VIVEKANANDHA

COLLEGE OF ARTS AND SCIENCES FOR WOMEN

ELAYAMPALAYAM, TIRUCHENGODE (Tk.), NAMAKKAL (Dt.).

(Affiliated to Periyar University, Approved by AICTE & Re-Accredited with A Grade by NAAC) Recognized under section 2(f) and 12(B) Under UGC Act, 1956



PG AND DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

B.Sc. COMPUTER SCIENCE SYLLABUS & REGULATIONS

FOR CANDIDATES ADMITTED FROM 2021-22 ONWARDS UNDER AUTONOMOUS & OBE PATTERN

VIVEKANANDHA EDUCATIONAL INSTITUTIONS Angammal Educational Trust Elayampalayam, Tiruchengode (Tk.), Namakkal (Dt.)

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VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN

(AUTONOMOUS)

B.Sc CS

(BACHALOR OF COMPUTRE SCIENCE)

(Candidates admitted from 2021-2022 onwards)

REGULATIONS

I. SCOPE OF THE PROGRAMME

Bachelor of Information Technology can be considered to be one of the most prominent UG level programs in our country. This program mainly deals with the development of computer applications for the purpose of updating computer programming languages. B.Sc.[CS] also aims at creating strong knowledge of theoretical Information Technology subjects who can be employed in software development and testing units of industries. The course has a time period of 3 years with 6 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 PROGRAMME

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

IV. ELIGIBILITY FOR ADMISSION

A Candidates seeking admission to the first year Degree course (B.Sc. Computer Science) shall be required to have passed Higher Secondary Examination with Mathematics or Business Mathematics or Computer Technology or Statistics (Academic Stream or Vocational Stream) as one of the subject under Higher Secondary Board of Examination, conducted by the Government of Tamilnadu or an examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the B.Sc. Computer Science Degree Examination of Periyar University after a course of study of three academic years.

V. DURATION OF THE PROGRAMME

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

VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the Internal

ASSESSMENT MARKS FOR THEORY PAPERS WILL BE AS UNDER:

1	Average of Two Tests		-	05
2	Model Exam		-	10
3	Assignment		-	05
4	Attendance		-	05
		Total	-	25

ASSESSMENT MARKS FOR PRACTICAL PAPERS WILL BE AS UNDER:

1	Model Exam	-	20
2	Observation Note	-	10
3	Attendance	-	10

THEORY	In the End Semester Examinations, the passing minimum shall be 40%
	out of 75 Marks. (30 Marks)
PRACTICAL / MINI	In the End Semester Examinations, the passing minimum shall be 40%
PROJECT	out of 60 Marks. (24 Marks)

PASSING MINIMUM - EXTERNAL

VII. ELIGIBILITY FOR EXAMINATION

A candidate will be permitted to appear for the University Examination only on learning 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.

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

DISTRIBUTION OF MARKS FOR ATTENDANCE:

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the Examination of Core Courses (Main & Allied Subjects) & 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..
- c) 50% & 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 Academic years comprising of six semesters and passed the Examinations prescribed and fulfilled such conditions has have been prescribed therefore.

X. PROCEDURE IN THE EVENT OF FAILURE

If a candidate fails in a particular subject, she may reappear for the university 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 2021-2022 (i.e.,) for the students who are to be admitted to the First year of the course during the Academic year 2021-22 and thereafter.

XII. TRANSITORY PROVISIONS

Candidates who were admitted to the UG course of study before 2018-2019 shall be permitted to appear for the examinations under those regulations for the period of Three years ie., upto and inclusive of the Examinations of 2021-2022. Thereafter, they will be permitted to appear for the examinations only under the regulations then in force.

QUESTION PAPER PATTERN – Theory				
Tir	me duration: 3 Hours	Max. Marks: 75		
PART- A:	Answer all the Questions			
(20 x 1= 20)	Four Questions from each Unit			
PART- B:	Answer all the questions			
(5 x 5 = 25)	One Question from each Unit (Either or Type)		
PART- C:	Answer any THREE of the questions			
(3 x 10 = 30)	One Question from each Unit (3 Out of 5)			
IN THE END SEMESTER EXAMINATIONS, THE PASSING MINIMUM SHALL BE 40% OUT OF 75				
MARKS. (30 MARKS)				

EVALUATION OF EXTERNAL EXAMINATIONS (EE)

QUESTION PAPER PATTERN – Practical

Time duration: 3 Hours Max. Marks	: 60				
1. One compulsory question from the given list of objectives	30 Marks				
2. One either/or type question from the given list of objectives	30 Marks				
IN THE END SEMESTER EXAMINATIONS, THE PASSING MINIMUM SHALL BE 40% OUT OF 60					
MARKS. (24 MARKS)					

B.Sc CS CURRICULUM FOR ACADEMIC YEAR 2021 – 2022

COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER AUTONOMOUS, CBCS & OBE PATTERN

FOR THE CANDIDATES ADMITTED FROM THE YEAR 2021 – 2022 SEMESTER: I & II

SEM	DADT	COURSE COURSE TITLE		Hrs	CRE	MARKS			
SLIVI	FANT	CODE	піз	DIT	CIA	EE	тот		
	Ι	18U1LT01	Tamil – I		6	3	25	75	100
	П	17U1LE01B	English – I		6	3	25	75	100
	===	18U1MAA03	Allied – I: Numerical Methods		4	4	25	75	100
	==	21U1CSC01	Core: I Programming in C		4	4	25	75	100
	Ш	21U1CSCP01	Practical – I: Programming in C Lab		4	4	40	60	100
	111	21U1CSCP02	Practical –II: Office Automation Lab		4	3	40	60	100
	IV	18U1VE01	Value Education		2	2	25	75	100
			1	Total	30	23	205	495	700
	Ι	18U2LT02	Tamil – II		6	3	25	75	100
	Ш	18U2LE02B	English – II 6		6	3	25	75	100
	===	18U2MAA06	Allied – II: Discrete Mathematics	Illied – II: Discrete Mathematics				75	100
	Ш	21U2CSC02	Core: II Programming in C++		4	4	25	75	100
Ш	111	21U2CSCP03	Practical – III: Programming in C++ Lab	Practical – III: Programming in C++ Lab			40	60	100
	===	21U2CSC03	Core: III Data Structures and Algorithms		4	4	25	75	100
	IV	18U2ES01	Environmental Studies		2	2	25	75	100
			1	Total	30	23	190	510	700

SEMESTER: III & IV

SEM	Part	Course		Hrs	CRE	MARKS			
JLIVI	rait	Code		1115	DIT	CIA	EE	TOT	
	Ш	18U3CMA03	Allied – III: Financial Accounting	4	4	25	75	100	
	Ш	21U3CSC04	Core: IV Java Programming	5	4	25	75	100	
	III	21U3CSC05	Core: V Operating System	5	4	25	75	100	
	III	21U3CSC06	Core: VI Computer Networks	4	4	25	75	100	
Ш	III	21U3CSCP04	Practical- IV: Java Programming Lab	4	3	40	60	100	
	III	21U3CSCP05	Practical: V HTML & Web Designing Lab	2	2	40	60	100	
	IV	21U3CSS01	SBEC:I HTML & Web Designing	2	2	25	75	100	
	IV		NMEC – I:	2	2	25	75	100	
			Library & Sports	2	0	-	-	-	
			Total	30	25	230	570	800	
	Ш	18U4CMA04	Allied – IV: Cost & Management Accounting	4	4	25	75	100	
	Ш	21U4CSC07	Core: VII Relational Database Management System	5	4	25	75	100	
	111	21U4CSC08	Core: VIII Software Engineering	4	3	25	75	100	
	Ш	21U4CSC09	Core: IX R Programming	4	3	25	75	100	
	Ш	21U4CSCP06	Practical: VI Relational Database Management System Lab	4	3	40	60	100	
IV	Ш	21U4CSCP07	Practical: VII R Programming Lab	3	3	40	60	100	
	Ш	21U4CSS02	SBEC:II Internet of Things	2	2	25	75	100	
	IV		NMEC – II	2	2	25	75	100	
			Library & Sports	2	0	-	-	-	
			Total	30	24	230	570	800	

CENA	Devit	COURSE		Line	CRE	MARKS			
SEIVI	Part	CODE	COURSE IIILE	Hrs	DIT	CIA	EE	тот	
	111	21U5CSC10	Core: X Dot Net Programming	5	4	25	75	100	
		21U5CSC11	Core: XI PHP Programming	5	4	25	75	100	
		21U5CSE	Elective – I	5	3	25	75	100	
	Ш	21U5CSCP08	Practical: VIII Dot Net Programming Lab	4	3	40	60	100	
v	111	21U5CSCP09	Practical: IX PHP Programming Lab	5	3	40	60	100	
	111	21U5CSCPR01	PROJECT – I: Project Work (In - House Project)	4	3	40	60	100	
	IV	21U5CSS03	SBEC: III Soft Skill	2	2	25	75	100	
	Total				22	220	480	700	
	Ш	21U6CSC12	Core: XII Python Programming	5	4	25	75	100	
	Ш	21U6CSC13	Core: XIII Mobile Application Development	5	4	25	75	100	
		21U6CSE	Elective – II	5	3	25	75	100	
VI	111	21U6CSCP10	Practical – X Mobile Application Development Lab	5	3	40	60	100	
	Ш	21U6CSCP11	Practical: XI Python Programming Lab	4	3	40	60	100	
		21U6CSCPR02	PROJECT – II: Project Work	4	3	40	60	100	
	IV	21U6CSS04	SBEC: IV: Desktop Publishing	2	2	25	75	100	
	V	21U6EX01	Extension Activities	-	1	-	-	-	
			Total	30	23	220	480	700	
			Grand Total	180	140	1295	3105	4400	

SEMESTER: V & VI

	ELECTIV	/E — I	ELECTIVE – II				
Semester	Course Code	Title	Semester	Course Code	Title		
	21U5CSE01	Cryptography		21U6CSE04	E-Technology		
V	21U5CSE02	Client/ Server Technologies	VI	21U6CSE05	Pervasive Computing		
	21U5CSE03	Artificial Intelligence		21U6CSE06	Big Data Analytics		



EMPOWER		;;;;;		8-			-			
Programme	B.Sc	Programme Code		UCS Regulations			2	2021-2022		
Department	Compu	iter Science				Semester				1
			Pe	eriod	.S	Credit	Maxim	um Mar	ks	-
Course Code	C	Course Name	per	We	ek					
			L	Т	Р	С	СА	ESF	Ę	Total
	Pro	gramming in C	4	0	0	4	25	75	_	100
21U1CSC01		888				· · ·				
COURSE	This subject is to	provide the students a stron	g four	ndati	on o	n programmin	g concepts	s and its	app	olication. It
OBJECTIVES	also enables the	students to solve problems u	sing p	rogr	amn	nable logic				
POs		PRO	GRAN	ИМЕ	E OU	ЛСОМЕ				
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core	informatio	n techno	olog	jies
PO 2	Build software s	stems and apply the technol	logies	in v	ariou	us fields of Co	mputer Te	chnolog	gy, ii	ncluding
	hardware problem	hardware problems, Web site development and management, databases, and software engineering								
	techniques.									
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	sired needs	within	the	realistic
	constraints.									
PO 4	Review literature	e and indulge in research using	ng res	earc	h bas	sed knowledge	e and meth	ods to d	lesig	n new
	experiments, and	lyze, and interpret data to dr	aw va	lid c	oncl	usions.		<u> </u>		<u> </u>
PO 5	Select and apply	current techniques, skills, ar	id too	ls ne	cess	ary for compu	ting practi	ce and 1	nteg	grate
DO 6	A nulve contextue	hs into the user environment	effect		y 	alth social or	nd aultural	iconoc	d	
PO 0	profession practi	r knowledge to assess profes	sional	i, ieg	ai, n	leann, social a	na cuntural	issues	uurn	ng
PO 7	Analyze the loca	cc. Land global impact of comp	uting	on ir	divi	duals organiz	ations and	1 society	.7	
PO 8	Apply ethical pri	nciples and responsibilities	during	on n	fessi	onal practice	ations, and	1 SOCIET	y.	
PO 9	Function effective	velv as a team member or a lo	eader	to ac	com	plish a comm	on goal in	a multic	lisci	plinary team
PO 10	Communicate ef	fectively with a range of aud	lience	s usi	ng a	range of moda	alities inclu	uding w	ritte	n, oral and
	graphical.	, ,			U	U		U		,
PO 11	Apply the knowledge of technology and management principles to manage projects effectively in diverse						in diverse			
	environments as	a member or a leader in the	team.							
PO 12	Engage in indepe	endent and life-long learning	for c	ontir	nued	professional d	levelopmei	nt.		
PO 13	Ability to unders	tand and analyze a given rea	ıl-time	e pro	blen	ns and propose	e feasible c	omputi	ng s	olutions.
PO 14	Evaluate and use	appropriate tools and techn	iques	in de	evelo	ping applicati	on activitie	es.		
PO 15	Updating themselves through e-learning and self-study courses.									

COs	COURSE OUTCOME			
CO 1	To interpret the basic elements like variables, data types and operators in C Language			
CO 2	To implement the C Program Decision making and Branching Statements			
CO 3	Execute Character Arrays and Strings by using String handling functions and User defined functions in C			
	Language			
CO 4	Organize Structures, Unions and Pointers in C Language			
CO 5	Generate Array of Pointers and Files in C Language			
Pre-requisites	Basic Computer Knowledge			

Knowledge Levels I.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing CO / PO / KL Mapping (3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak) COs KLs POs KLs

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									РО	1			1	_		
CO	1				2				PO	2			2	I 1 2 6 5 3 5 4 6 6 6 6 6 6 6 6 5 6 6 5 013 P014 P015 1 2		
									PO	3			6	KLs 1 2 6 5 3 5 4 6 6 6 6 6 6 6 6 6 6 6 6 6 5 013 PO14 PO15 1 1 1 1 1 1		
									PO	4			I 1 2 6 5 3 5 4 6 6 6 6 6 6 6 6 6 5 6 5 6 5 6 5 6 5 1 1 1 1 1			
CO	CO 2				3				PO	5			3	3		
								PO	6			4	I I 1 2 6 5 3 5 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 5 6 6 5 6 6 5 013 P014 P015 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2			
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CO 3					3				PO	8			1 2 6 5 3 5 4 6 6 6 6 6 6 6 6 6 6 6 6 5 6 6 5 6 6 5 6 6 5 6 6 5 012 PO13 PO14 PO15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
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									PO 1	3			6	6 6 5 6 6 5		
CO	5				6				PO 1	4			6	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		
									PO 1	5			4	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		
						CO /	PO Ma	pping								
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)				
<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	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO2	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1	
CO3	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1	
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2	
CO5	1	1	3	2	1	2	1	3	3	3	3	2	3	3	2	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus								
	Overview of C	Periods	10						
Unit I	History - Importance - Basic structure of C programs. Constants, variables	s and data types -	Operators and						
Unit - I	-Type conversions in expressions - Operator precedence and associativity.								
	Branching and Looping	Periods	10						
Unit - II	Decision making and branching - Decision making and looping- Arrays: Definition & Declaration - Types -								
	Dynamic arrays.	Dynamic arrays.							
	Arrays and Strings	Periods	10						
Unit III	Character arrays and strings- User - Defined functions- Elements - Definition of functions - Return values								
Unit - III	and their types - Function calls - Function declaration - Categories of Functions.								
	Structures and Unions	Periods	10						
Unit IV	Understanding pointers - Accessing the address of a variable - Initializing of pointer variables. Chain of								
Unit - IV	Pointers - Arrays of pointers - Pointers as function arguments - Pointer and structures.								
	File Management	Periods	10						
Unit V	I/O operation on files - Error handling during I/O operations -Dynamic M	I/O operation on files - Error handling during I/O operations -Dynamic Memory Allocation and Linked List							
Unit - V	- Malloc - Calloc - Free - Realloc -Linked list: Concept - Types- Advantage	ges- Creating a lir	nked list -						
	Applications								
	Total Periods	Total Periods 50							

Text Books	
1	"Programming in ANSI C", E. Balgurusamy Tata McGraw Hill, New Delhi, 4th Edition
References	
1	"C: The Complete Reference", Herbert Schildt, Mc Graw Hill, New Delhi, 4th Edition
2	"Programming In C", B.L.JUNEJA, Cengage Learning India
3	"Programming In ANSI C", E. Balagurusamy TMG Hill, New Delhi, 5th Edition.
E-References	
1	https://www.programiz.com/c-programming
2	https://www.tutorialspoint.com/cprogramming/index.htm
3	https://en.wikipedia.org/wiki/C_(programming_language)
4	https://www.geeksforgeeks.org/c-programming-language/

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WOMEN EN	POWERMENT		Elayampalayam, T	iruch	nengo	ode-6	37 205.				
Progr	amme	B.Sc	Programme Code			U	CS	Regulat	tions	:	2021-2022
Depa	rtment	Compu	ter Science				Semester				1
			F	Perio	ds	Credit	Maxim	um Mai	rks		
Cours	Course Code Course Name		pe	er We	eek						
				L	Т	Р	С	CA	ESI	E	Total
21U1	CSCP01	Pro	gramming in C Lab	0	0	4	3	40	60		100
List of I	List of Experiments										
1	1 Write a c program to 5 wap two numbers without using time Number.										
2	Write a c program to print multiplication of 2 matrices.										
3	Wri	ite a c program	to convert decimal nu	mber	to t	oinar	у.				
4	Wr	ite a c program	to reverse given numb	oer us	sing	for l	oop.				
5	C p	rogram to find	sum of array elements	usin	g D	ynan	nic Memory	Allocatio	on.		
6	Wri	te a program f	or accessing union mer	nbers	s.						
7	Wri	ite a program fo	or access data member	s of a	a stru	ıctur	e using a st	ruct varia	ıble.		
8	C P	rogram to crea	te, initialize, assign an	d acc	essa	a poi	nter variab	le.			
9	Wr	ite a c program	for copy one file to an	other	r file	e.					
10	Wri	ite a c program	to Employee record sy	stem	1 usi	ng fi	le.				

A LONG AND	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205.							
Programme	B.Sc	Programme Code		l		Regula	tions	2021-2022
Department	Compu	ter Science			Semester	8		1
1	F		Pe	riods	Credit	Maxim	um Mark	
Course Code	C	Course Name	per L	Week T P	C	CA	ESE	Total
21U1CSCP02	Off	ice Automation lab	0	0 2	2	40	60	100
List of Experime	ist of Experiments							
	MS Word							
1 2 2 2 0 3 3 7 4 5 Create 5 Create 5 Create 6 7 7 8 1	Enter a text ab Set the paper s Make the titles Justify the enti- Use Drop Cap Change the for Use bulleted li Insert a picture Save the file. e the document tion and Print 1 e a student bio- letters using M a Statement in e using Ms. Ex (Things to be C • Enter T • Enter T	out your Institution with ize A4 and orientation of a to Center, Bold, Font s ire Text. Set the margin in 1st paragraph 1st cha at size of the text to 12 s st and Highlight the imple, word art, Header and 1 ts using Header, Footer, Preview. - data. ail Merge in MS – Wor MS. MS. Excel regarding pa cel (Fields : Roll No. , I Covered) Two Titles he 1st and 2ndTitles in f Roll No., Name, etc as F he Roll Number using F 0 students particulars. the Titles. a New Row between 5th New Student's particul the Last row. a New Column between Sex column enter Sex = all the Data in Centre.	in two of the ize 20 left 1 aracte size. portar Foote Page d Exce articu Name "irst an ield r iill Ha ars ir 3rdt a "M"	Titles paper 0 and . 5, R er for 3 at sent r. e Setup el lars of , Com nd sec names andle. 6thRo n the n and 4t or "F'	to Portrait. style in Aria ight 1 . 5, To lines. ences. b, Border, Pa	 age numb of I Year of I Year B, Age, A ath difference 	ottom5 per, wate	ermarking, of your s, & 10th size and

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Prog	ramme	B.Sc	P	rogramme	Code			U	CS	Regulat	tions	2	2021-2022
Depa	artment	Compu	ter Scie	ence					Semester				1
Cours	se Code	(Course N	Jame		1	Perio per W	ds eek	Credit	Maxim	um Ma	rks	
						Ι	LT	Р	С	CA	ESI	Е	Total
21U1	ICSCP02	Off	ice Auto	omation la	ıb	(0 0	2	2	40	60		100
6	 Create a worksheet, moving/ copying/ inserting/ deleting rows and columns (usage of cut, paste, commands, copying a single cell, copying a range of data, filling up a cell. Undo command, inserting a row, column, deleting rows and columns). Formatting worksheets Bold, Italic, Font size changing, Auto fill, date format, Currency format. 												
7	Open a S. N	Name M1 M2 M3 M4 M5 Total Avg Result Grade of the M1 M2 M3 M4 M5 Total Avg Result Grade or S.No, Name, marks for 10 students Student Student Student Student Student											
	 i. Enter S.No, Name, marks for 10 students ii. Find total and average using formula. iii. Find Result whether the student is pass or fail and also assign grade as per our university norms. iv. Insert a column chart showing the comparison of marks in different subjects of different students. 												
8	i. Creat ii. Assi iii. Edit	ing and runnin gning button to ting a macro.	g a ma o a defi	icro. ined mae	cro.								
				MS.	Powerpo	oint	t Pres	senta	tion				
9	 9 Create a power-point presentation with minimum 5 slides. a. The first slide must contain the topic of the presentation and name of the presentation. b. Must contain at least one table. c. Must contain at least 5 bullets, 5 numbers. d. The heading must be, font size:32, font-face: Arial Rounded MT Bold, font-color: blue. e. The body must be, font size: 24, font-face: Comic Sans MS, font-color: green. f. Last slide must contain ,,thank you". 												
10	Create images	a presentation /word art and a	with a animat	pply bac the im	kground	/Th th e	nemes effects	, app s.	bly custom a	nimation	on te	xt, i	insert
11	Create a. Use time. b. Use	a presentation custom animati proper transitio	with m ion opt on for t	ninimum tion to an the slide	n 5 slides nimate th s.	he to	ext; ti	he te	xt must mov	ve left to	right	one	line at a

