VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN
(AUTONOMOUS)
B.Sc., (COMPUTER SCIENCE)
(Candidates admitted from 2020-2021 onwards)

REGULATIONS

I. SCOPE OF THE PROGRAMME

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

II. SALIENT FEATURES

- Regular conduct of guest lectures and seminars
- Campus recruitment
- Provides facilities such as hi-speed Internet Access and in-house library
- Provides career guidance for Post Graduate courses like M.Sc.(CS), M.Sc.(IT), MCA and the certifications in programming languages
- Conduct of Personality Development Program
- Arranging visiting faculties from various industries

III. OBJECTIVES OF THE COURSE

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

IV. ELIGIBILITY FOR ADMISSION

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

V. DURATION OF THE PROGRAMME

➢ The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to April.

➢ The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Computer Science, Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University.

VI. CONTINUOUS INTERNAL ASSESSMENT (CIA)

The performance of the students will be assessed continuously and the

Internal Assessment Marks for Theory papers

1.	Model Test	-	10 Marks
2.	Average of Two Tests	-	05 Marks
3.	Assignment	-	05 Marks
4.	Attendance	-	05 Marks

Total = 25 Marks

Internal Assessment Marks for Practical

1.	Test	-	20 Marks
2.	Attendance	-	10 Marks
3.	Observation	-	10 Marks

Total = 40 Marks

PASSING MINIMUM (Theory)

EXTERNAL

In the Autonomous Examinations, **the passing minimum shall be 40 % out of 75 Marks. (30 Marks)**

PASSING MINIMUM (Practical / Mini project)

EXTERNAL

In the Autonomous Examinations, **the passing minimum shall be 40 % out of 60 Marks. (24 Marks)**

Distribution of Marks

Problem Understanding   : 05 Marks

Program writing   : 10 Marks

Debugging   : 10 Marks

For Correct Results   : 05 Marks

VII. ELIGIBILITY FOR EXAMINATION

Distribution of marks for attendance

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

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

VIII. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Successful candidates passing the examination of Core Courses (main and allied subjects) and securing marks

a) 75 % and above shall be declared to have passed the examination in first class with Distinction provided they pass all the examinations prescribed for the course at first appearance itself.

b) 60% and above but below 75 % shall be declared to have passed the examinations in First class without Distinction.

c) 50%and above but below 60% shall be declared to have passed the examinations in Second class.

d) All the remaining successful candidates shall be declared to have passed the examinations in Third class.

e) Candidates who pass all the examinations prescribed for the course at the first appearance itself and within a period of three consecutive academic years from the year of admission only will be eligible for ranking.

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 have been prescribed therefore.

X. PROCEDURE IN THE EVENT OF FAILURE

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

XI. COMMENCEMENT OF THESE REGULATIONS

These regulations shall take effect from the academic year 2020-2021 (i.e.,) for the students who are to be admitted to the first year of the course during the academic year 2020-2021 and thereafter.

XII. TRANSITORY PROVISIONS

Candidates who were admitted to the UG course of study before 2020-2021 shall be permitted to appear for the examinations under those regulations for the period of three years ie., upto and inclusive of the examinations of 2021-2022. Thereafter, they will be permitted to appear for the examinations only under the regulations then in force.

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

Two 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 Questions

One Question from each unit (3 Out of 5)

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

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

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)
Elayampalayam, Thiruchengode, Namakkal (DT), Tamil Nadu 637 205

VISION OF THE COLLEGE

- To evolve into a centre of Excellence in higher education through creative and innovative practices to secure social equity for women.

MISSION OF THE COLLEGE

- To provide sufficient learning infrastructure to the students to pursue their studies.
- To provide good opportunity for higher education and conducive environment to students to acquire education.
- To provide quality academic programs, training activities and Research Facilities.
- To facilitate Industry-Institute interaction.

PG RESEARCH DEPARTMENT OF COMPUTER SCIENCE AND APPLICATIONS

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 Applications 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.

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B.Sc. (COMPUTER SCIENCE)

PROGRAM OBJECTIVES

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PO1: The B.Sc. Computer Science program is to provide advanced and in depth knowledge of Computer Science and its applications to enable students pursue a professional career in information and communication technology in related industry, business and research.

PO2: The course designed to impact professional knowledge and practical skills to the students.

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PROGRAM SPECIFIC OUTCOMES

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After completion of the program the graduates will be able to

PSO1: To understand the fundamental concepts of computer system, including hardware and networking.

PSO2: To Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

PSO3: Ability to communicate effectively in both verbal and written form in industry and society.

PSO4: Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks

DURATION OF THE PROGRAMME

- ➢ The course shall extend over a period of three academic years consisting of six semesters. Each academic year will be divided into two semesters. The First semester will consist of the period from July to November and the Second semester from December to April.

- ➢ The subjects of the study shall be in accordance with the syllabus prescribed from time to time by the Board of Studies of Computer Science, Vivekanandha College of Arts and Sciences for Women with the approval of Periyar University

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN
[AUTONOMOUS]
ELAYAMPALAYAM, TIRUCHENGODE - 637 205
DEPARTMENT OF COMPUTER SCIENCE
B.Sc COMPUTER SCIENCE
COURSE PATTERN AND SCHEME OF EXAMINATIONS UNDER OBE

Sem	Course Code	Part	Courses	Hr	Credit	Marks		
						Int.	Ext.	Total
For the Candidates admitted from the year 2020- 2021(Onwards)								
I	18U1LT01	I	Tamil-I	6	3	25	75	100
	18U1LE01	II	English I	6	3	25	75	100
	18U1MAA04	III	Allied-I Numerical Methods	4	4	25	75	100
	20U1CSC01	IV	Core – I Computer Fundamentals and C Programming	5	5	25	75	100
	20U1CSCP01	IV	Core I P-I - Programming in C Lab	4	4	40	60	100
	20U1CSCP02	IV	Core II P-II - PC Hardware Assembling Lab	3	2	40	60	100
	18U1VE01		Value Added Course YOGA	2	2	25	75	100
			TOTAL	**30**	**23**	**205**	**495**	**700**
II	18U2LT02	I	Tamil-II	6	3	25	75	100
	18U2LE02	II	English-II	6	3	25	75	100
	18U2MAA08	III	Allied II- Discrete Mathematics	4	4	25	75	100
	20U2CSC02	IV	Core III - Programming in C++ and Data Structures	4	4	25	75	100
	20U2CSCP03	IV	Core III P-III Programming in C++ Lab	4	3	40	60	100
	20U2CSCP04	IV	Core IV P-IV System Software Installation and Configuring Lab	2	2	40	60	100
	18U2ES01		Environmental Studies	4	4	25	75	100
			TOTAL	**30**	**23**	**205**	**495**	**700**
III	18U3LT03	I	Tamil-III	6	3	25	75	100
	18U3LE03	II	English-III	6	3	25	75	100
	18U3CMA03	III	Allied-III Financial and Cost Accounting	4	4	25	75	100
	20U3CSC03	IV	Core V- JAVA Programming	4	5	25	75	100
	20U3CSCP05	IV	Core V P-V Programming in Java Lab	4	4	40	60	100
	18U3MAN__	VI	NMEC-I	2	2	25	75	100
	20U3CSS01	VII	SBEC-I - Office Automation	2	2	25	75	100
	20U3CSCP06	IV	CORE VI P-VI Office Automation Lab	2	2	40	60	100
			TOTAL	**30**	**23**	**205**	**495**	**700**

