VIVEKANANDHA

COLLEGE OF ARTS AND SCIENCES FOR WOMEN

(Autonomous)

[AN ISO 9001 : 2008 CERTIFIED INSTITUTION]

Affiliated to Periyar University, Approved by AICTE &
Re-Accredited with 'A' Grade by NAAC,
Recognized under section 2(f) & 12(B) of UGC Act, 1956)
ELAYAMPALAYAM, TIRUCHENGODE (Tk.), NAMAKKAL (Dt.)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

BCA

(Bachelor of Computer Applications)

FOR CANDIDATES ADMITTED FROM 2021 – 2022

ONWARDS UNDER AUTONOMOUS – CBCS & OBE PATTERN

Date: 07-07-2021 **Venue:** IT Seminar Hall

Member
BCA
PG & Research Department of Computer Science & Applications,
Vivekanandha College of Arts & Sciences for Women,
Tiruchengode.

HoD
PG & Research Department of Computer Science & Applications,
Vivekanandha College of Arts & Sciences for Women,
Tiruchengode.

Dean
PG & Research Department of Computer Science & Applications,
Vivekanandha College of Arts & Sciences for Women,
Tiruchengode.

University Nominee

Subject Expert

VIVEKANANDHA EDUCATIONAL INSTITUTIONS

Elayampalayam, Tiruchengode (Tk), Namakkal (Dt).,

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN
(AUTONOMOUS)

BCA (BACHALOR COMPUTER APPLICATIONS)
(Candidates admitted from 2021-2022 onwards)

REGULATIONS

I. SCOPE OF THE PROGRAMME

The IT boom and the rapid growth in science and technology have opened up new vistas of job opportunities .The college offers Bachelor of Computer Applications which seeks to equip the learners to meet the spiraling demand of the IT industry. It provides special training in computer application of software's. The syllabus has been designed at a level equal to that of professional courses. Focus is also on developing soft skills of the students.

II. SALIENT FEATURES

- Qualified and Experienced team of faculty members with varied experience in areas of Computer Architecture, Artificial Intelligence, Mobile and Computer Networks, Graphics and Image Processing and Database Management System
- Motivating of students enhanced with immense expertise, massive technical exposure & structured creative initiatives.
- Industrial visits to various renowned companies are arranged to give an exposure to the students
- Students are taught by using Audio Visual aids like OHP's & LCD Projectors and modern E-learning
- Course is specially designed for a higher level Career Placement
- Project work is included in the syllabus to enhance conceptual, analytical & deductive skills

III. OBJECTIVES OF THE PROGRAMME

- To produce a highly qualified professionals impart of both theoretical and practical knowledge in computer systems and its application.
- To produce fully skilled and trained manpower capable of solving the software & hardware problems, and discovering software solutions related to business organizations.
- To provide an in-depth knowledge of specific sub-disciplines chosen by the students as areas of special interest in the form of elective courses.
- The BCA Program is aimed at providing a platform to the students to enhance their skills in various fields of Computer Science & Information Technology like Hardware, Software development, Networking, Database Management & IT enabled services and to facilitate students to interact with IT professionals, Industry Partners & Academicians from IT and related areas.
- The courses is designed to develop computer professionals versatile is use of computers in almost all field of computer application .The main emphasis of the course is an applied computer use in various fields.

IV. ELIGIBILITY FOR ADMISSION

A candidate who has passed in Higher Secondary Examination with Mathematics or Business Mathematics or Computer Science or Computer Application or Statistics (Academic stream or Vocational stream) as one of the subject under Higher Secondary Board of Examination, Tamil Nadu as per norms set by the Government of Tamil Nadu or an Examination accepted as equivalent thereto by the syndicate, subject to such conditions as may be prescribed there to are permitted to appear and qualify for the Bachelor of Computer Application degree examination 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 March.
- The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University, Salem.
- Each subject will have four to six hours of lecture per week apart from practical training at the end of each semester.

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	CIA Test I & II (2.5 from each Test)	-	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
	Total	-	40

PASSING MINIMUM - EXTERNAL

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

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.

DISTRIBUTION OF MARKS FOR ATTENDANCE:

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

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 2021-22 (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 2021-2022 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 2023-2024. Thereafter, they will be permitted to appear for the examinations only under the regulations then in force.

EVALUATION OF EXTERNAL EXAMINATIONS (EE)

QUESTION PAPER PATTERN – THEORY	
Time duration: 3 Hours	**Max. Marks: 75**
PART- A: **(20 x 1= 20)**	Answer all the Questions Four Questions from each Unit
PART- B: **(5 x 5 = 25)**	Answer all the questions One Question from each Unit (Either or Type)
PART- C: **(3 x 10 = 30)**	Answer any **THREE** of the questions 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)	

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)	

BCA (COMPUTER APPLICATIONS)

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	PART	COURSE CODE	COURSE TITLE	Hrs	CREDIT	MARKS		
						CIA	EE	TOT
I	I	18U1LT01	Tamil – I	6	3	25	75	100
	II	17U1LE01B	English – I	6	3	25	75	100
	III	18U1MAA03	Allied – I: Numerical Methods	4	4	25	75	100
	III	21U1CAC01	Programming in C	4	4	25	75	100
	III	21U1CACP01	Programming in C Lab	4	4	40	60	100
	III	21U1CACP02	Office Automation Lab	4	3	40	60	100
	IV	18U1VE01	Value Education	2	2	25	75	100
			Total	**30**	**23**	**205**	**495**	**700**
II	I	18U2LT02	Tamil – II	6	3	25	75	100
	II	18U2LE02B	English – II	6	3	25	75	100
	III	18U2MAA06	Allied – II: Discrete Mathematics	4	4	25	75	100
	III	21U2CAC02	Programming in C++	4	4	25	75	100
	III	21U2CAC03	Data Structures and Algorithms	4	4	25	75	100
	III	21U2CACP03	Programming in C++ Lab	4	3	40	60	100
	IV	18U2ES01	Environmental Studies	2	2	25	75	100
			Total	**30**	**23**	**190**	**510**	**700**

SEMESTER: III & IV

SEM	Part	Course Code	COURSE TITLE	Hrs	CREDIT	MARKS		
						CIA	EE	TOT
III	III	18U3CMA03	Financial Accounting	4	4	25	75	100
	III	21U3CAC04	Java Programming	5	4	25	75	100
	III	21U3CAC05	Operating Systems	5	4	25	75	100
	III	21U3CAC06	Computer Networks	4	4	25	75	100
	III	21U3CACP04	Java Programming Lab	4	3	40	60	100
	III	21U3CACP05	Web Designing Lab	2	2	40	60	100
	IV		NMEC – I	2	2	25	75	100
	IV	21U3CAS01	HTML & Web Designing	2	2	25	75	100
			Library & Sports	2	0	-	-	-
	Total			**30**	**25**	**230**	**570**	**800**
IV	III	18U4CMA04	Cost & Management Accounting	4	4	25	75	100
	III	21U4CAC07	Relational Database Management Systems	5	4	25	75	100
	III	21U4CAC08	Software Engineering	4	3	25	75	100
	III	21U4CAC09	R Programming	4	3	25	75	100
	III	21U4CACP06	Relational Database Management Systems Lab	4	3	40	60	100
	III	21U4CACP07	R Programming Lab	3	3	40	60	100
	IV	21U4CAS02	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**

SEMESTER: V & VI

SEM	Part	COURSE CODE	COURSE TITLE	Hrs	CREDIT	MARKS		
						CIA	EE	TOT
V	III	21U5CAC10	.NET Programming	5	4	25	75	100
	III	21U5CAC11	PHP Programming	5	4	25	75	100
	III	21U5CAE__	Elective – I	5	3	25	75	100
	III	21U5CACP08	.NET Programming Lab	4	3	40	60	100
	III	21U5CACP09	PHP Programming Lab	5	3	40	60	100
	III	21U5CACPR01	Project Work (In - House Project)	4	3	40	60	100
	IV	21U5CAS03	Soft Skills	2	2	25	75	100
	Total			**30**	**22**	**220**	**480**	**700**
VI	III	21U6CAC12	Python Programming	5	4	25	75	100
	III	21U6CAC13	Mobile Application Development	5	4	25	75	100
	III	21U6CAE__	Elective – II	5	3	25	75	100
	III	21U6CACP10	Python Programming Lab	5	3	40	60	100
	III	21U6CACP11	Mobile Application Development Lab	4	3	40	60	100
	III	21U6CACPR02	Project Viva Voce	4	3	25	75	100
	IV	21U6CAS04	Digital Imaging	2	2	25	75	100
	V	21U6EX01	Extension Activities	-	1	-	-	-
	Total			**30**	**23**	**205**	**495**	**700**
Grand Total				**180**	**140**	**1280**	**3120**	**4400**

ELECTIVE – I			ELECTIVE – II		
Semester	**Course Code**	**Title**	**Semester**	**Course Code**	**Title**
V	**21U5CAE01**	E – Technologies	VI	**21U6CAE04**	Artificial Intelligence
	21U5CAE02	Software Quality Assurance		**21U6CAE05**	Data Mining & Warehousing
	21U5CAE03	Software Project Management		**21U6CAE06**	Block Chain Management

DEPARTMENT OF COMPUTER APPLICATIONS
(BCA)