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)									TOV	ISO 9001/2008 (Phencland INTERCO		
Prog	ramme	B.Sc	Programme Code	Iruch	engo	0ae-6. U(57 205. CS	Regulat	tions	2	2021-2022	
Depa	rtment	Compu	ter Science				Semester			1		
Course Code Course Name		Course Name	Pe	erio r Wo	ods eek	Credit	Maxim	um Ma	rks			
			·	L	Т	Р	C	CA 40	ESI	E	Total	
21U1	CSCP02	Off	ice Automation lab	0	0	2	2	40	60		100	
	Ms Access											
12.	 Create a database "Student" with, a. At least one table named "mark sheet" with field name "student name, roll number, mark1, mark2, mark3, mark4, total" 12. b. The data types are, student name: text, roll number: number, mark1 to mark4: number, total: number. Roll number must be the primary key. c. Enter data in the table. The total must be calculated using update query. d. Use query for sorting the table according to the descending/ascending order of the total marks. 							nark1, r, total: al marks.				
13.	 With addition to the table above, a. Add an additional field "result" to the "mark sheet" table. b. Enter data for at least 10 students c. Calculate the result for all the students using update queries, if total>=200, then pass, else fail. d. Search the students, whose name starts with "sh". a. Show the names and total marks of the students who have passed the examination. 											
14.	 e. Show the names and total marks of the students who have passed the examination. 14. Create a employee personal information using MS – Access 											



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CERTIFIED	www.tuv.com

EMPOWER		,,, _,, _							
Programme	B.Sc	Programme Code			UC	CS .	Regulat	tions	2021-2022
Department	Compu	iter Science				Semester			2
			Pe	riod	s	Credit	Maxim	um Mar	rks
Course Code		Course Name	per	We	ek				
			I.	т	Р	C	CA	ESE	E Total
	Prog	ramming in C++	5	0	0	C	25	75	100
21U2CSC02	1105		5	0	U		23	75	100
COURSE	To learn the basi	c concepts of object oriented	l progr	amı	ning	& the syntax	of C++ lar	nguage.	To impart the
OBJECTIVES	programming sk	ills C++ and the concepts of	Objec	t Or	iente	ed Software D	evelopmen	t Life C	Cycle and about
	Unified Modelin	g Language.							
POs		PRO	GRAN	1ME	EOU	TCOME			
PO 1	Apply the knowl	edge of mathematics, scienc	e and o	com	puti	ng in the core	informatio	n techn	ologies
PO 2	Build software s	stems and apply the technol	logies	in v	ariou	us fields of Co	mputer Te	chnolog	gy, including
	hardware problem	ms, Web site development an	nd mar	nage	men	t, databases, a	nd softwar	e engin	eering
	techniques.								
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	ired needs	within	the realistic
	constraints.	constraints.							
PO 4	Review literature	e and indulge in research using	ng rese	earc	h bas	sed knowledge	e and meth	ods to d	lesign new
DO 5	experiments, and	lyze, and interpret data to dr	aw va		concl	usions.			
PO 5	Select and apply	current techniques, skills, and into the user environment	affaat	is ne	cess	ary for compu	ung pracu	ce and i	Integrate
PO 6	Apply contextua	Is into the user environment	sional		y. al h	alth social a	nd cultural	iccular	during
100	profession practi	ce.	sionai,	, icg	,ai, 11	cartii, sociai ai	na cunturai	155005	during
PO 7	Analyze the loca	l and global impact of comp	uting o	on ir	ndivi	duals, organiz	ations, and	l society	у.
PO 8	Apply ethical pri	nciples and responsibilities	during	pro	fessi	onal practice.			
PO 9	Function effective	vely as a team member or a le	eader t	to ac	com	plish a comm	on goal in	a multio	disciplinary
	team.								
PO 10	Communicate ef	fectively with a range of aud	iences	s usi	ng a	range of moda	alities inclu	uding w	ritten, oral and
	graphical.								
PO 11	Apply the knowl	edge of technology and man	ageme	ent p	orinc	iples to manag	ge projects	effectiv	vely in diverse
	environments as	a member or a leader in the	team.						
PO 12	Engage in indepe	endent and life-long learning	for co	ontir	nued	professional d	levelopme	nt.	
PO 13	Ability to unders	tand and analyze a given rea	I-time	pro	blen	ns and propose	e teasible c	omputi	ng solutions.
PO 14	Evaluate and use	appropriate tools and techn	iques i	n de	evelo	ping applicati	on activitie	es.	
PO 15	Updating themselves through e-learning and self-study courses.								

COs	COURSE OUTCOME
CO 1	Distinguish between Structured and Object Oriented problem solving approaches and apply them based on
	the problem given
CO 2	Identify classes and objects from the given problem description and able to create classes and objects using
	C++
CO 3	Achieve code reusability and extensibility by means of Inheritance and Polymorphism.
CO 4	Understand the complexity of Industrial Strength Software and the application of Unified Process Model.
CO 5	
Pre-requisites	

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

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

г

1. Course End Delivery

Content of the	Syllabus								
	Basic Concepts of OOP	Periods	12						
	Basic Concepts of OOP - Benefits of OOP - Applications of OOP -Structure of C++ - Simple programs in								
Unit I	C++ -Applications of C++ -Tokens- Keywords- Identifiers and Constant-Data types - Variables -								
Unit - I	Operators-Manipulators-Expressions- Control Structures. Functions -The main function- Prototype- Call by								
	Reference- Return by reference- Inline Functions- Default Arguments- Fu	nction Overloadin	ng.						
	Classes and Objects	Periods	12						
	Classes and Objects - Introduction- Specifying a class - defining a Memb	er Functions - An	ray with in a						
Unit - II class- Memory Allocation for Objects- Static data members - Static member function- Arra									
	Objects as Function Arguments - Friendly Functions- Returning Objects-const Member Functions-								
	Constructors and Destructors. Operator Overloading and type conversions								
	Inheritance:	Periods	12						
	Inheritance: defining a derived class - Derived Classes- single inheritance- Multilevel Inheritance-								
Unit - III	Multiple Inheritance- Hierarchical Inheritance- Hybrid Inheritance- Virtual Base Classes- Abstract Classes,								
	Pointers, virtual Functions and Polymorphism: Pointers - Pointers to Objects - these Pointers Virtual								
	Functions - Pure Virtual Functions.								
	Managing I/O Operations:	Periods	12						
Unit - IV	Managing I/O Operations: Streams in C++ - C++ Stream Classes - unformatted I/O operation-								
Ollit IV	Formatted Consol I/O Operations - Managing Output with Manipulators								
	Templates:	Periods	12						
Unit - V	Templates: Class templates- Class templates with Multiple Parameters- Fi	unction templates	- Function						
ent v	Templates with Multiple Parameters- Member Function Templates.								
	Total Periods		60						

Text Books	
1	1. E.Balagurusamy, "Object-Oriented Programming with C++", Tata McGraw Hill Publishing Company
	Limited, New Delhi ,Second Edition, 2001.
2	2. Bahrami "Object Oriented Systems", McGraw Hill International Edition, 1999.
References	
1	1. Robert Lafore, "Object Oriented Programming in Turbo C++", Galgotia ,2001.
2	2. Herbert Schildt, "Teach Yourself C++", Third Edition. Tata McGraw Hill, 5th Reprint, 2000
3	3. K.R Venu Gopal, Rajkumar, T.Ravishankar, "Mastering C++", TMG Ltd, New Delhi
E-References	
1	1. https://bookstore.github.io/cse/secondyear/Balaguruswamy%20Object%20Oriented%20Programming%2
	0With%20C++%20Fourth%20Edition.pdf
2	2. http://www.ddegjust.ac.in/studymaterial/mca-3/ms-17.pdf
3	3. https://www.scribd.com/doc/272353233/Object-Oriented-Programming-in-C-Balaguruswamy-pdf





EMPOWER		······································	8							
Programme	B.Sc	Programme Code	τ	UCS		Regulat	tions	2	021-2022	
Department	Compu	iter Science			Semester				2	
			Periods		Credit	Maxim	um Mai	rks		
Course Code	C C	Course Name	per Week							
			Г Т Г				CA ESE To			
	Data Strong	tures and Algorithms			4	25 25	75		100	
21U2CSC03	Data Sulu	tures and Algorithms	4 0 0	,	4	23	75		100	
COURSE	• Understan	d and remember algorithms	and its analy	sis p	orocedure. â€	¢ Introdu	ice the	conce	ept of data	
OBJECTIVES	structures throug	structures through ADT including List, Stack, and Queues.• To design and implement various data								
	structure algorith	tructure algorithms.• To introduce various techniques								
POs			CDAMME (TIT	COME					
FOS		FKO	OKAIVIIVIE (01	COME					
PO 1	Apply the knowl	edge of mathematics, scienc	e and compu	ting	g in the core	information	n techn	ologi	ies	
PO 2	Build software s	Build software systems and apply the technologies in various fields of Computer Technology, including								
	hardware problems, Web site development and management, databases, and software engineering									
	techniques.									
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic									
	constraints.	constraints.								
PO 4	Review literature	e and indulge in research usi	ng research t	base	d knowledge	and metho	ods to d	lesigi	n new	
PO 5	experiments, and	alyze, and interpret data to di	aw valid cor		sions.	tina prosti	oo ond i	intog	roto	
FO 5	IT based solution	s into the user environment	affectively	ssai	ry for compu	ting practio		Integr	Tale	
PO 6	Apply contextua	l knowledge to assess profes	sional legal	hes	alth social a	nd cultural	issues	durir	<u>.</u>	
100	profession practi	re	sionai, iegai	, nee	ann, sociai ai	ia culturai	155005	uum	18	
PO 7	Analyze the loca	l and global impact of comp	uting on indi	vidu	uals, organiz	ations, and	l society	v.		
PO 8	Apply ethical pri	nciples and responsibilities	during profes	ssion	nal practice.					
PO 9	Function effectiv	vely as a team member or a l	eader to acco	mpl	lish a commo	on goal in a	a multio	discij	plinary	
	team.			_		-				
PO 10	Communicate ef	fectively with a range of auc	liences using	a ra	ange of moda	alities inclu	ıding w	ritter	n, oral and	
	graphical.									
PO 11	Apply the knowl	edge of technology and man	agement prin	ncip	oles to manag	e projects	effectiv	ely i	n diverse	
	environments as	a member or a leader in the	team.							
PO 12	Engage in indepe	endent and life-long learning	g for continue	ed pi	orofessional d	levelopmer	nt.			
PO 13	Ability to unders	tand and analyze a given rea	al-time probl	ems	and propose	feasible c	omputi	ng sc	olutions.	
PO 14	Evaluate and use	appropriate tools and techn	iques in deve	elopi	ing applicati	on activitie	es.			
PO 15	Updating themse	elves through e-learning and	self-study co	ourse	es.					

COs	COURSE OUTCOME
CO 1	Explain the organization and operations of data structures Stack, Queues, Trees, Graphs, Heaps.
CO 2	Compare and contrast the functionalities and applications of different data structures
CO 3	Demonstrate specific search and sort algorithms using data structures given specific user requirements
CO 4	Apply the operations of data structures in designing software procedures based on specific requirements
CO 5	Assess the applicability of given data structures and associated operations to real time
Pre-requisites	Know about algorithms

	Knowledge Levels														
1.Remen	1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing														
							. / 171 .	<i>.</i>							
		(3/2)	/1 indic	ates the	e streng	O/PC) / KL I orrelati	Mappin on 3-st	g trong 2	-mediu	m 1-we	ak)			
COs	3	(3/2)	1 mare	aces an	KLs	,ui 01 0		011, 5 5	POs	3		(uit)	KI	Ls	
									PO	1			1		
CO 1					5				PO	2			2	2	
									PO	3			6	ō	
	_				-				PO	4			5	5	
CO	2				2				PO :	5			3	;	
									PO (5 7		5			
CO 3			1						PO	8		6			
	-				-				PO	9		6			
									PO 1	0			6	ō	
CO	4		3						PO 1	1			6	Ď	
								PO 12				5			
	_				_			PO 13				6			
CO	5				2			PO 14				6			
						CO /		nning	POI	3			3)	
		(3/2)	/1 indic	ates the	e streng	th of c	orrelati	on. 3-st	rong. 2	-mediu	m. 1-we	eak)			
		(2) _				P	rogram	me Ou	tcome (POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus									
	An Introduction to Data Structure:	Periods	12							
Unit I	Algorithms - Modular Programming - Top-Down Algorithm Design Bottom - Up Algorithm Design -									
Unit - I	Structured Programming - Analysis of Algorithm - Classification of Data Structure - Arrays - Lists.									
	Stack: Periods 12									
Unit II	Operations Performed on Stack - Stack Implementation - Stack Using Ar	rays - Applicatior	ns of Stacks -							
Unit - II	Evaluating Postfix Expression. Queue: Algorithms for Queue Operations - Circular Queue - Deques -									
	Applications of stacks.									
	Linked List:	Periods	12							
	Representation - Advantages and Disadvantages - Operations - Types of	linked list - Singl	y - Doubly -							
Unit - III	circular. Sorting Techniques: Complexity of Sorting Algorithms - Bubble Sort - Insertion Sort - Shell Sort									
	Trees:	Periods	12							
Unit IV	Basic Terminologies - Binary Trees - Representation of Binary tree - Ope	erations - Types o	f Binary Trees:							
Unit - I v	Binary Search Tree - Expression tree - Balanced Binary Tree - AVL Tree	- Applications. C	ase study: Heap							
	Tree.									
	Graphs:	Periods	12							
Unit V	Introduction-Graph Terminologies-Representation of Graphs-Operations	on Graphs - Brea	dth first search -							
Unit - V	Depth first search - Applications of Graph: Minimum Spanning Tree - Sh	ortest path. Searcl	hing							
	Techniques: Sequential - Binary and Fibonacci search.									
	Total Periods 60									

Text Books	
1	1. Vinu V Das "Principles of Data Structures using C and C++", New Age International Pvt Ltd Publishers,
	New Delhi, 2011.
References	
1	1. Chitra A & Rajan PT, "Data Structures", 2nd Edition, Vijay Nicole Publications, 2016
2	2. Reema Thareja "Data Structures using C" Oxford University Press Second Edition, New Delh, 2014.
3	3. Debasis Samanta "Classical Data structure" 2nd Edition, PHI Learning Private Limited, New Delhi,
	2011.
4	4. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd edition, Pearson Education Asia, 2009
E-References	
1	1. www.freetechbooks.com/algorithms-and-data-structures-f11.html
2	2. https://sonucgn.files.wordpress.com/2018/01/data-structures-by-d-samantha.pdf

SUCHIONA	L INSTITUT	VIVEKAN	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR												
0	E		WOMEN (AU	JTON	NON	ЛО	US)			TO	VRheinland Chriteloo				
NOMEN EMP	92 + WENNENT		Elayampalayam, Ti	iruche	engo	de-6	37 205.								
Progr	amme	B.Sc	Programme Code			U	CS	Regulat	tions		2021-2022				
Depar	Department Computer Science						Semester				2				
				Pe	eriod	s	Credit	Maxim	um Ma	rks					
Course	e Code	C	Course Name	per	Wee	ek									
			L	Т	Р	С	CA	ESI	E	Total					
21U2	CSCP03	Pro	gramming in C++ Lab	0	0	4	3	40	60		100				
List of F	List of Experiments														
List of I	Classe														
1	Classe	es and Objects													
2	Constr	ructors & Dest	ructors												
3	Inline	Functions													
4	Funct	ion Overloadin	g												
5	Opera	tor Overloadin	g												
6	Inheri	tance (Any Tw	o Types)												
7	Dynar	nic Polymorph	ism – Virtual Functions	5.											
8	Friend	l Function													
9	Pointe	ers													
10	Temp	lates	iplates												



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Programme	B.Sc	Programme Code			UC	Ś	Regulat	tions	2021-202	22		
Department	Compu	ter Science				Semester			3			
Course Code	C	Course Name				Credit	Maxim	um Mar	ks			
			L	Т	Р	C	CA	ESE	E Total	i –		
21U3CSC04	Java	a Programming	4	0	0	4	25	75	100			
COURSE OBJECTIVES	To know how to program in the Java programming language. To develop knowledge of object-oriented paradigm in the Java programming language. Apply and use of Java in a variety of technologies and on different platforms.											
POs	PROGRAMME OUTCOME											
PO 1	Apply the knowledge of mathematics, science and computing in the core information technologies											
PO 2	Build software systems and apply the technologies in various fields of Computer Technology, including											
	hardware problen techniques.	ns, Web site development a	nd ma	nage	men	t, databases, a	nd softwar	e engine	eering			
PO 3	Design, impleme	nt and evaluate a computer-	based	syst	em t	o meet the des	ired needs	within	the realistic			
PO 4	Review literature experiments, ana	e and indulge in research usi lyze, and interpret data to da	ng res raw va	earcl alid c	n bas oncl	sed knowledge lusions.	and metho	ods to d	esign new			
PO 5	Select and apply IT-based solution	current techniques, skills, a is into the user environment	nd too	ols ne tively	cess ⁄	ary for compu	ting praction	ce and i	ntegrate			
PO 6	Apply contextual profession practi	l knowledge to assess profes ce.	ssiona	l, leg	al, h	ealth, social a	nd cultural	issues o	luring			
PO 7	Analyze the loca	l and global impact of comp	uting	on ir	divi	duals, organiz	ations, and	society	<i>.</i>			
PO 8	Apply ethical pri	nciples and responsibilities	during	g pro	fessi	onal practice.						
PO 9	Function effective	ely as a team member or a l	eader	to ac	com	plish a commo	on goal in a	a multic	lisciplinary t	eam		
PO 10	Communicate ef graphical.	fectively with a range of auc	lience	s usi	ng a	range of moda	alities inclu	iding w	ritten, oral ar	nd		
PO 11	Apply the knowl	edge of technology and mar	nagem	ent p	rinc	iples to manag	e projects	effectiv	ely in divers	e		

Engage in independent and life-long learning for continued professional development.

Evaluate and use appropriate tools and techniques in developing application activities.

Ability to understand and analyze a given real-time problems and propose feasible computing solutions.

environments as a member or a leader in the team.

Updating themselves through e-learning and self-study courses.

PO 12

PO 13

PO 14

PO 15

COs	COURSE OUTCOME
CO 1	Understand and write the program in Java with basic input and output functions
CO 2	To understand the functions, Class and Objects, Inheritance and Packages in Java
CO 3	To understand and apply the exception handling mechanisms in Java
CO 4	To know the concept of JDBC and apply in the program to connect with the Java Program
CO 5	To know and develop Applets and know its use
Pre-requisites	Have an idea on Object Oriented languages such as C++

Kne	owlee	lge	Leve	ls

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

				_	(CO / PC) / KL]	Mappin	g								
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)					
CO	COs				KLs					POs				KLs			
									PO	1			1	l			
CO	1		2						PO	2			2	2			
									PO	3			6	5			
									PO	4			5	5			
CO	2				3				PO	5			1	3			
									PO	6			5	5			
									PO	7			4	ļ			
CO	3		3					PO 8				6					
								PO 9				6					
								PO 10				6					
CO	4		4						PO 1	1			6	5			
									PO 1	12			5	5			
			3					PO 13				6					
CO	5							PO 14				6					
								PO 15				5					
						CO /	PO Ma	pping									
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)					
<u> </u>						Р	rogram	ime Ou	tcome ((POs)							
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15		
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1		
CO2	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1		
CO3	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1		
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2		
CO5	1	2	1	1	3	1	2	2 1 1 1 1 1 1 1 1									

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus									
	Overview of Java Language	Periods	12							
Linit I	Introduction - simple java program-Java program structure-Java Tokens-Implementing a Java program									
Unit - I	Constants, variables, Data Types and Operators: Constants-variables-Data Types-Declaration of									
	variables-Operators and Expression.									
	Classes, objects and Methods	Periods	12							
Unit II	Defining a classes-Field and method declaration-creating objects-constructors-methods overloading-static									
Unit - II	members-Abstract class. Array: Introduction - One Dimensional Array-Cu	eating Array-Two	o dimensional							
	Аттау									
	Inheritance and Packages Periods 12									
Unit III	Extending a class -Overriding methods. Interfaces: Defining Interface-Extending Interface. Packages: Java									
Unit - III	API package-creating package-Accessing Package. Java String.									
	Exception Handling	Periods	12							
Unit - IV	Hierarchy, Advantage, Types, Keywords. Multithreading: Advantage, Mu	ltitasking. I/O Str	reams.							
	Applet Programming	Periods	12							
Unit V	Building Applet Code-Applet Life Cycle-Designing a web page-Applet T	ag-Running the A	Applet.AWT							
Unit - V	Event Handling: Introduction to AWT package-Swing Package-JDBC.									
	Total Periods 60									

Text Books	
1	Balagurusamy, "Programming in Java", 4th Edition 2010, TMH, New Delhi. Unit–I (Chapter –
	3.1,3.2,3.5,3.6,3.9,4.1 – 4.5, 5) Unit –II(Chapter – 8.2 -8.5,8.7 -8.9,8.16,9.1-9.4) Unit – III
	(Chapter – 8.11, 8.12,10.2,10.311.2,11.5,11.6) Unit – IV (Chapter –14.4,14.5,14.7,14.814.10) Unit
	–V (Chapter – 15.2,15.3,15.5-15.7,15.9-15.11,16.1-16.12)
References	
1	Herbert Scheldt, "Java2 The complete Reference" -McGraw Hill Publication
2	John R. Hubbard, "Programming With Java", 2nd Edition, TMH
E-References	
1	www.learnjavaonline.org
2	www.javaworld.com
3	www.onjava.com
4	www.java.sun.com



EMPOWERING		;;;;								
Programme	B.Sc	Programme Code	UCS Regulations					2	2021-2022	
Department	Compu	ter Science				Semester				3
			Pe	Periods Credit Maximum Mark						
Course Code	C	Course Name	per	We	ek					
	-			Т	Р	С	СА	CA ESE To		Total
	Ope	rating Systems	4	0	0	3	25	75		100
21U3CSC05		8	Ť	÷						
COURSE	To introduce stue	dents with basic concepts of	Opera	ting	Syst	tem, its function	ons and ser	rvices. 7	Го fa	amiliarize
OBJECTIVES	the students with	various views and manager	nent p	olici	es a	dopted by O.S	. as pertair	ning wit	h	
	processes,Deadlo	ock, memory,File and I/O op	eratio	ns						
POs		PRO	GRAN	/ME	E OU	TCOME				
PO 1	Apply the knowl	edge of mathematics scienc	e and	com	nuti	ng in the core	informatio	n techn	റിറം	ries
PO 2	Build software s	Build software systems and apply the technologies in various fields of Computer Technology, including								
	hardware problems, Web site development and management, databases, and software engineering									
	techniques.									
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	sired needs	within	the	realistic
	constraints.	constraints.								
PO 4	Review literature	e and indulge in research using	ng res	earc	h bas	sed knowledge	e and meth	ods to d	lesig	n new
	experiments, ana	lyze, and interpret data to dr	aw va	lid c	oncl	usions.				
PO 5	Select and apply	current techniques, skills, ar	nd tool	ls ne	cess	ary for compu	ting practi	ce and i	integ	grate
	IT-based solution	ns into the user environment	effect	ivel	y 					
PO 6	Apply contextua	l knowledge to assess profes	sional	, leg	al, h	ealth, social a	nd cultural	issues	duri	ng
PO 7	A polyzo the loop	ce. Land global impact of comp	uting	on ir	divi	duala organiz	ations and	lagaiat		
PO 7	Analyze the loca	nciples and responsibilities	during		facci	onal practice	auons, and	i society	y.	
PO 9	Function effective	rely as a team member or a l	auling eader i	to ac	com	nlish a comm	on goal in	a multic	lisci	inlinary team
PO 10	Communicate ef	fectively with a range of aud	iences		ng a	range of mod	alities inclu	uding w	ritte	n oral and
1010	graphical.					141160 01 11100				,
PO 11	Apply the knowl	edge of technology and man	ageme	ent p	rinc	iples to manag	ge projects	effectiv	vely	in diverse
	environments as	a member or a leader in the	team.	1					2	
PO 12	Engage in indepe	endent and life-long learning	for co	ontir	ued	professional d	levelopme	nt.		
PO 13	Ability to unders	tand and analyze a given rea	l-time	e pro	blen	ns and propose	e feasible c	omputi	ng s	olutions.
PO 14	Evaluate and use	appropriate tools and techn	iques i	in de	velo	ping applicati	on activitie	es.		
PO 15	Updating themse	lves through e-learning and	self-st	udy	coui	rses.				