	18U4LT04	I	Tamil-IV	6	3	25	75	100
	18U4LE04	II	English-IV	6	3	25	75	100
	18U4BAA01	III	Allied-IV Organizational Behavior	4	4	25	75	100
	20U4CSC04	IV	Core-VII- Relational Database Management System	4	5	25	75	100
IV	20U4CSCP07	IV	Core-VII P-VII Relational Database Management System Lab	4	4	40	60	100
	18U4MAN__	VI	NMEC-II	2	2	25	75	100
	20U4CSS02	VII	SBEC-II- HTML and Web Designing	2	2	25	75	100
	20U4CSCP08	IV	CORE-VIII P-VIII HTML and Web Designing Lab	2	2	40	60	100
			TOTAL	30	**23**	**205**	**495**	**700**
V	20U5CSC05	IV	Core-IX VB.Net	5	5	25	75	100
	20U5CSC06	IV	Core-X Operating Systems	5	4	25	75	100
	20U5CSCP09	IV	Core-IX P-IX VB.Net Lab	5	3	40	60	100
	20U5CSCP10	IV	Core- X P-X Operating System Lab	5	3	40	60	100
	20U5CSE__	V	Elective – I	4	3	25	75	100
	20U5CSS03	VII	SBEC –III Soft Skills	2	2	25	75	100
	20U5CSPR01		Mini Project	4	2	40	60	100
			TOTAL	**30**	**24**	**245**	**555**	**800**
VI	20U6CSC07	IV	Core- XI Computer Networks	5	4	25	75	100
	20U6CSC08	IV	Core-XII PHP Programming	5	4	25	75	100
	20U6CSCP11	IV	Core-XI P-XI -Network Lab	6	4	40	60	100
	20U6CSCP12	IV	Core-XII P-XII PHP Programming - Lab	6	4	40	60	100
	20U6CSE__	V	Elective – II	5	3	25	75	100
	20U6CSS04	VII	SBEC –IV Java Script and VB Script	2	2	25	75	100
	20U6EX01		Extension Activities	-	1	-	-	-
			Library	1	0	-	-	-
			TOTAL	**30**	**24**	**205**	**495**	**700**
			CORE TOTAL	**180**	**140**	**1270**	**3030**	**4300**

ELECTIVE – I			ELECTIVE – II		
Sem	**Course Code**	**Title**	**Sem**	**Course Code**	**Title**
V	20U5CSE01	Computer Graphics	**VI**	20U6CSE04	E-Commerce
	20U5CSE02	Grid Computing		20U6CSE05	Android Applications
	20U5CSE03	Software Engineering		20U6CSE06	Middleware Technologies
SKILL BASED PAPER			**NON-MAJOR ELECTIVE COURSES**		
Sem	**Course Code**	**Title**	**Sem**	**Course Code**	**Title**
III	20U3CSS01	SBEC- I Office Automation	**III**	18U3CSN01	Quantitative Aptitude – I
IV	20U4CSS02	SBEC-II HTML and Web Designing			
V	20U5CSS03	SBEC–III Soft Skills	**IV**	18U4CSN02	Quantitative Aptitude – II
VI	20U6CSS04	SBEC-IV Java Script and VB Script			

Subject Title	PROGRAMMING IN C LAB	Semester	I
Subject Code	20U1CSCP01	Specialization	NA
Type	CORE –I P-I PRACTICAL	L:T:P:C	0:0:4:4

COURSE OBJECTIVE

- On successful completion of this laboratory the students have the programming ability in C language

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	To Design algorithm for the given problem specifications	K1
CO2	To Develop C programs for the designed algorithm specification	K2
CO3	To implement control and looping statements in real time applications	K3 K4
CO4	To Apply the concept of arrays and functions to solve the real time problems	K3 K4
CO5	To Apply the structure and file concepts	K3 K4

Subject Title	PROGRAMMING IN C LAB	Semester	I
Subject Code	20U1CSCP01	Specialization	NA
Type	CORE –I P-I PRACTICAL	L:T:P:C	0:0:4:4

S.No	List of Programs	Level
1	Program to multiply two floating point numbers	K1
2	Program to check whether the given number is odd or even number	K1

3	Program for (i) Using WHILE Statement
	           (ii) Using DO...WHILE Statement
	           (iii) Using FOR Statement
		K2

4	Program to Sort given array of numbers in ascending order	K3
5	Program to implement Matrix Manipulation	K3
6	Program to Program to implement string handling functions (i) Check whether the given string is Palindrome or not (ii) Sorting the given names in ascending and descending order	K3
7	Program for finding factorial of a number using function	K2
8	Program to Swap two numbers using Pointers	K3 K4
9	Program to prepare Student Mark list using structure	K3 K4
10	Program to prepare Pay Bill using files.	K3 K4

Pedagogy : Chalk and Talk, PPT ……..

MAPPING WITH PROGRAM OUTCOMES

CO/PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2		✓	✓	✓
CO3			✓	✓
CO4			✓	✓

Subject Title	PC HARDWARE ASSEMBLING LAB	Semester	I
Subject Code	20U1CSCP02	Specialization	NA
Type	CORE – II P – II – PRACTICAL	L:T:P:C	0:0:3:2

COURSE OBJECTIVE

- On successful completion of this laboratory the students have to assemble hardware components of a computer system.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Examine the computer and peripheral devices	K1
CO2	Understand the concept of motherboard and its types	K1
CO3	Assemble and disassemble the hardware components	K1
CO4	Installation of software and troubleshoot	K3 K4

Subject Title	PC HARDWARE ASSEMBLING LAB	Semester	I
Subject Code	20U1CSCP02	Specialization	NA
Type	CORE – II P - II – PRACTICAL	L:T:P:C	0:0:3:2
S.No	List of Programs		Level
1.	Inspect the computer and peripheral components		K1
2.	To revise of SMPS and UPS		K1
3.	Study on working keyboards and mouse		K2
4.	To study various types of cables & connectors		K1
5.	Find different ports and slots and its uses		K2
6.	Remove the PC system unit cover and examine internal components		K3
7.	To study different types of motherboard		K2
8.	Gather basic information about the Processor and RAM		K2
9.	Assembling and disassembling the system hardware components of the personal computer		K1
10.	Printer Installation and troubleshoot		K3 K4

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

CO/PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓			
CO2	✓			
CO3			✓	✓
CO4			✓	✓

Subject Title	**PROGRAMMING IN C++ LAB**	Semester	**II**
Subject Code	**20U2CSCP03**	Specialization	**NA**
Type	**CORE – III P – III – PRACTICAL**	L:T:P:C	**0:0:4:3**

COURSE OBJECTIVE

Formulate all techniques of software development in the C++ Programming Language and demonstrate these techniques by the solution of a variety of problems spanning the breadth of the language.

COURSE OUTCOMES

CO Number	CO Statement	Knowledge Level
CO1	Design algorithms for the given problem specifications	**K1**
CO2	Implement the techniques and features of the Object Oriented Programming constructs to build an application.	**K2**
CO3	Implement method overloading and method overriding for different user specifications	**K3 & K4**
CO4	To Apply the linear data structures using arrays to solve the real time problems.	**K3 & K4**
CO5	Implement sorting and searching techniques	**K3 & K4**

Subject Title	**PROGRAMMING IN C++ LAB**	Semester	**II**
Subject Code	**20U2CSCP03**	**Specialization**	**NA**
Type	**CORE PRACTICAL-III**	**L:T:P:C**	**0:0:4:3**

List of Programs			Level
1.	Write a C++ program to check if a year is leap year or not		K1
2.	Write a C++ program to create a class and access its members through object.		K1
3.	Write a C++ program for Friend function		**K2**
4.	Write a C++ program for Function overloading		**K1**
5.	Write a C++ program for operator overloading i) Binary operator overloading ii) Unary operator overloading		**K3**
6.	Write a C++ program for implementing Inheritance Concepts i) Single Inheritance ii) Multiple Inheritance		**K3 & K4**
7.	Implement push, pop Operations of a stack using Array		**K4**
8.	Implement Add Operation of a Queue using Array		K4
9.	Write a C++ program to sort a set of integers using bubble sort		**K3 & K4**
10.	Write a C++ program to sort a set of integers using Binary Search Algorithm		**K3 & K4**

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO CO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2		✓	✓	✓
CO3			✓	✓
CO4			✓	✓
CO5			✓	✓

Subject Title	SYSTEM SOFTWARE INSTALLATION AND CONFIGURING LAB	Semester	II
Subject Code	20U2CSCP04	Specialization	NA
Type	CORE –IV P-IV-PRACTICAL	L:T:P:C	0:0:2:2

COURSE OBJECTIVE

- To gain knowledge about installing operating system and partitioning hard disk and how to install LINUX operating system.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Examine boot disks	K1
CO2	Installation of Windows OS and other OS	K1 K2
CO3	Planning to partition disk drives	K3
CO4	Planning to partition disk drives	K2 K3
CO5	Evaluate OS	K3 K4

Subject Title	SYSTEM SOFTWARE INSTALLATION AND CONFIGURING LAB	Semester	II
Subject Code	20U2CSCP04	Specialization	NA
Type	CORE –IV P-IV-PRACTICAL	L:T:P:C	0:0:2:2

S.No	List of Programs	Level
1	To creating boot disks.	K1
2	Installing a Windows Operating System.	K1 K2
3	Creating drive partitions.	K2
4	Formatting drive partitions.	K2 K3
5	Install and Configure Dual OS Installation.	K3 K4
6	Linux Operating System Installation	K1 K2

Pedagogy : Talk,Demo ……..