VISION OF THE DEPARTMENT

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

MISSION OF THE DEPARTMENT

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

PROGRAMME OUTCOMES

K1 : REMEMBER **K3 : APPLY** **K5 : EVALUATE**
K2 : UNDERSTAND **K4 : ANALYZE** **K6 : CREATE**

PROGRAMME OUTCOMES

The graduate will

POs	DESCRIPTIONS	Knowledge level
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.	K1
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.	K1
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.	K2
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.	K2
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports	K3
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.	K3
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.	K3
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.	K4
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.	K4
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.	K4
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.	K4
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.	K5

PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.	K5
PO 14	To integrate ethics and values in designing computer application.	K6
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design	K6

PROGRAMME SPECIFIC OUTCOMES

BCA (COMPUTER APPLICATIONS)

AFTER COMPLETION OF THE PROGRAMME THE GRADUATES WILL BE ABLE TO

PROGRAM SPECIFIC OUTCOME (PSO)

The graduate will

PSOs	DESCRIPTIONS	Knowledge Level
PSO 01	Students have a clear understanding of the concepts of key areas in Computer Applications.	K1
PSO 02	Students are capable to analyze and apply latest technologies to solve problems in the areas of Computer Applications.	K3
PSO 03	It makes them to analyze and synthesis computing systems through quantitative and qualitative techniques.	K4
PSO 04	The BCA Program is aimed at providing a platform to the students to enhance their skills in various fields of Computer Science & Information Technology like Hardware, Software development, Networking, Database Management & IT enabled services and to facilitate students to interact with IT professionals, Industry Partners & Academicians from IT and related areas.	K6

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

The graduate will

PEOs	DESCRIPTIONS	Knowledge level
PEO 01	Befall an entrepreneur who can afford resolutions & extend software harvest for activity needs.	K3
PEO 02	Engross in life-long learning to acclimatize the technical encroachments in the budding vicinities of Computer Applications.	K4
PEO 03	To provide students with an academic situation that fosters Excellence, intelligibility, and headship and Promote restiveness of life-long learning.	K5
PEO 04	Evolve as globally skilled Computer professionals possessing control dexterity for developing novel solutions in multidisciplinary domains.	K5

SEMESTER – I

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**1**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U1CAC01	Programming in C		4	0 0	4	25	75 100
COURSE OBJECTIVES	This subject is to provide the students a strong foundation on programming concepts and its application. It also enables the students to solve problems using programmable logic						
POs	PROGRAMME OUTCOME						
PO 1	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 2	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 3	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 4	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 5	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 7	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 8	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 9	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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

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

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

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**1**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U1CACP01	Programming in C Lab	0	0	4	3	40	60	100

List of Experiments

1	Write a c program to Swap two numbers without using third Number.
2	Write a c program to print multiplication of 2 matrices.
3	Write a c program to convert decimal number to binary.
4	Write a c program to reverse given number using for loop.
5	C program to find sum of array elements using Dynamic Memory Allocation.
6	Write a program for accessing union members.
7	Write a program for access data members of a structure using a struct variable.
8	C Program to create, initialize, assign and access a pointer variable.
9	Write a c program for copy one file to another file.
10	Write a c program to Employee record system using file.

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations	**2021-2022**	
Department	**B.C.A**		Semester			**1**	
Course Code	Course Name	Periods per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
21U1CACP02	OFFICE AUTOMATION LAB	0	0	2	2	40	60	100

List of Experiments

	MS Word
1	Creating a Document using MS Word: • Enter a text about your Institution with two Titles. • Set the paper size A4 and orientation of the paper to Portrait. • Make the titles to Center, Bold, Font size 20 and style in Arial. • Justify the entire Text. Set the margin left 1 . 5, Right 1 . 5, Top and Bottom5 • Use Drop Cap in 1st paragraph 1st character for 3 lines. • Change the font size of the text to 12 size. • Use bulleted list and Highlight the important sentences. • Insert a picture, word art, Header and Footer. • Save the file.
2	Enhance the documents using Header, Footer, Page Setup, Border, Page number, watermarking, Orientation and Print Preview.
3	Prepare a student bio – data.
4	Create letters using Mail Merge in MS – Word
	MS. Excel
5	Create a Statement in MS. Excel regarding particulars of 10 students of I Year MOP of your College using Ms. **Excel** (Fields : Roll No. , Name, Community, DOB, Age, Address, & 10thMark. (Things to be Covered) • Enter Two Titles • Enter the 1st and 2ndTitles in first and second rows with different font size and styles. • Enter Roll No., Name, etc as Field names. • Enter the Roll Number using Fill Handle. • Enter 10 students particulars. • Centre the Titles. • Insert a New Row between 5th and 6thRow . • Enter a New Student's particulars in the new Row. • Delete the Last row. • Insert a New Column between 3rdt and 4th Column for Sex. • In the Sex column enter Sex = "M" or "F" • Align all the Data in Centre. • Save the File.

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FORWOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**1**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U1CACP02	OFFICE AUTOMATION LAB	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, Currencyformat.
7	Open an excel and create fields as follows S. No | Name of the student | M1 | M2 | M3 | M4 | M5 | Total | Avg | Result | Grade 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 differentstudents.
8	i. Creating and running a macro. ii. Assigning button to a defined macro. iii. Editing a macro.
	MS. Powerpoint Presentation
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 a presentation with apply background/Themes, apply custom animation on text, insert images/word art and animate the images with effects.
11	Create a presentation with minimum 5 slides a. Use custom animation option to animate the text; the text must move left to right one line at atime. b. Use proper transition for the slides.

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FORWOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**1**
Course Code	Course Name	Periods per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
21U1CACP02	OFFICE 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" 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.
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". e. Show the names and total marks of the students who have passed the examination.
14.	Create a employee personal information using MS – Access

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**			Regulations	**2021-2022**	
Department	**B.C.A**		Semester				**2**	
Course Code	Course Name		Periods per Week			Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U2CAC02	PROGRAMMING IN C++		5	0	0		25	75	100

COURSE OBJECTIVES	To learn the basic concepts of object oriented programming & the syntax of C++ language. To impart the programming skills C++ and the concepts of Object Oriented Software Development Life Cycle and about Unified Modeling Language.
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.

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

CO / PO Mapping

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

COs	Programme Outcome (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	3
CO2	2	3	1	1	2	1	1	1	1	1	1	1	1	1	2
CO3	1	1	1	2	2	2	1	1	1	1	1	2	1	1	1
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	1
CO5	1	1	2	3	1	3	2	2	2	2	2	3	2	2	1

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

Content of the Syllabus			
Unit - I	Basic Concepts of OOP	Periods	12
	Basic Concepts of OOP - Benefits of OOP - Applications of OOP -Structure of C++ - Simple programs in C++ -Applications of C++ -Tokens- Keywords- Identifiers and Constant-Data types - Variables - Operators-Manipulators-Expressions- Control Structures. Functions -The main function- Prototype- Call by Reference- Return by reference- Inline Functions- Default Arguments- Function Overloading.		
Unit - II	Classes and Objects	Periods	12
	Classes and Objects - Introduction- Specifying a class - defining a Member Functions - Array with in a class- Memory Allocation for Objects- Static data members - Static member function- Array of Objects- Objects as Function Arguments - Friendly Functions- Returning Objects-const Member Functions- Constructors and Destructors. Operator Overloading and type conversions		
Unit - III	Inheritance:	Periods	12
	Inheritance: defining a derived class - Derived Classes- single inheritance- Multilevel Inheritance- 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.		
Unit - IV	Managing I/O Operations:	Periods	12
	Managing I/O Operations: Streams in C++ - C++ Stream Classes - unformatted I/O operation- Formatted Consol I/O Operations - Managing Output with Manipulators		
Unit - V	Templates:	Periods	12
	Templates: Class templates- Class templates with Multiple Parameters- Function templates- Function 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%20With%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

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**Information Technology**		Semester		**2**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U2CAC03	DATA STRUCTURES AND ALGORITHMS	4	0	0	4	25	75	100

COURSE OBJECTIVES	Understand and remember algorithms and its analysis procedure. Introduce the concept of data structures through ADT including List, Stack, and Queues To design and implement various datastructure algorithms. To introduce various techniques
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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

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

Content of the Syllabus			
Unit - I	An Introduction to Data Structure:	Periods	12
	Algorithms - Modular Programming - Top-Down Algorithm Design Bottom - Up Algorithm Design - Structured Programming - Analysis of Algorithm - Classification of Data Structure - Arrays - Lists.		
Unit - II	Stack:	Periods	12
	Operations Performed on Stack - Stack Implementation - Stack Using Arrays - Applications of Stacks - Evaluating Postfix Expression. Queue: Algorithms for Queue Operations - Circular Queue - Deques - Applications of stacks.		
Unit - III	Linked List:	Periods	12
	Representation - Advantages and Disadvantages - Operations - Types of linked list - Singly - Doubly - circular. Sorting Techniques: Complexity of Sorting Algorithms - Bubble Sort - Insertion Sort - Shell Sort - Quick Sort - Merge Sort - Radix Sort - Heap Sort - External Sorting.		
Unit - IV	Trees:	Periods	12
	Basic Terminologies - Binary Trees - Representation of Binary tree - Operations - Types of Binary Trees: Binary Search Tree - Expression tree - Balanced Binary Tree - AVL Tree - Applications. Case study: Heap Tree.		
Unit - V	Graphs:	Periods	12
	Introduction-Graph Terminologies-Representation of Graphs-Operations on Graphs - Breadth first search - Depth first search - Applications of Graph: Minimum Spanning Tree - Shortest path. Searching 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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FORWOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**				
Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**2**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U2CACP03	PROGRAMMING IN C++ LAB	0	0	4	3	40	60	100