COs	COURSE OUTCOME
CO 1	Analyze the structure of OS and basic architectural components involved in OS design
CO 2	Analyze and design the applications to run in parallel either using process or thread models of different OS
CO 3	Organize the various device and resource management techniques for time sharing and distributed systems
CO 4	Explain the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
CO 5	Interpret the mechanisms adopted for file sharing in distributed Applications
Pre-requisites	Knowledge of data structures and algorithms for an Operating Systems and Systems Programming

	Knowledge Levels															
1.Remer	1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing															
					C	CO / PC) / KL 1	Mappin	g							
		(3/2/	/1 indic	ates the	e streng	th of co	orrelati	on, 3-st	rong, 2	2-mediu	m, 1-we	eak)				
CO	8				KLs				POs	8			KI	LS		
									PO	1			1			
CO	1		4						PO	2			2	-		
									PO	3			6)		
CO	n				6				PO 4 5 PO 5 3 PO 6 5							
02					0				PO	5 6			5	· · · · · · · · · · · · · · · · · · ·		
								PO	7			4	_			
CO	CO 3				5				PO	8			6	5		
									PO	9			6 6 6			
									PO 9 0 PO 10 6 PO 11 6							
CO	4		4						PO 1	1			6	i		
								PO 12 5								
								PO 13				6				
CO	5				2		PO 14 6									
						<u> </u>		·····	PO I	5			5	1		
		(3/)	/1 india	otos th	strong	th of c	PO Ma	pping	rong	modiu	$m = 1 w^{2}$	ak)				
		(3/2/	'i muic	ates th	sucing	p p	rogram	me Ou	tcome ((POs)	III, 1-wc	<i>a</i> k)				
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2	
CO2	1	1	3	2	1	2	1	3	3	3	3	2	3	3	2	
CO3	1	1	2	3	1	-	2	2	2	2	2	3	2	2	3	
<u> </u>	1	1	1	2	2	2	-	1	1	1	1	2	1	1	2	
C04	2	2	1	1	2	ے 1	1	1	1	1	1	ے 1	1	1	ے 1	
005	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 S	Syllabus									
	Operating System Overview	Periods	12							
	Operating System Objectives and Functions. History of Operating System: First, Second, Third & Fourt									
Unit - I	Generation Operating System. Types of Operating System: Main Frame - Server - Multiprocessor -									
	Personal Computer - Embedded - Real-Time Operating System. The Evolution of Operating System									
	Mutual Exclusion and SynchronizationPeriods12									
	Threads: Process and Threads - Multithreading - Thread Functionality -M	utual Exclusion a	nd							
Unit - II	Synchronization: Principles of Concurrency - Mutual Exclusion - Semaphores. Deadlock and Starvation:									
	Resources - Principles of Deadlock - Deadlock Detection and Recovery - Deadlock Avoidance and									
	Prevention.									
	Memory Management	Periods	12							
Unit III	Memory Management Requirements - Memory Partitioning - Paging - Segmentation. Virtual Memory:									
Onit - III	Hardware and Control Structures. Operating System Software: Fetch Policy - Placement Policy -									
	Replacement Policy - Basic Algorithms - Page Buffering.									
	Scheduling	Periods	12							
	Types of Scheduling: Long Term Scheduling - Medium Term Scheduling - Short-Term Scheduling.									
Unit - IV	Scheduling Algorithm: Short Term Scheduling Criteria - The Use of Priorities - Alternative Scheduling									
	Policies. File Management: Overview - File Organization and Access - File Sharing - Record Blocking -									
	Secondary Storage Management.									
	I/O Devices-Organization of the I/O Functions	Periods	12							
	The Evolution of the I/O function-Direct Memory Access. I/O Buffering: Single Buffer-Double									
Unit - V	Buffer-Circular Buffer-The Utilities of Buffering. Disk Scheduling: Disk Performance Parameters-Disk									
	Scheduling Polices-RAID. Case Study: Windows OS, Linux OS, and MA	C OS								
	Total Periods		60							

Text Books	
1	"Operating Systems Internals and Design Principles" by William Stallings, Second Edition, PHI Learning
	Private Limited, New Delhi, 2012.
References	
1	"Modern Operating Systems" by Andrew S. Tanenbaum, Third Edition, PHI Learning Private Limited,
	NewDelhi, 2011.
2	"Operating Systems", by Achyut S Godbole, Second Edition, TMH Publishing Company Limited, New
	Delhi, 2008.
3	"Operating System Concepts", by Silberschatz, Galvin and Gagne, Sixth Edition, John Wiley & Sons Inc
	2002.
E-References	
1	http://faculty.salina.k-state.edu/tim/ossg/Introduction/OSrole.html
2	www.tutorialspoint.com/operating_system/



MEN EMPOWERME		Elayampalayam, 11	uene	ngu	uc-o	57 205.					
Programme	B.Sc	Programme Code			UC	S	Regulat	tions	2	2021-2022	
Department	Compu	iter Science		Semester						3	
			Periods Credit Maximum Marks								
Course Code	C	Course Name	per	per Week							
			L	Т	Р	С	CA	ESE	ESE Total		
	Com	puter Networks	4	0	0	4	25	75		100	
21U3CSC06											
COURSE	To understand th	e basics of Computer Netwo	rks.To	o un	ders	tand the impor	tant OSI la	ayers of	con	nputer	
OBJECTIVES	Networks.Becom	ne familiar with the basics of	comp	outer	net	work architect	ures and pi	rotocols			
POs		PRO	GRAN	/ME	E OL	ЛСОМЕ					
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core	informatio	n techno	olog	jies	
PO 2	Build software s	Build software systems and apply the technologies in various fields of Computer Technology, including									
	hardware problems, Web site development and management, databases, and software engineering										
	techniques.										
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	sired needs	within	the	realistic	
	constraints.										
PO 4	Review literature	e and indulge in research usin	ng res	earc	h ba	sed knowledge	e and meth	ods to d	esig	n new	
	experiments, ana	lyze, and interpret data to dr	aw va	lid c	concl	usions.					
PO 5	Select and apply	current techniques, skills, ar	id tool	ls ne	ecess	ary for compu	ting practi	ce and i	nteg	grate	
	TT-based solution	is into the user environment	effect	ivel	y	1.1 . 1	1 1. 1		<u> </u>		
PO 6	Apply contextua	I knowledge to assess profes	sional	, leg	al, h	ealth, social a	nd cultural	issues of	durn	ng	
DO 7	profession practi	ce.			1::	duala ananin		1			
PO 7	Analyze the loca	nainles and responsibilities	uting -		101VI	onal practica	ations, and	i society	/.		
PO 9	Eurotion effectiv	rely as a team member or a l	ander	$\frac{1}{10}$	ressi	olial practice.	on goal in	a multid	lisci	nlinary team	
PO 10	Communicate ef	fectively with a range of aud	iences		ng a	range of mode	alities inclu	iding w	ritte	pilitary team	
1010	graphical.	lectively with a fallee of add	icitee	5 451	iig a	Tange of mode	anties men	uuing w	mu	in, or ar and	
PO 11	Apply the knowl	edge of technology and man	ageme	ent p	orinc	iples to manag	ge projects	effectiv	ely	in diverse	
	environments as	a member or a leader in the	team.	_					-		
PO 12	Engage in indepe	endent and life-long learning	for co	ontir	nued	professional d	levelopmei	nt.			
PO 13	Ability to unders	tand and analyze a given rea	l-time	e pro	blen	ns and propose	e feasible c	omputii	ng s	olutions.	
PO 14	Evaluate and use	appropriate tools and techni	iques i	in de	evelo	ping applicati	on activitie	es.			
PO 15	Updating themselves through e-learning and self-study courses.										

COs	COURSE OUTCOME					
CO 1	To know about the security model					
CO 2	CO 2 To know and understand about the various security attacks and ethics in Information Security					
CO 3	o know and mange the risk management					
CO 4	To understand the Information security policy, standards, and practices					
CO 5	Demonstrate the Physical Security in the organization and in workplace					
Pre-requisites	A basic knowledge about Data Structure and Algorithm					

	Knowledge Levels															
1.Remer	1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing															
					-											
		(3/2	/1 india	eates the	e streng	20 / PC) / KL I orrelati	Mappin on. 3-st	g trong. 2	2-mediu	m. 1-we	ak)				
COs	3	(3/2)	1 marc		KLs	,ui oi e		011, 5 5	POs	3		uit)	KI	Ls		
									PO	1			1			
CO	1				3				PO	2			2	2		
									PO	3			6	5		
									PO	4		5 3				
CO 2					2				PO :	5			3	<u>}</u>		
									PO	6			5			
CO 3					1					/			4	-		
					1				PO 0	0 9			6	6		
									PO 1	.0			6	5 4 6 6 6 6 5		
CO	4				2			PO 11 6				õ				
									PO 1	2			5	i		
						PO 13 6					Ď					
CO	5				2				PO 1	4			6	6		
									PO 1	5			5	i		
		(2)	/1 • 1•			CO /	PO Ma	pping			4	1 \				
		(3/2)	/1 indic	cates the	e streng	th of co	orrelati	on, $3-st$	trong, 2	2-mediu	m, I-we	ak)				
COs	DOI	D 00	DOA	DO (D O #	P	rogram	me Ou	tcome (POS)	DOIL	D010	D010	DOIL	D015	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	POII	PO12	PO13	PO14	PO15	
C01	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus									
	Introduction Periods									
IIn:t I	Uses of Computer Network- LAN - WAN- MAN- Protocol Hierarchies - Protocols and									
Unit - I	Standards-Connection Oriented and Connection less Services - OSI Reference Model.									
	Physical Layer Periods 12									
Unit II	Transmission Media: Guided Transmission media - Wireless Transmissio	n - Communicatio	on Satellites -							
Public Switched Telephone Network.										
	Data Link Layer	Periods	12							
Unit - III	Data Link Layer Design Issues - Error Detection and Correction - Elementary data link protocols - Sliding									
	Window Protocols.									
	Network Layer	Periods	12							
Unit IV	Network Layer Design Issues. Routing Algorithms: Shortest Path- Link State - Distance Vector. Congestion									
Unit - I V	Control Algorithms: Principles. Inter networking: - Fragmentation - IP Addresses -OSPF.									
	Transport Layer	Periods	12							
Unit - V	Transport Services - Elements of Transport protocols - Application layer:	DNS- Electronic	mail-World							
	Wide Web.									
	Total Periods		60							

Text Books	
1	"Computer Networks" Andrew S. Tanenbaum, 5th Ed, PHI private Ltd, 2009.
References	
1	Behrouz A. Forouzan, "Data Communication and Networking", TMH, 2009.
E-References	
1	https://stevessmarthomeguide.com/basic-networking-course/
2	https://www.studytonight.com/computer-networks/



EMPOWERING		= =		80		. 2000				
Programme	B.Sc	Programme Code	UCS Regulations 2021-20						2021-2022	
Department	Compu	ter Science				Semester				3
			Pe	eriod	.S	Credit	Maxim	um Mar	:ks	
Course Code	C	Course Name	per	per Week						
		L	Т	Р	С	CA	ESF	Ξ	Total	
	HTML	& Web Designing	2	0	0	2	25	75		100
21U3CSS01										
COURSE	To inculcate kno	wledge on HTML concepts	and Pr	rogra	amm	ing knowledge	e.To under	stand ba	asic	concepts of
OBJECTIVES	style sheets and g	graphics.Students will under	stand	the b	oasic	structure of w	eb page cr	reation a	and	to know the
	impact of HTML	tags.								
POs		PRO	GRAN	/ME	EOU	TCOME				
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core i	informatio	n techno	olog	jies
PO 2	Build software s	Build software systems and apply the technologies in various fields of Computer Technology, including								
	hardware problems, Web site development and management, databases, and software engineering									
	techniques.									
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic									
	constraints.	constraints.								
PO 4	Review literature	e and indulge in research using	ng rese		h bas	sed knowledge	and metho	ods to d	lesig	in new
PO 5	Select and apply	current techniques skills ar	aw va	lia c	CONCI	usions.	ting practi	ce and i	ntac	rrata
105	IT-based solution	into the user environment	effect	ively	v v	ary for compu	ing practi		meε	grate
PO 6	Apply contextual	knowledge to assess profes	sional	leg	y alh	ealth social a	nd cultural	issues	duri	nø
100	profession practi	ce.	sionai	, 108	, 11	ourur, soorur u	ia cuitaiai	155405	ci ci li	
PO 7	Analyze the loca	l and global impact of comp	uting	on ir	ndivi	duals, organiz	ations, and	l society	<i>y</i> .	
PO 8	Apply ethical pri	nciples and responsibilities of	during	, pro	fessi	onal practice.				
PO 9	Function effectiv	rely as a team member or a le	eader 1	to ac	com	plish a commo	on goal in	a multic	lisci	plinary team
PO 10	Communicate ef	fectively with a range of aud	liences	s usi	ng a	range of moda	alities inclu	ıding w	ritte	en, oral and
	graphical.									
PO 11	Apply the knowl	edge of technology and man	ageme	ent p	rinc	iples to manag	e projects	effectiv	ely	in diverse
	environments as	a member or a leader in the	team.							
PO 12	Engage in indepe	endent and life-long learning	for co	ontir	nued	professional d	evelopmer	ıt.		
PO 13	Ability to unders	tand and analyze a given rea	ll-time	e pro	blen	ns and propose	teasible c	omputii	ng s	olutions.
PO 14	Evaluate and use	appropriate tools and techni	iques i	in de	evelo	ping application	on activitie	es.		
PO 15	Updating themse	lves through e-learning and	self-st	udy	cour	rses.				

COs	COURSE OUTCOME
CO 1	Understand the basic concepts of HTML
CO 2	Discuss about cascading style sheet
CO 3	Applying graphics for web use
CO 4	Creation of table
CO 5	Creation of frames
Pre-requisites	A basic knowledge of Computer

Knowledge Levels															
1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing															
		(2)2	/1 · 1·	. л	(CO / PC) / KL I	Mappin	g		1	1 \			
(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)															
COs			KLS					POS				<u>NLS</u>			
CO 1			1					PO 1 PO 2				2			
								PO 3				6			
CO 2			1					PO 4				5			
								PO 5				3			
								PO 6				5			
CO 3			2					PO 7				4			
								PO 8				6			
							_	PO 10				6			
CO 4			2					PO 11				6			
								PO 12				5			
								PO 13				6			
CO 5			2					PO 14				6			
								PO 15				5			
CO / PO Mapping															
	(3/2		cates the	e streng	$\frac{1}{D}$	rogram	$\frac{00}{2}$	teoma ($\frac{1}{2}$	m, 1-we	eak)				
COs	DO1	DOJ	DO2	DO4	DO5	DO4				PO10	DO11	DO12	DO12	DO14	DO15
CO1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1
	3	2	1	1	1	1	1	1	1	1	1	1		1	1
<u>CO2</u>	3	2	1	1	1	1	1	1	1	1	1			1	1
CO3	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus					
	HTML Basics	Periods	4			
Unit - I	Getting Started with web designing - Creating a Simple Page - Marking Up Text.					
	Hyperlinks	Periods	4			
Unit - II	Adding Links -Adding Images.					
	Tables & Forms	Periods	4			
Unit - III	Tables Markup - Forms - Embedded Media					
	Cascading Style Sheet	Periods	4			
Unit - IV	Introducing Cascading Style Sheet - Formatting Text - Colors and Backgr	ounds.				
	Padding and Margins	Periods	4			
Unit - V	Thinking Inside the Box - CSS Layout with Flex Box and Grid.					
	Total Periods					

Text Books													
1	"Learning Web Designing" - A Beginner's Guide to HTML, CSS, JavaScript and Web Graphics -												
	Jennifer Niederst Robbins ,5th Edition , O'Reilly Media.												
References													
1	"Web design with HTML", C. Xavier, TMH Publisher, 2000												
E-References													
1	www.w3schools.com/html/												
2	www.w3schools.com/html/html_responsive.a636sp												
3	www.how - to - build - websites.com/												
The second secon	LLA BORNESS	VIVEKAN	NANDHA COLLEGE WOMEN (AU	OF A	ART NON	'S A MO	AND SCIEN US)	ICES FO	DR	TÜV	Rheinland (6 STREPHONE)		
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NOMEN EMP	92 + NO		Elayampalayam, Tiruchengode-637 205.										
Progr	amme	B.Sc	Programme Code	UCS Reg					Regulations		2021-2022		
Depai	rtment	Compu	ter Science				Semester				3		
Course	e Code	C	Course Name	Pe per	eriod Wee	s ek	Credit	Maximum Marks					
				L	Т	Р	С	CA	ESE		Total		
21U3	CSCP04	Java	a Programming Lab	0	0	4	3	40	60		100		
List of F	Experime	nts											
1	Create	e a Simple Prog	ram Using Array in Jav	a.									
2	Create	e a Simple Prog	ram Using Java String.										
3	Write	a Java Progran	n to Create Multi threadi	ng.									
4	Write	a Java Progran	n to handle Exception Ha	andli	ng.								
5	Write	a Java Progran	n for File Operation Usin	ng IO) Str	ean	1.						
6	Create Event Handling using Mouse.												
7	Create	Event Handlin	ig using Keyboard.										
8	AWT	Package Using	Student Information.										
9	Swing	Package Using	g Telephone Bill System	l.									
10	JDBC	Using Employ	ee Details.										

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VEW EMPOWER											
Programme	B.Sc	Programme Code			U	CS	Regulat	tions	2021-2022		
Department Computer Science						Semester				3	
Course Code	(Course Name	Pe	eriod r Wee	iods Credit Week		Maxim	um Mar	ks		
			L	Т	Р	С	CA	ESI	Ξ	Total	
21U3CSCP	21U3CSCP05 HTML & Web Designing Lab					2	40	60		100	
List of Experin	nents ate a web page ill	ustrating text formatting	g tag	s , fe	ont	variations,	paragrapl	n align	men	t and	
$\frac{1}{2}$ Cre	lings in marquee	Ving hypertext link and i	maga	I	hvn	arlink					
³ Des	ign a catalog for	a restaurant using lists	mage	2 4 5 1	тур						
4 Usi	ng Nested tables	create your Mark sheet.									
⁵ Cre	ate a class time ta	able using tables.									
⁶ Des	Design a login form.										
7 Prej	 Prepare a student registration form. 										
⁸ Des	⁸ Design an application for pay slip through HTML forms.										
9 Cre owr	⁹ Create a HTML page to demonstrate the usage of Frames. Choose the content of the page on your own.								e on your		
¹⁰ Des	Design a simple college website.										





EMPOWER					. 2001							
Programme	B.Sc	Programme Code		UC	CS	Regula	tions	2021-2022				
Department	Compu	iter Science			Semester			4				
			Perio	ds	Credit	Maxim	um Mar	:ks				
Course Code	C	Course Name	per W	eek								
			L T	Р	С	CA	ESE	E Total				
	Relational Data	hase Management Systems	5 0	0	4	25	75	100				
21U4CSC07	Relational Data	buse management bystems	5 0	Ū	•	23	75	100				
COURSE	•To inculcate	knowledge on RDBMS cond	epts and	Prog	ramming with	Oracle.â€9	tTo und	lerstand a role of				
OBJECTIVES	database manage	latabase management system in an organization.•To understand basic database concept including the										
	structure and ope	eration of the relational data	model									
POs		PROGRAMME OUTCOME										
PO 1	Apply the knowl	apply the knowledge of mathematics, science and computing in the core information technologies										
PO 2	Build software s	uild software systems and apply the technologies in various fields of Computer Technology, including										
	hardware problem	nardware problems, Web site development and management, databases, and software engineering										
	techniques.	echniques.										
PO 3	Design, impleme	ent and evaluate a computer-	based sys	tem t	to meet the de	sired needs	within	the realistic				
	constraints.											
PO 4	Review literature	e and indulge in research using	ng resear	ch ba	sed knowledg	e and meth	ods to d	esign new				
PO 5	experiments, and	alyze, and interpret data to dr	aw valid	conc	lusions.	tina prosti	oo ond i	ntograta				
105	IT-based solution	s into the user environment	effective	lv	ary for compt	ning practi		Integrate				
PO 6	Apply contextua	knowledge to assess profes	sional le	ry. galh	ealth social a	nd cultural	issues	during				
100	profession practi	ce.	sional, ie	5 m	ourin, soorar a	ina cantaran	155405	aanng				
PO 7	Analyze the loca	l and global impact of comp	uting on i	indivi	duals, organiz	zations, and	l society	у.				
PO 8	Apply ethical pri	nciples and responsibilities	during pro	ofessi	onal practice.							
PO 9	Function effective	vely as a team member or a l	eader to a	accom	plish a comm	on goal in	a multic	lisciplinary				
	team.											
PO 10	Communicate ef	fectively with a range of aud	iences us	sing a	range of mod	alities inclu	uding w	ritten, oral and				
	graphical.											
PO 11	Apply the knowledge of technology and management principles to manage projects effectively in diverse											
	environments as	a member or a leader in the	team.									
PO 12	Engage in indepe	endent and life-long learning	for conti	inued	professional	developmen	nt.					
PO 13	Ability to unders	tand and analyze a given rea	l-time pr	oblen	ns and propos	e feasible c	omputi	ng solutions.				
PO 14	Evaluate and use	appropriate tools and techn	ques in d	levelo	ping applicat	ion activitie	es.					
PO 15	Updating themselves through e-learning and self-study courses.											