MAPPING WITH PROGRAM OUTCOMES

CO/PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓			
CO2			✓	
CO3		✓	✓	
CO4		✓	✓	✓
CO5			✓	✓

Subject Title	**PROGRAMMING IN JAVA LAB**	Semester	III
Subject Code	**20U3CSCP05**	Specialization	NA
Type	**CORE V P-V-PRACTICAL**	L:T:P:C	0:0:4:4

COURSE OBJECTIVE

- Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- Be aware of the important topics and principles of software development.
- Have the ability to write a computer program to solve specified problems.
- Be able to use the Java SDK environment to create, debug and run simple Java programs

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Implement the fundamental concepts and features of Java Programming language	**K1**
CO2	Implements Multiple Inheritance in Java.	**K1**
CO3	Implement Exception Handling in Java	**K2**
CO4	Use and create Packages and Interfaces in a Java program	**K3**
CO5	Develop Graphical User Interface applications and Web based applications in Java by importing applet, AWT	**K3 K4**

Subject Title	**PROGRAMMING IN JAVA LAB**	Semester	III
Subject Code	**20U3CSCP05**	**Specialization**	**NA**
Type	**CORE V P-V-PRACTICAL**	**L:T:P:C**	**0:0:4:4**

List of Programs		Level
1.	Write a Java Applications to extract a portion of a character string and print the extracted string.	**K1**
2.	Write a Java Program to implement the concept of multiple inheritance using Interfaces.	**K1**
3.	Write a Java Program to create an Exception called payout-of-bounds and throw the exception.	**K2**
4.	Write a Java Program to demonstrate the Multiple Selection List-box	**K3**
5.	Write a Java Program to create a frame with four text fields name, street, city and pin ode with suitable tables. Also add a button called"my details", When the button is clicked its corresponding values are to be appeared in the text fields.	**K3 K4**
6.	Write a Java Program to demonstrate the Multiple Selection List-box	**K1**
7.	Write a Java Program to draw circle, square, ellipse and rectangle at the mouse click positions.	**K1**
8.	Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "stop" or "ready" or "go" should appear above the buttons in a selected color. Initially there is no message shown	**K2**
9.	Develop an applet that displays a simple message.	**K3**
10.	Develop an Applet that receives an integer in one text field & compute its factorial value & returns it in another text filed when the button "Compute" is clicked	**K3 K4**

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓
CO2	✓			✓
CO3	✓	✓		✓
CO4		✓		✓
CO5				

Subject Title	**OFFICE AUTOMATION LAB**	Semester	**III**
Subject Code	**20U3CSCP06**	**Specialization**	**NA**
Type	**CORE VI P-VI-PRACTICAL**	**L:T:P:C**	**0:0:2:2**

COURSE OBJECTIVE

- On successful completion of this practical subject students will be trained in MS Word, MS Access, MS power point etc.
- To create a document, biodata, mailmerge using MS-Word.
- To perform basic calculations and create charts and to store the data in table.
- Create a presentation in MS_Powerpoint that is very interactive and legible content.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	To perform documentation	**K1**
CO2	To perform accounting operation	**K1**
CO3	To use drawing and graphics tool	**K2**
CO4	To perform presentation skill	**K2**
CO5	To create database and table	**K3**

Subject Title	OFFICE AUTOMATION LAB	Semester	III
Subject Code	20U3CSCP06	Specialization	NA
Type	CORE VI P-VI-PRACTICAL	L:T:P:C	0:0:2:2

List of Programs		Level
1.	Prepare a student bio – data using MS – Word	K1
2.	Create letters using Mail Merge in MS – Word	K1
3.	Create a word document to implement Table and Sort the data	K1
4.	Create an Excel Worksheet to sort the data	K2
5.	Create an Excel worksheet to implement charts	K2
6.	Create an Excel worksheet to implement Mathematical & Trigonometry functions	K2
7.	Create a slide show for a seminar using power point	K2
8.	Design an advertisement by using power point	K2
9.	Create a student mark list using MS – Access	K3
10.	Create a employee personal information using MS – Access	K3

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO CO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2			✓	
CO3	✓	✓		
CO4		✓	✓	✓
CO5	✓	✓	✓	✓

Subject Title	**RELATIONAL DATABASE MANAGEMENT SYSTEM LAB**	Semester	IV
Subject Code	**20U4CSCP07**	**Specialization**	**NA**
Type	**CORE-VII P-VII-PRACTICAL**	**L:T:P:C**	**0:0:4:4**

COURSE OBJECTIVE

- To create RDBMS Programming skill and to sketch out the hidden talent of students community.

- To construct simple and moderately advanced database queries using structure query language.

- To introduce the concept of table creation, data manipulation, and built in functions.

- PL/SQL is a procedural language used to create applications.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand, appreciate and effectively explain the underlying concepts of database technologies	**K1**
CO2	Design and implement a database schema for a given problem-domain	**K2**
CO3	Normalize a database	**K2**
CO4	Populate and query a database using SQL DML/DDL commands	**K2**
CO5	Programming PL/SQL including stored procedures, stored functions, cursors,packages.	**K2 K3**

Subject Title	RELATIONAL DATABASE MANAGEMENT SYSTEM LAB	Semester	IV
Subject Code	20U4CSCP07	Specialization	NA
Type	CORE-VII P-VII-PRACTICAL	L:T:P:C	0:0:4:4

List of Programs	Level

1. Table Creation
i) Create the table with the following attribute
   Table Name: Employee
   Attributes: Eno (PK), Ename, Dept, Design, Salary, Phone Number
ii) Alter the table employee, adds the column age, community.
	K1

2. 1. Data Manipulation a. Insert the values to the above table b. Display the employee names who is working as "Lecturer" c. Display the table in ascending order Update the table employee; add 20% Bonus to each employee	K2
3. 2. Execute the following queries i) Select ename from employee table such that salary greater than 8000. ii) Select Eno, Ename from employee whose salary between 6000 and 15000. Create a view tick from employee with Ename, Phone, and Department.	K2
4. Write simple queries to implement built in functions	K2
5. Write simple queries using set operations	K2 K3
6. Write PL/SQL queries i) Creation of student information records containing Reg.No, Name, Subject Code, Marks, Course and Grade. ii) Find the Total and average for each student table. iii) Record Manipulations such as deletion, Modification, Addition and counting the record.	K3
7. Writing a PL/SQL Program to find the total amount based on rules similar to the following i) If UNIT <= 100 then Price is 85 paise per UNIT ii) If UNIT >101 and <= 150 then Price is 1.50 paise per UNIT If UNIT > 151 then Price is 2.00 paise per UNIT	K3
8. Write a PL/SQL block to count the number of students in each department. If the count value is greater than 60 in each department, then transfer the excess records into another table department wise. Use exception handler to handle this routine.	K3
9. Write a database trigger to implement the concept of master detail relationship.	K3
10. Write a PL/SQL procedure to design Pay Bill.	K3

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓	✓	✓
CO2	✓	✓	✓	✓
CO3	✓	✓	✓	✓
CO4	✓	✓	✓	✓
CO5	✓	✓	✓	✓

Subject Title	**HTML AND WEB DESIGNING LAB**	Semester	IV
Subject Code	**20U4CSCP08**	Specialization	NA
Type	**CORE-VIII P-VIII-PRACTICAL**	L:T:P:C	**0:0:2:2**

COURSE OBJECTIVE

- To inculcate knowledge on HTML concepts and Programming knowlege.
- Understanding the basic structure of website and ability to build website.
- Students will learn about the how to link pages.
- Learn how to use graphics in webdesign.
- Design and develop the website text,image,link,list and tables for navigation layout.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand the formatting text	**K1**
CO2	Understand word document	**K2**
CO3	To create a Web page with image as hyperlink	**K2**
CO4	Using table creation for mark sheet	**K3**
CO5	Demonstrate web page creation for biodata	**K2**

