethic				onsibilities	and not	rms of				
100	professional con	-	ind cy		Sulutions, lesp	onsionnes	, and not					
PO 7	-	eed, and have the ability, to	engage i	n inde	pendent learni	ng for cont	inual dev	velopment as a				
10 /	computing profe		enguge i	n maej		ing for cont	indui de v	ciopinent us u				
PO 8			of the co	mputir	g and manage	ement princ	iples and	apply these to				
100	Demonstrate knowledge and understanding of the computing and management principles and apply these to ones own work, as a member and leader in a team, to manage projects and in multidisciplinary											
	environments		,		6- F- J		r	- 5				
PO 9		fectively with the computing	g comm	initv. a	and with socie	tv at large.	about co	mplex				
		ties by being able to compre		•		•		-				
		ations, and give and underst			1			,				
PO 10		assess societal, environment		h, safe	ty, legal, and c	cultural issu	es within	n local and				
		and the consequential respon										
PO 11	-	vely as an individual and as				_						
	environments							-				
PO 12	Identify a timely	opportunity and using inno	vation to	pursu	e that opportu	nity to crea	te value	and wealth for				
	the betterment of	f the individual and society a	at large									
PO 13	To apply knowle	edge of computing to create	effective	desig	ns and solution	ns for comp	olex prob	olems				
PO 14	To identify, anal	yse and synthesize scholarly	literatu	re rela	ting to the fiel	d of Compu	uter Scien	nce				
PO 15	To develop scier demands	ntific outlook that solves any	probler	n, enco	ompassing the	expected a	spectsof	market				

COs	COURSE OUTCOME
CO 1	Able to get the knowledge about Problem and searching techniques and space management
CO 2	Able to realize the Heuristic Search Techniques
CO 3	Able to understand Knowledge Representation Issues
CO 4	Understand the basics of Machine Learning
CO 5	Able to get the knowledge about Bayesian Decision Theory
Pre-requisites	

					]	Know	ledge	Level	S						
1.Remer	nberi	ng, 2.1	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	5
		(3/2/	1 indic	ates the		CO / PC			-	2-mediu	m. 1-we	eak)			
CO	s	(0, 1,			KLs	,		,	POs			)	KI	Ls	
	005								PO				2		
СО	CO 1				2				PO				1		
									PO	3			2	2	
									PO				3		
CO	2				3			PO 5					2		
								PO 6					2		
00	2		2					PO 7 PO 8				3			
CO	3				2				PO			3			
									PO 1				2		
CO	4		3					PO 11					3		
								PO 12				2			
									PO 1	3		1			
CO	5				3			PO 14				2			
									PO 1	5			1	-	
		(2)	(1 . 1	1	. 4		PO Ma			1.	1	1.)			
	1	(3/2/	1 indic	ates the	e streng				-	2-mediu	m, 1-we	eak)			
COs		DCC	DO2	DO 4	D07	1	-	me Ou			DO11	DO 12	DO12	DO14	DO15
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13		PO15
CO1	3	2	3	2	3	3	2	1	2	3	2	3	2	3	2
CO2	2	1	2	3	2	2	1	2	3	2	3	2	1	2	1
CO3	3	2	3	2	3	3	2	1	2	3	2	3	2	3	2
CO4	2	1	2	3	2	2	1	2	3	2	3	2	1	2	1
CO5	2	1	2	3	2	2	1	2	3	2	3	2	1	2	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