COs	COURSE OUTCOME
CO 1	Understand the database concepts, different database models, and database management systems and design
	database schema.
CO 2	Develop the ER structures for real world examples using the concept of Entity Relationship models with
	constraints and cardinalities.
CO 3	Apply the concepts of Normalization and design database which possess no anomalies.
CO 4	Apply the concepts of relational database theory to manage relational database management system.
CO 5	Exhibit database programming skills in SQL
Pre-requisites	Know about files, tables and database

Knowledge Levels

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

	CO / PO / KL Mapping														
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)			
СО	s		KLs					POs				KLs			
									РО	1			1		
CO	1		1						PO	2			2)	
									PO	3			6	ō	
									PO	4			5	5	
CO	2				1				PO	5			3	5	
									PO	6			5	i	
									PO	7			4	-	
CO 3					2				PO	8			6	,	
								PO 9				6			
								PO 10				6			
CO	4		2						PO 1	1			6	Ď	
									PO 1	2			5	i	
			3					PO 13				6			
CO	5							PO 14				6			
								PO 15				5			
		(2/2	/1 :			CO/	PO Ma	pping				- 1 -)			
		(3/2		cates the	e streng	$\frac{g_{\text{III}}}{g_{\text{III}}} = \frac{g_{\text{III}}}{g_{\text{III}}} = $	orrelati	on, 5-si	rong, 2		m, 1-we	eak)			
COs		1	1			P	rogram	me Ou	tcome ((POs)		1	1		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO3	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO4	2	3	1	1	2	1	1 1 1 1 1 1 1 1 1						1		
CO5	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus										
	Introduction to DBMS:	Periods	12								
Unit I	Introduction-Database System Applications - Purpose of Database Systems - View of Data - Database										
Unit - I	Languages and its types - Database Design - Database Engine - Database Architecture - Database Users and										
	Administrators - History of Database Systems.										
	Database Design Using ER Model:Periods12										
Unit II	Overview - The Entity- Relationship Model - Mapping Cardinalities - Prin	mary Key - Reduc	ing ER								
Unit - II	Diagrams to Relational Schemas - ER Features -Symbols used in ER Notation.										
	Relational Database Design:Periods12										
Unit III	Relational Database Design- Features - Decomposition using Functional Dependency - Normal Forms -										
Onit - III	1NF,2NF,3NF and BCNF- Relational Algebra: Introduction- Relational Algebra Operations.										
	SQL:	Periods	12								
Unit IV	Overview-Structure of SQL-Set Operations-Aggregate Functions- Modification of the Database -										
Unit - I v	Joins-Transactions - Integrity Constraints .										
	PL/SQL: Periods 12										
Unit V	History- Fundamentals - Block structure - comments -Â- Data types - De	claration - Assign	ment operation-								
Unit - V	cursor and exceptions. PL/SQL Named blocks: Procedure -Â- Function-	Package- Triggers	5.								
	Total Periods		60								

Text Books							
1	1. A Silberschatz, H Korth, S Sudarshan, "Database System and Concepts", 7th Edition McGraw-Hill,						
	2019.(Unit I to IV)						
2	2.Database system using ORACLEÂ", Nilesh Shah, PHI publication, 2nd Edition, 2010 (Unit V)						
References							
1	1. Fundamentals of Data base management SystemÂ", Alexix Leon and Mathew Leon, TMH Publications,						
	2010.						
2	2. E-Book : Bill Pribyl, Steven Feuerstein, "Oracle PL/SQL Programming", O'Reilly Media, Inc., 6th						
	Edition, February 2014.						
E-References							
1	• www.javatpoint.com						
2	• www.w3schools.com						
3	• www.geeksforgeeks.org						
4	• www.oracletutorial.com						



EN EMPOWER		,,		,							
Programme	B.Sc	Programme Code		UC	CS	Regulat	tions	2021-2	2022		
Department	Compu	ıter Science			Semester			4			
			Perio	ods	Credit	Maxim	aximum Marks				
Course Code	0	Course Name	per W	/eek							
			LT	Р	С	СА	ESI	E To	otal		
	Softv	vare Engineering	4 () 0	3	25	75		00		
21U4CSC08				, <u> </u>	U U		,,,				
COURSE	To provide techn	nological view of Software E	ngineeri	ng.To	enhance Softv	ware relate	d issues	.To impro	we the		
OBJECTIVES	design and modu	larization ideology. To provi	ide guida	ince a	bout document	tation.To r	ecogniz	e testing			
	methodologies, i	thodologies, implementation and maintenance.									
POs		PROGRAMME OUTCOME									
PO 1	Apply the knowl	edge of mathematics, scienc	e and co	mputi	ng in the core	informatio	n techn	ologies			
PO 2	Build software s	uild software systems and apply the technologies in various fields of Computer Technology, including									
	hardware problem	ms, Web site development a	nd manag	gemer	nt, databases, a	nd softwar	e engin	eering			
	techniques.										
PO 3	Design, impleme	ent and evaluate a computer-	based sy	stem t	to meet the des	sired needs	within	the realisti	ic		
	constraints.										
PO 4	Review literature	e and indulge in research usi	ng resear	ch ba	sed knowledge	e and meth	ods to c	esign new	7		
PO 5	experiments, and	alyze, and interpret data to di	aw valid	conc	lusions.	ting prosti	oo ond i	ntograta			
FO 5	IT based solution	ns into the user environment	affective	alv	ary for compu	ning practi		megrate			
PO 6	Apply contextua	1 knowledge to assess profes	sional le	ory. Doal h	ealth social a	nd cultural	issues	during			
100	profession practi	ce.	bioliui, i	ogui, i	iourin, soorur u	ina cuntanan	155405	aaring			
PO 7	Analyze the loca	l and global impact of comp	uting on	indivi	iduals, organiz	ations, and	l society	<i>.</i>			
PO 8	Apply ethical pri	inciples and responsibilities	during pi	rofessi	ional practice.						
PO 9	Function effective	vely as a team member or a l	eader to	accom	plish a comm	on goal in	a multio	lisciplinar	у		
	team.										
PO 10	Communicate ef	fectively with a range of auc	liences u	sing a	range of mode	alities inclu	uding w	ritten, oral	l and		
	graphical.										
PO 11	Apply the knowl	edge of technology and man	agement	princ	iples to manag	ge projects	effectiv	ely in dive	erse		
	environments as	a member or a leader in the	team.								
PO 12	Engage in indepe	endent and life-long learning	tor cont	inued	professional c	levelopme	nt.				
PO 13	Ability to unders	stand and analyze a given rea	u-time p	roblen	ns and propose	e teasible c	omputi	ng solution	as.		
PO 14	Evaluate and use	e appropriate tools and techn	iques in o	aevelo	ping applicati	on activitie	es.				
PO 15	Updating themse	Updating themselves through e-learning and self-study courses.									

COs	COURSE OUTCOME
CO 1	Recall about the software evolution and software engineering practice.
CO 2	Illustrate on various Phases of software Project and its life cycle models.
CO 3	Classify the various building models in software development.
CO 4	Apply the various software testing tactics and its Methodologies.
CO 5	Identify the System, Acceptance and Performance Testing's criteria and its best practice.
Pre-requisites	Basic knowledge of Software industries and IT Sector

Knowledge Levels															
1.Remen	1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing														
		(2.12)	/4 • 1•		C	CO / PC) / KL]	Mappin	g			1.			
~~	(3/2/1 indicates the strength of correlation, 3-strong, 2-medium, 1-weak)														
COs					KLs				POs	8			KI	LS	
									PO	1			1		
CO 1					1				PO	2			2		
								PO .	3			6			
CO^{2}	,				2				PO 4	4 5			2	1	
02					2				PO	5			5		
									PO /	7			4		
CO 3	CO 3			2				PO 8				6			
000									PO	9		6			
									PO 1	0		6			
CO 4	Ļ		3					PO 11				6			
								PO 12				5			
								PO 13				6			
CO 5	i		3					PO 14				6			
									PO 1	5			5		
				_		CO /	PO Ma	pping							
		(3/2/	/1 indic	ates the	e streng	th of c	orrelati	on, 3-st	rong, 2	2-mediu	m, 1-we	eak)			
COs						Р	rogram	me Ou	tcome ((POs)					
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO3	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO4	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO5	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus									
	Introduction to Software Engineering	Periods	12							
	The Evolving role of Software - Software - Changing nature of Software - Legacy Software - Software									
Unit - I	myths. Software Engineering Practice: Software engineering practice - Communication practices - Planning									
	practices - Modeling practices - Construction practice- Deployment.									
	Software Development Life Cycle models	Periods	12							
Unit II	Phases of Software project-Quality, Quality Assurance, Quality control -	Testing, Verificat	ion and							
Olitt - II	Validation - Process Model to represent Different Phases - Life Cycle models. System Engineering:									
	Computer based systems - The system Engineering Hierarchy.									
	Building the Analysis Model	Periods	12							
	Requirement Analysis - Analysis Modeling Approaches - Data Modeling concepts - Object Oriented									
Unit - III	Analysis -Flow Oriented Modeling-Design Engineering - Design concepts - The design model-Modeling									
	component-Level Design: Designing class Based components.									
	Testing Tactics	Periods	12							
Unit IV	Software Testing Fundamentals - Types of Testing: White Box Testing - Static Testing-Structural									
Unit - I V	Testing-Black Box Testing- Challenges in White Box and Black Box Testing. Integration Testing:									
	Integration Testing- Integration Testing as Type of Testing.									
	System and Acceptance Testing	Periods	12							
	System Testing Overview- Functional testing versus Nonfunctional Testing-Functional testing -									
Unit - V	Non-functional Testing - Acceptance Testing and its criteria -Performance Testing: Factors governing									
	Performance testing-What is Regression testing- Best Practices in Regress	sion Testing.								
	Total Periods		60							

Text Books	
1	Roger S. Pressman Software Engineering: A Practitioners Approach, McGraw-Hill Education, 2010.
2	Srinivasan Desikan, Gopalaswamy Ramesh- Software Testing Principles and Practices, Pearson Education,
	2012.
References	
1	Rajib Mall Fundamentals of Software Engineering Prentice Hall of India Pvt Ltd, 3 rd Edition 2010.
2	Sandeep Desai, Abhishek Srivastava Software Testing: A Practical Approach PHI Learning Pvt. Ltd, 2012.
3	David Burns Selenium 2 Testing Tools: Beginners Guide Tata MCGraw Hill Edition, 2012.
E-References	
1	www.softwareengineerinsider.com/articles/what-is-software-engineering.html.
2	https://www.udemy.com/courses/development/software-engineering.
3	https://www.tutorialspoint.com/software_testing/index.htm.



2021-2022

 Elayampalayam, Tiruchengode-637 205.

 B.Sc
 Programme Code
 UCS
 Regulations

 Computer Science
 Semester

Programme

Department	Computer Science	Semester 4									
		P	eriod	.S	Credit	Maxim	um Mark	S			
Course Code	Course Name	per	r We	ek							
		L	Т	Р	С	CA	ESE	Total			
21114CSC00	R Programming	4	0	0	3	25	75	100			
2104C3C09											
COURSE	Understand the basics in R programming in t	erms	of co	nstr	ucts, control st	atements,	string				
OBJECTIVES	functionsUnderstand the use of R for Big Dat	ta ana	alytic	sLea	rn to apply R	programm	ing for T	ext processing.			
POs	PROGRAMME OUTCOME										
PO 1	Apply the knowledge of mathematics, science	e and	com	puti	ng in the core i	informatio	n technol	logies			
PO 2	Build software systems and apply the technol	ogies	s in v	ario	us fields of Co	mputer Te	chnology	, including			
	nardware problems, Web site development and management, databases, and software engineering										
	techniques.										
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic										
	constraints.										
PO 4	Review literature and indulge in research using research based knowledge and methods to design new										
	experiments, analyze, and interpret data to dr	aw va	$\frac{1}{1}$	onc	usions.		1.				
PO 5	Select and apply current techniques, skills, ar	id too	ols ne	cess	ary for compu	ting practi	ce and in	tegrate			
PO 6	A pply contextual knowledge to assess profes	enec		y.	alth coaid a	ad aultural	icence di	urina			
FU 0	profession practice	siona	I, leg	ai, 11	earur, sociar ai		issues ut	uring			
PO 7	Analyze the local and global impact of comp	uting	on ir	ndivi	duals organiz	ations and	lsociety				
PO 8	Apply ethical principles and responsibilities of	luring	g nro	fessi	onal practice	ations, and	i society.				
PO 9	Function effectively as a team member or a le	eader	to ac	com	plish a commo	on goal in a	a multidi	sciplinary			
	team.				1	8		I by			
PO 10	Communicate effectively with a range of aud	ience	s usi	ng a	range of moda	alities inclu	ıding wri	itten, oral and			
	graphical.										
PO 11	Apply the knowledge of technology and man	agem	ent p	rinc	iples to manag	e projects	effective	ly in diverse			
	environments as a member or a leader in the	team.									
PO 12	Engage in independent and life-long learning	for c	contir	nued	professional d	levelopmer	nt.				
PO 13	Ability to understand and analyze a given rea	l-tim	e pro	blen	ns and propose	feasible c	omputing	g solutions.			
PO 14	Evaluate and use appropriate tools and techni	ques	in de	evelo	ping applicati	on activitie	es.				
PO 15	Updating themselves through e-learning and	self-s	study	cou	rses.						

COs	COURSE OUTCOME
CO 1	To understand the History and Overview of R
CO 2	To gain knowledge in Getting Data In and Out of R
CO 3	Able to understand various Vectorized Operations
CO 4	Able to understand various Control Structures in R
CO 5	Scoping Rules of R.
Pre-requisites	Basic knowledge of mathematics and programming language

]	Know	ledge	Level	S						
1.Reme	nberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.E [.]	valuat	ing, 6.	Synth	esizin	5
		(2)	/1 :	otoo th	(CO/PC) / KL l	Mappin	g man a 7			- 1 -)			
C0	9	(3/2		cates in	e streng	gin of c	orrelati	on, 3-s	$\frac{1}{1000}$		m, 1-we	eak)	V	[0	
	5				KLS					\$ 1			1	LS	
CO	1		2						PO /	1 7			1	L 	
00	1				2				PO	3			1	[
									PO	4			1	l	
CO	2				1				PO	5			1	l	
								PO	6		1				
								PO 7				1			
CO 3					4				PO	8			1	[
									PO 9	9			1	1	
CO	Λ			5					PO 1	1			1	L	
0	-				5			PO 12					1		
								PO 12				1			
CO	5				6			PO 14				1			
									PO 1	5			1	l	
						CO /	PO Ma	pping							
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	2-mediu	m, 1-we	eak)			
COs		1				Р	rogram	me Ou	tcome ((POs)				1	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO2	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
CO5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus											
	History and Overview of R	Periods	12									
	What is R? What is S? The S Philosophy - Back to R - Basic Features of R - Free Software - Design of the											
Their T	R System - Limitation of R - R Resources Getting Started with R: Installation - Getting started with the R											
Unit - I	interface. R Nuts and Bolts: Entering Input - Evaluation - R Objects - Numbers - Attributes - Creating											
	Vectors - Mixing Objects - Explicit Coercion - Matrices - Lists - Factors - Missing Values - Data Frames -											
	Names.											
	Getting Data In and Out of R	Periods	12									
Reading and Writing Data - Reading Data Files with read.table() - Reading in Larger Datasets with												
Unit II	read.table - Calculating Memory - Requirements for R Objects - Using the readr Package - Using Textual											
Ont - II	and Binary Formats for Storing Data - Using dput() and dump() - Binary Formats - Interfaces to the Outside											
	World - File Connections - Reading Lines of a Text File - Reading From a	World - File Connections - Reading Lines of a Text File - Reading From a URL Connection										
	Subsetting R Objects Periods 12											
	Subsetting R Objects - Subsetting a Vector - Subsetting a Matrix - Subsett	ing Lists - Subset	ting Nested									
Unit - III	Elements of a List - Extracting Multiple Elements of a List - Partial Matching - Removing NA Values.											
	Vectorized Operations - Vectorized Matrix Operations - Dates and Times - Dates in R Times in R -											
	Operations on Dates and Times - Summary											
	Managing Data Frames	Periods	12									
	Managing Data Frames with the dplyr package - Data Frames - The dplyr Package - dplyr Grammar -											
Unit - IV	Installing the dplyr package - select() - filter() - arrange() - rename() - mut	ate() - group_by(). Control									
	Structures - if-else - for Loops - Nested for loops - while Loops - repeat Lo	oops - next, break	- Summary.									
	Functions and Standards	Periods	12									
	Functions - Functions in R - Your First Function - Argument Matching - I	Lazy Evaluation T	The Argument									
Unit - V	- Arguments Coming After the Argument.Coding Standards for R - Loc	p Functions - Lo	oping on the									
	Command Line - lapply() - sapply() - split() - Splitting a Data Frame - tap	ply - apply() - Co	l/Row Sums and									
	Means - Other Ways to Apply - mapply()											
	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
3	Paal Teetor, "R Cook Book", O' Reilly, Paperback Edition, 2011
4	Joris Meys Andrie de Vries, "R Programming Dummies", Paperback Edition, 2016 (eBook).
E-References	
1	https://www.youtube.com/watch?v=_V8eKsto3Ug
2	https://www.youtube.com/watch?v=7NLPPFU0O3w
3	https://www.javatpoint.com/r-tutorial



EN EMPOWER											
Programme	B.Sc	Programme Code			UC	S	Regulat	tions	2	2021-2022	
Department	Compu	iter Science				Semester				4	
			Pe	eriod	ls	Credit	Maxim	um Mai	rks		
Course Code	C C	Course Name	per	We	ek						
			L	Т	Р	С	СА	ESH	E	Total	
	Inte	ernet of Things	2	0	0	2	25	75	_	100	
21U4CSS02				Ŭ	Ŭ			,,,		100	
COURSE	•Obtain an ov	erview of IoT applications.â	€¢Cor	npre	hend	d the architectu	ure, design	princip	oles a	and	
OBJECTIVES	standards of IoT.•Understand M2M and IoT technology fundamentals.•Knowing about Python										
	language.										
POs		PRO	GRAN	MME	E OL	JTCOME					
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core	informatio	n techn	olog	gies	
PO 2	Build software s	ystems and apply the techno	logies	in v	ario	us fields of Co	mputer Te	chnolog	gy, i	ncluding	
	hardware problems, Web site development and management, databases, and software engineering										
	techniques.										
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic										
	constraints.	constraints.									
PO 4	Review literature	e and indulge in research usi	ng res	earc	h ba	sed knowledge	e and meth	ods to d	lesig	gn new	
PO 5	Select and apply	current techniques skills a	aw va	llia c	conci	ary for compu	ting practi	co and i	intor	arata	
105	IT-based solution	as into the user environment	effect	tivel	v	ary for compu	ning practi		meg	grate	
PO 6	Apply contextua	knowledge to assess profes	sional	l. leg	y. ral. h	ealth, social a	nd cultural	issues	duri	ng	
	profession practi	ce.		-, 2	,,	,				0	
PO 7	Analyze the loca	l and global impact of comp	uting	on ii	ndivi	duals, organiz	ations, and	l society	y.		
PO 8	Apply ethical pri	nciples and responsibilities	during	g pro	fessi	onal practice.					
PO 9	Function effective	vely as a team member or a l	eader	to ac	com	plish a comm	on goal in	a multio	disci	plinary	
	team.										
PO 10	Communicate ef	fectively with a range of auc	lience	s usi	ng a	range of moda	alities inclu	uding w	ritte	en, oral and	
	graphical.										
PO 11	Apply the knowl	edge of technology and man	agem	ent p	orinc	iples to manag	ge projects	effectiv	vely	in diverse	
DC 12	environments as	a member or a leader in the	team.			<u> </u>	1 1				
PO 12	Engage in indepe	endent and life-long learning	$\frac{1}{1}$ tor c	ontir	nued	protessional c	levelopmer	nt.		alasti an -	
PO 13	Additive to unders	annu and analyze a given rea	u-time	e pro	olen	ns and propose	e reasible c	omputi	ng s	olutions.	
PO 14	Evaluate and use	appropriate tools and techn	iques	in de		ping applicati	on activitie	es.			
PU 15	Opdating themse	erves through e-learning and	Updating themselves through e-learning and self-study courses.								