Subject Title	HTML AND WEB DESIGNING LAB	Semester	IV
Subject Code	20U4CSCP08	Specialization	NA
Type	CORE-VIII P-VIII-PRACTICAL	L:T:P:C	0:0:2:2
List of Programs			**Level**
1	Create a web page illustrating text formatting tags		K1
2	Create a web page to demonstrate font variations		K1
3	Create a web page that describes different types of heading and different paragraph alignment		K1
4	Create a web page with moving text		K1
5	Create a web page with hypertext link to a word document		K2
6	Create a web page with Image as hyperlink		K2
7	Prepare a sample code to illustrate three types of lists in HTML		K2
8	Using Nested tables create your Mark sheet		K3
9	Create a web page to display your Curriculum Vitae		K2
10	Create a form that accepts the information from the subscriber of a mailing system		K2

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2	✓	✓	✓	
CO3	✓	✓		✓
CO4	✓	✓	✓	✓
CO5	✓	✓		✓

Subject Title	VB.NET LAB	Semester	V
Subject Code	20U5CSCP09	Specialization	NA
Type	CORE-IX P – IX PRACTICAL	L:T:P:C	0:0:5:3

COURSE OBJECTIVE

- Design/develop programs with GUI interfaces
- Code programs and develop interface using Visual Basic.Net
- Perform tests, resolve defects, and revise existing code

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Perform a simple application program	K1
CO2	Apply tools for paint brush	K2
CO3	Develop an application using controls	K3
CO4	Develop an application using files	K4
CO5	Developing an application using ADO.NET	K4

Subject Title	VB.NET LAB	Semester	V
Subject Code	20U5CSCP09	Specialization	NA
Type	CORE-IX P - IX PRACTICAL	L:T:P:C	0:0:5:3
List of Programs			**Level**
1	Develop an Image Viewer Application		**K1**
2	Simulate a Scientific Calculator		**K1**
3	Simulate a Paint Brush Application		**K2**
4	Develop a Notepad Editor using Dialog Control		**K3**
5	To Move an object using Timer Control		**K3**
6	Develop a Simple Student Information System Using Files		**K4**
7	Develop a College Admission Form Using MDI		**K4**
8	Validate a Bio – Data Application Form		**K4**
9	Develop an Inventory Control System Using ADO.NET		**K4**
10	Develop a CIA SYSTEM Using Grid Control		**K4**

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	✓		✓	
CO2		✓		
CO3	✓			
CO4	✓		✓	✓
CO5		✓	✓	✓

Subject Title	**OPERATING SYSTEM LAB**	**Semester**	**V**
Subject Code	**20U5CSCP10**	**Specialization**	**NA**
Type	**CORE-X P-X -PRACTICAL**	**L:T:P:C**	**0:0:5:3**

COURSE OBJECTIVE

- To familiarize students with the architecture of Unix OS and provide necessary skills for developing programs in Unix.
- Students can able to understand and appreciate the principles in the design and implementation of operating systems software.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Develop and debug C programs created on UNIX platform and shell programming	**K1**
CO2	Implement file allocation strategies	**K2**
CO3	Implement different kinds of algorithm for detection and recovery	**K2 K3**
CO4	Implement file optimization techniques	**K3**
CO5	Implement threading and synchronization mechanism	**K3**

Subject Title	OPERATING SYSTEM LAB	Semester	V
Subject Code	20U5CSCP10	Specialization	NA
Type	CORE-X P-X -PRACTICAL	L:T:P:C	0:0:5:3

	List of Programs	Level
1	Implement Sequential File Allocation strategies	K2
2	Implement the following CPU scheduling algorithms 1.SJF 2.FCFS	K1
3	Implement Semaphores	K2
4	Implement Bankers Algorithm for Dead Lock Avoidance	K2
5	Implement an Algorithm for Dead Lock Detection	K2
6	Implement FIFO replacement algorithms	K2 K3
7	Implement Interprocess Communication	K2 K3
8	Implement Single Level Directory File Organization Techniques	K2
9	Unix Commands	K1
10	Shell Programming	K1

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓			
CO2	✓			
CO3	✓	✓		
CO4	✓	✓	✓	✓
CO5	✓	✓		✓

Subject Title	**NETWORK LAB**	**Semester**	VI
Subject Code	**20U5CSCP11**	**Specialization**	NA
Type	**CORE–XI P–XI– PRACTICAL**	**L:T:P:C**	**0:0:6:4**

<u>COURSE OBJECTIVE</u>

- To create Network Programming skill and to sketch out the hidden talent of students community.
- To understand the working principle of various communication protocols.
- To analyze the various routing algorithms
- To know the concept of data transfer between client/server

<u>COURSE OUTCOMES</u>

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Detecting errors by applying different methods	**K3 K4**
CO2	Implement Asynchronous communication	**K3 K4**
CO3	Implement protocol for different user specifications	**K3 K4**
CO4	Apply algorithm to solve real time problems	**K4**
CO5	Implement client server communication through file transfer	**K2**

Subject Title	NETWORK LAB	Semester	VI
Subject Code	20U5CSCP11	Specialization	NA
Type	CORE–XI P–XI– PRACTICAL	L:T:P:C	0:0:6:4

	List of Programs	Level
1	Write a program to Detect Errors using Cyclic Redundancy Check (CRC)	**K3 K4**
2	Write a program to implement Stop & Wait Protocol	**K3 K4**
3	Write a program to implement Sliding Window Protocol	**K3 K4**
4	Write a program to implement the Shortest Path Routing using Dijkstra algorithm	**K3 K4**
5	Write a Socket Program to Perform file transfer from Server to the Client	**K3 K4**
6	Write a Program to implement Remote Procedure call under Client / Server Environment	**K3 K4**
7	Write a program for implementing Client-Server chat using TCP.	**K3 K4**
8	Write a program for implementing chat program using UDP.	**K4**
9	Write a program for the simulation of Domain Name System	**K2**
10	Write a program to implement RSA algorithm	**K2**

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

PSO / CO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2	✓		✓	
CO3	✓	✓		✓
CO4	✓	✓	✓	✓
CO5	✓	✓	✓	✓

Subject Title	**PHP PROGRAMMING – LAB**	Semester	VI
Subject Code	**20U6CSCP12**	Specialization	NA
Type	**CORE–XII P–XII – PRACTICAL**	L:T:P:C	**0:0:6:4**

COURSE OBJECTIVE

- To develop an ability to design and implement static and dynamic website.
- Gain the PHP programming skills needed to successfully build interactive, data-driven sites.
- Test and debug a PHP application programs.
- Working with regular expressions, hashing functions, and date and time functions
- Students will develop practical skills , design and implementation of software based projects.

COURSE OUTCOMES

On the successful completion of the course the student will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	To understand the basic concepts of PHP	**K1**
CO2	Implement using controls and functions	**K3 K4**
CO3	Solve real time problems	**K3 K4**
CO4	To understand the validation of input and output	**K4**
CO5	Implement Hashing function for different user specifications	**K3 K4**

Subject Title	**PHP PROGRAMMING – LAB**	**Semester**	VI
Subject Code	**20U6CSCP12**	**Specialization**	NA
Type	**CORE–XII P–XII – PRACTICAL**	**L:T:P:C**	**0:0:6:4**

	List of Programs	Level
1	Write a PHP Program to display the Display "Hello" and today's date	**K1**
2	Develop a PHP program using controls and functions	**K3 K4**
3	Develop a PHP program and check message passing mechanism between pages	**K2**
4	Develop a PHP program using String function and Arrays	**K3 K4**
5	Database connectivity in PHP with MySQL	**K3 K4**
6	Develop a PHP program to display student information using MYSQL table	**K3 K4**
7	Develop a PHP program to design a college application form using MYSQL table	**K3 K4**
8	Develop a PHP program Validating Input and Formatting the Output	**K4**
9	Develop a PHP program and check Regular Expression, HTML functions, Hashing functions	**K3 K4**
10	Develop a PHP program and check File System functions, Date and time functions	**K3 K4**