	Artificial Intelligence	Periods	12							
	The AI problems - The underlying Assumption - AI Technique - The level of the Model - Criteria for									
Unit - I	Success. Problems, Problem Space, and Search: Defining the problem as a									
	systems - problem characteristics - Production system characteristics - Iss	-								
	Programmes	-								
	Heuristic Search Techniques	Periods	12							
Unit - II	Generate and Test - Hill Climbing - Best First Search - Problem Reduction - constraint Satisfaction - Mea									
	ends Analysis									
	Knowledge Representation Issues	Periods	12							
	Representations and Mappings - Approaches to Knowledge Representation - Issues in Knowledge									
Unit - III	Representation - The Frame problem. Using Predicate Logic: Representin	g Simple Facts in	Logic -							
	Representing Instance and ISA Relationships - Computable Functions and Predicates- Resolution									
	Introduction to Machine Learning	Periods	12							
	Machine Learning - Examples of Machine Learning Applications - Learni	ng Associations -	classification							
Unit - IV	Regression -Unsupervised Learning - Reinforcement Learning - Supervised Learning: Learning a Class									
	from Examples - Vapnik - Chervonenkis(VC) Dimension - Probably Approximately Correct (PAC)									
	Learning - Noise - Learning Multiple Classes - Regression - Model Selection and Generalization -									
	Dimensions of a Supervised Machine Learning Algorithm									
	Bayesian Decision Theory	Periods	12							
Unit - V	Classification - Losses and Risks - Discriminant Functions - Association Rules - Parametric Methods:									
Unit - v	Introduction - Maximum Likelihood Estimation - Evaluating an Estimator: Bias and Variance - The Bayes									
	Estimator - Parametric Classification - Regression									
	Total Periods		60							

Text Books	
1	Elaine Rich and Kevin Knight (2009). Artificial Intelligence, 3/e; New Delhi: Tata McGraw-Hill
2	Tom M. Mitchell, ―Machine Learning, McGraw-Hill Education (India) Private Limited, 2013
References	
1	J. Nilsson (2001). Principles of Artificial Intelligence; New Delhi: Narosa Publishing
2	Stephen Marsland, ―Machine Learning: An Algorithmic Perspective, CRC Press, 2009
E-References	
1	www.tutorialspoint.com
2	www.webopedia.org
3	www.geeksforgeeks.com



MOMEN EMPOWERMEN		Elayampalayam, Ti	rucheng	ode-6	37 205.								
Programme	МСА	Programme Code		Р	CA	Regulati	ons	2021-2022					
Department		M.C.A			Semester			3					
			Perio	ds	Credit	Maximu	m Mark	KS					
Course Code	c c	ourse Name	per W	eek									
			L T	Р	С	CA	ESE	Total					
21P3CAE14	DATA MINING	G AND WAREHOUSING	4 0	0	4	25	75	100					
COURSE	To introduce gen	eral techniques for analyzin	g comput	er alg	gorithms To lea	arn differen	t algorit	thm design					
OBJECTIVES	-	echniques To understand the limitations of Algorithm power											
POs		PROGRAMME OUTCOME											
PO 1	Apply knowledge	e of computing fundamental	ls, compu	ting s	pecialization,	mathematic	s, and d	lomain					
	knowledge appro	priate for the computing spe	ecializatio	on to	the abstraction	and concept	otualizat	tion					
	ofcomputing mo	dels from defined problems	and requi	reme	nts								
PO 2	Identify, formula	te, research literature, and s	olve com	plex o	computing pro	blems reach	ing sub	stantiated					
		g fundamental principles of	mathema	tics, o	computing scie	ences, and re	elevant						
	domaindiscipline												
PO 3	-	ate solutions for complex contracts		-		-							
		ents, or processes that meet	-	need	s with appropr	iate conside	ration f	for public health					
	-	al, societal, and environmen											
PO 4		ed knowledge and research				-							
PO 5		pretation of data, and synthe											
PO 5		apt and apply appropriate te ties, with an understanding				dern compu	ting too	ors to complex					
PO 6		commit to professional ethic				onsibilities	and						
100		onal computing practice	s und cyc		Sulutions, resp	onoiointico,	una						
PO 7	-	ed, and have the ability, to e	engage in	inde	pendent learnii	ng for conti	nual dev	velopment as					
	acomputing profe		0.0	]		8		1					
PO 8		wledge and understanding of	of the con	nputir	ng and manage	ment princi	ples and	d apply these to					
	ones own work, a	as a member and leader in a	team, to	mana	ge projects and	d in							
	multidisciplinary	environments.											
PO 9		fectively with the computing		-									
		ng activities by being able to				ctive reports	s, desigi	n					
		nakeeffective presentations,											
PO 10		assess societal, environment			• •								
		ts, and the consequential res						g practice.					
PO 11		ely as an individual and as a	a member	or le	ader in diverse	e teams and	in						
	multidisciplinary		notion (		a that are set		o1	and mealst					
PO 12		opportunity and using innov			e inai opportui	inty to creat	e value	and wealth					
PO 13		t of the individual and societ dge of computing to create			ns and solution	is for comp	ex nrob	lems					
PO 13 PO 14		yse and synthesize scholarly		-		-	-						
PO 15		tific outlook that solves any											
	demands	unit outdoor that borres any	Problem	, enec	pussing the	enpeeted us	reets of						
L													