COs	COURSE OUTCOME
CO 1	To know about the evolution for mobile, home and embedded applications that is connected to the internet,
	to integrate communication.
CO 2	To gather knowledge about how the devices share the data on the cloud and analyze it in a secure manner
	on the network.
CO 3	To know how the industries are adopting internet-of-things-solutions to improve their existing systems.
CO 4	To get knowledge about how the things to be connected with various devices.
CO 5	To get familiar about python data types.
Pre-requisites	Knowing about Programming Language to build the Internet and different elements

Knowledge Levels

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

		(3/2	/1 indic	cates the	C e streng	CO / PC) / KL] orrelati	Mappin on, 3-si	g trong, 2	2-mediu	m, 1-we	eak)				
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CO	2				1				PO	5			3	}		
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CO	3				4				PO	8		4 6 6 6 6 5				
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	7 0 /								PO 10				6			
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									PO 1	2		6 6 5 6				
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CO	5				6				PO 1	4		6 5 6 6 5				
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	r	(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-s	trong, 2	-mediu	m, I-we	eak)				
COs						Р	rogram	me Ou	tcome ((POs)		1	1			
000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15	
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
CO3	1	1	1	2	2	2	1	1	1	1	1	2 1 1 2				
CO4	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3	
CO5	1	1	3	2	1	2	1	3	3	3	3	2	3	3	2	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus									
	Introduction TO Internet OF Things:	Periods	5							
Unit - I	Introduction - Physical Design of IoT - Things in IoT, IoT Protocols.		•							
	IoT Enabled Technologies:	Periods	5							
Unit - II	Wireless Sensor Networks - Cloud Computing - Big data analytics - Com	munication proto	cols - Embedded							
	Systems.									
	Domain Specific IoTs:									
Unit - III	Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industr	y, health and Life	estyle.							
	IoT Platforms Design Methodology:	Periods	5							
Unit - IV	Introduction - IoT Design Methodology.		•							
	Logical Design Using Python:	Periods	5							
Unit V	IoT Systems - Logical Design Using Python: Introduction - Installing Pyt	hon - Python Data	a Types & Data							
Unit - V	Structures: Numbers - Strings - Lists.									
	Total Periods		20							

Text Books	
1	1. Arshdeep Bahga and Vijay Madisetti, "Internet of Things - A Hands-on Approach", Universities Press,
	2015.
References	
1	1. Samuel Greengard, "The Internet of Things".
2	2. Cuno Pfister, "Getting started with Internet of Things".
E-References	
1	1. https://wwkw.tutorialspoint.com/internet_of_things/
2	2. https://www.guru99.com/iot-tutorial.html
3	3. http://www.steves-internet-guide.com/internet-of-things/

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Progr	amme	B.Sc	Programme Code			U	CS	Regula	tions	2021-2022		
Depar	rtment	Compu	iter Science				Semester			4		
Course Code		Course Name			Periods Credit per Week				um Mar	ks		
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21U4	4CSCP06Relational Database Management System004440Lab									100		
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4	Write	a program to in	mplement Built in Func	ctions	in S	QL.						
6	Write	a program to in PL/SQL Funct	tion to find factorial.	ns.								
7	Write	PL/SQL Progr	am for Electricity Bill	Calcu	latic	on us	sing Cursor.					
8	Write	a PL/SQL prod	cedure to insert a numb	er.								
9	Write	a Database Tri	igger for displaying G	rade	of th	e Sti	udent					
10	Datab	ase Design and	Implementation Pay R	loll Pi	roce	ssing	g					

HOMEN ENPON	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205.											
Progra	mme	B.Sc	Programme Code			UC	ĊS	Regulat	ions	2021-2022		
Depart	Department Computer Science			Semester							4	
Course Code		C	Course Name	Pe	Periods per Week		Credit	Maximum Mar		ks		
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21U4C	21U4CSCP07 R Programming Lab					3	3	40	60		100	
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8	Regres	sion: Perform	Simple Regression usir	ng R P	acka	ıge						
9	Cluste	ring: Apply k-r	neans by using R Pack	age	/	T 1		1				
10	Classi	tication: Use R	andom Forest / Naïve l	Bayes	/ NN	l by	using R Pac	ckage				



Programme	B.Sc	Programme Code			UC	CS	Regula	tions	2	2021-2022
Department	Compu	ter Science				Semester				5
			Pe	riod	5	Credit	Maxim	um Mar	ks	
Course Code	0	Course Name	per	Wee	k					
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			L	1	Р	C	CA	ESE	5	Iotal
21U5CSC10	.NET]	Programming	5	0	0	4	25	75		100
COURSE	The course is des	igned for the beginners as a g	guide t	o de	velo	p applications	using VB.	Net and	ASP	Net. This
OBJECTIVES	course is develop	ed to provide the understand	ing of	Dot	Net	framework, V	B.Net,ASF	Net and	ł XN	4L
POs		PRO	GRAN	MME	OU	TCOME				
PO 1	Apply the knowle	edge of mathematics, science	and c	omp	uting	g in the core in	formation	technolo	gies	
PO 2	Build software sy	stems and apply the technological	ogies i	n var	ious	fields of Com	puter Tech	nology,	incl	uding
	hardware probler	hardware problems, Web site development and management, databases, and software engineering								
	techniques.									
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints.									
PO 4	Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions.									
PO 5	Select and apply	current techniques, skills, and	d tools	nece	essai	ry for computin	ng practice	and inte	egrat	e
	IT-based solution	is into the user environment	effecti	vely.						
PO 6	Apply contextual	knowledge to assess profess	ional,	legal	, hea	alth, social and	l cultural is	sues dur	ing	profession
	practice.									
PO 7	Analyze the local	and global impact of compu	ting o	n ind	ivid	uals, organizat	ions, and s	ociety.		
PO 8	Apply ethical prin	nciples and responsibilities d	uring p	profe	ssio	nal practice.				
PO 9	Function effectiv	ely as a team member or a le	ader to	o acco	omp	lish a common	goal in a 1	multidise	cipli	nary team.
PO 10	Communicate eff graphical.	fectively with a range of audi	ences	usinį	g a ra	ange of modali	ties includ	ing writt	ten, o	oral and
PO 11	Apply the knowle environments as	edge of technology and mana a member or a leader in the t	igemei eam.	nt pri	ncip	les to manage	projects ef	fectivel	y in c	diverse
PO 12	Engage in indepe	ndent and life-long learning	for cor	ntinu	ed p	rofessional dev	velopment.			
PO 13	Ability to underst	and and analyze a given real	-time	probl	ems	and propose f	easible cor	nputing	solu	tions.
PO 14	Evaluate and use	appropriate tools and technic	ques ir	n de v	elop	ing applicatior	n activities.			
PO 15	Updating themselves through e-learning and self-study courses.									

COs	COURSE OUTCOME
CO 1	Impart knowledge in fundamental concepts of .Net
CO 2	Use .NET components in a windows and web application.
CO 3	Implement the concepts of Operators, Conditional Logics etc.,
CO 4	Inculcate ability in creativity & design of computer support systems and skills for analyze various software applications
CO 5	Understand & apply Data binding
Pre-requisites	Basic Knowledge of Programming Language and HTML

Knowledge Levels

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

		(3/2	/1 indic	ates the	C e streng	CO / PC gth of co) / KL N orrelati	Mappin on, 3-st	g rong, 2	-mediu	m, 1-we	eak)			
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									PO	4			6	j -	
CO	2				2				PO	5			(*)	5	
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CO	4		3					PO 11				4			
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				PO 15 6)					
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COs	DO1	DOO	DO 2	DO 4	DO5					103) DO10	DO11	DO12	DO12	DO14	DO15
	POI	PO2	PO3	PO4	P05	PO6	P07	P08	P09	POIO	POIT	POIZ	P013	P014	P015
CO1	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	1	3	1	2	1	1	1	1	1	1	1	1	1	1
CO3	2	1	3	1	2	1	1	1	1	1	1	1	1	1	1
CO4	1	2	2	1	3	1	2	2 1 1 1 2 1 1 1 1							
CO5	1	2	2	1	3	1	2	2 1 1 1 2 1 1 1 1							

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus									
	Introduction to .Net Periods 12									
Unit I	.Net Framework - Visual Basic .Net - Creating windows forms applications - creating a web forms									
Onit - I	application - Data types and variables - Operators -Conditional Logic.									
	Procedures Periods 12									
Unit - II	Procedures - Dialog Boxes - Dictionary Object - Namespaces - Visual Bas	sic .Net IDE - Cor	ntrols - Specific							
	controls.									
	Data Access	Periods	12							
Unit - III	Introduction to Data Access in .Net - Overview of ADO.Net - ADO .Net - Visual Studio .Net Database									
	Tools.									
	Introduction to XML	Periods	12							
Unit - IV	Introduction to XML in .Net - Introduction to Web Development - Introduction to ASP.Net - Page									
	framework.									
	Web Controls	Periods	12							
Unit - V	Web Controls - Validation Control - Events - Cascading Style sheets - AS	P.Net application	s.							
	Total Periods 60									

Text Books	
1	Bill Evjen & Jason Beres, Visual Basic .Net Programming Bible, Wiley Publishing, 2006
References	
1	David Chappell ,Understanding .NET ,Pearson education ,2002
2	Steven Holzner, VB.Net Programming Black book, Dreamtech ,2005
3	Matt J. Couch, ASP. NET and VB. NET Web programming, Pearson Education. 2002
E-References	
1	www.slideshare.net/
2	www.powershow.com/

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Department Computer Science Semester 5 Course Code Course Name Periods Credit Maximum Marks 21U5CSC11 PHP Programming 5 0 0 4 25 75 100 COURSE To highlight all features of PHP Programming and apply it to develop various websites & applications DBJECTIVES FOOD 4 25 75 100 COURSE To highlight all features of PHP Programming and apply it to develop various websites & applications DBJECTIVES FOOD Apply the knowledge of mathematics, science and computing in the core information technologies FOOD Build software systems and apply the technologies in various fields of Computer Technology, including hardware problems, Web site development and management, databases, and software engineering techniques. FOOD Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints. FOOD Review literature and induge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions. FOOD Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectively PO 5 Select and apply curtent techniques, skills, and tools necessary for computing practic	Programme	B.Sc	Programme Code			UC	S	Regulat	ions	2021-2022
Course Code Course Name Periods per Week Credit Maximum Marks 21U5CSC11 PHP Programming 5 0 0 4 25 75 100 21U5CSC11 PHP Programming 5 0 0 4 25 75 100 COURSE To highlight all features of PHP Programming and apply it to develop various websites & applications PBJECTIVES PROGRAMME OUTCOME PO 1 Apply the knowledge of mathematics, science and computing in the core information technologies Bould software systems and apply the technologies in various fields of Computer Technology, including hardware problems, Web site development and management, databases, and software engineering techniques. PO 3 Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints. PO 4 Review literature and induge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions. PO 5 Select and apply current techniques, skills, and tools necessary for computing practice and integrate Tr-based solutions into the user environment effectively PO 4 Apply ontextual knowledge to assess professional practice. PO 9 Function effectively as a team member or a leader to accomplish a common	Department	Compu	ter Science				Semester			5
Course Code Course Name per Weck I T P C CA ESE Total 21U5CSC11 PPP Programming 5 0 0 4 25 75 100 COURSE To highlight all features of PHP Programming and apply it to develop various websites & applications DBJECTIVES PO 1 Apply the knowledge of mathematics, science and computing in the core information technologies PO 1 Apply the knowledge of mathematics, science and computing in the core information technology, including hardware problems, Web site development and management, databases, and software engineering techniques. PO 1 Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints. PO 4 Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions. PO 5 Select and apply current techniques, skills, and tools necessary for computing practice and integrate T1-based solutions into the user environment effectively PO 6 Apply contextual knowledge to assess professional, legal, health, social and cultural issues d			ks							
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21USCSC11 If		рнр	Programming	5	0	0	4	25	75	100
COURSE To highlight all features of PHP Programming and apply it to develop various websites & applications DBJECTIVES POS PROGRAMME OUTCOME PO 1 Apply the knowledge of mathematics, science and computing in the core information technologies PO 2 Build software systems and apply the technologies in various fields of Computer Technology, including hardware problems, Web site development and management, databases, and software engineering techniques. PO 3 Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints. PO 4 Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions. PO 5 Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectively PO 6 Apply contextual knowledge to assess professional, legal, health, social and cultural issues during profession practice. PO 7 Analyze the local and global impact of computing on individuals, organizations, and society. PO 9 Function effectively with a range of audiences using a range of modalities including written, oral and graphical. PO 11 Apply the knowledge of technology and management principles to manage projects effectively in diverse environments as a member or a leader in the team. PO 12 Engage i	21U5CSC11	1111	Tiogramming	4	23	15	100			
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POs PROGRAMME OUTCOME PO 1 Apply the knowledge of mathematics, science and computing in the core information technologies PO 2 Build software systems and apply the technologies in various fields of Computer Technology, including hardware problems, Web site development and management, databases, and software engineering techniques. PO 3 Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints. PO 4 Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions. PO 5 Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectively PO 6 Apply contextual knowledge to assess professional, legal, health, social and cultural issues during profession practice. PO 7 Analyze the local and global impact of computing on individuals, organizations, and society. PO 8 Apply ethical principles and responsibilities during professional practice. PO 9 Function effectively as a team member or a leader to accomplish a common goal in a multidisciplinary team PO 10 Communicate effectively with a range of audiences using a range of modalities including written, oral and graphical. PO 11 Apply the knowledge of technology and management principles to manage projects effectivel	OBJECTIVES		DDO	CDAN	лл		TCOME			
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hardware problems, Web site development and management, databases, and software engineering techniques.PO 3Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints.PO 4Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions.PO 5Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectivelyPO 6Apply contextual knowledge to assess professional, legal, health, social and cultural issues during profession practice.PO 7Analyze the local and global impact of computing on individuals, organizations, and society.PO 8Apply ethical principles and responsibilities during professional practice.PO 9Function effectively as a team member or a leader to accomplish a common goal in a multidisciplinary teamPO 10Communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.PO 11Apply the knowledge of technology and management principles to manage projects effectively in diverse environments as a member or a leader in the team.PO 12Engage in independent and life-long learning for continued professional development.PO 13Ability to understand and analyze a given real-time problems and propose feasible computing solutions.PO 14Evaluate and use appropriate tools and techniques in developing application activities.PO 15Updating themselves through e-learning and self-study courses.	PO 2	Build software sy	ild software systems and apply the technologies in various fields of Computer Technology, including							
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PO 15 Updating themselves through e-learning and self-study courses.	PO 14	Evaluate and use	appropriate tools and techn	iques	ın de	evelo	ping application	on activitie	es.	
	PO 15	Updating themse	lves through e-learning and	self-st	tudy	cour	ses.			

COs	COURSE OUTCOME
CO 1	Understand the concepts of PHP programming language with Basics & Control Structures
CO 2	Working PHP With MySQL
CO 3	Understand the concepts of Functions & Arrays
CO 4	Applying the concepts of Object Oriented PHP, Error and Exception Handling in PHP Programming
CO 5	Explore the concepts Strings and Regular Expression, Design the Web Form
Pre-requisites	A basic knowledge of HTML and Web Designing

]	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	esizing	5
								Mannin	a						
		(3/2)	/1 indic	ates the	e streng	of c	orrelati	on 3-si	g trong 2	2-mediu	m 1-we	eak)			
COs KI s							POs	3		(uit)	KI	s			
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CO 1	1				3				PO	2			2		
									PO	3			6	; ;	
									PO	4			5		
CO 2					3				PO	5			3		
									PO	6			5		
			4				PO 7				4				
03					4				PO	8		6			
									PO 1	9			6)	
CO 4	1		4					PO 11					6	, ,	
								PO 12				5			
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CO 5	5		4				PO 14				6				
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COs	DO 1	DOO	DO2	DO 4	DOT	POC	rogram			POS)	DO11	DO 12	DO 12	DO14	DO15
	POI	PO2	PO3	PO4	PO5	P06	PO/	P08	PO9	POIO	POIT	PO12	P013	PO14	P015
COI	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO2	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO3	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	1	1	1	2	2	2	1	1 1 1 1 1 2 1 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									
	Introduction to PHP	Periods	12							
	History - General Language Features - PHP Basics: Embedding PHP Cod	e in your Web Pa	ges -							
Unit - I	Commanding Your Code - Output Data to the Browser. PHP's Support	rted Data Types-	Identifiers -							
	Variables - Constants - Expressions -String - Interpolation. Control Struct	ures: Conditional	Statements -							
	Looping Statements - File Inclusion Statements									
	Introduction to MySQL	Periods	12							
	Naming Database Elements-Choosing Your Column Types- Choosing oth	er Column Prope	rties-Accessing							
Unit - II	MySQL. Using PHP With MySQL Modifying The Template - Connecting To MySQL - Executing									
	Simple Queries - Retrieving Query Results -Ensuring Secure SQL-Counting Returned Records- Updating									
	Records With PHP.									
	Functions	Periods	12							
Unit - III	Invoking Function - Creating a Function - Function Libraries. Arrays: Creating an Array - Adding and									
Chit III	Removing Array Elements - Locating Array Elements - Traversing Array - Merging - Slicing - Splicing and									
	Dissecting Array.		1							
	Object Oriented PHP	Periods	12							
Unit - IV	Benefits of OOP - Key OOPs Concepts- Constructors and Destructors- Static Class Members - The instance									
Chit IV	of Keyword- Error and Exception Handling- Configuration Directives- Er	ror Logging-Exce	eption Handling							
	Strings and Regular Expression	Periods	12							
Unit - V	Other String Specific Function - Alternatives for Regular Expression Functions. Forms: PHP and Web									
chit v	Forms-Taking Advantage of Pear: HTML_QuickForm-Installimg HTML_QuickForm-Creating a Simple									
	Form- Using Auto-Completion		1							
	Total Periods		60							

Text Books	
1	"Beginning PHP and Oracle From Novoice to professional" W.Jason Gilmore and Bob Brylr edition –
	2008
2	"PHP 6 and my SQL 5 " Larry Ullman -2008(chapter 4 & 8)
References	
1	"Spring into PH5 the Small Professional choice" Steven Holzner, Pearson education, Edition: First
	Impression 2006.
2	"PHP and my SQL for dynamic websites" – Larry Ullam-fourth edition 2015
3	"PHP 6 and my SQL ": bible – Steve Suehring, Tim converse, Joy Park -2009
E-References	
1	www.w3schools.com/php/



EMPOWER				0					
Programme	B.Sc	Programme Code		UCS Regulations					
Department	Compu	iter Science				Semester			5
			Pe	riods		Credit	Maxim	um Ma	rks
Course Code		Course Name	per	Week					
	-		I	тр	,	С	CA	FSI	F Total
	Soft Ski	11s	2	0 0)	2	25	75	100
21U5CSS03	50H 5K			0 0	,	2	23	15	100
COURSE	To enable stud	ents to build Communication	on skill	s are a	lmo	ost always hig	gh on the 'e	essentia	ıl
OBJECTIVES	skills' list in an	y job advertisement.							
POs		PRO	GRAM	IME C	UT	ГСОМЕ			
PO 1	Apply the knowl	edge of mathematics, science	ce and o	compu	ting	g in the core	informatio	n techn	ologies
PO 2	Build software s	Build software systems and apply the technologies in various fields of Computer Technology, including							
	hardware problems, Web site development and management, databases, and software engineering								
	techniques.								
PO 3	Design, implement and evaluate a computer-based system to meet the desired needs within the realistic								
DO 4	constraints.								
PO 4	Review interature	Review literature and indulge in research using research based knowledge and methods to design new							
PO 5	Select and apply	current techniques skills a	nd tool	s nece	ciu	sions.	ting practi	ce and i	integrate
105	IT-based solution	ns into the user environment	t effecti	velv	5541	ry for compu	ing practi		integrate
PO 6	Apply contextua	knowledge to assess profe	ssional.	legal.	hea	alth. social a	nd cultural	issues	during
	profession practi	ce.	,	. 0 ,		,			6
PO 7	Analyze the loca	l and global impact of comp	outing o	on indi	vid	uals, organiz	ations, and	l societ	у.
PO 8	Apply ethical pri	inciples and responsibilities	during	profes	sio	nal practice.			
PO 9	Function effective	vely as a team member or a	leader t	o acco	mp	lish a commo	on goal in a	a multio	disciplinary
	team.								
PO 10	Communicate ef	fectively with a range of au	diences	using	a ra	ange of moda	alities inclu	uding w	ritten, oral and
	graphical.								
PO 11	Apply the knowledge of technology and management principles to manage projects effectively in diverse								
	environments as	a member or a leader in the	team.						
PO 12	Engage in indepe	endent and life-long learning	g for co	ntinue	ed p	professional d	evelopme	nt.	
PO 13	Ability to unders	stand and analyze a given re	al-time	proble	ems	s and propose	teasible c	omputi	ng solutions.
PO 14	Evaluate and use	appropriate tools and techn	iques i	n deve	lop	ong application	on activitie	es.	
PO 15	Updating themselves through e-learning and self-study courses.								

COs	COURSE OUTCOME
CO 1	Understanding about the communications skills.
CO 2	Improving Listening and Conversation.
CO 3	Knowing about Job Interview.
CO 4	Knowing about Group Discussion.
CO 5	Defining with Presentation Skill
Pre-requisites	Knowledge about Speaking Skills and Listening Skills.

					J	Know	ledge	Level	S						
1.Remer	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	5
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COs		(3/2)		ates the	KLs		orrelati	011, 5-51	POs	-mearu	III, 1-we	eak)	KI	s	
	,							PO 1				1			
CO	1		2						PO	2			2	2	
								PO 3					6	5	
									PO 4			5			
CO	2				2				PO	5			3	3	
									PO	6			5	5	
CO	2				5				PO	/			4	+	
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CO	5				5				PO 1	4			6	5	
						<u> </u>		PO 15 5			5				
		(3/)	/1 indic	entos the	a strong	CO/	PO Ma orroloti	pping	rong	modiu	m 1 w	nak)			
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COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO3	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO5	1	1	2	3	1	3	2	2	2	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 S	yllabus		
	Nature of technical communication	Periods	4
	Nature of technical communication: Communication as sharing - Stages	ofcommunicatio	n – Channels
Unit - I	of communication - Nature of technical communication - Importance a	and need for techn	ical
	communication – Technical communication skills.		
	The Listening process	Periods	4
	The Listening process: Types of listening – Listening with a purpos	e – Barriers tolis	stening -The
Unit - II	speech process - Conversation and oral skills - Strategies for good	d conversation – I	mproving
	fluency and self-expression – Body language.		
	Teb interviewe	Dania da	4
	Job interviews	Periods	4
	Job interviews: Interview process – Characteristics of job interview–Pre	-interviewprepara	tion techniques
Unit - III	- Interview questions – Answering strategies – Frequently asked interview	ew questions – Pro	ojecting a
	positive image – Alternative interview formats.		
	Group Discussion	Periods	4
	Group Discussion: Nature of group discussion - Characteristics of su	accessful group d	iscussions –
Unit - IV	Selection group discussion – Group discussion strategies – Techniques f	orindividual conti	ribution – Group
	interaction strategies.		
	Presentation Skills	Periods	4
Unit - V	Presentation Skills: Nature and importance of oral presentation –Planning	g the presentation	 Preparing
Unit V	the presentation – Organizing your presentation – Rehearsingthe presenta	tion – Improving	delivery.
	Total Periods		20

Text Books	
1	M. Ashraf Rizvi, "Effective Technical Communication" Tata McGraw – Hill Publishing Company Limited New Delbi Unit L(Chapter 1) Unit II(Chapter 4.6) Unit III(Chapter 9)
	Unit-IV(Chapter-10), Unit-V(Chapter-11).
References	
1	Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw-Hill.
	New Delhi
2	Sasikumar.V and P.V. Dhamija. "Spoken English: A Self-Learning Guide to
	Conversation Practice. ", 1993 34th Reprint. Tata McGraw-Hill. New Delhi.
E-References	
1	www. tutorialspoint.com.
2	www.myreaders.info.
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Progr	ramme	B.Sc	Programme Code			U	CS	Regulat	tions	20	21-2022	
Depa	rtment	Compu	iter Science				Semester				5	
Cours	e Code	(Course Name	P	Periods per Week		Credit	Maximum Marks		ks		
				L	Т	Р	С	CA	ESE	3	Total	
21U5	CSCP09	PHP	Programming Lab	0	0	5	3	40	60		100	
1	I	Develop PHP p Use of co Use of lo Use of di	rogram using the follo nditional statements in oping statements in PI fferent types of arrays	wing PHP HP								
2	W	rite a PHP prog	gram to prepare the stu	dent n	nark	s lis	t.					
3	Cr	eate a PHP Pro	ogram to find odd or ev	ven nu	mbe	er fro	om given n	umbers.				
4	W	rite a PHP Prog Gettype()	gram to demonstrate th b) Settype()	ne vari c) Iss	able et()	fun	ction d)	Unset()				
5	(Give the examp	ble of String function	c) Str	case	ecmr	(b ()	Strpos()				
6	W	rite a PHP Pro	gram that demonstrates	s Forn	n ele	men	t input elen	nents.				
7	Da	tabase connect	tivity in PHP with MyS	SQL								
8	To	Create a table	using PHP Programm	ing.								
9	Тс	create a table	and do all the DDL cor	mman	ds u	sing	PHP Prog	ramming				
10	De	evelop a PHP p	orogram to display stud	lent in	forn	natio	n using MY	YSQL tab	le.			
11	Cr	eating simple v	webpage using PHP									
12	Cr	eate a College	Web site using PHP Pr	rograr	n.							