List of Experiments

1	Classes and Objects
2	constructors & destructors
3	Inline Functions
4	Function overloading
5	Operator overloading
6	Inheritance (Any Two Types)
7	Dynamic Polymorphism – Virtual Functions.
8	Friend Function
9	Pointers
10	Templates

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**3**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U3CAC04	**JAVA PROGRAMMING**	4	0	0	4	25	75	100

COURSE OBJECTIVES	To know how to program in the Java programming languageTo 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 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
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PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

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++

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	Overview of Java Language	Periods	12
	Introduction - simple java program-Java program structure-Java Tokens-Implementing a Java program Constants, variables, Data Types and Operators: Constants-variables-Data Types-Declaration of variables-Operators and Expression.		
Unit - II	Classes, objects and Methods	Periods	12
	Defining a classes-Field and method declaration-creating objects-constructors-methods overloading-static members-Abstract class. Array: Introduction - One Dimensional Array-Creating Array-Two dimensional Array		
Unit - III	Inheritance and Packages	Periods	12
	Extending a class -Overriding methods. Interfaces: Defining Interface-Extending Interface. Packages: Java API package-creating package-Accessing Package. Java String.		
	Exception Handling	Periods	12
Unit - IV	Hierarchy, Advantage, Types, Keywords. Multithreading: Advantage, Multitasking. I/O Streams.		
	Applet Programming	Periods	12
Unit - V	Building Applet Code-Applet Life Cycle-Designing a web page-Applet Tag-Running the Applet.AWT 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, 10.3, 11.2, 11.5, 11.6) Unit IV: (Chapter 14.4, 14.5, 14.7, 14.8, 14.10) 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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**3**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U3CAC05	**OPERATING SYSTEMS**		4	0 0	3	25	75 100
COURSE OBJECTIVES	To introduce students with basic concepts of Operating System, its functions and services. To familiarize the students with various views and management policies adopted by O.S. as pertaining with processes, Deadlock, Memory, File and I/O operations						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	Operating System Overview	Periods	12
	Operating System Objectives and Functions. History of Operating System: First, Second, Third & Fourth Generation Operating System. Types of Operating System: Main Frame - Server - Multiprocessor - Personal Computer - Embedded - Real-Time Operating System. The Evolution of Operating System		
Unit - II	Mutual Exclusion and Synchronization	Periods	12
	Threads: Process and Threads - Multithreading - Thread Functionality -Mutual Exclusion and Synchronization: Principles of Concurrency - Mutual Exclusion - Semaphores. Deadlock and Starvation: Resources - Principles of Deadlock - Deadlock Detection and Recovery - Deadlock Avoidance and Prevention.		
Unit - III	Memory Management	Periods	12
	Memory Management Requirements - Memory Partitioning - Paging - Segmentation. Virtual Memory: Hardware and Control Structures. Operating System Software: Fetch Policy - Placement Policy - Replacement Policy - Basic Algorithms - Page Buffering.		
Unit - IV	Scheduling	Periods	12
	Types of Scheduling: Long Term Scheduling - Medium Term Scheduling - Short-Term Scheduling. 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.		
Unit - V	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 Buffer-Circular Buffer-The Utilities of Buffering. Disk Scheduling: Disk Performance Parameters-Disk Scheduling Polices-RAID. Case Study: Windows OS, Linux OS, and MAC 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/

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**			Regulations	**2021-2022**	
Department	**B.C.A**		Semester				**3**	
Course Code	Course Name		Periods per Week			Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U3CAC06	**COMPUTER NETWORKS**		4	0	0	4	25	75	100

COURSE OBJECTIVES	To understand the basics of Computer Networks.To understand the important OSI layers of computer Networks.Become familiar with the basics of computer network architectures and protocols
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

COs	COURSE OUTCOME
CO 1	To know about the security model
CO 2	To know and understand about the various security attacks and ethics in Information Security
CO 3	To 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.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
CO 1	3	PO 1	1
		PO 2	2
		PO 3	6
CO 2	2	PO 4	5
		PO 5	3
		PO 6	5
CO 3	1	PO 7	4
		PO 8	6
		PO 9	6
CO 4	2	PO 10	6
		PO 11	6
		PO 12	5
CO 5	2	PO 13	6
		PO 14	6
		PO 15	5

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	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

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

Content of the Syllabus			
Unit - I	Introduction	Periods	12
	Uses of Computer Network- LAN - WAN- MAN- Protocol Hierarchies - Protocols and Standards-Connection Oriented and Connection less Services - OSI Reference Model.		
Unit - II	Physical Layer	Periods	12
	Transmission Media: Guided Transmission media - Wireless Transmission - Communication Satellites - Public Switched Telephone Network.		
Unit - III	Data Link Layer	Periods	12
	Data Link Layer Design Issues - Error Detection and Correction - Elementary data link protocols - Sliding Window Protocols.		
Unit - IV	Network Layer	Periods	12
	Network Layer Design Issues. Routing Algorithms: Shortest Path- Link State - Distance Vector. Congestion Control Algorithms: Principles. Inter networking: - Fragmentation - IP Addresses -OSPF.		
Unit - V	Transport Layer	Periods	12
	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/

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**							
Programme	**BCA**	Programme Code	**UCA**			Regulations		**2021-2022**
Department	**Information Technology**		Semester					**3**
Course Code	Course Name		Periods per Week			Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U3CACP04	**JAVA PROGRAMMING LAB**		0	0	4	3	40	60	100

List of Experiments

1	Create a Simple Program Using Array in Java.
2	Create a Simple Program Using Java String.
3	Write a Java Program to Create Multi threading.
4	Write a Java Program to handle Exception Handling.
5	Write a Java Program for File Operation Using IO Stream.
6	Create Event Handling using Mouse.
7	Create Event Handling using Keyboard.
8	AWT Package Using Student Information.
9	Swing Package Using Telephone Bill System.
10	JDBC Using Employee Details.

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**							
Programme	**BCA**	Programme Code	**UCA**			Regulations		**2021-2022**
Department	**B.C.A**		Semester					**3**
Course Code	Course Name		Periods per Week			Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U3CACP05	**WEB DESIGNING LAB**		0	0	2	2	40	60	100

List of Experiments

1	Create a web page illustrating text formatting tags , font variations , paragraph alignment and headings in marquee.
2	Create a web page using hypertext link and image as hyperlink.
3	Design a catalog for a restaurant using lists.
4	Using Nested tables create your Mark sheet.
5	Create a class time table using tables.
6	Design a login form.
7	Prepare a student registration form.
8	Design an application for pay slip through HTML forms.
9	Create a HTML page to demonstrate the usage of Frames. Choose the content of the page on your own.
10	Design a simple college website.

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**3**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U3CAS01	**HTML & WEB DESIGNING**	2	0	0	2	25	75	100

COURSE OBJECTIVES	To inculcate knowledge on HTML concepts and Programming knowledge.To understand basic concepts of style sheets and graphics.Students will understand the basic structure of web page creation and to know the impact of HTML tags.
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

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

CO / PO / KL Mapping

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

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

CO / PO Mapping

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

COs	Programme Outcome (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	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
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	HTML Basics	Periods	4
	Getting Started with web designing - Creating a Simple Page - Marking Up Text.		
Unit - II	Hyperlinks	Periods	4
	Adding Links -Adding Images.		
Unit - III	Tables & Forms	Periods	4
	Tables Markup - Forms - Embedded Media		
Unit - IV	Cascading Style Sheet	Periods	4
	Introducing Cascading Style Sheet - Formatting Text - Colors and Backgrounds.		
Unit - V	Padding and Margins	Periods	4
	Thinking Inside the Box - CSS Layout with Flex Box and Grid.		
	Total Periods		20

Text Books	
1	"Learning Web Designing" - A Beginnerâ€™s Guide to HTML , CSS , JavaScript and Web Graphics - Jennifer Niederst Robbins ,5th Edition , Oâ€™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/

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**4**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U4CAC07	**RELATIONAL DATABASE MANAGEMENT SYSTEMS**		5	0	0	4	25	75	100
COURSE OBJECTIVES	â€¢To inculcate knowledge on RDBMS concepts and Programming with Oracle.â€¢To understand a role of database management system in an organization.â€¢To understand basic database concept including the structure and operation of the relational data model								
POs	PROGRAMME OUTCOME								
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.								
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.								
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.								
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.								
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports								
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.								
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.								
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.								
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.								
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.								
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.								
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.								
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.								
PO 14	To integrate ethics and values in designing computer application.								
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design								