COs	COURSE OUTCOME
CO 1	Demonstrate an understanding of the importance of data mining and the basic concepts of data mining
CO 2	Organize and Prepare the data needed for data mining using pre preprocessing techniques
CO 3	Understand the various data mining classification methods on large sets
CO 4	Implementing the appropriate clustering or Frequent Pattern mining on large data sets.
CO 5	Apply the data mining techniques in large databases and also learn about trends in data mining
Pre-requisites	Basic concepts of database

					I	Know	ledge	Level	s							
1.Remen	mberi	ng, 2.	Under	stand	ling, 3	.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	3	
		(2)2	(1 · 1·	1			) / KL N		-		1	1)				
СО		(3/2/	1 indic		streng KLs	th of co		on, 3-st	rong, 2 POs	2-mediu	m, 1-we	eak)	KI			
	5				KLS				PO				2			
СО	1				2				PO				3			
00	001				-				PO				2			
									PO	4			3	3		
CO	2				3				PO	5			2	2		
									PO				3			
			_					PO 7				2				
CO	3		2					PO 8 PO 9					3			
									PO PO 1				3			
СО	4		3					PO 10					3			
00	7		5					PO 12				2				
								PO 13				4				
СО	5				2			PO 14				3				
								PO 15					3			
		(3/2/	1 indic	ates the	streng		PO Ma orrelatio		rong, 2	2-mediu	m, 1-we	ak)				
<u> </u>						Р	rogram	me Ou	tcome (	(POs)						
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	2	3	2	3	2	3	2	3	2	1	2	3	1	2	2	
CO2	2	3	2	3	2	3	2	3	3	2	3	2	2	3	3	
CO3	2	3	2	3	2	3	2	3	2	3	2	1	3	2	2	
CO4	2	3	2	3	2	3	2	3	3	2	3	2	2	3	3	
CO5	2	3	2	3	2	3	2	3	2	1	2	3	1	2	2	
					-	5					_	5	· ·			

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

ontent of the	Syllabus									
	Introduction	Periods	12							
	Data mining - Data mining functionalities - kinds of patterns can be mined	d - classification -	major issues.							
Unit - I	Data warehouse - A multidimensional data model - Data warehouse architecture - Data warehouse									
	implementation - From data warehouse to data mining.									
	Data pre-processing	Data pre-processing Periods 12								
Unit - II	Data cleaning - Data Integration and Transformation - Data Reduction - D	Discredidation and	concept							
Unit - II	hierarchy generation - Data mining primitives - Data mining Task.									
	Association Rule Mining	Periods	12							
	- Mining single dimensional Boolean association rules from transactional databases Classification and									
Unit - III	prediction - Issues regarding classification and prediction - Bayesian classification- Classification by Back									
	propagation - classification based on concepts from association rule mining.									
	Cluster Analysis	Periods	12							
Unit - IV	- A categorization of Major clustering methods - Partitioning methods- Hi	ierarchical method	ls - Grid based							
Unit - I v	methods -Model based clustering methods - Density - based methods.									
	Applications and Trends in Data Mining	Periods	12							
Unit - V	- Data mining system products and Research prototypes - Additional them	nes on Data minin	g - Social							
Unit - V	Impacts of Data Mining - Trends in Data mining-Mining Spatial Database	es - Mining Time-	series and							
	sequence data - Mining the World wide web.									
	Total Periods		60							