	VIVEKAN	ANDHA COLLEGE O WOMEN (AU))F Al FON	RTS OM	AN IOU	ND SCIENC	ES FOR		TOVRIseinfand CERTIFIED	
ROHEN ENPOYERNEN		Elayampalayam, Tire	uchen	gode	÷-637	/ 205.				
Programme	B.Sc	Programme Code			U	CS	Regulati	ions	202	21-2022
Department	Comput	er Science				Semester			5	
Course Code	C	Course Name	Periods per Week			Credit	Maximu	Maximum Marks		
			L	Т	Р	С	CA	E	SE	Total
21U5CSCPR01	Pro (In-Ho)	oject Work-I use Mini Project)	0	0	4	3	40	6	j0	100
		Project Wor	rk Pa	tteri	n					
FIRST REVIE	ZW:		_	_		(20 N	(larks)	_	_	_
 Project Project Confirr Details Present 	Title Platform (Langua nation Letter (fro of Internal Guide tation	age / Package Selected) om Company / Industry) e with Designation & Quali	ficati	on (i	n th	e company / Ir	adustry)			
SECOND REV	/IEW:					(20 N	(larks)			
 Work C Module DFD / I Estimation Completion PowerI 	 SECOND REVIEW: (20 Marks) Work Observation Modules in Project (Design Screens Sample) DFD / ERD / System Flow Diagram (Whichever Applicable) Estimated Time of Completion Completed Work in the form of Percentage Analysis PowerPoint Presentation. 									
FINAL REVIE	EW:					(60 N	(larks)			
 Docum Screens DFD/I Final P 	entation 3 Shots ERD / System Flo roject Report (wi	ow Diagram (Whichever A ith executable format incluc	pplic، ding c	able comp) olete	source code)				
	The Pag	ssing minimum shall be 40	0% o	ut of	f 60	marks (24 M	arks)			



Programme	B.Sc	Programme Code	UCS				Regulat	ions	20	021-2022
Department	Comput	ter Science	Semester							5
			Pe	eriod	ls	Credit	Maximu	ım Mar	ks	
Course Code	C	Course Name	per	We	ek					
			L	Т	Р	С	CA	ESF	E	Total
	CRYP	TOGRAPHY	5	0	0	4	25	75		100
21U5CSE01										
COURSE	To provide deepe	er understanding into crypte	ogranl	hv i	its an	plication to				
OBJECTIVES	network security,	threats/vulnerabilities to ne	tworl	ks a	nd co	ountermeasure	es.			
POs		PRO	GRAN	MM	E OU	TCOME				
PO 1	Apply the know	ledge of mathematics, sci	ence	and	com	puting in the	core infor	matior	n tecl	hnologies
PO 2	Build software	systems and apply the tech	nolo	gies	in v	arious fields	of Compu	ter Tec	hno	logy,
	includinghardw	are problems, Web site de	evelop	pme	ent ai	nd manageme	ent, databa	ises, an	d so	ftware
	engineering tec	hniques.								
PO 3	Design, implem realisticconstrai	ent and evaluate a compu- ints.	ter-ba	ased	syst	em to meet th	ne desired	needs	with	in the
PO 4	Review literatur newexperiment	re and indulge in research s, analyze, and interpret d	using ata to	g res o dra	searc w va	h based know alid conclusio	vledge and ons.	l metho	ods to	o design
PO 5	Select and apply and integrateIT	y current techniques, skills -based solutions into the u	s, and ser e	l too nvir	ols ne	ecessary for co	omputing y.	practic	e	
PO 6	Apply contextu profession pract	al knowledge to assess pro ice.	ofessi	ona	l, leg	al, health, so	cial and cu	ultural	issue	es during
PO 7	Analyze the loc	al and global impact of co	mput	ing	on ii	ndividuals, or	ganizatio	ıs, and	soci	ety.
PO 8	Apply ethical pr	rinciples and responsibiliti	es du	iring	g pro	fessional prac	ctice.			
PO 9	Function effection multidisciplinar	vely as a team member or y team.	a lea	der	to ac	ccomplish a c	ommon g	oal in a	l	
PO 10	Communicate e oral andgraphic	ffectively with a range of al.	audie	ence	s usi	ng a range of	modalitie	s inclu	ding	; written,
PO 11	Apply the know diverseenviron	ledge of technology and r nents as a member or a lea	nanag ader i	gem in th	ent p ie tea	principles to r am.	nanage pr	ojects e	effec	tively in
PO 12	Engage in indep	pendent and life-long learn	ing f	or c	ontir	ued professio	onal devel	opmen	t.	
PO 13	Ability to under solutions.	stand and analyze a given	real-	tim	e pro	blems and pr	opose fea	sible co	ompi	uting
PO 14	Evaluate and us	e appropriate tools and tec	chniq	ues	in de	eveloping app	lication a	ctivitie	s.	
PO 15	Updating thems	ating themselves through e-learning and self-study courses.								

COs	COURSE OUTCOME
CO 1	Identify basic security attacks and services Use symmetric and asymmetrickey algorithms for cryptography
CO 2	Understanding of Block Ciphers and Algorithms
CO 3	Analyze Key Management techniques and importance of number Theory
CO 4	Understanding of Authentication functions the manner in which MessageAuthentication Codes and Hash Functions works cryptography
CO 5	To examine the issues and structure of Authentication Service and Electronic Mail Security
Pre-requisites	Most encryption is based heavily on number theory, most of it being abstract algebra . Calculus and trigonometry isn't heavily used

Knowledge Levels

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

		(3/2	/1 india	pates th	(e strend	CO / PC) / KL I	Mappin on 3-st	g rong ?	mediu	m 1_we	ak)			
CO	s	(3/2			KLs			011, 5-30	POs	5	III, 1-wc	uk)	KI	LS	
									РО	1			1		
СО	1				1				PO	2			4	ŀ	
									PO	3			2	2	
									PO	4			6	ō	
CO	2				2				PO	5			3	;	
									PO	6		5			
									PO	7			4	ŀ	
CO	3				2				PO 8			6			
									PO	9			5	i	
									PO 1	.0			5	i	
CO	4				3				PO 1	1			4	ŀ	
									PO 1	2			6)	
									PO 1	3			6	ĵ.	
CO	5				3				PO 1	4			5	i	
									PO 1	5		6			
						CO /	PO Ma	pping							
		(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-st	rong, 2	-mediu	m, 1-we	eak)			
CO						Р	rogram	me Ou	tcome ((POs)					
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1
CO2	2	1	3	1	2	1	1	1	1	1	1	1	1	1	1
CO3	2	1	3	1	2	1	1	1	1	1	1	1	1	1	1
CO4	1	2	2	1	3	1	2	1	1	1	2	1	1	1	1
CO5	1	2	2	1	3	1	2	1	1	1	2	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	Syllabus		
	Classical Cryptography	Periods	12
Unit - I	Classical Cryptography: Introduction to Cryptography and Network S Architecture – Introduction to Security Attacks – Security Mechanism Substitution Techniques: Caesar Cipher – Mono Alpha Cipher – Poly Pad – TranspositionTechniques – Steganography	Security – OSI S ns– Symmetric (Alphabetic Cip	ecurity Cipher Model – hers, One Time
	Block Ciphers	Periods	12
Unit - II	Block Ciphers: Block Cipher Principles – Data Encryption Standard operation – Advanced Encryption Standard (AES) – Blowfish , RC54	(DES) – Block C Algorithm	Cipher models of
	Public Key Cryptography	Periods	12
Unit - III	Public Key Cryptography : Principles of public key cryptosystems – management – Diffie Hellman Key Exchange – EllipticCurve:Arithm Cryptography	The RSAAlgorit netic, Elliptic Cu	hm – Key rve
Unit - IV	Hash Functions and Cryptographic Applications	Periods	12
	Hash Functions and Cryptographic Applications: MAC – Hash Algo Signature Standard – Applications pertaining to Encryption usingdiff way hashing algorithms	rithm (MD5,SH erent ciphers and	A) – Digital 1 modes – One
	Network and Internet Security	Periods	12
Unit - V	Network and Internet Security : Transport Level Security– SSL – TL Security – IEEE 802.11i Wireless LAN Security – WAP End to Ends Security – Pretty Good Privacy (PGP) – S/MIME	S – HTTPS – W Security – Electro	ireless Network onic Mail
	Total Periods		60

Text Books	
1	William Stallings, "Cryptography and Network Security - Principles and Practice ", 7thEdition,
	Pearson Education, 2017. ISBN-13: 978 - 9332585225.
References	
1	Atul Kahate, "Cryptography and Network Security",4th Edition,2019 ISBN-10: 978
	- 9353163307
2	V.K.Jain ,"Cryptography and Network Security ",1st Edition Khanna Publishing –New Delhi,2013
	ISBN-10: 978 - 9380016808.
E-References	
1	https://www.tutorialspoint.com/cryptography/index.htm
2	https://www.edureka.co/blog

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CERTIFIED	www.tuv.com

WEN EMPOWERM															
Programme	B.Sc	Programme Code			UC	S	Regulat	tions	2021-2022						
Department	Compu	iter Science				Semester			5						
			Per	iods	3	Credit	Maxim	um Mai	/larks						
Course Code	C	Course Name	per V	Wee	k										
			L '	Т	Р	С	CA	ESI	E Total						
	CLIENT/SERV	ER TECHNOLOGY	5	0	0	3	25	75	100						
21U5CSE02								1							
COURSE	This course ain	ns at providing a foundation	in dece	ntra	lize	d computer sy	stems, usir	ng the							
OBJECTIVES	client/server me	odel.													
POs	PROGRAMME OUTCOME														
PO 1	Apply the knowledge of mathematics, science and computing in the core information technologies														
PO 2	Build software sy	Build software systems and apply the technologies in various fields of Computer Technology, including													
	hardware problems, Web site development and management, databases, and software engineering														
	techniques.														
PO 3	Design, impleme	ent and evaluate a computer-	based s	yste	em t	o meet the des	ired needs	within	the realistic						
	constraints.														
PO 4	Review literature	e and indulge in research using	ng rese	arch	i bas	sed knowledge	e and metho	ods to c	lesign new						
PO 5	Select and apply	ayze, and interpret data to dr	aw van			usions.	ting prosti	co and i	ntagrata						
105	IT-based solution	ns into the user environment	effecti	velv	,	ary for compu	ung practio		megrate						
PO 6	Apply contextual	knowledge to assess profes	sional.	lega	ı. al. h	ealth, social a	nd cultural	issues	during						
100	profession practi	ce.	,	1081	,	•••••••••••••••••••		100000							
PO 7	Analyze the loca	l and global impact of comp	uting o	n in	divi	duals, organiz	ations, and	l society	у.						
PO 8	Apply ethical pri	nciples and responsibilities of	luring	prof	essi	onal practice.									
PO 9	Function effectiv	vely as a team member or a le	eader to	o aco	com	plish a commo	on goal in a	a multic	lisciplinary						
	team.														
PO 10	Communicate ef	fectively with a range of aud	iences	usin	ng a	range of moda	alities inclu	uding w	ritten, oral and	1					
	graphical.														
PO 11	Apply the knowl	edge of technology and man	agemei	nt pi	rinc	iples to manag	e projects	effectiv	ely in diverse						
	environments as	a member or a leader in the	team.												
PO 12	Engage in indepe	endent and life-long learning	tor co	ntin	ued	professional d	evelopmer	nt.	1.1						
PO 13	Ability to unders	tand and analyze a given rea	I-time	prot	olen	ns and propose	teasible c	omputi	ng solutions.						
PO 14	Evaluate and use	appropriate tools and techni	ques ir	1 de	velo	ping application	on activitie	es.							
PO 15	Updating themse	elves through e-learning and	self-stu	idy (cou	rses.									

COs	COURSE OUTCOME
CO 1	Client-server model is a distributed application structure that partitionstasks or workloads.
CO 2	Computer applications that use the client-server model are email, networkprinting, and the World Wide Web.
CO 3	A server host runs one or more server programs, which share their resources with clients
CO 4	A client usually does not share any of its resources, but it requests contentor service from a server
CO 5	The server component provides a function or service to one or manyclients
Pre-requisites	Prior experience with computer networks.

Knowledge Levels

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

		(2/2	/1 :		(CO / PC) / KL I	Mappin	g		1							
	2	(3/2)	/1 1nd10	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $														
	\$				KLS					5				79				
					_				PO	1			1	-				
CO	CO 1				2				PO	2		2						
									PO	3			6	5				
									PO	4			5	i				
CO	2				2				PO	5			3	5				
									PO	6			5	i				
								PO 7					4	ļ				
CO	3				5			PO 8				6						
									PO	9		3 5 4 6 6 6 6 5 6 6 6 5 5			6			
									PO 1	.0		6						
CO 4	4		2					PO 11					6					
								PO 12					5					
									PO 1	3		6						
CO	5				5				PO 1	4			6	5				
									PO 1	5		5						
						CO /	PO Ma	pping										
		(3/2	/1 indic	ates the	e streng	th of c	orrelati	on, 3-st	trong, 2	e-mediu	m, 1-we	eak)						
G 0						Р	rogram	me Ou	tcome ((POs)								
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15			
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1			
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1			
CO3	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3			
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1			
CO5	1	1	2	3	1	3	2	2	2	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

	Client/Server Computing	Periods	12								
	Client/Server Computing – Advantages of Client / Server Computing – To	echnology Revolu	ition –								
Unit - I	Connectivity - Ways to improve Performance - How to reduce network										
	Traffic.										
	Components of Client/Server Applications	Periods	12								
	Components of Client/Server Applications – The Client: Role of a Client	- Client Services	– Request fo								
Unit - II	Service. Components of Client/Server Applications – The Server: The Role of a Server – Server										
	Functionality in Detail – The Network Operating System – What are the	Available Platforn	ns – The								
	Service. Components of Client/Server Applications – The Server: The Role of a Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system. Components of Client/Server Applications Periods 12 Components of Client/Server Applications –Connectivity: Open System Interconnect – Communication Interface Technology – Inter process communication – WAN Technologies.										
	Components of Client/Server Applications	onents of Client/Server Applications Periods									
Unit - III	Components of Client/Server Applications –Connectivity: Open System I Interface Technology – Inter process communication – WAN Technologi	nterconnect – Cores.	mmunication								
	Components of Client/Server Applications-Software	Periods	12								
	Components of Client/Server Applications-Software: Factors Driving demand for application										
Unit - IV	software development – Rising Technology Staff costs – Need to improve Technology – Need for										
	Common Interface across Platforms – Client/Server System DevelopmentMethodology. Components										
	of Client/Server Applications-Hardware: Hardware/Network Acquisition	– PC-Level Proce	essing								
	Units – Macintosh, notebooks, Pen –UNIX Workstation – x-terminals – I	Disk, Tape, Optica	l Disks,								
	NIC and UPS.										
	Components of Client/Server applications-Service and Support	Periods	12								
	Juit - V Client/Server applications–Service and Support: System Administration. The Server applications–Service and Support: System Administration. The Server Components of Client/Server applications–Service and Support: System Administration. The Server										
Unit - V	Components of Client/Server applications–Service and Support: System A Client/Server Computing: Enabling Technologies – Transformational System	Administration. The stems.	he Future of								

Text Books									
1	CLIENT/SERVER COMPUTING - Patrick Smith, Steve Guenferich, 2 nd Edition, Prentice Hall of India								
	Private Limited ,New Delhi.								
References									
1	Internetworking with TCP/IP Client/Server Programming and its Applications by Douglas E Comer.								
E-References									
1	www.clientserverworld.com								
2	www.learnclientserveronline.com								





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Programme	B.Sc	Programme Code			UC	S	Regulat	tions	20	021-2022			
Department	Compu	iter Science				Semester				5			
			Pe	eriod	.S	Credit	Maxim	um Mai	rks				
Course Code	0	Course Name	per	: We	ek								
			L	Т	Р	С	CA	ESF	Ę	Total			
	Artifici	al Intelligence	5	0	0	3	25	75	_	100			
21U5CSE03	, interior		5	Ŭ	Ŭ	5	20	75		100			
COURSE	Working Know	vledge of designing a exper	t syste	ems	and	applying expe	ert system						
OBJECTIVES	technologies in	designing and analyzing eng	gineer	ing s	yste	ms.							
POs	PROGRAMME OUTCOME												
PO 1	Apply the knowledge of mathematics, science and computing in the core information technologies												
PO 2	Build software systems and apply the technologies in various fields of Computer Technology, including												
	hardware problems, Web site development and management, databases, and software engineering												
	techniques.												
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	ired needs	within	the re	ealistic			
	constraints.												
PO 4	Review literature	e and indulge in research usi	ng res	earc	h bas	sed knowledge	and meth	ods to d	lesigr	n new			
	experiments, ana	lyze, and interpret data to dr	aw va	ılid c	oncl	usions.							
PO 5	Select and apply	current techniques, skills, ar	nd too	ls ne	cess	ary for compu	ting practi	ce and i	integr	rate			
	IT-based solution	ns into the user environment	effect	tivel	у.								
PO 6	Apply contextua	l knowledge to assess profes	sional	l, leg	al, h	ealth, social a	nd cultural	issues	durin	ıg			
	profession practi	ce.											
PO 7	Analyze the loca	l and global impact of comp	uting	on ir	ndivi	duals, organiz	ations, and	l society	у.				
PO 8	Apply ethical pri	inciples and responsibilities	during	g pro	fessi	onal practice.							
PO 9	Function effectiv	vely as a team member or a le	eader	to ac	com	plish a comm	on goal in a	a multic	discip	olinary			
	team.												
PO 10	Communicate ef	fectively with a range of aud	lience	s usi	ng a	range of moda	alities inclu	iding w	ritter	1, oral and			
	graphical.					• •							
PO 11	Apply the knowl	edge of technology and man	agem	ent p	rinc	iples to manag	e projects	effectiv	vely in	n diverse			
	environments as	a member or a leader in the	team.							-			
PO 12	Engage in indepe	endent and life-long learning	$\frac{1}{1}$	ontir	ued	protessional d	levelopmer	1t.		1			
PO 13	Ability to unders	stand and analyze a given rea	u-time	e pro	blen	is and propose	e reasible c	omputi	ng so	nutions.			
PO 14	Evaluate and use	appropriate tools and techni	iques	in de	evelo	ping applicati	on activitie	es.					
PO 15	Updating themse	elves through e-learning and	self-s	tudy	cour	rses.							

COs	COURSE OUTCOME
CO 1	Solve basic AI based problems.
CO 2	Define the concept of Artificial Intelligence
CO 3	Apply AI techniques to real-world problems to develop intelligent systems.
CO 4	Apply AI techniques for reasoning.
CO 5	Defining with game playing in AI.
Pre-requisites	Strong knowledge of Mathematics.Good command over programming languages.

Knowledge Levels

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

		(2/2	/1 :		(CO / PC) / KL]	Mappin	g)		- a l-)				
COs	COs KLs						orrelati	011, 5-81	PO:	s	III, 1-we	KLs				
	-		+ +						PO	1		1				
07	1				2				PO	2			2)		
	001				2				PO	3				- 5		
									PO	4			4	5		
CO	2				2				PO	5			3	3		
									PO	6				5		
									PO	7		4				
CO	3			5					РО	8			6	5		
								PO 9 6			6 5 3 5 4 6 6 6 6 5 6 6 5 6 6 5 5 8 8 8 5					
									PO 1	0		6				
CO	4			2					PO 1	1		6				
									PO 1	2		5				
									PO 1	3		6				
CO	5				5			PO 14					6	5		
			PO 15 5						5							
						CO /	PO Ma	pping								
	-	(3/2	/1 indic	cates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	eak)				
<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	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO3	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3	
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1	
CO5	1	1	2	3	1	3	2	2	2	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		
	Introduction	Periods	12
Unit - I	Introduction: Artificial Intelligence Problems- Artificial IntelligenceTech Problems, Problems Space, Search: State Space Search-Production Syster in design of search. Heuristic Search Techniques: Generate & Test- Hill c Reduction, Constraint satisfaction, Means End Analysis.	niques-Criteria fo ns-Problem Chara limbing- BestFirs	r Success. acteristics- Issues t, problem
	Knowledge Representation Issues	Periods	12
Unit - II	Knowledge Representation Issues: Representations and Mappings- Appro representation-Issues in knowledgerepresentations-The Frame Problem. U RepresentingSimple Facts in Logic-Representing instance and ISA Relati Functions and Predicates- Resolution-Natural deduction.	oaches to Knowled Jsing Predicate Lo onships- Computa	lge ogic: able
	Representing Knowledge Rules	Periods	12
Unit - III	Representing Knowledge Rules: Procedural vs. Declarative Knowledge- Backward Reasoning- Matching- Control Knowledge-Symbolic Reasonin to Nonmonotonic Reasoning- Logics for Nonmonotonic Reasoning-Imple Problem Solver- Implementation: Depth First Search-Implementation: Br	Logic Programmin ng under Uncertain ementation Issues eadth First Search	ng- Forward vs nty: Introduction Augmenting
	Statistical Reasoning	Periods	12
Unit - IV	Statistical Reasoning: Probability and Bayes Theorem-Certainty Factors a Bayesian Networks- Dempster- Shafer Theory- Fuzzy Logic- Weak slot - Nets Frames. Strong Slot Filler Structures: Conceptual Dependency- Scrip	nd Rule-based Sy Filler Structures: pts	vstems- Semantic
	Game Playing	Periods	12
Unit - V	Game Playing: Overview-The Minimax Search Procedure-Adding Refinements- Expert Systems: Representing and using Domain Ku Explanation- KnowledgeAcquisition	Alpha- Beta Cu nowledge-Expert	itoffs-Additional system Shells-
	Total Periods		60

Text Books	
1	Elaine Rich ,Kevin Knight,Shivashankar B Nair, "Artificial Intelligence", Tata
	McGraw-Hill Publication, 3 rd Edition, 2010
References	
1	Donald A.Waterman – A Guide to Expert Systems Tata Mcgraw Hill – secondEdition,1991.
2	Stuart Russell and Peter Norving ,"Artificial Intelligence – A Modern Approach"Second Edition, 2007.
E-References	
1	www. tutorialspoint.com.
2	www.myreaders.info.