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

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

CO / PO Mapping

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

COs	Programme Outcome (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	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
CO5	1	2	1	1	3	1	2	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	Introduction to DBMS:	Periods	12
	Introduction-Database System Applications - Purpose of Database Systems - View of Data - Database Languages and its types - Database Design - Database Engine - Database Architecture - Database Users and Administrators - History of Database Systems.		
Unit - II	Database Design Using ER Model:	Periods	12
	Overview - The Entity- Relationship Model - Mapping Cardinalities - Primary Key - Reducing ER Diagrams to Relational Schemas - ER Features -Symbols used in ER Notation.		
Unit - III	Relational Database Design:	Periods	12
	Relational Database Design- Features - Decomposition using Functional Dependency - Normal Forms - 1NF,2NF,3NF and BCNF- Relational Algebra: Introduction- Relational Algebra Operations.		
Unit - IV	SQL:	Periods	12
	Overview-Structure of SQL-Set Operations-Aggregate Functions- Modification of the Database - Joins-Transactions - Integrity Constraints .		
Unit - V	PL/SQL:	Periods	12
	History- Fundamentals - Block structure - comments -Â– Data types - Declaration - Assignment operation- cursor and exceptions. PL/SQL Named blocks: Procedure -Â– Function- Package- Triggers.		
	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", Oâ€™Reilly Media, Inc., 6th Edition, February 2014.
E-References	
1	â€¢ www.javatpoint.com
2	â€¢ www.w3schools.com
3	â€¢ www.geeksforgeeks.org
4	â€¢ www.oracletutorial.com

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**4**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U4CAC08	**SOFTWARE ENGINEERING**		4	0 0	3	25	75 100
COURSE OBJECTIVES	To provide technological view of Software Engineering. To enhance Software related issues. To improve the design and modularization ideology. To provide guidance about documentation. To recognize testingmethodologies, implementation and maintenance.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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 Testingâ€™s criteria and its best practice.
Pre-requisites	Basic knowledge of Software industries and IT Sector

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

CO / PO Mapping

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

COs	Programme Outcome (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

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

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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**4**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U4CAC09	**R PROGRAMMING**		4	0 0	3	25	75 100
COURSE OBJECTIVES	Understand the basics in R programming in terms of constructs, control statements, string Functions. Understand the use of R for Big Data analytics. Learn to apply R programming for Text processing.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
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PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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

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

Content of the Syllabus			
Unit - I	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 R System - Limitation of R - R Resources Getting Started with R: Installation - Getting started with the R 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.		
Unit - II	Getting Data In and Out of R	Periods	12
	Reading and Writing Data - Reading Data Files with read.table() - Reading in Larger Datasets with read.table - Calculating Memory - Requirements for R Objects - Using the readr Package - Using Textual and Binary Formats for Storing Data - Using dput() and dump() - Binary Formats - Interfaces to the Outside World - File Connections - Reading Lines of a Text File - Reading From a URL Connection		
Unit - III	Subsetting R Objects	Periods	12
	Subsetting R Objects - Subsetting a Vector - Subsetting a Matrix - Subsetting Lists - Subsetting Nested Elements of a List - Extracting Multiple Elements of a List - Partial Matching - Removing NA Values. Vectorized Operations - Vectorized Matrix Operations - Dates and Times - Dates in R Times in R - Operations on Dates and Times - Summary		
Unit - IV	Managing Data Frames	Periods	12
	Managing Data Frames with the dplyr package - Data Frames - The dplyr Package - dplyr Grammar - Installing the dplyr package - select() - filter() - arrange() - rename() - mutate() - group_by(). Control Structures - if-else - for Loops - Nested for loops - while Loops - repeat Loops - next, break - Summary.		
Unit - V	Functions and Standards	Periods	12
	Functions - Functions in R - Your First Function - Argument Matching - Lazy Evaluation The ... Argument - Arguments Coming After the ... Argument.Coding Standards for R - Loop Functions - Looping on the Command Line - lapply() - sapply() - split() - Splitting a Data Frame - tapply - apply() - Col/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", Oâ€™ Reilly Inc., 2015
3	Paal Teetor, "R Cook Book", Oâ€™ 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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations	**2021-2022**	
Department	**B.C.A**		Semester			**4**	
Course Code	Course Name	Periods per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
21U4CACP06	**RELATIONAL DATABASE MANAGEMENT SYSTEMLAB**	0	0	4	4	40	60	100

List of Experiments

1	Data Definition Language (DDL) commands in RDBMS
2	Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS
3	Execute the following queries i. Display employee whose salary greater than 8000. ii. Display employee whose salary between 6000 and 15000. iii. Create a view employee with Ename, Phone and Department.
4	Write a program to implement Built in Functions in SQL.
5	Write a program to implement Set Operations.
6	Write PL/SQL Function to find factorial.
7	Write PL/SQL Program for Electricity Bill Calculation using Cursor.
8	Write a PL/SQL procedure to insert a number.
9	Write a Database Trigger for displaying Grade of the Student
10	Database Design and Implementation Pay Roll Processing.

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations	**2021-2022**	
Department	**B.C.A**		Semester			**4**	
Course Code	Course Name	Periods per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
21U4CACP07	**R PROGRAMMING LAB**	0	0	4	4	40	60	100

List of Experiments	
1	Installing R and R Studio
2	Applying Simple Commands in R
3	R as a Calculator application
4	Execution of Loops and Functions via R - Control Structures
5	Basic Descriptive Statistics using *summary() – sapply() – describe() – stat.desc()* – by group using *aggregate()* in R
6	Reading and writing different types of Datasets in R
7	Visualizations: Visualize various Plotting and Graphics in R
8	Regression: Perform Simple Regression using R Package
9	Clustering: Apply k-means by using R Package
10	Classification: Use Random Forest / Naïve Bayes / NN by using R Package

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**4**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U4CAS02	**INTERNET OF THINGS**		2	0 0	2	25	75 100
COURSE OBJECTIVES	â€¢Obtain an overview of IoT applications.â€¢Comprehend the architecture, design principles and standards of IoT.â€¢Understand M2M and IoT technology fundamentals.â€¢Knowing about Python language.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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

CO / PO / KL Mapping

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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

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

Content of the Syllabus			
Unit - I	Introduction TO Internet OF Things:	Periods	5
	Introduction - Physical Design of IoT - Things in IoT, IoT Protocols.		
Unit - II	IoT Enabled Technologies:	Periods	5
	Wireless Sensor Networks - Cloud Computing - Big data analytics - Communication protocols - Embedded Systems.		
Unit - III	Domain Specific IoTs:	Periods	
	Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.		
Unit - IV	IoT Platforms Design Methodology:	Periods	5
	Introduction - IoT Design Methodology.		
Unit - V	Logical Design Using Python:	Periods	5
	IoT Systems - Logical Design Using Python: Introduction - Installing Python - Python Data Types & Data 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/

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**							
Programme	**BCA**	Programme Code	**UCA**		Regulations	**2021-2022**		
Department	**B.C.A**		Semester			**5**		
Course Code	Course Name		Periods per Week		Credit	Maximum Marks		
			L	T	P	C	CA	ESE	Total
21U5CAC10	**.NET PROGRAMMING**		5	0	0	4	25	75	100
COURSE OBJECTIVES	To understand .Net frame work and enhancing in depth knowledge in VB.net and toenable them to developing simple projects.							
POs	PROGRAMME OUTCOME							
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi							
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.							
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.							
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.							
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports							
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.							
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.							
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the							
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.							
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.							
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.							
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.							
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.							
PO 14	To integrate ethics and values in designing computer application.							
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design							

COs	COURSE OUTCOME
CO 1	Tell about the .Net frame work features and to develop VB.Net using IDE.
CO 2	Usage of various Elements of VB.Net to develop programs using them
CO 3	Solve the real world problems using looping , branching and arrays
CO 4	Illustrate Menus and Toolbar, Dialog Boxes, Procedures by developing programs.
CO 5	Examine the complexity of problems, Modularize the problems into small modules and then convert them into programs
Pre-requisites	Prior experience with any programming language.

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

CO / PO Mapping

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

COs	Programme Outcome (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	1	2	1	1	3	1	2	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

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

Content of the Syllabus			
Unit - I	Visual Basic .NET and the .NET Framework	Periods	12
	Introduction to .net framework- Components of .NET- Framework Class Library(FCL),Common Language Runtime (CLR) -Garbage collection-Assemblies - IDE components -toolbox, Solution explorer window, properties window, Server Explorer window, Adding controls the windows forms applications and Adding source code to the control, Application, Executing The web application. Variables, operators and constants		
Unit - II	Common Controls	Periods	12
	Introduction- Textbox, label , Link label, List Box Control, Checked Listbox Control, Picture boxcontrol, Pickers, Tree View Control, ListView controls, Rich TextBox, Button, Check Box Control, ComboBox Control, Masked TextBox Control, Notify Icon control, Progress bar control, tooltip control, Webbrowser control.		
Unit - III	Programming in Visual basic .net	Periods	12
	Conditional Logic : The If-then-Else statement, The Select-case statement, Do-Loop Statement, While-EndWhile Statement, For..Next Statement, For-Each Next Statement, A Complete Example. Arrays- Introducing Arrays, Multidimensional Arrays, The Array Class Members- An Example- Array of Arrays.		
Unit - IV	Menus and Toolbar, Dialog Boxes, Procedures	Periods	12
	Menus and toolbars- Context Menu Strip, Status Strip, Tool strip, Tool Strip Container,Working with MDI, In-built Dialogs - PageSetupDialog, PrintDialog, Print Document, PrintPreviewControl, PrintPreviewDialog, ColorDialog, FolderBrowser Dialog, FontDialog,OpenFileDialog, SaveFileDialog, Procedures-Overview, Types of Procedures, Built-in functions.		
Unit - V	Advanced Concepts in VB.Net	Periods	12
	Concepts of Object Oriented Programming- Introduction, Classes , Constructors, Destructors,Inheritance, Overriding, Overloading, Polymorphism, Working with Database : Introduction, Databases, Server Explorer, Basic SQL Commands, Relational Database, Data Binding, Data Binding with Controls ADO.Net - Accessing ADO.NET Features and Namespaces- Using ADO.NET - Understanding Data Providers, Datasets.		
Total Periods			60