Text Books	
1	1. Jaiwei Han, Michelien Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann
	Publishers an Imprint of Elsevier, 2001
References	
1	5. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2001
2	6. George M. Marakas, Modern Data warehousing, Mining and Visualization: core concepts, Printice Hall,
	First Edition, 2002.
3	7. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
4	8. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008.
E-References	
1	1. https://www.guru99.com/data-mining-tutorial.html
2	2. https://www.tutorialspoint.com/data_mining/
3	3. www.knowledge-management-tools.net/data-warehousing.html



POMEN EMPOWERMENT		Elayampalayam, Ti	rucheng	ode-6	37 205.					
Programme	MCA	Programme Code		PCA Regulations						
Department	M.C.A Semester							3		
			Perio	ds	Credit	Maximu	ım Mark	KS		
Course Code	C	ourse Name	per W	eek						
			L T	Р	С	CA	ESE	Total		
21P3CAE15	R PR	OGRAMMING	4 0	0	4	25	75	100		
COURSE	To Understand D	ata Science and its application	ons, Intr	oduce	yourself to R	Programmi	ing and '	To Explore		
OBJECTIVES	how basic graphs	and statistics works in R								
POs		PRO	GRAMM	IE OU	JTCOME					
PO 1	Apply knowledge	e of computing fundamental	s, compu	ting s	pecialization,	mathematic	es, and d	lomain		
		priate for the computing spe				and concept	ptualiza	tion of		
		ls from defined problems an	*							
PO 2	-	te, research literature, and se		-			-			
		g fundamental principles of	mathema	tics, o	computing scie	ences, and re	elevant	domain		
	disciplines			1	1 11 '	1 1				
PO 3	-	ate solutions for complex co		-		-	•			
		processes that meet specified ocietal, and environmental	needs w	itn ap	propriate cons	ideration ic	or public	c nearth and		
PO 4		ed knowledge and research	methods	inclu	ding design of	experiment	te analy	reis and		
104		data, and synthesis of the in:			• •	-	is, anary	sis and		
PO 5	*	apt and apply appropriate te		-			ting too	ols to complex		
		ties, with an understanding					0	I		
PO 6		commit to professional ethic				onsibilities,	, and no	rms of		
	professional com	puting practice								
PO 7	Recognize the ne	ed, and have the ability, to e	engage in	inde	pendent learnii	ng for conti	nual dev	velopment as a		
	computing profes	ssional								
PO 8		wledge and understanding of		-		-	-			
		as a member and leader in a	team, to	mana	ge projects and	d in multidi	sciplina	ry		
	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, and give and understand									
<b>DO</b> 10	-	*		C	. 1 1 1	1, 1,	•.1 •	1 1 1		
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	•				-	1				
1011	Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments									
PO 12		opportunity and using innov	vation to	pursu	e that opportu	nity to creat	te value	and wealth for		
		the individual and society a		1	PPortu	.j .s 01000				
PO 13		dge of computing to create e		desig	ns and solutior	ns for comp	lex prob	olems		
PO 14				-			-			
PO 15		To identify, analyse and synthesize scholarly literature relating to the field of Computer Science To develop scientific outlook that solves any problem, encompassing the expected aspects of market lemands								

COs	COURSE OUTCOME					
CO 1	The gain the knowledge in Overview of R and its installation					
CO 2	To understand the concepts of Data In and Out of R					
CO 3	To learn about the vectorized operations in R					
CO 4	To understand the various control structures of R					
CO 5	To acquire knowledge in scoping rules of R					
Pre-requisites	Programming basics and Data Mining					