Pedagogy : Talk, Demo…

MAPPING WITH PROGRAM OUTCOMES

CO \ PSO	PSO1	PSO2	PSO3	PSO4
CO1	✓	✓		
CO2	✓	✓	✓	
CO3	✓	✓	✓	
CO4	✓	✓	✓	✓
CO5	✓	✓	✓	✓

Programme	**B.Sc**	Programme Code		**101**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**1**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U1CSC01	COMPUTER FUNDAMENTALS AND C PROGRAMMING	5	0	0	5	25	75	100

COURSE OBJECTIVES	On successful completion of this subject the students have the computer fundamentals and programming ability in C Language

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Recall the concept of computer system and its components
CO 2	Conversion of number systems and illustrate the logic gates using Boolean Algebra
CO 3	Understand the basic concept of C Programming
CO 4	To Develop Programs using Branching and Looping statements, Usage of arrays and functions
CO 5	To Explore the concept of pointers, structures, union and flies in C
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	1	PO 1	2
		PO 2	2
		PO 3	2
CO 2	2	PO 4	1
		PO 5	2
		PO 6	3
CO 3	1	PO 7	3
		PO 8	4
		PO 9	2
CO 4	3	PO 10	6
		PO 11	6
		PO 12	5
CO 5	4	PO 13	2
		PO 14	2
		PO 15	2

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	3	2	1	1	1	2	1	1	1	2	2	2
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	3	3
CO3	2	2	2	3	2	1	1	1	2	1	1	1	2	2	2
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	2	2
CO5	1	1	1	1	1	2	2	3	1	1	1	2	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 computers	Periods	12
	Introduction - Characteristics - Generation of computers - Classification of digital computer system - Functions & Components of computer system - Memory units - Input devices: Keyboard - mouse - OCR - OMR - Touch screen. Output Devices: Monitor - Printer: Dot matrix, laser printer.		
Unit - II	Number System	Periods	12
	Decimal - Binary - Octal - Hexadecimal number system - Conversion - Binary Addition - Binary Subtraction - Complements - BCD - ASCII Code - EBCDIC Code. Boolean Algebra & Gate network: AND - OR - NOR - NAND - XOR Gates. Demorgans Theorem.		
Unit - III	Overview of C	Periods	12
	Introduction - Basic structure of C programs - Character set - C Tokens - Keywords & Identifiers - Constant - Variables and its types - Operators & expressions - Type conversions in expressions - Managing Input & Output Operations.		
Unit - IV	Decision Making & Branching Statements	Periods	12
	IF - IF-else - Nesting of IF-else - Switch - GOTO Statement. Looping Statement: While - Do..While statement - For statement. Arrays: Definition & Declaration - Simple Array - One dimensional - Multi dimensional. String Handling. Function: Introduction - Function calls - Function declarations & Return types - Recursion.		
Unit - V	Structures & Unions	Periods	12
	Defining a structure - Declaring structure variables - Accessing structure members - structure Initialization. Unions. Pointers: Introduction - Understanding pointers - Accessing the address of a variable - Initializing of pointer variables. File Management: Introduction - Defining & Opening a file - Closing a file - Input / Output Operation on files.		
	Total Periods		60

Text Books	
1	"Fundamentals of Computer Science & Communication Engineering". Alexis Leon, Mathew Leon, Vikas Publishing house, New Delhi, 2012 (Unit I: Chapters 2, 3, 4, 6, 7, 8, 9 & 10)
2	"Digital Computer Fundamentals" Thomas C Bartee, 6th Edition TMH Publisher, New Delhi, 2011 (Unit II: Chapters 2 & 3).
3	"Programming in ANSI C", E. Balagurusamy Tata MC Graw hill, New Delhi, 4th Edition, 2012. (Unit III: Chapters 1, 2, 3 & 4 Unit IV: Chapters 5, 6, 7, 8 & 9 Unit V: Chapters 10,11&12)
References	
1	"The C programming language" Brain W.Kernighan, Dennis M.Ritchie, 2009.
2	"C Programming: A Modern Approach", K.N.King, 2010.
E-References	
1	www.tutorialspoint.com/cprogramming/
2	www.programiz.com/c - programming

Signature of BOS Chairman

<table>
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	VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)	
	Elayampalayam, Tiruchengode-637 205.	

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**2**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U2CSC02	PROGRAMMING IN C++ AND DATA STRUCTURES	4	0	0	4	25	75	100

COURSE OBJECTIVES	On successful completion of this subject the students have to master all techniques of software developmentin C++ Programming Language and to demonstrate these techniques by implementing the solution for variety of problems

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

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	Explain the organization and operations of data structures Stack, Queues, Trees.
CO 5	Demonstrate specific trees and sorting algorithms using data structures given specific user requirements
Pre-requisites	Student must know about C and Basic knowledge on Computers

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

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	3	2	1	1	1	2	1	1	1	3	1	2
CO2	3	3	3	2	3	2	2	1	3	1	1	1	2	1	3
CO3	2	2	2	1	2	3	1	2	2	1	1	1	1	1	2
CO4	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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	Programming in C++: Introduction		Periods	12
	Programming in C++: Introduction - Basic concepts of OOP - Applications of OOP - What is C++? - Applications of C++ - Structure of C++ program - Tokens - Keywords - Identifiers and constants - Data types - symbolic constants - Operators - Manipulators - Control Structures - Arrays.			
Unit - II	Functions in C++		Periods	12
	Functions in C++: Main Function - Function prototyping - call and return by reference - Inline Functions -Function overloading - Friend and virtual functions. Class and Objects: Introduction - Specifying a class -Defining Member Functions - C++ program with class - Memory allocation for objects - static data members - static member functions - Returning objects. Constructors - Default Constructors - Parameterized Constructors - Copy Constructors - Dynamic Constructors - Destructors			
Unit - III	Operator Overloading		Periods	12
	Operator Overloading: Introduction - Overloading Unary, Binary Operators - Manipulation of strings usingOperators - Type Conversions - Inheritance - Defining derived classes - single inheritance - multilevel inheritance - multiple inheritance - hierarchical inheritance - hybrid inheritance - virtual base class - this pointer - virtual functions.			
Unit - IV	Data Structures		Periods	12
	Introduction– Definition – Stacks: Representation of Stacks – Operations on Stacks – Applications of Stack. Queues: Introduction – Definition – Representation on Queues. Linked List: Definition; Single Linked List: Representation, operations; Double Linked Lists– Circular Linked Lists.			
Unit - V	Trees		Periods	12
	Trees: Concepts – Tree Traversals – Representation of Binary Tree – Operations on Binary Tree – Types of Binary Tree; Sorting: Insertion sort – Bubble sort – Selection sort – Quick sort – Heap sort.			
	Total Periods			60

Text Books	
1	"Object Oriented Programming with C++", E.Balagurusamy 2011. (Unit I: Chapters 1, 2 & 3 Unit II: 4,5&6, Unit III: Chapters 7, 8, 9, 12 & 13)
2	2. "Data Structures and Algorithms", Alfred V. Aho, Murray Hill, John E.Hopcroft, Jeffrey D.Ullman, 2009. (Unit IV: Chapter 2, Unit " V: Chapter 3)
References	
1	1. "The C programming language" Brain W.Kernighan, Dennis M.Ritchie, 2009.
2	2. "C Programming: A Modern Approach" By K.N.King, 2010.
E-References	
1	www.tutorialspoint.com/cprogramming/
2	www.programiz.com/c - programming

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**	Regulations	**2020-2021**
Department	**Computer Science**		Semester			**3**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U3CSC03	JAVA PROGRAMMING	4	4		5	25	75	100

COURSE OBJECTIVES	The model of object oriented programming: abstract data types, encapsulation, inheritance and polymorphism. Fundamental features of an object oriented language like Java: object classes and interfaces,exceptions and libraries of object collection

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the programâ€™s student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Identify classes, objects, members of a class and relationships among them needed for a specific problem
CO 2	Demonstrate OOP principles and proper program structuring
CO 3	Demonstrate the concepts of polymorphism and inheritance
CO 4	Demonstrate program structure using applet
CO 5	Demonstrate the concepts of AWT,Files and Streams
Pre-requisites	STUDENTS HAD TO GET