NEW EMPOWER			uene		ue o	0. 2001						
Programme	B.Sc	Programme Code	UCS Regulations 2020 -									
Department	Compu	ter Science			6							
			Pe	riod	.S	Credit	Maxim	Maximum Marks				
Course Code	C	ourse Name	per	We	ek							
			L T P			С	СА	ESI	E Total			
	Pytho	on Programming	5	0	0	4	25	75	100			
21U6CSC12				Ũ	Ů				100			
COURSE	•To learn a dynamic, interpreted (Byte code-Compiled) and high level programming language.•To											
OBJECTIVES	know the basics of algorithmic problem solving •To use Python data structures lists, tuples,											
	dictionaries.											
POs		PRO	GRAM	1ME	EOU	TCOME						
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core	informatio	n techn	ologies			
PO 2	Build software s	stems and apply the technol	logies	in v	ario	us fields of Co	mputer Te	chnolog	gy, including			
	hardware problem	ns, Web site development a	nd mar	nage	men	t, databases, a	nd softwar	e engin	eering			
	techniques.											
PO 3	Design, impleme	nt and evaluate a computer-	based	syst	em t	o meet the des	sired needs	within	the realistic			
DO 4	constraints.			1	. 1			. 1. (1			
PO 4	Review literature	and indulge in research using the second interpret data to dr	ng rese	earci	n bas	sed knowledge	e and meth	oas to c	lesign new			
PO 5	Select and apply	current techniques skills at	aw va nd tool	nu c	Cess	ary for compu	ting practi	ce and i	integrate			
105	IT-based solution	is into the user environment	effect	ivel	v.	ary for compa	ting proof	ee una i	integrate			
PO 6	Apply contextua	knowledge to assess profes	sional	, leg	al, h	ealth, social a	nd cultural	issues	during			
	profession practi	ce.		, 0		,			C			
PO 7	Analyze the loca	l and global impact of comp	uting o	on ir	ndivi	duals, organiz	ations, and	l societ	y.			
PO 8	Apply ethical pri	nciples and responsibilities	during	pro	fessi	onal practice.						
PO 9	Function effectiv	ely as a team member or a le	eader t	to ac	com	plish a comm	on goal in	a multi	disciplinary			
	team.											
PO 10	Communicate ef	fectively with a range of aud	liences	s usi	ng a	range of mode	alities inclu	uding w	ritten, oral and			
	graphical.											
PO 11	Apply the knowl	edge of technology and man	ageme	ent p	rinc	iples to manag	ge projects	effectiv	ely in diverse			
DO 12	environments as	a member or a leader in the	team.			C 1 1	1 1					
PO 12	Engage in indepe	endent and life-long learning	for co	ontin	hlar	protessional c	evelopmen	nt.	na aclutiona			
PO 13	Additional and use	annu and analyze a given rea	u-ume	pro	velo	is and propose	on activiti		ng solutions.			
PO 14	Evaluate and use	appropriate tools and technic	$\frac{1}{1}$	n ae		ping applicati		5 8.				
PO 15	Opdating memselves through e-learning and self-study courses.											

COs	COURSE OUTCOME
CO 1	To read and write simple Python programs.
CO 2	To define Python functions and call them.
CO 3	To develop Python programs with conditionals and loops.
CO 4	To do input/output with files in Python and develop GUI based programs
CO 5	
Pre-requisites	Know about Programming Languages

]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.	Under	rstand	ling, 3	B.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	5
									~						
		(3/2	/1 indic	ates the	e streng	th of c	orrelati	on. 3-st	g rong. 2	-mediu	m. 1-we	ak)			
CO	s	(2) _			KLs	,		,	POs	5			KI	LS	
									PO	1			1		
CO	1				2				PO	2			2	2	
									PO	3			6	ō	
									PO 4	4			5	i	
CO	2				1				PO :	5		3			
									PO	5			5)	
CO	3		2						PO	2			4	+	
0	5		5						PO 0	5 9				, i	
								PO 10					6	, j	
CO	4				4				PO 1	1			6	ō	
								PO 12					1		
									PO 1	3			6	5	
CO	CO 5			5				PO 14					6	ō	
									PO 1	5			5	5	
		(2)	/1 • 1•			CO /	PO Ma	pping			4	1 \			
		(3/2		cates the	e streng	gth of co	orrelati	on, $3-st$	rong, 2		m, I-we	ak)			
COs	DOI	200	DOG	DO 1	D0.	P	rogram	me Ou	come (POS)	DOIL	D010	D010	DOIN	D015
	POI	PO2	PO3	PO4	POS	PO6	PO/	PO8	PO9	POIO	POIT	PO12	PO13	PO14	PO15
CO1	2	3	1	1	2	1	1	1	1	1	1	2	1	1	1
CO2	3	2	1	1	1	1	1	1	1	1	1	3	1	1	1
CO3	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO4	1	1	1	2	2	2	1	1	1	1	1	1	1	1	2
CO5	1	1	2	3	1	3	2	2	2	2	2	1	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	yllabus										
	Python Overview, Data Types, Expressions:	Periods	10								
TT 1 T	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.										
	Functions, Modules and Control Statements	Periods	14								
	Functions and Modules- Calling Functions, The math Module, The Main	Module, Program	Format and								
Unit II	Structure and Running a Script from a Terminal Command Prompt - Itera	tion - for loop - S	election -								
Unit - II	Boolean Type, Comparisons, and Boolean Expressions, if-else Statements	s, One-Way Selec	tion Statements,								
	Multi-way if Statements, Logical Operators and Compound Boolean Expr	essions, Short- Ci	ircuit Evaluation								
	and Testing Selection Statements - Conditional Iteration - while loop.										
	Strings and Text Files	Periods	12								
	Strings-Accessing Characters and Substrings in Strings - Data Encryption - Strings and Number 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 Side										
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 l	Dictionary.	1								
	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 Program's Namespace - Data M	lodeling and Struc	cturing Classes								
Child y	with Inheritance and Polymorphism - Behavior of terminal based program	ns and GUI based	programs-								
	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
References	
1	1. Dr. S. Suresh kumar, "Problem Solving and Python Programming" Charulatha Publications, 2018.
2	2. Python Essential Reference (4th Edition): David Beazley.
3	3. Michal Jaworski, TarekZiade, "Expert Python Programming ", Packt Publishing, Second Revised edition
	2016.
4	. Sam Washington, Dr. M. O. FaruqueSarker, "Learning Python Network Programming", Packt
	Publishing Limited, 2015.
E-References	
1	https://www.w3schools.com/python/1.
2	www.python.org/about/gettingstarted/

3	www.tutorialspoint.com/python/index.htm
4	. www.realpython.com/python-beginner-tips/



MEN EMPOWERMS		Liayampalayam, Th	uchen	500	ic-0	57 205.						
Programme	B.Sc	Programme Code			UC	S	Regulat	tions	20	021-2022		
Department	Compu				6							
			Peri	iods	5	Credit	Maximum Marks					
Course Code	C	Course Name	per V	Vee	k							
			L	Г	Р	С	CA	ESH	E	Total		
	Mobile Apr	nlication Development	5	0	0	4	25	75	_	100		
21U6CSC13		$\frac{5}{6} = \frac{5}{6} = \frac{5}$										
COURSE	•To understan	•To understand the concept of Android Technology.•To understand applications of android.•To										
OBJECTIVES	understand andro	oid web apps.										
POs		PROC	GRAMI	ME	OU	TCOME						
PO 1	Apply the knowl	edge of mathematics, science	e and co	omp	outii	ng in the core	informatio	n techn	ologi	es		
PO 2	Build software s	ystems and apply the technol	ogies ii	n va	riou	us fields of Co	mputer Te	chnolog	gy, in	cluding		
	hardware problem	ns, Web site development ar	nd mana	agei	men	t, databases, a	nd softwar	e engin	eerin	g		
	techniques.											
PO 3	Design, impleme	ent and evaluate a computer-	based s	yste	em t	o meet the des	ired needs	within	the re	ealistic		
	constraints.											
PO 4	Review literature	e and indulge in research usin	ng resea	arch	bas	sed knowledge	e and meth	ods to d	lesigr	n new		
	experiments, ana	lyze, and interpret data to dr	aw vali	d co	oncl	usions.						
PO 5	Select and apply	current techniques, skills, an	id tools	neo	cess	ary for compu	ting practi	ce and i	integr	rate		
	TT-based solution	hs into the user environment	effectiv	/ely	. 1 1.		1	•	1			
PO 6	Apply contextua	I knowledge to assess profes	sional,	lega	al, h	ealth, social ai	nd cultural	1ssues	durin	g		
PO 7	A polyzo the loop	ce.	ting or	. in	divi	duala organiz	ations and	laggiot	7			
PO 8	Analyze the loca	nciples and responsibilities of	luring of	r III		onal practice	auons, and	society	y.			
PO 9	Function effectiv	vely as a team member or a le	eader to		com	nlish a comm	on goal in	a multic	liscir	linary		
107	team.	ery us a team member of a R		uci	com		on gour m	u mun	liseip	Jiiidi y		
PO 10	Communicate ef	fectively with a range of aud	iences	usin	ig a	range of moda	alities inclu	uding w	ritter	n. oral and		
	graphical.	ggg				8				-,		
PO 11	Apply the knowl	edge of technology and man	agemer	nt pr	rinc	iples to manag	e projects	effectiv	ely in	n diverse		
	environments as	a member or a leader in the	team.									
PO 12	Engage in indepe	endent and life-long learning	for cor	ntin	ued	professional d	levelopmer	nt.				
PO 13	Ability to unders	tand and analyze a given rea	l-time j	prot	olen	ns and propose	e feasible c	omputi	ng so	lutions.		
PO 14	Evaluate and use	appropriate tools and techni	ques in	de	velo	ping applicati	on activitie	es.				
PO 15	Updating themse	Updating themselves through e-learning and self-study courses.										

COs	COURSE OUTCOME
CO 1	Learning Basics and History of Mobile Software Development
CO 2	Applying Application Design Essentials
CO 3	Analyzing tools using to develop Android Apps
CO 4	Linking Database with Apps
CO 5	
Pre-requisites	Know about designing tools

]	Know	ledge	Level	s						
1.Reme	nberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizinş	3
					(<u>CO / PC</u>) / KL I	Mappin	g						
		(3/2	/1 indic	ates the	e streng	th of c	orrelati	on, 3-st	rong, 2	-mediu	m, 1-we	ak)			
COs KLs POs KLs											Ls				
									PO	1			1		
CO	1				2				PO	2			2)	
									PO	3			6	j	
									PO 4	4			5	i	
CO	2				3				PO :	5			3		
									PO	6		5			
CO	•								PO	7		4			
0	3		4					PO 8				6			
									PO 1	9			6)	
CO	1				4			PO 11 6							
60	-				-			PO 12					5		
									PO 1	3			6	5	
СО	5				1			PO 14				6			
									PO 1	5			5	i	
						CO /	PO Ma	pping			·				
		(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-st	rong, 2	-mediu	m, 1-we	eak)			
COs						Р	rogram	me Ou	tcome ((POs)					
COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO2	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1
CO3	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the S	yllabus										
	Introduction to Android:	Periods	10								
I luit I	Introducing Android- Open Handset Alliance - The Android Platform - Layers of Android-Android SDK										
Unit - I	Kinds of Android Components.										
	Android Application Design Essentials:	Periods	10								
	Anatomy of an Android Applications - Android Terminology - Application	on Context - Activ	es - Services -								
Unit - II	Intents - Receiving andBroadcasting Intents-Interaction with server side a	pplications-Using	Google maps,								
	GPS, WIFI-Integrating with Social Media Applications.										
	Android Application Design Essentials:	Periods	10								
Unit - III	User Interface Screen Elements - Designing User Interfaces with Layouts	- Drawingand We	orking with								
	Animation.										
	Using Common Android APIs:	Periods	10								
Unit IV	Using Android Data and Storage APIs- Managing data using SQLite - Sh	aring Databetweer	n Applications								
Unit - I v	with Content ProvidersIOS-Integrating Calendar and address book with s	ocial media applic	cations.								
	DDMS	Periods	10								
Unit - V	Debug and Other View: DDMS - Dalvik DebugMonitor Server - LogCat	View.									
	Total Periods		50								

Text Books		
1	1.Jeff McWherter and Scott Gowell, "Professional Mobile Application Development", Wrox,	
	2012(Unit 2,4)	
2	2. Charlie Collins, Michael Galpin and Matthias Kappler, "Android in Practice", DreamTech, 2012.(Unit 5)	
3	3.Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Ed	cation, 2nd
	Ed, 2011.(Unit 1,3,5)	
4	4.W. Frank Ableson, Robi Sen, Chris King, "Android in Action", 2nd Ed, Manning Publications Co., 2011.	
References		
1	1. James Dovey and Ash Furrow, "Beginning Objective C", Apress, 2012	
2	2. David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, "Beginning iOS 6 Development:	
	Exploring the iOS SDK", Apress, 2013	
3	3.Chris Haseman, "Android Essentials", Apress Publications, 2008.	
4	4.James Steele, Nelson To, "The Android Developer's Cookbook-Building Applications with the	
	Android SDK", Addison-Wesley Publications, 2011.	
E-References		
1	1. https://www.cs.cmu.edu/~bam/uicourse/830spring09/BFeiginMobileApplication	
2	2. http://developer.android.com/develop/index.html	



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Programme	B.Sc	Programme Code			UC	S	Regulat	tions	20	021-2022				
Department	Computer	Science				Semester				6				
			Pe	riod	s	Credit	Maxim	um Mar	:ks					
Course Code	C	Course Name	per	We	ek									
			L	Т	Р	С	CA	ESF	Ξ	Total				
LIPCCAESET21U6CSS04DESKTOP PUBLISHING20022575						100								
21U6CSS04														
COURSE	• To provide	a hands on experience in the	e Desk	top	Publ	ishing Packag	es.							
OBJECTIVES		DDO	CDAN	AME		TCOME								
POS		FROM	JKAN		200	TCOME								
PO 1	Apply the knowl	edge of mathematics, scienc	e and	com	puti	ng in the core	informatio	n techno	ologi	es				
PO 2	Build software s	ild software systems and apply the technologies in various fields of Computer Technology, including												
	hardware problem	rdware problems, Web site development and management, databases, and software engineering												
	techniques.													
PO 3	Design, impleme	ent and evaluate a computer-	based	syst	em t	o meet the des	ired needs	within	the re	ealistic				
	constraints.													
PO 4	Review literature	e and indulge in research using	ng rese	earcl	h bas	sed knowledge	and meth	ods to d	lesign	n new				
	experiments, ana	lyze, and interpret data to dr	aw va	lid c	oncl	usions.								
PO 5	Select and apply	current techniques, skills, ar	nd tool	ls ne	cess	ary for compu	ting practi	ce and i	ntegr	ate				
	IT-based solution	ns into the user environment	effect	ively	y.									
PO 6	Apply contextua	l knowledge to assess profes	sional	, leg	al, h	ealth, social a	nd cultural	issues of	durin	g				
	profession practi	ce.												
PO 7	Analyze the loca	l and global impact of comp	uting o	on ir	idivi	duals, organiz	ations, and	l society	<i>.</i>					
PO 8	Apply ethical pri	nciples and responsibilities	during	pro	fessi	onal practice.								
PO 9	Function effectiv	rely as a team member or a lo	eader t	to ac	com	plish a comm	on goal in a	a multic	liscip	olinary				
	team.		•						•	<u> </u>				
PO 10	Communicate ef	fectively with a range of aud	iences	s usi	ng a	range of moda	alities inclu	iding w	ritten	i, oral and				
	graphical.							<u> </u>						
PO 11	Apply the knowl	Apply the knowledge of technology and management principles to manage projects effectively in diverse												
DO 10	environments as a member or a leader in the team.													
PO 12	Engage in indepe	endent and life-long learning	$\frac{1}{1}$ tor co	ontin	ued	professional c	levelopmer	nt.		1				
PO 13	Addity to unders	and analyze a given rea	u-time	e pro	olen	is and propose	e leasible c	omputii	ng so	iutions.				
PO 14	Evaluate and use	appropriate tools and techni	iques 1	in de	velo	ping applicati	on activitie	es.						
PO 15	Updating themse	erves through e-learning and	self-st	udy	cou	rses.								

COs	COURSE OUTCOME
CO 1	To know about hardware requirements
CO 2	To know about Photoshop workspace
CO 3	Implementing Image basics and colors
CO 4	Implementing Corel DRAW like lines ,shapes and outlines
CO 5	Working with shapes and filling the objects
Pre-requisites	Know about some basic designing tools

]	Know	ledge	Level	s						
1.Remen	nberi	ng, 2.	Under	rstand	ling, 3	3.App	lying,	4.Ana	alyzin	g, 5.Ev	valuat	ing, 6.	Synth	esizing	5
		(2)	/1 • 1•	1	(CO / PC) / KL I	Mappin	g	. 1.	1	1 \			
		(3/2	/ 1 1nd10	cates the	e streng	gth of co	orrelati	on, 3-si	rong, 2	-mediu	m, I-we	ak)	1/1		
0	s			-	KLS				POS	5				LS	
CO	1				2				PO PO	1 ว			1)	
0	1				2				PO 2	3				5 5	
PO 4 5															
CO 2 2 PO 5 3															
PO 6 5															
PO 7 4												4			
CO 3 4 PO 8 6															
									PO	9			6	5	
60	4				F			PO 10) -	
0	4				5				PO 1	PO 12 5					
							PO 13			6					
СО	5				5				PO 1	4			6	5	
									PO 1	5			5	5	
						CO /	PO Ma	pping			·				
	1	(3/2	/1 indic	ates the	e streng	gth of c	orrelati	on, 3-st	trong, 2	2-mediu	m, 1-we	ak)			
COs						P	rogram	me Ou	tcome ((POs)					
PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PO13 PO14 PO15										PO15					
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO3	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO4	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3
CO5	1	1	2	3	1	3	2	2	2	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 S	Syllabus									
	INTRODUCTION:	Periods	5							
Unit - I	Hardware Requirement for DTP - Font Types - Text Organization - Design	gn Common Med	ia Publication.							
	Introducing Adobe Photoshop CS6:	Periods	5							
Unit - II Knowing when to use Photoshop - Looking at Whatâ€ [™] s New in Photoshop CS6. Exploring the										
Photoshop Workspace: Understanding the Toolbox and tool options bar - Exploring the Photoshop Menu										
	Bar - Exploring Panels - Configuring Presets.									
	Performing Image Basics:	Periods	5							
	Exploring File Types - Resizing Files and Adjusting Resolution - Croppin	ng and Straighten	ing Images.							
Unit - III	Unit - III Understanding Colors: Knowing Color Basics - Working in Different Color Modes. Learning All About									
Layers: Introducing Layers - Manipulating Layer Masks. Working with Selections: Using the Selection										
	Tools.									
	CorelDraw X7:	Periods	5							
	Starting and Setting up - CorelDRAW basics - CorelDRAW workspace to	our. Lines, Shapes	and outlines:							
Unit - IV	Working with lines, outlines, and brushstrokes: Drawing Lines - Formatti	ng lines and outli	nes Adding							
	arrowheads to lines and curves. Drawing Shapes: Drawing rectangles, and	l Squares - Drawi	ng ellipses,							
	circles, arcs, and pie Shapes.									
	Shaping objects:	Periods	5							
Using curve objects - Selecting and moving nodes. Text: Artistic Text - Paragraph Text - Applying color to										
Unit - V Text - Fitting text to a path. FILLING OBJECTS: Applying Uniform fills - Applying fountain fills -										
	Applying pattern fills - Applying texture fills.									
	Total Periods		20							

Text Books	
1	• Lisa DaNae Dayley, Brad Dayley, "Adobe Photoshop CS6 BIBLE The Comprehensive, Tutorial
	Resource", John Weley & Sons, Inc, 2012.
2	• CorelDRAW X7 User Guide, 2014 Coral Corporation.
References	
1	• Shirish Chavan, "Rapidex DTP Course Book", Desktop Publishing.
E-References	
1	• https://www.javatpoint.com/photoshop
2	• https://www.photoshopessentials.com/basics/
3	• https://www.javatpoint.com/coreldraw
4	• https://learn.corel.com/graphics-tutorials/

A DEAL OF THE REAL	AL ANTICE CONTRACTOR	VIVEKAN	VANDHA COLLEGE WOMEN (AU Elayampalayam, T	OF A JTOI	ART NOI engo	[S A MO] de-63	ND SCIEN US) 37 205.	NCES FO)R	TÛV	Reserved Res				
Progr	amme	ions	2	2021-2022											
Depa	rtment	Compu	ter Science				Semester			6					
Cours	e Code	um Mar	ks												
		LTPCCAESESCP10Mobile Application Development Lab00534060													
21U6	CSCP10	Mobile Application Development Lab 0 0 5 3 40 60													
List of I	Experime	CSCP10													
1 2 3 4 5 6 7 8 9		How to make ' How to add tw Create a simple Develop an ap Create an Andr How to build b How to create Develop an ap Implement an	[•] Hello World "applicat o numbers in Android A e calculator layout in ar plication that uses even roid Application in java oasic games in Android. a simple Alarm Clock u plication that makes use application that creates	ion in Appli idroic t liste usin using e of d an al	n and icatio d stu eners g an And iatab	droid on dio. s. limat droid base. vhen	d studio	a message							
10		Create a simple	e project using Android	Арр	olicat	tion	for internal	mark Ca	lculatio	ons.					
11		Create a andro a. Registrat b. Login wi	id application of ion with SQLite databa th SQLite database.	se				DUD							
12		Create an andr	old application to conne	ect wi	ith N	MyS	QL through	PHP							