					]	Know	ledge	Level	S							
1.Reme	mberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E <sup>,</sup>	valuat	ing, 6.	Synth	esizing	5	
		(3/2)	/1 indic	ates the				Mappin	-	2-mediu	m 1-we	eak)				
СО	s	(3/2/			KLs			511, 5 50	POs			Juny	KI	_s		
	5								PO				2			
СО	1				2				PO				3			
									PO	3			2			
									PO	4			4	-		
CO	2				3				PO				3			
									PO				3			
00	2		3					PO 7				2 3				
CO	3							PO 8 PO 9				4				
								PO 10				3				
CO	4		4					PO 11					4			
								PO 12				2				
								PO 13					3			
CO	5		3					PO 14				4				
								PO 15				3				
		(2)2	/1 • 1•				PO Ma				1	1 \				
	1	(3/2/	1 indic	ates the	e streng				-	2-mediu	m, 1-we	eak)				
COs		PO2	PO3	PO4	PO5	PO6	-	me Ou	r		DO11	DO12	DO12	DO14	DO15	
	PO1						PO7	PO8	PO9	PO10		PO12	PO13			
CO1	3	2	3	1	2	2	1	2	1	2	1	3	2	1	2	
CO2	2	3	2	2	3	3	2	3	2	3	2	2	3	2	3	
CO3	2	3	2	2	3	3	2	3	2	3	2	2	3	2	3	
CO4	1	2	1	3	2	2	1	2	3	2	3	1	2	3	2	
CO5	2	3	2	2	3	3	2	3	2	3	2	2	3	2	3	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Connections-Reading Lines of a Text File-Reading From a URL Connection-Subsetting R         Objects-Subsetting a Vector-Subsetting a Matrix-Subsetting Lists-Subsetting Nested Elements of a List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.         Init - III       Periods       12         Vectorized Operations-Vectorized Matrix Operations -Dates and Times-Dates in R Times in R-Operati on Dates and Times-Summary-Managing Data Frames with the dplyr package-Data Frames-The dplyr Package-dplyr Grammar-Installing the dplyr package       -select()-filter()-arrange()-rename()-mutate()-group_by().         Unit - IV       Control Structures and functions       Periods       12         Unit - IV       Control Structures-if-else-for Loop-Nested for loops-while Loops-repeat Loops-next, break-Functions in R- our First Function - Argument Matching-Lazy Evaluation The Argument -Arguments Coming After the Argument.		History and Overview of R	Periods	12							
Unit - 1       interface. R Nuts and Bolts: Entering Input - Evaluation - R Objects - Numbers - Attributes - Creating Vectors - Mixing Objects - Explicit Coercion - Matrices - Lists - Factors - Missing Values - Data Fram Names         Image: Control Structures - Getting Data In and Out of R       Periods       12         Reading and Writing Data-Reading Data Files with read.table()-Reading in Larger Datasets with read.talaculating Memory-Requirements for R Objects-Using the readr Package-Using Textual and Binary       12         Unit - II       Formats for Storing Data-Using dput() and dump()-Binary Formats-Interfaces to the Outside World-Fil Connections-Reading Lines of a Text File-Reading From a URL Connection-Subsetting R Objects-Subsetting a Vector-Subsetting a Matrix-Subsetting Lists-Subsetting Nested Elements of a List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.         Imit - III       Vectorized Operations-Vectorized Matrix Operations -Dates and Times-Dates in R Times in R-Operati on Dates and Times-Summary-Managing Data Frames with the dplyr package-Data Frames-The dplyr Package-dplyr Grammar-Installing the dplyr package         Imit - III       Control Structures and functions       Periods       12         Imit - Functions - Functions in R - our First Function - Argument Matching-Lazy Evaluation The Argument -Arguments Coming After the Argument.       12         Imit - IV       Scoping Rules of R-A Diversion on Binding Values to Symbol-Scoping Rules-Lexical Scoping: Why I I t Matter?-Lexical vs. Dynamic Scoping- Optimization- lotting the Likelihood. Coding Standards for R-Loop Functions-Looping on the Command Line-lapply()-sapply()-split()-Splitting a Dat		What is R? What is S? The S Philosophy - Back to R - Basic Features of I	R - Free Software	- Design of the							
interface. R Nuts and Bolts: Entering Input - Evaluation - R Objects - Numbers - Attributes - Creating Vectors - Mixing Objects - Explicit Coercion - Matrices - Lists - Factors - Missing Values - Data Fram. Names         Vectors - Mixing Objects - Explicit Coercion - Matrices - Lists - Factors - Missing Values - Data Fram. Names         Image: Control Structures of Control Structures and Times-Summary-Managing Data Files with read.table()-Reading in Larger Datasets with read.talculating Memory-Requirements for R Objects-Using the read Package-Using Textual and Binary alculating Memory-Requirements for R Objects-Using the read Package-Using Textual and Binary Formats for Storing Data-Using dput() and dump()-Binary Formats-Interfaces to the Outside World-Fil Connections-Reading Lines of a Text File-Reading From a URL Connection-Subsetting R Objects-Subsetting a Vector-Subsetting a Matrix-Subsetting Lists-Subsetting Nested Elements of a List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.         