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	1
		PO 3	1
CO 2	2	PO 4	1
		PO 5	1
		PO 6	1
CO 3	2	PO 7	1
		PO 8	1
		PO 9	1
CO 4	3	PO 10	1
		PO 11	1
		PO 12	1
CO 5	3	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	3	3	3	3	3	3	1	3	3	3	3	3	3	3	3
CO2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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	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	Periods	12	
	Extending a class -Overriding methods. Interfaces: Defining Interface-Extending Interface. Packages: Java API package-creating package-Accessing Package			
Unit - IV	Applet Programming	Periods	12	
	Building Applet Code-Applet Life Cycle-Designing a web page-Applet Tag-Running the Applet. Graphics Programming: The Graphics Class - Lines and Rectangle-Drawing Arcs-Drawing polygons-Line graphics-Drawing bar Chart			
Unit - V	AWT Event Handling	Periods	12	
	Introduction to AWT package-Introduction to swings. Input/Output Files: Introduction to Files and Streams			
	Total Periods		60	

Text Books	
1	1. Balagurusamy, "Programming in Java", 4th Edition 2010, TMH, New Delhi.
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

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**3**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U3CSS01	OFFICE AUTOMATION	2	2		2	25	75	100

COURSE OBJECTIVES	To provide knowledge in the field of office automation and to sketch out the hidden talent of students towards the same. Office automation refers to the varied computer machinery and software used to digitallycreate, collect, store, manipulate.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Understand the basic concepts of MS-Word
CO 2	Understand the basic concepts of MS-Excel
CO 3	Understand the basic concepts of MS-Powerpoint
CO 4	Understand and Implement the basic concepts of MS-Access
CO 5	Understand the basic concepts of MS-Frontpage
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	2	PO 1	2
		PO 2	2
		PO 3	2
CO 2	2	PO 4	1
		PO 5	2
		PO 6	3
CO 3	2	PO 7	3
		PO 8	4
		PO 9	2
CO 4	3	PO 10	6
		PO 11	6
		PO 12	5
CO 5	2	PO 13	2
		PO 14	5
		PO 15	2

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	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO3	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	3	3	3	2	3	2	2	1	3	1	1	1	3	1	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	MS-WORD		Periods	4
	Introduction to Ms - Office.MS - word: Introduction to Word Basics - Commands - Copying and MovingText - Working with Text - Find and Replace - Formatting Text - Mail Merge - Table - Spell Check and Grammar			
Unit - II	MS-EXCEL		Periods	4
	Excel Basics - Introduction - Menus - Toolbars - Icons - Opening Excel - Cells - Entering and Editing Data - Creation of Chart - Naming Formulas - Functions			
Unit - III	MS-POWERPOINT		Periods	4
	Introduction - Menus - Toolbars - Creating and Editing Slides - Working with PowerPoint			
Unit - IV	MS-EXCESS		Periods	4
	Introduction - Starting Microsoft Access - Creating New Database - Opening Existing Database - Access Database Wizards - Tables - Creating Query			
Unit - V	MS-FRONTPAGE		Periods	4
	Introduction - Menus - Toolbars - Creating Webpage - With Wizard - Hyperlinks			
	Total Periods			20

Text Books	
1	"MS OFFICE 2000 for Everyone", Sanjay Saxena, Vikas Pub. House New Delhi, 2010.
References	
1	"Step by Step 2007 Microsoft Office System", Joyce Cox & Team , PHI Learning Private limited, New Delhi, 2009
E-References	
1	www.tutorialspoint.com/word/
2	www.officeskills.org/microsoft - office - tutorials.html
3	www.microsoft.com/en - us/learning/training.aspx

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**4**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U4CSC04	RELATIONAL DATABASE MANAGEMENT SYSTEMS	4	0	0	5	25	75	100

COURSE OBJECTIVES	To inculcate knowledge on RDBMS concepts and Programming with Oracle. To understand a roleof database management system in an organization. To construct simple and moderately advanced database queries using structure query language.
POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

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	Need Knowledge about basic DataBase concepts.

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

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

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO3	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO4	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO5	2	2	2	1	2	3	1	2	2	1	1	1	2	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 DBMS		Periods	12
	Information - Data and Data Management - File based data management - Organization of a database - Characteristics of a data in a database - DBMS: Benefits of DBMS - Functions of DBMS - Components ofDBMS - data dictionary - data base users.Data Base Architecture and Design: Introduction - Data base architecture - data abstraction - ANSI/SPARC Architecture - Database Language - Data base Design - Design Constraints.			
Unit - II	Data Models		Periods	12
	Introduction - Types - Comparison between the various model Entity Relationship Model: Introduction - ER Model - Components of ER model - ER diagram conversions - Relationships - Composite entities - Entity list - ER diagrams - ER modeling symbols			
Unit - III	RDBMS		Periods	12
	Introduction - RDBMS terminology - relational data structure - codd's rules - Relational data integrity and database constraints: Introduction - Integrity constraint - Data Normalization: Introduction - Types of Normal forms - Pitfalls in Relational Database Design - Decomposition - Functional Dependencies - Denormalization. Relational Algebra: Introduction - Relational Algebraic Operations - Aggregate functions - update operations. Relational calculus: Introduction - tuple relational calculus - domain relational calculus.			
Unit - IV	SQL		Periods	12
	Introduction - history of SQL - characteristics of SQL - Advantages of SQL - SQL data types and literals -Types of SQL commands - SQL operators - Tables, views and Indexes: Introduction - Views - Indexes. Aggregate functions - INSERT, UPDATE and DELETE operations - join and union			
Unit - V	PL/SQL		Periods	12
	Programming language: History - Fundamentals - Block structure - commends - Data types - other data types - Declaration - Assignment operation - Bind variables - Substitution variables - printing.Pl/SQL cursor and exceptions - PL/SQL Composite data types: Records - Tables. PL/SQL Named block: Procedure - Function - Package - Triggers.			
	Total Periods			60

Text Books	
1	"Fundamentals of Data base management System", Alexix Leon and Mathew Leon, TMH Publications, 2010. (Chapter 1, 2,3,4,5,6,7,8,9,10,11)
2	"Database system using ORACLE", Nilesh Shah, PHI publication, 2nd Edition, 2010 (Chapter 10,11,12,13,14).
References	
1	Database System Concepts Silberschatz, Korth, MCH International, Sixth Edition, 2010.
E-References	
1	www.w3schools.com
2	www.techfaq360.com
3	www.databasedir.com

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**	Regulations	**2020-2021**
Department	**Computer Science**			Semester		**4**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U4CSS02	HTML AND WEB DESIGNING	2	0	0	2	25	75	100

COURSE OBJECTIVES	To inculcate knowledge on HTML concepts and Programming knowlege. To understand basic concepts of style sheets and graphics. Students will learn about image types and use cases. Understanding the basic structure of website.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the programs student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

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	Basic knowledge of web

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO3	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO4	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO5	3	3	3	2	3	2	2	1	3	1	1	1	3	1	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	HTML Basics	Periods	4
	Understanding HTML - Setting Up the Document Structure - Formatting text by Using Tags - Using Lists and Backgrounds - Creating Hyperlinks and Anchors.		
Unit - II	Style Sheets and Graphics	Periods	4
	Introduction to Style Sheets - Formatting Text by using Style Sheets - Formatting Paragraphs by using Style Sheets.		
Unit - III	Displaying Graphics	Periods	4
	Selecting a graphics format - Preparing graphics for web use - Inserting graphics - Arranging elements on the page - Controlling image size and Padding - Hyper linking from graphics - Utilizing Thumbnail graphics - Including alternate text for graphics.		
Unit - IV	Navigation	Periods	4
	Creating Navigational Aids - Creating Tables - Formatting Tables		
Unit - V	Layouts	Periods	4
	Creating Division - based Layouts - Creating User Forms - Using Frames for layout - Incorporating Audio and Video.		
	Total Periods		20

Text Books	
1	1."Microsoft Step by Step HTML and XHTML", Faithe Wempen. PHI, 2009
References	
1	1."Web design with HTML", C. Xavier, TMH Publisher, 2000
E-References	
1	www.w3schools.com/html/
2	www.w3schools.com/html/html_responsive.asp
3	www.how - to - build - websites.com/

Signature of BOS Chairman

<table>
<tr><td colspan="8">VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)
Elayampalayam, Tiruchengode-637 205.</td></tr>
</table>

Programme	**B.Sc**	Programme Code		**UCS**	Regulations		**2020-2021**
Department	**Computer Science**			Semester			**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSC05	VB.NET	5	0	0	5	25	75	100