Text Books	
1	Sham Tickoo, MeenuBhat ,Learning Visual Basic 2008 with .NET Framework 3.5, CADCIM Technologies, Pearson Education 2009
2	Bill Evjen, Jason Beres, et.al, Visual Basic .NET Programming,Bible Wiley,2014
References	
1	David Chappell, Understanding .NET, Pearson education 2006
2	Jeffery R. Shapiro, The Complete Reference Visual Basic .NET,Tata McGraw Hills 2002
3	Julia Case Bradley, Anita C.Millspaugh Programming in VB.Net Tata McGraw Hills 2007
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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Periods per Week			Credit	Maximum Marks
			L	T	P	C	CA / ESE / Total
21U5CAC11	**PHP PROGRAMMING**		5	0	0	4	25 / 75 / 100
COURSE OBJECTIVES	To highlight all features of PHP Programming and apply it to develop various websites & applications						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	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	2	1	1	2

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

Content of the Syllabus			
Unit - I	Introduction to PHP	Periods	12
	History - General Language Features - PHP Basics: Embedding PHP Code in your Web Pages - Commanding Your Code - Output Data to the Browser. PHPâ€™s Supported Data Types- Identifiers - Variables - Constants - Expressions -String - Interpolation. Control Structures: Conditional Statements - Looping Statements - File Inclusion Statements		
Unit - II	Introduction to MySQL	Periods	12
	Naming Database Elements-Choosing Your Column Types- Choosing other Column Properties-Accessing 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.		
Unit - III	Functions	Periods	12
	Invoking Function - Creating a Function - Function Libraries. Arrays: Creating an Array - Adding and Removing Array Elements - Locating Array Elements - Traversing Array - Merging - Slicing - Splicing and Dissecting Array.		
Unit - IV	Object Oriented PHP	Periods	12
	Benefits of OOP - Key OOPs Concepts- Constructors and Destructors- Static Class Members -The instance of Keyword- Error and Exception Handling- Configuration Directives- Error Logging-Exception Handling		
	Strings and Regular Expression	Periods	12
Unit - V	Other String Specific Function - Alternatives for Regular Expression Functions. Forms: PHP and Web Forms-Taking Advantage of Pear: HTML_QuickForm-Installimg HTML_QuickForm-Creating a Simple Form- Using Auto-Completion		
Total Periods			60

Text Books	
1	"Beginning PHP and Oracle From Novoice to professional" W.Jason Gilmore and Bob Brylr edition â€“ 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" â€“ Larry Ullam-fourth edition 2015
3	"PHP 6 and my SQL ": bible â€“ Steve Suehring, Tim converse, Joy Park -2009
E-References	
1	www.w3schools.com/php/

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U5CAE01	**E – TECHNOLOGIES**		5	0 0	3	25	75 100
COURSE OBJECTIVES	To understand the purpose and the value of Ecommerce. To apply the principles of business oriented teams in computer applications. To understand the security issues of Ecommerce.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

COs	COURSE OUTCOME
CO 1	To develop skills in electronic commerce and complete email services.
CO 2	To Understand about Internet services in detail.
CO 3	Able to know how to apply electronic commerce skills in Internet services.
CO 4	Explores about issues faced by internet services especially legal issues.
CO 5	To provide an opportunity to make it easier to acquire knowledge about security Issues.
Pre-requisites	Knowledge of Commerce

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	**Electronic Commerce**	Periods	12
	Electronic Commerce: Electronic Commerce - Electronic Data Interchange - Value Added Networks - Electronic Commerce over the internet - Internet Commerce Examples –Commerce Net. PCs and Networking: Networking - Communication Media. Electronic Mail: Computer communication system ISO's Open System Interconnection model – Electronic Mail - The X.400 message handling system - internet mail - Email security - X.500 directory services - Mail user agent.		
Unit - II	**The Internet**	Periods	12
	The Internet: A Brief Introduction- Internet Communication Protocols- Internet Services and Resources - Internet Mail - Internet Search - Concerns About - The Internet –Browsers - Hypertext Markup Language - Java - The Java Electronic Commerce Framework - Internet 2. Intranets: Intranet Services - Intranet Implementation -The Webmaster. Electronic Data Interchange: Electronic Data Interchange Costs and Benefits –Components of EDI Systems EDI Implementation Issues - Legal Aspects.		
Unit - III	**The UN/EDIFACT Standard:**	Periods	12
	The UN/EDIFACT Standard: Introduction - An EDIFACT Message - Interchange structure – UN/EDIFACT Message Directories. The Internet and Extranets for Electronic Commerce: E-Commerce - Commerce over The Internet - Commerce Over Extranets. Identification and Tracking Tools for Electronic Commerce: The EAN System - EANCOM - Article Numbering - Bar Coding. The serial shipping container code and the EAN label - EAN Location Numbers.		
Unit - IV	**Legal Issues**	Periods	12
	Legal Issues: Paper Documents Versus Electronic Document –Technology for Authenticating an Electronic Document - Laws for E-Commerce - EDI Interchange Agreement - Legal Issues for Internet Commerce. E-Commerce in India: EDI India. The Internet in India - Laws for E-Commerce in India - Payment for Goods and Services. Business Process Reengineering: Introduction –Approach to BPR Strategic Alignment Model BPR Methodology. Management of Change: Change Management in Public Administration The Implement Plan		
Unit - V	**Security Issues**	Periods	12
	Security Issues: Security Concerns - Security solutions - Electronic Cash over the Internet –Security and UN/EDIFACT Message - Internet Security – Guidelines for Cryptography Policy.		
	Total Periods		60

Text Books	
1	E-Commerce, The Cutting Edge of Business - KamleshK.Bajaj ,Debjani Nag Second Edition Tata Mc-Graw- Hill (Chapter 2,3,4,5,6,7,8,9,10,13,14).
References	
1	E-Commerce Strategy, Technologies and Applications David Whiteley Tata Mc-Graw- Hill.
E-References	
1	https://www.pearsonhighered.com/samplechapter/0131735160.pdf
2	https://florida.theorangegrove.org/og/file/29589c3c-8bcd-72c1-b2f2-37789232eb3c/1/Electronic_Commerce.pdf

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U5CAE02	**SOFTWARE QUALITY ASSURANCE**		5	0	0	3	25	75	100

COURSE OBJECTIVES	To Understand Product Life Cycle, Project Life Cycle, Software Configuration, Definitions and Terminology, Project Initiation, Quality Management, Project Management.
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

COs	COURSE OUTCOME
CO 1	To get knowledge about ISO Standards.
CO 2	To know about quality of the products.
CO 3	Can able to know about the cost fixation and project planning and Tracking.
CO 4	Getting an opportunity about software testing strategies.
CO 5	Explores the knowledge about Project Management.
Pre-requisites	Knowledge of Software Development.

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	**Software Quality**	Periods	12
	Software Quality: Introduction, Constraints of Software Product Quality Assessment, Customer is a King, Quality and Productivity Relationship, Requirements of a Product, Organisation Culture, Characteristics of Software, Software Development Process, Types of Products, Schemes of Criticality Definitions, Problematic Areas of Software Development Life Cycle, Software Quality Management, Why Software Has Defects? Processes Related to Software Quality, Quality Management System Structure, Pillars of Quality Management System, Important Aspects of Quality Management.		
Unit - II	**Testing**	Periods	12
	Testing : what is Testing , List out the types of testing. **Unit Testing: Boundary Value Testing:** Normal Boundary Value Testing, Robust Boundary Value Testing, Worst-Case Boundary Value Testing, Special Value Testing, Examples, Random Testing, Guidelines for Boundary Value Testing. **Equivalence Class Testing:** Equivalence Classes, Traditional Equivalence Class Testing, Improved Equivalence Class Testing, Edge Testing, Guidelines and Observations. **Decision Table–Based Testing:** Decision Tables, Decision Table Techniques, Cause-and-Effect Graphing, Guidelines and Observations. **Path Testing:** Program Graphs, DD-Paths, Test Coverage Metrics, Basis Path Testing, Guidelines and Observations. **Data Flow Testing:** Define/Use Testing, Slice-Based Testing, Program Slicing tools.		
Unit - III	**Project Initiation**	Periods	12
	Project Initiation – Project Planning and Tracking – What, Cost, When and How – Organizational Processes – Assigning Resources – Activities to specific to Project Tracking – Project Closure – When and How.		
Unit - IV	**Quality Management**	Periods	12
	Quality Management – Software Quality, Software Quality Dilemma - Achieving Software Quality – Software Testing Strategies – Strategic Approach - Test Stategies for Conventional Software and Object Oriented Software.		
Unit - V	**Project Management**	Periods	12
	Project Management -The People, The Product, The Process - Project Scheduling - Risk Management –Maintenance and Reengineering - Business Process Reengineering – Software Re Engineering – Reverse Engineering – Restructuring - Forward Engineering.		
	Total Periods		60