Unit - III       Vectorized Operations-Vectorized Matrix Operations -Dates and Times-Dates in R Times in R-Operati on Dates and Times-Summary-Managing Data Frames with the dplyr package-Data Frames-The dplyr package -dplyr Grammar-Installing the dplyr package         unit - III       Control Structures-if-else-for Loop-Nested for loops-while Loops-repeat Loops-next, break-Functions-Functions in R- our First Function - Argument Matching-Lazy Evaluation The Argument -Arguments Coming After the Argument.         Unit - V       It Matter?-Lexical vs. Dynamic Scoping - Optimization- lotting the Likelihood. Coding Standards for R-Loop Functions-Looping on the Command Line-lapply()-split()-Spliting a Data Frame-tapply()-split()-Spliting a Data Frame-tapply()-split()-Spliting a Data Frame-tapply()-split()-Spli	<b>T</b> T '/ <b>T</b>	R System - Limitation of R - R Resources Getting Started with R: Installa	tion - Getting star	ted with the R							
Names           Image:	Unit - I	interface. R Nuts and Bolts: Entering Input - Evaluation - R Objects - Nut	mbers - Attributes	- Creating							
Image: Control Structures-if-else-for Loop-Nested for loops-while Loops-repeat Loops-next, break- Functions-Functions in R- our First Function - Argument Matching-Lazy Evaluation The Argument Control Structures if R- objects - Using Control Structures if R- objects - Using the cotype poly().Periods12Unit - IVImage: Control Structures if R- Reading Data Pielse of R-A Diversion on Binding Values to Symbol-Scoping Rules-Lexical Scoping Rules of R-A Diversion on the Command Line-lapply()-sapply()-split()-Splitting a Data Frame-tapplyPeriods12Unit - VImage: Reading Data Pielse Rules of R-A Diversion on the Command Line-lapply()-sapply()-split()-Splitting a Data Frame-tapplyPeriods12Image: Rule Rules		Vectors - Mixing Objects - Explicit Coercion - Matrices - Lists - Factors -	- Missing Values -	Data Frames							
Integrating the set of the		Names									
Init - IIalculating Memory-Requirements for R Objects-Using the readr Package-Using Textual and Binary Formats for Storing Data-Using dput() and dump()-Binary Formats-Interfaces to the Outside World-Fil Connections-Reading Lines of a Text File-Reading From a URL Connection-Subsetting R Objects-Subsetting a Vector-Subsetting a Matrix-Subsetting Lists-Subsetting Nested Elements of a List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.Unit - IIIPeriods12Vectorized Operations-Vectorized Matrix Operations -Dates and Times-Dates in R Times in R-Operati on Dates and Times-Summary-Managing Data Frames with the dplyr package-Data Frames-The dplyr Package-dplyr Grammar-Installing the dplyr package -select()-filter()-arrange()-rename()-mutate()-group_by().12Unit - IVControl Structures and functionsPeriods12Unit - IVControl Structures-if-else-for Loop-Nested for loops-while Loops-repeat Loops-next, break- Functions-Functions in R- our First Function - Argument Matching-Lazy Evaluation The Argument -Arguments Coming After the Argument.Unit - VIt Matter?-Lexical vs. Dynamic Scoping- Optimization- lotting the Likelihood. Coding Standards for R-Loop Functions-Looping on the Command Line-lapply()-sapply()-split()-Splitting a Data Frame-tapply		Getting Data In and Out of R	Periods	12							
Unit - IIFormats for Storing Data-Using dput() and dump()-Binary Formats-Interfaces to the Outside World-Fill Connections-Reading Lines of a Text File-Reading From a URL Connection-Subsetting R Objects-Subsetting a Vector-Subsetting a Matrix-Subsetting Lists-Subsetting Nested Elements of a List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.Image: the text of t		Reading and Writing Data-Reading Data Files with read.table()-Reading	in Larger Datasets	with read.tab							
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List-Extracting Multiple Elements of a List-Partial Matching-Removing NA Values.Image: Periods of the period											
Unit - IIIPeriods12Unit - IIIVectorized Operations-Vectorized Matrix Operations -Dates and Times-Dates in R Times in R-Operati on Dates and Times-Summary-Managing Data Frames with the dplyr package-Data Frames-The dplyr Package-dplyr Grammar-Installing the dplyr package -select()-filter()-arrange()-rename()-mutate()-group_by().Periods12Unit - IVControl Structures and functionsPeriods12Control Structures-if-else-for Loop-Nested for loops-while Loops-repeat Loops-next, break- Functions-Functions in R- our First Function - Argument Matching-Lazy Evaluation The Argument -Arguments Coming After the Argument.PeriodsUnit - VScoping Rules of R-A Diversion on Binding Values to Symbol-Scoping Rules-Lexical Scoping: Why I It Matter?-Lexical vs. Dynamic Scoping- Optimization- lotting the Likelihood. Coding Standards for R-Loop Functions-Looping on the Command Line-lapply()-split()-Splitting a Data Frame-tapp											
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	Unit - V										
apply()-Col or Row Sums and Means-Other Ways to Apply-mapply().			()-Splitting a Data	a Frame-tapply							
Total Periods 60											