COURSE OBJECTIVES	Introduction to Networking and the world wide web. Building multi-tier enterprise applications. Introduction to the .NET framework .NET Interoperation services. Client side programming: HTTP, CGI, Cookies, JavaScript, HTML, XML.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Explain the overview of .NET framework
CO 2	Explain the classes ,objects & control statements
CO 3	Explain objects and Inheritance
CO 4	Perform Exception Handling mechanism and Multithread
CO 5	Understand database connectivity that can be applied in different applications
Pre-requisites	BASICS ABOUT VB CODING

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO3	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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	Net Framework And Vb.Net	Periods	12
	Evolution of the .NET Framework - Overview of the .Net Framework - VB.NET - Simple VB.Net Program.Variables, Constants And Expressions: Value Types and Reference Types - Variable Declarations and Initializations - Value Data Types - Reference Data Types - Boxing and Un boxing - Arithmetic Operators- Textbox Control - Label Control - Button Control.		
Unit - II	Control Statements	Periods	12
	If Statements - Radio Button Control - Check Box Control - Group Box Control - Listbox Control - Checked List Box Control - Combo box Control - Select Case Statement - While Statement - Do Statement - For Statement. Methods And Arrays: Types of Methods- One Dimensional Array - Multi Dimensional Arrays - Jagged Arrays. Classes: Definition And Usage of a Class - Constructor Overloading - CopyConstructor - Instance and Shared Class Members - Shared Constructors.		
Unit - III	Inheritance And Polymorphism	Periods	12
	Virtual Methods - Abstract Class and Abstract Methods - Sealed Classes. Interfaces, Namespaces And Components: Definition of Interfaces - Multiple Implementations of Interfaces - Interface Inheritance - Namespaces - Components - Access Modifiers. Delegates, Events And Attributes: Delegates - Events- Attributes - Reflection.		
Unit - IV	Exception Handling	Periods	12
	Default Exception Handling Mechanism - User Defined Exception Handling Mechanism - Throw Statement - Custom Exception. Multithreading: Usage Of Threads - Thread Class - Start(), Abort(), Join(), and Sleep() Methods - Suspend() And Resume() Methods - Thread Priority - Synchronization. I/O Streams: Binary DataFiles - Text Files - Data Files - FileInfo and DirectoryInfo Classes.		
Unit - V	Additional Controls	Periods	12
	Timer - ProgressBar - LinkLabel - Panel - TreeView - Splitter - Menu - SDI & MDI - Dialog Boxes - Toolbar - StatusBar. Database Connectivity: Advantages Of ADO.NET - Developing a Simple ADO.NET Based Application		
	Total Periods		60

Text Books	
1	1. C.Muthu "Visual Basic.Net" McGraw-Hill Education(India) Pvt.Ltd Reprint 2012 (Unit I : Chapter 1.2, 1.3, 1.5, 1.6, 3.2 to 3.10), (Unit II Chapter 4.2 to 4.12, 5.2 to 5.6 6.2 to 6.6), (Unit III Chapter 7.2 to 7.4,8.2 to 8.7, 9.2 to 9.5), (Unit IV Chapter 10.2 to 10.6, 11.2 to 11.7, 12.3 to 12.6), (Unit V Chapter 14.3 to 14.14,15.2 to 15.8)
References	
1	1. David S Platt, "Introducing Microsoft .Net", Prentice Hall of India, New Delhi, 2003.
2	2. David Chappell, Understanding .Net, Addison-Wesley Professional; 2 Edition,2006
E-References	
1	www.Vb-informations.com
2	www.vbcodesource.com/netlinks.php
3	www.ni.com

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**	Regulations	**2020-2021**
Department	**Computer Science**			Semester		**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSC06	Operating Systems	5	0	0	4	25	75	100

COURSE OBJECTIVES	Enable the student to get sufficient knowledge on various system resources. Understand the structure and functions of OS. Learn about Processes, Threads and Scheduling algorithms. Understand the principles ofconcurrency and Deadlocks.
POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real lifeproblems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's studentoutcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web sitedevelopment and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society

COs	COURSE OUTCOME
CO 1	Describe and explain the fundamental components of a computer operating system
CO 2	Explain the policies for deadlock
CO 3	Design and construct the OS components by system calls, schedulers, Memory Management system
CO 4	Discuss about the implementation of file system
CO 5	Discuss about LINUX operating system
Pre-requisites	Basic knowledge of computers.

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO3	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	2	2	2	1	2	3	1	2	2	1	1	1	2	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	Periods	12
	OS goals and functions - History of operating system- Different kinds of operating system- Computer hardware review - Operation system concept- System calls-Operating system structure.		
Unit - II	Processes and Threads	Periods	12
	Processes - threads - thread model and usage - inter process communication; Deadlocks: Resources- introduction to deadlocks - deadlock detection and recovery - deadlocks avoidance - deadlock prevention.		
Unit - III	Memory management	Periods	12
	Basis memory management - virtual memory - page replacement algorithms; Input/Output: principles of I/O hardware - principles of I/O software.		
Unit - IV	Files systems	Periods	12
	Files - directories - files systems implementation; Multiple processor system: multiprocessors - multi computers - distributed systems.		
Unit - V	Case Study : Unix and Linux	Periods	12
	Overview of Unix: Goals – Interfaces to Unix – The Unix Shell – Unix Utility Programs – Input/output in UNIX: Fundamental Concepts - Input/output System Calls in UNIX – The Unix File System: Fundamental Concepts – File System calls in UNIX		
	Total Periods		60

Text Books	
1	1. Modern Operating Systems–, Second Edition, Andrew S. Tanenbaum, PHI private Limited, New Delhi, 2008 ,Linux Learning the Essentials–,K.L.James, PHI.
References	
1	1. Operating Systems Internals & Design Principles, William Stallings. Prentice " Hall of India P.Ltd New Delhi 110001. 5th Edition&3)
2	2. Operating Systems W.Mary Maggdalene Viola ,V.Mahalakshmi,Charulatha Publications
E-References	
1	www.businessinsider.com
2	www.vnsgu.ac.in

Signature of BOS Chairman

<table>
<tr><td colspan="4" align="center">VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.</td></tr>
</table>

Programme	**B.Sc**	Programme Code		**UCS**	Regulations		**2020-2021**
Department	**Computer Science**			Semester			**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSS03	SOFT SKILLS	2	2	0	2	25	75	100

COURSE OBJECTIVES	Develop their communicative competence in English with specific reference to speaking and listening. Enhance their ability to communicate effectively in interviews.Strengthen their prospects of success in competitive examination.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To develop communication skills and to know about the stages of communication
CO 2	To understand 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	Students have a basic knowledge about interview skills,reading,writing,listing,speaking skills.

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

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	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	1	2	1	3	1
CO4	1	1	1	1	1	2	2	3	1	1	1	2	1	3	1
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	3	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	4
	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	4
	Types of listening - Listening with a purpose - Barriers to listening - The speech process - Conversion and oral skills - Body language.			
Unit - III	Job interviews		Periods	4
	Pre - interview preparation techniques - Interview questions - Answering strategies - Frequently asked interview questions - Projecting a positive image - Alternative interview formats.			
Unit - IV	Group Discussion		Periods	4
	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	4
	Planning the presentation - Preparing the presentation - Organizing your presentation - Rehearsing the presentation - Improving delivery			
	Total Periods			20

Text Books	
1	Effective Technical Communication , M. Ashraf Rizvi, Tata McGraw Hill Publishing Company Limited , New Delhi.
References	
1	Soft Skills - Enhancing Employability: Connecting Campus with Corporate,M.S.Rao,I.K.International Publishing House Pvt.Ltd,New Delhi,2010.
E-References	
1	https://www.thebalancecareers.com Finding a Job Job Searching Resumes
2	https://en.wikipedia.org/wiki/Soft_skills

Signature of BOS Chairman

COs	COURSE OUTCOME
CO 1	To develop communication skills and to know about the stages of communication
CO 2	To understand 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	Development of Communication Skill