Text Books	
Text Books	1. William E.Levis, "Software Testing and continuous Quality Improvement", CRC Press (3RD publisher), 2016 (Unit 1,2) 2. Gopalaswamy Ramesh, "Managing Globle Software Projects" Tata McGraw Hill.Publishing Company Ltd, New Delhi, 2002. (Unit-I :Chapter 3,4&5, Unit-II: Chapter 6,7, Unit-III: Chapter 10,11 & 12) 3. Pressman, Roger, "Software Engineering ", A Practitioner's approach, 7th edition, Tata Mc- Graw Hill, 2006. 6th Edition (Unit-IV: Chapter 25, 26, Unit-V: 21, 31)
References	1. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 2004. 2. Bob Hughes and Mike Cotterell "Software Project Management" 2nd Edition, TataMcGraw Hill Publishing Company Ltd., New Delhi, 2002. 3. "Software Project Management", Ashfaque Ahmed 2013.
E-References	1. http://www.cs.toronto.edu/~yijun/csc408h/handouts/lecture5.pdf 2. https://www.vidyarthiplus.com/vp/thread-23085.html#.WUSxK9R97Dc 3. https://www.slideshare.net/abasit83/software-quality-assurance-lecture-1

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U5CAE03	**SOFTWARE PROJECT MANAGEMENT**		5	0	0	3	25	75	100
COURSE OBJECTIVES	Understand how blockchain systems (mainly Bitcoin and Ethereum) work. To securely interact with them. Design, build, and deploy smart contracts and distributed applications. Integrate ideas from blockchain technology into their own projects.								
POs	PROGRAMME OUTCOME								
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.								
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.								
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.								
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.								
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports								
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.								
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.								
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.								
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.								
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.								
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.								
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.								
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.								
PO 14	To integrate ethics and values in designing computer application.								
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design								

COs	COURSE OUTCOME
CO 1	Identify the different project contexts and suggest an appropriate management strategy
CO 2	Practice the role of professional ethics unsuccessful software development.
CO 3	Identify and describe the key phases of project management.
CO 4	Determine an appropriate project management approach through an evaluation of the business context and scope of the project.
CO 5	Acquire the knowledge of managing, economics for conventional, modern and future software projects.
Pre-requisites	Analyze and design the software architecture.

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	**Introduction to Software Project Management**	Periods	12
	Introduction to Software Project Management: Introduction, Why is Software Project Management Important? What is a Project? Software Projects versus Other Types of Project, Contract Management and Technical Project Management, Activities Covered by Software Project Management, Plans, Methods and Methodologies, Some Ways of Categorizing Software Projects, Project Charter, Stakeholders, Setting Objectives, The Business Case, Project Success and Failure, What is Management? Management Control, Project Management.		
Unit - II	**Project Life Cycle and Effort Estimation**	Periods	12
	Project Life Cycle and Effort Estimation: Software process and Process Models – Choice of Process models – Rapid Application development – Agile methods – Dynamic System Development Method – Extreme Programming- Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques -COSMIC Full function points – COCOMO II – a Parametric Productivity Model.		
Unit - III	**Activity Planning and Risk Management**	Periods	12
	Activity Planning and Risk Management: Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling -Network Planning models – Formulating Network Model – Forward Pass and Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Risk Planning -Risk Management – – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical paths – Cost schedules.		
Unit - IV	**Monitoring and Control**	Periods	12
	Monitoring and Control: Introduction, Creating the Framework, Collecting the Data, Review, Visu Progress, Cost Monitoring, Earned Value Analysis, Prioritizing Monitoring, Getting the Project Back to Change Control, Software Configuration Management (SCM).		
Unit - V	**Cryptocurrency Regulation**	Periods	12
	Managing people and Organizing Team : Organizational behavior – Best methods of staff selection – Motivation – The Oldham – Hackman job characteristic model – Stress – Health and Safety – Ethical and Professional concerns – Working in teams – Decision making – Organizational structures – Dispersed and Virtual teams – Communications genres – Communication plans – Leadership.		
	Total Periods		60

LEARNING RESOURCES	
Text Books	1. Bob Hughes, Mike Cotterell and Rajib Mall: "Software Project Management" – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
References	1. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 2004. 2. Gopalaswamy Ramesh, "Managing Global Software Projects" Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002
E-References	1. https://en.wikipedia.org/wiki/Software_quality_managementhttps://en.wikipedia.org/wiki/Software_quality_control

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations	**2021-2022**	
Department	**B.C.A**		Semester			**5**	
Course Code	Course Name	Periods per Week			Credit	Maximum Marks	
		L	T	P	C	CA	ESE	Total
21U5CACP08	**DOT NET PROGRAMMING LAB**	0	0	4	3	40	60	100

List of Experiments

1	Implementing.Net controls and creation of menus.
2	Mouse Events Using VB.Net
3	Implementing dialog controls
4	Validation control in ASP.Net
5	Implementing Data grid.
6	Web page creation using ASP.Net.
7	Implementation with connectivity of database.
8	Feedback form creation using ASP.Net.
9	Employee Database maintenance using ASP.Net.
10	Create a user control that displays the current date and time. Include it in a Web Form and refresh each time a button is clicked.

Signature of BOS Chairman

	VIVEKANANDHACOLLEGEOFARTSANDSCIENCESFORWOMEN (AUTONOMOUS) Elayampalayam, Tiruchengode-637205.						
Programme	**BCA**	ProgrammeCode	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Period per Week		Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U5CACP09	**PHP PROGRAMMING LAB**		0	0	5	3	40	60	100

	List of Experiments
1	Develop PHP program using the following a) Use of conditional statements in PHP b) Use of looping statements in PHP c) Use of different types of arrays
2	Write a PHP program to prepare the student marks list.
3	Create a PHP Program to find odd or even number from given numbers.
4	Write a PHP Program to demonstrate the variable function a) Gettype() b)Settype() c)Isset() d)Unset()
5	Give the example of String function a) Substr(); b)Strcmp() c)Strcasecmp() d)Strpos()
6	Write a PHP Program that demonstrates Form element input elements.
7	Database connectivity in PHP with MySQL
8	To Create a table using PHP Programming.
9	To create table and do all the DDL commands using PHP Programming
10	Develop a PHP program to display student information using MYSQL table.
11	Creating simple webpage using PHP
12	Create a College Website using PHP Program.

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FORWOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**5**
Course Code	Course Name		Periods per Week			Credit	Maximum Marks
			L	T	P	C	CA / ESE / Total
21U5CACPR01	**Project Work (In-house Project)**		0	0	4	3	40 / 60 / 100

List of Experiments

1	**FIRST REVIEW:** **(20 Marks)** 1. Project Title 2. Project Platform (Language / Package Selected) 3. Confirmation Letter (from Company / Industry) 4. Details of Internal Guide with Designation & Qualification (in the company / Industry/Organization). 5. Presentation
2	**SECOND REVIEW:** **(20 Marks)** 1. Work Observation 2. Modules in Project (Design Screens Sample) 3. DFD / ERD / System Flow Diagram (Whichever Applicable) 4.Estimated Time of Completion 4. Completed Work in the form of Percentage Analysis PowerPoint Presentation.
3	**FINAL REVIEW:** **(60 Marks)** 1. Documentation 2. Screens Shots 3. DFD / ERD / System Flow Diagram (Whichever Applicable) 4. Final Project Report (with executable format including complete source code)

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**							
Programme	**BCA**	Programme Code	**UCA**			Regulations		**2021-2022**
Department	**B.C.A**		Semester					**5**
Course Code	Course Name		Periods per Week			Credit	Maximum Marks	
			L	T	P	C	CA	ESE	Total
21U5CAS03	**SOFT SKILLS**		2	0	0	2	25	75	100
COURSE OBJECTIVES	To enable students to build a repositories of functional vocabulary and to move from the lexical level to the syntactic level. To train students to summon words, phrases relevant to the immediate communication tasks.							
POs	PROGRAMME OUTCOME							
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi							
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.							
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.							
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.							
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PO 07	Apply ethical principles and commit to professional ethics and responsibilities.							
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the							
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.							
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PO 12	Evaluate and use appropriate tools and techniques in developing application activities.							
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.							
PO 14	To integrate ethics and values in designing computer application.							
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design							

COs	COURSE OUTCOME
CO 1	To develop communication skills and to know about the stages of communication.
CO 2	To Understanding about the listening and speech process.
CO 3	Able to know how to face the interview and to prepare for the interview.
CO 4	Making to discuss a topic with friends or classmates helps in learning the topic with perfection. It involves sharing of learning by the participants which equally benefits all the participants.
CO 5	To provide an opportunity to make it easier to engage the audience, Flexibility, Consistency and Versatility.
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
CO 1	1	PO 1	1
		PO 2	2
		PO 3	6
CO 2	2	PO 4	5
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		PO 8	6
		PO 9	6
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		PO 11	6
		PO 12	5
CO 5	3	PO 13	6
		PO 14	6
		PO 15	5

CO / PO Mapping

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

COs	Programme Outcome (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	1	2	1	1	3	1	2	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

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

Content of the Syllabus			
Unit - I	**NATURE OF TECHNICAL COMMUNICATION**	Periods	05
	Nature of technical communication: Communication as sharing – Stages of communication – Channels of communication – Nature of technical communication – Importance and need for technical communication – Technical communication skills.		
Unit – II	**THE LISTENING PROCESS**	Periods	05
	Types of listening – Listening with a purpose – Barriers to listening –The speech process – Conversation and oral skills –Strategies for good conversation – Improving fluency and self-expression – Body language.		
Unit - III	**JOB INTERVIEWS**	Periods	05
	Interview process – Characteristics of job interview–Pre-interview preparation techniques – Interview questions – Answering strategies – Frequently asked interview questions – Projecting a positive image – Alternative interview formats.		
Unit – IV	**GROUP DISCUSSION**	Periods	05
	Nature of group discussion – Characteristics of successful group discussions – Selection group discussion – Group discussion strategies – Techniques for individual contribution – Group interaction strategies.		
Unit – V	**PRESENTATION SKILLS**	Periods	05
	Nature and importance of oral presentation –Planning the presentation – Preparing the presentation – Organizing your presentation – Rehearsing the presentation – Improving delivery.		
Total Periods			25