Text Books	
1	Roger D. Peng, "R Programming for Data Science", LeanPub, 2015. (e-Book
References	
1	Tony Fischetti, "Data Analysis with R", Paperback, PACKT Publications, 2015
2	Grolemund, Garrett, "Hands on Programming with R", O' Reilly Inc., 2015
E-References	
1	www.w3schools.com
2	www.tutorialspoint.com
3	www.geeksforgeeks.com



MOMEN EMPOWERMENT		Elayampalayam, Ti	ruchengo	ae-o	37 205.						
Programme	MCA	Programme Code		PCA Regulations							
Department		M.C.A Semester									
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COURSE	Students gain the	skills to exploit the capabil	ities of in	form	ation security a	and Unders	stand wit	th modern			
OBJECTIVES	security technolo	gies such as firewalls, VPN	s, intrusic	n det	ection system						
POs		PRO	GRAMM	E Ol	JTCOME						
PO 1	Apply knowledg	e of computing fundamental	s, compu	ting s	pecialization,	mathematio	cs, and d	lomain			
		priate for the computing spe				and conce	ptualizat	tion of			
		ls from defined problems an									
PO 2		te, research literature, and so	-	-			-				
	conclusions using fundamental principles of mathematics, computing sciences, and relevant domain										
DO 2	disciplines						1				
PO 3	-	ate solutions for complex co		-		-	•				
	components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental										
PO 4		ed knowledge and research	methods	nclu	ding design of	experimen	ts analy	sis and			
104		data, and synthesis of the inf			• •	-	ts, anary	sis and			
PO 5		apt and apply appropriate te		-			uting too	ols to complex			
		ties, with an understanding of	-			1	0	1			
PO 6		commit to professional ethic				onsibilities	, and not	rms of			
	professional com	puting practice.									
PO 7	Recognize the ne	ed, and have the ability, to e	engage in	inde	pendent learnii	ng for conti	inual dev	velopment as a			
	computing profes										
PO 8		wledge and understanding of			0 0		-				
	ones 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										
PO 10	effective presentations, and give and understand										
PO 10	Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and										
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										
1011	environments.	ery as an marviadar and as c	t memoer	or ic		counts and	i III IIIuit	iaiseipinia y			
PO 12		opportunity and using innov	vation to 1	oursu	e that opportui	nity to crea	te value	and wealth for			
		the individual and society a			rronu	., erou					
PO 13		dge of computing to create e	-	lesig	ns and solutior	ns for comp	olex prob	olems			
PO 14		yse and synthesize scholarly		-		-	-				
PO 15	To develop scien demands	tific outlook that solves any	problem,	enco	ompassing the	expected as	spectsof	market			