ANOMES	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637 205.													
SA EMP	OWER													
Progra	amme	B.Sc	Programme Code			U	CS	Regulat	ions	20	021-2022			
Depar	tment	Comput	er Science				Semester				6			
Course	e Code	C	ourse Name	Pe per	eriod Wee	s ek	Credit	Maximu	um Mar	ks				
				L	Т	Р	С	CA	ESE	E	Total			
21U60	CSCP11	Python	Programming Lab	0	0	5	3	40	60		100			
List of E	Experimer	ıts												
1	Write	a python progra	m using Control statem	nents										
2	Write	a python progra	am using Functions and	Strin	g Oj	pera	tions							
3	Write	a python progra	am using List, Tuples an	nd Lis	t co	mpr	ehensions							
4	Write	a python progra	am using Inheritance											
5	Write	a python progra	am using Synchronization	on										
6	Write	a python progra	am using Text Files											
7	Write	a python progra	m using Graphical user	Inter	face	es								
8	Write	a python progra	um using Exceptional H	andliı	ng									
9	Write	a python progra	m using Classes and O	bjects	5									
10	Write	a python progra	am using Chat Applicati	ions										

	VIVEKAN	ANDHA COLLEGE O WOMEN (AU)	DF ARTS AND SCIENCES FOR TONOMOUS)									
HOMEN ENPOWER MENT	Elayampalayam, Tiruchengode-637 205.											
Programme	B.Sc	Programme Code			U	CS	Regulat	ions	202	21-2022		
Department	Comput	er Science				Semester	<u> </u>			6		
Course Code	(Course Name	Pe per	riods Wee	, k	Credit	Maximu	ım Ma	arks			
			L	Т	Р	С	CA	E	SE	Total		
21U6CSCPR02	Pro	ject Work-II	0	0	4	3	40	6	50	100		
		Project Wo	rk Pa	tterı	n							
FIRST REVIE	SW:					(20 N	(larks)					
 Project Project Confirr Details Present 	Title Platform (Langua nation Letter (fro of Internal Guide tation	age / Package Selected) om Company / Industry) e with Designation & Quali	ficati	on (i	n the	e company / Ir	ndustry)					
SECOND REV	VIEW:					(20 N	larks)					
 Work C Module DFD / I Estimation Complete PowerF 	Dbservation es in Project (Desi ERD / System Flo ted Time of Comj eted Work in the Point Presentation	ign Screens Sample) by Diagram (Whichever A pletion form of Percentage Analysi i.	.pplic is	able))							
FINAL REVI	FINAL REVIEW: (60 Marks)											
 Docum Screens DFD / 1 Final P 	 Documentation Screens Shots DFD / ERD / System Flow Diagram (Whichever Applicable) Final Project Report (with executable format including complete source code) 											
	The Pa	ssing minimum shall be 40	0% oʻ	ut of	: 60 :	marks (24 Ma	arks)					



WEN EMPOWERM													
Programme	B.Sc	Programme Code			U	CS	Regulat	tions	2021-2022				
Department	Con	nputer Science				Semester			6				
			Pe	riod	S	Credit	um Mar	ks					
Course Code		'ourse Name	per	We	ek								
eouise coue			г	<u>т</u>	D	C	CA	ESE	Total				
	E	$\begin{array}{c c c c c c c c c c c c c c c c c c c $											
21U6CSE04	E.	- Technology											
COURSE	To learn about th	e business over internet, and	to pro	omo	te an	d encourage u	ise of com	puters.					
OBJECTIVES POs		PROGRAMME OUTCOME											
PO 1	Develop problem	evelop problem solving abilities using a computer											
PO 2	Build the necess	ary skill set and analytical ab	ilities	for	deve	loping compu	ter based s	olutions	for real life				
	problems.												
PO 3	Imbibe Quality S	Software Development practi	ces										
PO 4	Create awareness	s about process and product s	standa	rds									
PO 5	Train students in	professional skills related to	Softv	vare	Indu	ıstry.							
PO 6	An ability to app	ly knowledge of computing	and m	athe	mati	cs appropriate	e to the pro	gramâ€	^{гм} s student				
	outcomes and to	the discipline.											
PO 7	Apply the techno	ologies in various fields of Co	omput	er S	cien	ce, including I	Mobile app	olication	s, Web site				
	development and	l management, databases, and	d com	pute	er net	works							
PO 8	An ability to fun	ction effectively on teams to	accon	npli	sh a o	common goal.							
PO 9	An understandin	g of professional, ethical, leg	al, see	curit	y, so	cial issues and	d responsit	oilities					
PO 10	Ability to under	stand and analyze a given rea	al-time	e pro	obler	ns and propos	e feasible o	computi	ng solutions				
PO 11	An ability to ana	alyze the local and global imp	pact of	f co	mput	ing on individ	luals, orga	nization	s, and society				
PO 12	Evaluate and use	Evaluate and use appropriate tools and techniques in developing application activities											
PO 13	Design, and anal	yze precise specifications of	algori	thm	s, pr	ocedures, and	interaction	n behavi	or.				
PO 14	Design, and anal	yze precise specifications of	algori	thm	s, pr	ocedures, and	interactior	n behavi	or.				
PO 15	Ability to comm	unicate effectively in both ve	rbal a	nd v	vritte	en form in ind	ustry and s	ociety.					

COs	COURSE OUTCOME
CO 1	To understand the growth of internet, advantages and disadvantages of commerce
CO 2	To understand the Characteristics of address system, ISP
CO 3	Analyze the concept of E-marketing and E-Advertising
CO 4	Analyze the Concepts of E-Security and firewall concept
CO 5	To know about the mobile commerce
Pre-requisites	The product description very important of an E-Commerce of an business always, make sure that you have
	an effective, dynamic product description to encage and make it more likely to buy.

					I	Know	ledge	Level	S							
1.Remen	nberi	ng, 2.1	Under	stand	ling, 3	S.App	lying,	4.Ana	alyzin	g, 5.E	valuat	ing, 6.	Synth	esizinį	3	
						'O / PC) / KI N	Mannin	σ							
		(3/2)	1 indic	ates the	e streng	th of c	orrelati	on, 3-st	s rong, 2	-mediu	m, 1-we	ak)				
COs KLs POs KLs																
									PO	1			2	2		
CO	1				1				PO	2			2	2		
									PO	3			2	2		
	PO 4 1															
$\begin{array}{c} CO 2 \\ 2 \\ \hline PO 5 \\ \hline 2 \\ \hline PO 6 \\ \hline 3 \\ \hline \end{array}$																
PO 6 3											PO 6					
$\begin{array}{c c} PO 7 & 3 \\ \hline PO 8 & 4 \\ \hline \end{array}$											PO 8			4		
	0				•				PO	9			2	2		
									PO 1	0			6	5		
CO	4				3				PO 1	1			6	ō		
									PO 1	2		5				
									PO 1	3			2	2		
CO	5				6				PO 1	4			5	5		
						<u> </u>		•	PO 1	5			2			
		(3/)	1 india	atas th	strong	th of o	PO Ma	pping	rong ?	modiu	m = 1 m	alz)				
		(3/2/	1 muic		sucing	p p	rogram	me Ou	tcome (POs)	III, 1-wc	/ak)				
COs	PO1	PO2	PO3	PO4	PO5	PO6				PO10	PO11	PO12	PO13	PO14	PO15	
CO1	2	2	2	3	2	100	107	1	2	1 010	1	1	2	1	2	
	2	2	2	2	2	2	2	1	2	1	1	1	2	1	2	
002	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3	
CO3	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1	
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2	
CO5	1	1	1	1	1	1	1	1	1	3	3	2	1	2	1	

Direct

1. Continuous Assessment Test I, II & Model

2. Assignment

3. End Semester Examinations

Indirect

1. Course End Delivery

Content of the	Syllabus								
	History of E-commerce	Periods	12						
	History of E-commerce: Emergence of the internet: Commercial use of internet -Growth of the								
II: I	Internet-Origins of the web-Advantages of E-commerce-Disadvantages of	f E-commerce-the	information						
Unit - I	Technology ACT 2000. Business models for E-commerce: B2B, B2C, C2	2C, C2B E-busine	ss model:						
	Brokerage model: characteristics -Advantages of the Brokerage model-pr	ice discovery med	hanisms						
	Enabling Technologies of the World Wide Web	Periods	12						
	Enabling Technologies of the World Wide Web: Internet client server Ap	plications: Telnet	-FTP-Chat on						
Unit II	the web-MIME. Networks and internet: Internet protocol suite-IP address	s system-Domain							
Unit - II	Name-URLs-Defining URLs-IPVs-TCP. Internet service Provider (ISP): Architecture of public access								
	provide-NAPs and ISPs - terms related to ISPs-Broadband Technologies-Types of Broadband Technologies								
	E-marketing	Periods	12						
	E-marketing: Traditional Marketing-Identifying Web presence Goals-Achieving web presence								
Unit - III	Goals-uniqueness of the web-site adhesion: Content, Format and Access-Maintaining a website-metrics								
	defining internet units of measurement. E-advertising: Means of Advertising -Conductions Online Market								
	research-market segmentation- Data mining & market research.								
	E-security	Periods	12						
	E-security: Security on the internet-Network and security risks-How are sites hacked?-Security incidents on								
Unit IV	the internet -Security and E-mail- Network and web based security. Business risk management issues: The								
0111 - 1 V	firewall concept-Firewall Components-Benefits of an Internet Firewall-Secure physical Infrastructure.								
	E-Payment System: Classification of new payment system-Digital signatu	ure.							
	Information system for mobile commerce	Periods	12						
	Information system for mobile commerce: Mobile Commerce-Wireless A	Applications -Wire	less						
Unit - V	Spectrum-Technologies for mobile Commerce-Wireless Technologies. Legal and Ethical Issues: Computer								
	as targets for crime-privacy is at risk in the internet age-cookies and priva	acy-Phishing - cop	yright-internet						
	Gambling-Threats to children.								
	Total Periods		60						

Text Books	
1	1. E-commerce An Indian Perspective P.T. Joseph, S.J., PHI, 4th Edition.
References	
1	1."E-Commerce Strategy, Technologies and Applications" David Whiteley Tata Mc- Graw-Hill
E-References	
1	1. https://www.google.com/ E-Commerce + Strategy.
2	2.https://www.google.com/search/E-Commerce



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Programme	B.Sc	Programme Code		U	CS	Regula	tions	2021-2022	
Department	Con	nputer Science			Semester	•		6	
			Per	iods	Credit	Maxim	um Mar	:ks	
Course Code	C	Course Name	per V	Week					
			L '	Г Р	С	CA	ESF	E Total	
21116000005	PERVAS	SIVE COMPUTING	5	0 0	3	25	75	100	
2106CSE05			LI					I	
COURSE	Providing a soun	d conceptual foundation in t	he area	of Perv	vasive Compu	ting aspect	s and de	eveloping a	
OBJECTIVES	design thinking a	approach towards problem-so	olving i	n this d	omain				
POs		PROGRAMME OUTCOME							
PO 1	Develop problem	n solving abilities using a co	mputer						
PO 2	Build the necessa	ary skill set and analytical at	oilities f	for deve	eloping compu	ter based s	solution	s for real life	
	problems.								
PO 3	Imbibe Quality S	oftware Development practi	ces						
PO 4	Create awareness	s about process and product	standar	ds					
PO 5	Train students in	professional skills related to	o Softw	are Ind	ustry.				
PO 6	An ability to app	ly knowledge of computing	and ma	themat	ics appropriate	e to the pro	gramâ€	^{€TM} s student	
	outcomes and to the discipline.								
PO 7	Apply the techno	ologies in various fields of C	ompute	er Scien	ce, including l	Mobile app	olication	is, Web site	
	development and	development and management, databases, and computer networks							
PO 8	An ability to fun	ction effectively on teams to	accom	plish a	common goal	•			
PO 9	An understandin	g of professional, ethical, leg	gal, sec	urity, so	ocial issues an	d responsil	oilities		
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions								
PO 11	An ability to ana	alyze the local and global im	pact of	compu	ting on individ	luals, orga	nization	is, and society	
PO 12	Evaluate and use	appropriate tools and techni	iques ir	n develo	ping applicati	on activiti	es		
PO 13	Design, and anal	yze precise specifications of	algorit	hms, pi	ocedures, and	interaction	1 behav	ior.	
PO 14	Design, and anal	yze precise specifications of	algorit	hms, pi	ocedures, and	interaction	n behav	ior.	
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.								

COs	COURSE OUTCOME
CO 1	Describe the characteristics of pervasive computing applications including the basic computing application
	problems, performance objectives and quality of services, major system components and architectures of
	the systems.
CO 2	Analyze the strengths, problems and limitations of the current tools, devices and communications for
	pervasive computing systems.
CO 3	Recognize the different ways that humans will interact with systems in a ubiquitous environment and
	account for these accordingly
CO 4	List and exemplify the key technologies involved in the development Ubicomp systems
CO 5	Develop an attitude to identify and propose solutions for security and privacy issues
Pre-requisites	IOT is the main objective of this paper.

Knowledge Levels

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

		(2)2		1	C	CO / PC)/KLN	Mappin	g			1 \			
		(3/2/	I indic	ates the	e streng	th of co	orrelatio	on, 3-st	rong, 2	2-mediu	m, I-we	eak)			
COs	5]	KLs				POs	3			KI	_S	
									PO	1			2		
CO	1				1				PO	2			2		
									PO	3			2		
									PO	4			1		
CO	2				2				PO	5			2		
									PO	5			3		
									PO ′	7			3		
CO	3				4			PO 8				4			
								PO 9				2			
								PO 10				6			
CO	4		3					PO 11				6			
								PO 12				5			
			6					PO 13				2			
CO	5							PO 14				5			
								PO 15				2			
		(2) (2)				CO /	PO Ma	pping	-			• `			
		(3/2/	I indic	ates the	e streng	th of co	orrelatio	on, 3-st	rong, 2	2-mediu	m, 1-we	eak)			
COs						P	rogram	gramme Outcome (POs)							
003	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	1	1 1 1 1 1 1 1 1 3 3 2 1 2 1						1							

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 to Ubiquitous Computing Periods								
Unit I	Concept of Distributed Computing- Mobile Computing- Pervasive Compu	iting- Wearable C	Computing-						
Unit - I	Modeling the Key Ubiquitous/Pervasive Computing Properties- Mobile A	daptive Computin	ng - Mobility						
	Management and Caching.								
	Pervasive Computing Devices	Periods	12						
Unit II	Smart Environment: CPI and CCI Smart Devices: Application and Requir	ements- Device T	echnology and						
Unit - II	Connectivity- Human Computer Interaction.								
	Human Computer InteractionPeriods12								
Unit III	Explicit HCI- Implicit HCI- User Interface and Interaction for four hand-h	CI- User Interface and Interaction for four hand-held widely used devices- Hidden							
Unit - III	UI via basic smart devices- Hidden UI via wearable and Implanted devices- Human centered design- user								
	models.								
	Middleware for Pervasive Computing	Periods	12						
Unit - IV	Adaptive middleware- Context aware middleware- Mobile middleware- S	ervice Discovery-	- Mobile Agents.						
	Security in Pervasive Computing	Periods	12						
Unit - V	Security and Privacy in Pervasive Networks- Experimental Comparison o	f Collaborative D	efense Strategies						
	for Network Security								
	Total Periods		60						

Text Books	
1	1.Stefan Poslad, "Ubiquitous Computing, Smart devices, environment and interaction," Wiley.
2	2. Frank Adelstein, Sandeep Gupta, Golden Richard III, Loren Schwiebert, "Fundamentals of Mobile and
	Pervasive Computing," Tata McGraw Hills.
References	
1	JochenBurkhardt, Horst Henn, Stefan Hepper, Klaus Rindtor, Thomas Schaeck, "Pervasive Computing,"
	Pearson, Eighteenth Impression, 2014.
E-References	



6

Total

100

Elayampalayam, Tiruchengode-637 205. Programme **B.Sc** Programme Code UCS Regulations 2021-2022 Department **Computer Science** Semester Periods Credit Maximum Marks Course Code Course Name per Week Т L Р С CA ESE 5 25 **Big Data Analytics** 0 0 3 75 21U6CSE06 COURSE To provide an overview of an exciting growing field of big data analytics. To introduce the tools required to **OBJECTIVES** manage and analyze big data like Hadoop, NoSql MapReduce. POs PROGRAMME OUTCOME PO 1 Apply the knowledge of mathematics, science and computing in the core information technologies PO 2 Build software systems and apply the technologies in various fields of Computer Technology, including hardware problems, Web site development and management, databases, and software engineering techniques. PO 3 Design, implement and evaluate a computer-based system to meet the desired needs within the realistic constraints.

PO 4	Review literature and indulge in research using research based knowledge and methods to design new
	experiments, analyze, and interpret data to draw valid conclusions.
PO 5	Select and apply current techniques, skills, and tools necessary for computing practice and integrate
	IT-based solutions into the user environment effectively.
PO 6	Apply contextual knowledge to assess professional, legal, health, social and cultural issues during
	profession practice.
PO 7	Analyze the local and global impact of computing on individuals, organizations, and society.
PO 8	Apply ethical principles and responsibilities during professional practice.
PO 9	Function effectively as a team member or a leader to accomplish a common goal in a multidisciplinary
	team.
PO 10	Communicate effectively with a range of audiences using a range of modalities including written, oral and
	graphical.
PO 11	Apply the knowledge of technology and management principles to manage projects effectively in diverse
	environments as a member or a leader in the team.
PO 12	Engage in independent and life-long learning for continued professional development.
PO 13	Ability to understand and analyze a given real-time problems and propose feasible computing solutions.
PO 14	Evaluate and use appropriate tools and techniques in developing application activities.
PO 15	Updating themselves through e-learning and self-study courses.

COs	COURSE OUTCOME
CO 1	Understanding the basic concepts of data science and its functions
CO 2	Exploring cluster analysis methods
CO 3	Exploring big data from different perspective
CO 4	Understanding hadoop framework with HDFS concepts
CO 5	Process Data with MapReduce
Pre-requisites	Prior experience with any programming language.

	Knowledge Levels														
1.Remen	1.Remembering, 2.Understanding, 3.Applying, 4.Analyzing, 5.Evaluating, 6.Synthesizing														
					C	CO / PC) / KL I	Mappin	g						
		(3/2	/1 indic	ates the	e streng	gth of co	orrelati	on, 3-st	trong, 2	-mediu	m, 1-we	eak)			
CO	S				KLs				POs	3			KI	LS	
~~									PO	1			1		
CO	1				2				PO	2			2		
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CO	2				2				PO 4	+ 5				, ;	
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									PO '	7			4	Ļ	
CO	3		5					PO 8				6			
								PO 9				6			
								PO 10				6			
CO	4		2						PO 1	1			6	5	
								PO 12				5			
60	~		~					PO 13				6			
CO	5		5					PO 14				5			
						CO /	PO Ma	nning	101	5					
		(3/2	/1 indic	ates the	e streng	th of c	orrelati	on, 3-st	trong, 2	-mediu	m, 1-we	ak)			
						P	rogram	me Ou	tcome ((POs)		,			
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO3	1	1	2	3	1	3	2	2	2	2	2	3	2	2	3
CO4	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1
CO5	1	1	2	3	1	3	2	2	2	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 S	Syllabus									
	Introduction	Periods	12							
	Types of Digital Data: Classification of Digital Data. Introduction to Big	Data: Characterist	ics of Data-							
Unit - I	Evolution of Big Data- Definition of Big Data- Challenges with Big Data	-What is big Data	? Why big Data?							
	Traditional Business Intelligence versus Big Data-A Typical Data Wareho	ouse Environment	- A Typical							
	Hadoop Environment.									
	Big Data Analytics	Periods	12							
	Where do we Begin? What is Big Data Analytics? What is Big Data Anal	ytics Isn't? C	assification of							
Unit - II	Analytics-Why Big Data Analytics Important? Challenges Facing Big Da	ta-Data Science-T	erminologies							
	used in Big Data Environment-Basically Available Soft State Eventual co	nsistency (BASE)).							
	The Big Data Technology Landscape: NoSQL: Hadoop	Periods	12							
	Where it is used? What is it? Types of NoSQL Databases- Why NoSQL - Advantages of NoSQL- What									
Unit III	we miss with NoSQL? -Use of NoSQL in Industry- NoSQL Vendors- SQL vs NoSQL-									
Onit - III	NewSQL-comparision of SQL, NoSQL and NewSQL.Hadoop:Feature of Hadoop-Key Advantage of									
	Hadoop-versions of Hadoop- Overview of Hadoop Ecosystem- Hadoop	Distribution- Had	loop versus							
	SQL- cloud Based Hadoop solution									
	Introduction to Hadoop	Periods	12							
	Introducing Hadoop-Why Hadoop?-why not RDBMS?- RDBMS vs Hadoop=Distributed Computing									
Unit - IV	Challenges- History of Hadoop-Overview of Hadoop- Use Case of Hadoop- Hadoop Distribution-									
	HDFS-Processing Data with Hadoop- Managing resources and Applications with Hadoop YARN-									
	Interacting with Hadoop Ecosystem.									
	Introduction to MongoDB	Periods	12							
Unit - V	What is MongoDB? - Why MongoDB-Terms Used in RBDMS and MongoDB- Data Types in MongoDB-									
	MongoDB Query Language.									
	Total Periods 60									

Text Books	
1	Seema Acharya, Subhashini Chellappan, "Big Data and Analytics", Wiley Publication, 2015.
References	
1	Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman, "Big Data for Dummies", John Wiley &
	Sons, Inc., 2013.
2	Tom White, "Hadoop: The Definitive Guide", O'Reilly Publications, 2011.
3	Kyle Banker, "Mongo DB in Action", Manning Publications Company, 2012.
4	Russell Bradberry, Eric Blow, "Practical Cassandra A developers Approach", Pearson Education, 2014.
E-References	
1	https://www.webopedia.com/TERM/B/Big_data_analytics.html
2	https://www.simplilearn.com/data-science-vs-big-data-vs-data-analytics-article