Text Books	
1	M. Ashraf Rizvi, "Effective Technical Communication" Tata McGraw – Hill Publishing Company Led, New Delhi. Unit -I (Chap-1), Unit-II (Chap-4,6), Unit-III (Chap-9), Unit-IV (Chap-10), Unit-V (Chap-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	https://www.thebalancecareers.com/job-interview-skills-to-get-hired-4138625
2	https://www.skillsyouneed.com/presentation-skills.html

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2017-2018**
Department	B.C.A		Semester		**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U6CAC12	**PYTHON PROGRAMMING**	5	0	0	4	25	75	100

COURSE OBJECTIVES	â€¢To learn a dynamic, interpreted (Byte code-Compiled) and high level programming language. â€¢To know the basics of algorithmic problem solving â€¢To use Python data structures -- Lists, Tuples, Dictionaries.
POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	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

Course Assessment Methods
Direct

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

Indirect
1. Course End Delivery

Content of the Syllabus			
Unit - I	**Python Overview, Data Types, Expressions:**	Periods	10
	Python programming - variable, Datatype, Keywords, Literals, Operator, Expression, type conversion, Comments, input and output, Strings, Assignment and Comments - Numeric Data Types and Character Sets, Expressions.		
Unit - II	**Functions, Modules and Control Statements**	Periods	14
	Functions and Modules- Calling Functions, The math Module, The Main Module, Program Format and Structure and Running a Script from a Terminal Command Prompt - Iteration - for loop - Selection - Boolean Type, Comparisons, and Boolean Expressions, if-else Statements, One-Way Selection Statements, Multi-way if Statements, Logical Operators and Compound Boolean Expressions, Short- Circuit Evaluation and Testing Selection Statements - Conditional Iteration - while loop.		
Unit - III	**Strings and Text Files**	Periods	12
	Strings-Accessing Characters and Substrings in Strings - Data Encryption - Strings and Number Systems 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.		
Unit - IV	**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 Effects, Equality and Tuples - Defining Simple Functions - Syntax, Parameters and Arguments, return Statement, Boolean Functions and main function, Dictionaries-Dictionary Literals - Adding Keys and Replacing Values - Accessing Values, Removing Keys and Traversing a Dictionary.		
	Design with Functions and Classes, Graphical User Interface	Periods	12
Unit - V	Design with Functions and Design with Classes - Functions as Abstraction Mechanisms - Design with Recursive Functions and Managing a Programâ€™s Namespace - Data Modeling and Structuring Classes with Inheritance and Polymorphism - Behavior of terminal based programs and GUI based programs- Coding simple GUI based programs- Other useful GUI resources- Case Study: GUI based 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/

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**BCA**	Programme Code	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U6CAC13	**MOBILE APPLICATION DEVELOPMENT**	5	0	0	4	25	75	100

COURSE OBJECTIVES	â€¢To understand the concept of Android Technology. â€¢To understand applications of android.

POs	PROGRAMME OUTCOME
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.
PO 14	To integrate ethics and values in designing computer application.
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design

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

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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

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

Content of the Syllabus			
Unit - I	Introduction to Android:	Periods	10
	Introducing Android- Open Handset Alliance - The Android Platform - Layers of Android-Android SDK - Kinds of Android Components.		
	Android Application Design Essentials:	Periods	10
Unit - II	Anatomy of an Android Applications - Android Terminology - Application Context - Actives - Services - Intents - Receiving andBroadcasting Intents-Interaction with server side applications-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 Working with Animation.		
Unit - IV	Using Common Android APIs:	Periods	10
	Using Android Data and Storage APIs- Managing data using SQLite - Sharing Databetween Applications with Content ProvidersIOS-Integrating Calendar and address book with social media applications.		
	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 Education, 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 Developerâ€™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

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**6**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U6CAE04	**ARTIFICIAL INTELLIGENCE**		5	0 0	3	25	75 100
COURSE OBJECTIVES	This subject deals with various AI Concepts and Methodologies. To have enriched knowledge regarding heuristic search, Knowledge representation and Expert systems						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

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	Select appropriately from a range of techniques when implementing intelligent systems.
CO 5	To give understanding of the main abstractions and reasoning for intelligent systems.
Pre-requisites	Ability to understand complex algorithms, Good command over programming languages.

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	Overview of Artificial Intelligence	Periods	12
	Overview of Artificial Intelligence: Introduction-Applications of AI-Objectives of AI-Artificial Intelligence Programming-criticism of AI-Future of AI		
Unit - II	**Knowledge Acquisition and Representation**	Periods	12
	Knowledge Acquisition and Representation: Machine Intelligence – Knowledge Engineering-Procedure for knowledge Acquisition-Knowledge Representation-Network Representation Schemes Reasoning and KRR Systems: reasoning-Knowledge Representation and Reasoning System Knowledge Representation Languages-Domain Modeling		
Unit - III	**Search Techniques**	Periods	12
	Search Techniques: problem Representation-Definitions-Representation Schemes-Problem Solving in AI Heuristic Search Techniques-Game Searches-Programming Feature		
Unit - IV	**AI Technologies**	Periods	12
	AI Technologies: Computer Vision-Natural Language Processing- Grammar-Parser-Types of Grammars Driving Sentences from a Grammar-Top-down Parsing-Bottom-up parsing-chart parsing-Grammars and Logic programming-Knowledge Representation Languages-examples-ELIZA-Speech recognition		
Unit - V	**Expert Systems**	Periods	12
	Expert Systems: Introduction-Skill versus Knowledge-Basic Characteristics of an Expert System-History of expert system-Knowledge Engineering- Inferencing -Programming Methodology-Expert systems-Tools-Applications		
	Total Periods		60

Text Books	
Text Books	1. Rajendra Akerkar , "Introduction to Artificial Intelligence" PHI Learning Private Limited. Unit-I (Chapter – 1.1-1.7), Unit-II (Chapter –3.2-3.8,4.3-4.5), Unit-III (Chapter – 6.2-6.9), Unit-IV (Chapter – 7.2,7.3), Unit-V (Chapter – 8.1-8.8)
References	1. "Artificial Intelligence "– Tata McGraw-Hill Education Private Limited, Third Edition 2. "Artificial Intelligence a modern Approach "– Stuart Russell & Peter Norvig, 2nd Edition Perason Education. 3. "Artificial Intelligence ", George F Luger , 4thEdition , Pearsons Education Publ, 2002. 4. "Foundations of Artificial Intelligent and Expert Systems", V S Janaki Raman, K Sarukesi, P Gopalakrishnan, MacMillan India limited
E-References	1. https://www.javatpoint.com/artificial-intelligence-tutorial 2. https://www.guru99.com/artificial-intelligence-tutorial.html 3. https://www.w3schools.com/ai/

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**6**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U6CAE05	**DATA MINING AND WAREHOUSING**		5	0 0	3	25	75 100
COURSE OBJECTIVES	(a) To identify the scope and essentiality of Data Warehousing and Mining. (b) To analyze data, choose relevant models and algorithms for respective applications. (c) To study spatial and web data mining. (d) To develop research interest towards advances in data mining.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

COs	COURSE OUTCOME
CO 1	Understand Data Warehouse fundamentals, Data Mining Principles
CO 2	Design data warehouse with dimensional modeling and apply OLAP operations
CO 3	Identify appropriate data mining algorithms to solve real world problems
CO 4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
CO 5	Describe complex data types with respect to spatial and web mining
Pre-requisites	Statistical Knowledge

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	**Introduction**	Periods	12
	Introduction: What motivated data mining?-Why is it important?-What is data mining?-Data mining-On what kind of data?-Data mining Functionalities-Classification of Data mining-Data mining task primitives-Integration of a Data mining System with a Database or Data Warehouse System-Major issues in Data mining		
Unit - II	**Data Preprocessing**	Periods	12
	Data Preprocessing: Why Preprocess the Data?-Descriptive Data Summarization-Data Cleaning-Data Integration and Transformation-Data Reduction-Data Discretization and Concept Hierarchy Generation		
Unit - III	**Mining Frequent patterns, Associations and Correlations**	Periods	12
	Mining Frequent patterns, Associations and Correlations: Mining various kinds of association Rules-Classification and Prediction: What is Classification? What is Prediction? Issues regarding classification and Prediction-Bayesian Classification-Classification by Back propagation-Prediction		
Unit - IV	**Types of Data in cluster Analysis**	Periods	12
	Types of Data in cluster Analysis-Categorization of major Clustering methods Hierarchical methods-Density Methods-Spatial Data mining-Text mining-Data Mining Applications-Social Impacts of data mining-Trends mining		
Unit - V	**Data Warehouse and OLAP Technology**	Periods	12
	Data Warehouse and OLAP Technology: What is Data Warehouse? A Multidimensional Data Model-Data Warehouse Architecture-Data Warehouse Implementation		
	Total Periods		60