COs	COURSE OUTCOME
CO 1	To provide students the right skills and knowledge needed to develop ApplicationsmongoDB
CO 2	To provide students the right skills and knowledge needed to run on Applications
CO 3	Explain the detailed architecture, define objects, load data, query data and performance
CO 4	Understand replication and sharding in MongoDB
CO 5	To learn about deployment and administration
Pre-requisites	

					]	Know	ledge	Level	s						
1.Reme	nberi	ng, 2.	Under	stand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	Ş
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10		PO12	PO13	PO14	PO15
CO1	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO2	2	3	2	2	1	2	1	1	2	1	3	2	1	3	2
CO3	2	1	2	2	3	2	1	1 3 2 3 1 2 3 1 2						2	
CO4	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3
CO5	3	2	3	3	2	3	2	2	3	2	2	3	2	2	3

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

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1. Course End Delivery

	GETTING STARTED	Periods	12							
TT.' T	A database for the modern web - MongoDB through the JavaScript shell - Writing programsusing									
Unit - I	MongoDB- MongoDB Document Model									
	APPLICATION DEVELOPMENT	Periods	12							
	Document-oriented data - Principles of schema design - Designing an e-co	ommerce data mo	del - Nuts and							
Unit - II	bolts on databases, collections, and documents. Queries and aggregation - E-commerce queries -									
	MongoDBâ€ <sup>™</sup> s query language - Data Types in MongoDB -Aggregating orders -Aggregation in detail									
	UPDATES, ATOMIC OPERATIONS, AND DELETES	Periods	12							
Unit - III	A brief tour of document updates - E-commerce updates - Atomic document processing - MongoDB									
Olint - III	updates and deletes. Indexing and query optimization: Indexing theory - Indexing in practice.									
	REPLICATION	Periods	12							
Unit - IV	Overview - Replica sets - Master-slave replication - Drivers and replication	on. Shading: Over	view - A sample							
Unit - I v	shard cluster - Querying and indexing a shard cluster - Choosing a shard key									
	DEPLOYMENT AND ADMINISTRATION	Periods	12							
Unit - V	Deployment - Monitoring and diagnostics - Maintenance - Performance to	roubleshooting								
	Total Periods60									

Text Books	
1	Kyle Banker. (2012). MongoDB in Action. Manning Publications Co
2	Rick Copeland. (2013). MongoDB Applied Design Patterns, 1st Edition, O"Reilly Media Inc.
References	
1	Gautam Rege (2012). Ruby and MongoDB Web Development Beginners Guide. Packt Publishing Ltd
2	Mike Wilson (2013). Building Node Applications with MongoDB and Backbone, OReilly Media Inc
3	David Hows (2009) The definitive guide to MongoDB, 2nd edition, Apress Publication, 8132230485
E-References	
1	https://www.tutorialspoint.com
2	www.w3schools.com
3	www.javatpoint.com