LEARNING RESOURCES	
Text Books	1. Jiawei Han and Micheline Kamber, "DATA MINING Concepts and Techniques", Morgan Kaufmann Publishers, Second Edition, 2006.
References	1. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008. 2. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2001. 3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
E-References	1. https://en.wikipedia.org/wiki/Data_mining 2. www.hinduwebsite.com/webresources/data_warehousing.asp

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**6**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U6CAE06	**BLOCKCHAIN MANAGEMENT**		5	0 0	3	25	75 100
COURSE OBJECTIVES	Understand how blockchain systems (mainly Bitcoin and Ethereum) work. To securely interact with them. Design, build, and deploy smart contracts and distributed applications. Integrate ideas from blockchain technology into their own projects.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

COs	COURSE OUTCOME
CO 1	Clarify design principles of Bitcoin and Ethereum.
CO 2	Clarify Nakamoto consensus.
CO 3	Explain the Simplified Payment Verification protocol.
CO 4	List and describe differences between proof-of-work and proof-of-stake consensus.
CO 5	Interact with a blockchain system by sending and reading transactions.
Pre-requisites	Fundamental skill and Knowledge in Technical Field, Decentralized Applications

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit - I	Basics	Periods	12
	Distributed Database-Two General Problem-Byzantine General problem and Fault Tolerance-Hadoop Distributed File System- Distributed Hash Table- ASIC resistance- Turing Complete. Cryptography: Hash function- Digital Signature - ECDSA- Memory Hard Algorithm- Zero Knowledge Proof.		
Unit - II	**Blockchain**	Periods	12
	Introduction- Advantage over conventional distributed database-Blockchain Network- Mining Mechanism- Distributed Consensus-Merkle Patricia Tree- Gas Limit- Transactions and Fee- Anonymity- Reward- Chain Policy- Life of Blockchain application- Soft & Hard Fork- Private and Public blockchain.		
Unit - III	**Distributed Consensus**	Periods	12
	Nakamoto consensus- Proof of Work- Proof of Stake- Proof of Burn- Difficulty Level- Sybil Attack- Energy utilization and alternate.		
Unit - IV	**Cryptocurrency**	Periods	12
	History- Distributed Ledger-Bitcoin protocols - Mining strategy and rewards-Ethereum - Construction- Smart Contract- GHOST- Vulnerability- Attacks-Sidechain-Namecoin		
Unit - V	**Cryptocurrency Regulation**	Periods	12
	Stakeholders- Roots of Bit coin- Legal Aspects-Crypto currency Exchange- Black Market and Global Economy.		
	Total Periods		60

LEARNING RESOURCES	
Text Books	1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller and Steven Goldfeder, Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction, Princeton University Press (July 19, 2016).
References	1. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies 2. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System 3. Dr. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014. 4. Nicola Atzei, Massimo Bartoletti, and TizianaCimoli, A survey of attacks on Ethereum smart contracts
E-References	1. http://www.cs.toronto.edu/~yijun/csc408h/handouts/lecture5.pdf 2. https://www.vidyarthiplus.com/vp/thread-23085.html#.WUSxK9R97Dc 3. https://www.slideshare.net/abasit83/software-quality-assurance-lecture-1

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam,Tiruchengode-637205.

Programme	**BCA**	ProgrammeCode	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**6**

Course Code	Course Name	Periods perWeek			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U6CACP10	**PYTHON PROGRAMMING LAB**	0	0	5	3	40	60	100

List of Experiments

1	Write a python program using Control statements
2	Write a python program using Functions and String Operations
3	Write a python program using List, Tuples and List comprehensions
4	Write a python program using Inheritance
5	Write a python program using Synchronization
6	Write a python program using Text Files
7	Write a python program using Graphical user Interfaces
8	Write a python program using Exceptional Handling
9	Write a python program using Classes and Objects
10	Write a python program using Chat Applications

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam,Tiruchengode-637205.

Programme	**BCA**	ProgrammeCode	**UCA**	Regulations	**2021-2022**
Department	**B.C.A**		Semester		**6**

Course Code	Course Name	Periods perWeek			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
21U6CACP11	**MOBILE APPLICATION DEVELOPMENT LAB**	0	0	5	3	40	60	100

List of Experiments

1	How to make “HelloWorld” application in android studio.
2	How to add two numbers in Android Application
3	Create a simple calculator layout in android studio.
4	Develop an application that uses event listeners.
5	Create an Android Application in java using animations.
6	Build basic game in Android.
7	Create a simple Alarm Clock using Android.
8	Develop an application that makes use of database.
9	Implement an application that creates an alert when receiving a message.
10	Create a simple projectu sing Android Application for internal mark Calculations.
11	Create a android application of a. Registration with SQLite Database b. Login with SQLite Database.
12	Create an Android Application to connect with MySQL through PHP

Signature of BOS Chairman

	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS) **Elayampalayam, Tiruchengode-637 205.**						
Programme	**BCA**	Programme Code	**UCA**		Regulations		**2021-2022**
Department	**B.C.A**		Semester				**6**
Course Code	Course Name		Periods per Week		Credit	Maximum Marks	
			L	T P	C	CA	ESE Total
21U6CAS04	**DIGITAL IMAGING**		5	0 0	3	25	75 100
COURSE OBJECTIVES	Learn about design techniques of CorelDRAW X7 and working with the Applications.						
POs	PROGRAMME OUTCOME						
PO 01	Computer Applications graduates to work effectively both as an individual and a team leader on multi disciplinary projects.						
PO 02	Computer Applications Graduates follow ethical principles and norm in developing applications.						
PO 03	Inculcates the ability to analyze, identify, formulate and develop computer applications using modern computing tools and techniques.						
PO 04	Computer Applications Graduates apply the knowledge of mathematical fundamentals in the field of Computer Application developments.						
PO 05	Improves communication skills so that they can effectively present technical information in oral and written reports						
PO 06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practices.						
PO 07	Apply ethical principles and commit to professional ethics and responsibilities.						
PO 08	Prepares to create design innovative methodologies for solving complex / real life problems for the betterment of the society.						
PO 09	Computer Applications graduates will use various investigation techniques and investigate large and complex problems.						
PO 10	Function effectively as an individual, and as a leader in assorted panels, and in multidisciplinary backgrounds.						
PO 11	Computer Applications graduates will be able to analyze customer requirements, create high level design, implement and document robust and reliable software systems.						
PO 12	Evaluate and use appropriate tools and techniques in developing application activities.						
PO 13	Computer Applications graduates will be use design solutions for complex problem and design the system components or processes that meet the specific needs.						
PO 14	To integrate ethics and values in designing computer application.						
PO 15	Develop software solutions to problems across a broad range of application domains through analysis and design						

COs	COURSE OUTCOME
CO 1	Understand Data Warehouse fundamentals, Data Mining Principles
CO 2	Design data warehouse with dimensional modeling and apply OLAP operations
CO 3	Identify appropriate data mining algorithms to solve real world problems
CO 4	Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
CO 5	Describe complex data types with respect to spatial and web mining
Pre-requisites	Statistical Knowledge

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

CO / PO Mapping

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

COs	Programme Outcome (POs)														
	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	3	2	2	2	2	2	3	2	2	3
CO4	1	1	1	2	2	2	1	1	1	1	1	2	1	1	2
CO5	2	3	1	1	2	1	1	1	1	1	1	1	1	1	1

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

Content of the Syllabus			
Unit – I	**CorelDRAW X7**	Periods	05
	CorelDRAW X7: Starting and Setting up – CorelDRAW Basics – CorelDRAW Workspace tour. **LINES, SHAPES AND OUTLINES:** Working with lines, outlines, and brushstrokes: Drawing Lines – Formatting lines and outlines Adding arrowheads to lines and curves.		
Unit - II	**DRAWING SHAPES**	Periods	05
	DRAWING SHAPES: Drawing rectangles, and Squares – Drawing ellipses, circles, arcs, and pie Shapes – Drawing polygons and stars – Drawing Spirals. **Shaping objects:** Using curve objects – Selecting and moving nodes – Skewing and smearing Objects – Roughening Objects.		
Unit - III	**OBJECTS, SYMBOLS AND LAYERS**	Periods	05
	OBJECTS, SYMBOLS AND LAYERS: Working with objects – Selecting Objects – Transforming objects – Copying, duplicating, and Deleting objects – Cloning objects – Aligning and distributing objects – Grouping Objects – Combining objects.		
Unit - IV	**WORKING WITH COLOR**	Periods	05
	WORKING WITH COLOR: Understanding color models – Choosing Colors. **FILLING OBJECTS:** Applying Uniform fills – Applying fountain fills – Applying pattern fills – Applying texture fills.		
Unit - V	**WORKING WITH TEXT**	Periods	05
	WORKING WITH TEXT: Adding and Manipulating Text**:**– Adding Artistic text – Adding Paragraph text – Changing one to another type – Fitting text to a path. **Formatting text:-** Changing color of text – Changing text cases – Bullets – Drop Cap – Alignment.		
	Total Periods		25

LEARNING RESOURCES	
Text Books	1. CorelDRAW X7 User Guide, 2014 Coral Corporation.
References	1. Alur Deepak & Malis Dan, “Mastering Corel Draw 7”
E-References	1. https://www.javatpoint.com/coreldraw 2. https://learn.corel.com/graphics-tutorials/ 3. https://coreldrawtips.com/ 4. https://coreldrawdesign.com/all-tutorials.php

Signature of BOS Chairman