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

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	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO2	2	2	2	3	2	1	1	1	2	1	1	1	2	1	2
CO3	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO4	1	1	1	1	1	1	1	2	1	2	2	3	1	3	1
CO5	1	1	1	1	1	1	1	1	1	3	3	2	1	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	Nature of technical communication	Periods	4	
	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	4	
	Types of listening - Listening with a purpose - Barriers to listening - The speech process - Conversion and oral skills - Body language.			
Unit - III	Job interviews	Periods	4	
	Pre - interview preparation techniques - Interview questions - Answering strategies - Frequently asked interview questions - Projecting a positive image - Alternative interview formats.			
Unit - IV	Group Discussion	Periods	4	
	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	4	
	Planning the presentation - Preparing the presentation - Organizing your presentation - Rehearsing the presentation - Improving delivery			
	Total Periods		20	

Text Books	
1	Effective Technical Communication , M. Ashraf Rizvi, Tata McGraw Hill Publishing Company Limited , New Delhi.
References	
1	Soft Skills - Enhancing Employability: Connecting Campus with Corporate,M.S.Rao,I.K.International Publishing House Pvt.Ltd,New Delhi,2010.
E-References	
1	https://www.thebalancecareers.com Finding a Job Job Searching Resumes
2	https://en.wikipedia.org/wiki/Soft_skills

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**	Regulations		**2020-2021**
Department	**Computer Science**			Semester			**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSC07	COMPUTER NETWORKS	5	0	6	4	25	75	100

COURSE OBJECTIVES	To understand the basics of Computer Networks. To understand the layers of Computer Networks. Become familiar with the basics of Computer Network architectures and protocols
POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real lifeproblems
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the programÃ¢â¬â„¢s studentoutcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior
PO 15	Ability to communicate effectively in both verbal and written form in industry and society

COs	COURSE OUTCOME
CO 1	Describe the functions of each layer in OSI Model
CO 2	Explain the types of transmission media that are applied in real time applications
CO 3	Describe the functions of data link layer design issues and its services
CO 4	Classify the routing algorithm and analyze how to assign the IP addresses for the give network
CO 5	Describe the transport layer , application layer and how to secure data
Pre-requisites	Basics of Networks

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

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	3	2	1	1	2	1	1	1	1	2	1	2
CO2	2	2	2	3	2	1	1	2	1	1	1	1	2	1	2
CO3	3	3	3	2	3	2	2	3	1	1	1	1	3	1	3
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	1	1	1	1	1	2	2	1	3	1	1	2	1	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	Introduction	Periods	12
	Business Applications - Home Applications - LAN - WAN- MAN- Protocol Hierarchies - Protocols andStandards-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 - Protocols Verification		
Unit - IV	Network Layer	Periods	12
	Network Layer: Network Layer Design Issues. Routing Algorithms: Shortest Path- Link State - Distance Vector. Quality of Service: Application Requirement - Packet Scheduling-Internetworking		
Unit - V	Transport Layer	Periods	12
	Transport Layer: Transport Services - Elements of Transport protocols - Application layer: DNS-Electronic mail-World Wide Web. Network Security: Cryptography-Symmetric and Public-key algorithms-Digital signatures.		
	Total Periods		60

Text Books	
1	"Computer Networks" Andrew S. Tanenbaum, Fifth edition, PHI private Ltd, New Delhi , 2009.
References	
1	Behrouz A. Forouzan, " Data Communication and Networking", Tata MC- Hill, 2009.
2	William Stallings, Data and Computer Communication, 8th Edition, Pearson Education, 2003 / PHI.
E-References	
1	https://en.wikipedia.org
2	https://www.tutorialspoint.com
3	https://www.coursera.org

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSC08	PHP PROGRAMMING	5	0	0	4	25	75	100

COURSE OBJECTIVES	How to Write Coding in PHP, Learn MySQL server as a backend. To Use the Connectivity of PHP with MySQL. PHP is a server-side scripting language, mainly used for web development to create dynamiccontent that interact with databases.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the programâ€™s student outcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Understand the basic concepts PHP
CO 2	Execute Queries using PHP
CO 3	Implement Functions and Arrays in PHP
CO 4	Apply OOPS concepts in PHP
CO 5	Implement Web Forms
Pre-requisites	knowledge about basic html, knowledge about mysql

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO4	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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			
	Introduction to PHP	Periods	12
Unit - I	History - General Language Features - PHP Basics: Embedding PHP Code in your Web Pages - Commanding Your Code - Output Data to the Browser. PHP Supported Data Types - Identifiers - Variables - Constants - Expressions - String - Interpolation. Control Structures: Conditional Statements - Looping Statements - File Inclusion Statements		
	Introduction to MySQL	Periods	12
Unit - II	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.		
	Functions & Arrays	Periods	12
Unit - III	Invoking a Function - Creating a Function - Function Library. Arrays: Creating an Array - Adding and Removing Array Elements - Locating Array Elements - Traversing Array - Merging - Slicing - Splicing andDissecting Array.		
	Object Oriented PHP	Periods	12
Unit - IV	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 - Installing 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, 2008
2	"PHP 6 and my SQL 5 ", Larry Ullman, 2008
References	
1	"Spring into PH5 the Small Professional choice", Steven Holzner, Pearson education, 2006.
2	"PHP and my SQL for dynamic websites", Larry Ullam, Fourth Edition, 2015
3	"PHP 6 and my SQL", Tim converse, Joy Park, 2009.
E-References	
1	www.6.470.scripts.mit.edu/2013/assets/resources/php_ppt.pdf
2	www.msu.ac.zw/elearning/material/1296460382php%20module.pdf
3	www.tutorialspoint.com/php/php_tutorial.pdf
4	www.downloads.mysql.com/docs/apis - php - en.pdf

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSS04	Java Script and VB Script	2	0	0	2	25	75	100

COURSE OBJECTIVES	To understand the essentials of Java scriptTo understand the features of VB scriptTo improve the web designing skill of the students
POs	**PROGRAMME OUTCOME**
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
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PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To understand the basic concept of Java Script
CO 2	To understand functions and objects in Java Script
CO 3	To analyze the flow of data with conditions and loops
CO 4	To learn the basic concepts of VB Script
CO 5	Examine the types of error handling and debugging
Pre-requisites	Introduction about Java and VB

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

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	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO2	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO3	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO4	3	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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	Understanding JavaScript	Periods	4	
	Learning Web Scripting Basics - How Java Script fits into a Web page - Browsers and JavaScript. Creating Simple Scripts: Tools for Scripting - Beginning the Script - Adding JavaScript Statements - Creating Output.			
Unit - II	Using Variables, String and Arrays	Periods	4	
	Using Variables - Expressions and Operators - Data Types in JavaScript - String Objects - Using Numeric and String Arrays. Functions and Objects: Using Functions - Introducing Objects - Using Objects tosimplify Scripting - Extending Built-in Objects.			
Unit - III	Controlling Flow with Conditions and Loops	Periods	4	
	The if Statement - Using Shorthand Conditional Expressions - Testing Multiple Conditions with If and Else - Using Multiple Conditions with switch - Using for Loops - Using While Loops - Using Do . . While Loops. Using Built-in Functions and Libraries: Using the Math Object - Working with Math Functions.			
Unit - IV	What VB Script Is and Isnt?	Periods	4	
	VB Script is Scripting Language-Advantage of using VB Script-VB Script Fits in with the Visual Basic Family-What Can You Do with VB Script? Data Types: The Variant, VB Script Only Data Type-Arrays asComplex Data Types. Variables and Procedures: Naming Variables-Procedures and Functions-By Ref and By Val.			
Unit - V	Error Handling and Debugging	Periods	4	
	Types of Errors-Error Visibility and Context-Handling Errors. Classes in VB Script (Writing Your Own COM Objects): Objects, Classes, and Components-The Class Statement- Defining Properties- DefiningMethods- Class Events.			
	Total Periods		20	

Text Books	
1	Teach Yourself Java Script in 24 Hours by Michael Moncur, Fourth Edition, published by Pearson Education.
2	VB Script Programmers Reference by Adrian Kingsley-Hughes, Kathie. Kingsley-Hughes, Daniel Read, Wrox Publishing, Third Edition 2007.
References	
1	Microsoft VB Script: Step by Step by Ed Wilson,Microsoft Press,2007
2	JavaScript by Joel Murach and Michael Urban, 2nd Edition, 2010
E-References	
1	www.w3schools.com
2	www.tutorialspoint.com
3	msdn.microsoft.com

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSE01	COMPUTER GRAPHICS	4	4		3	25	75	100

COURSE OBJECTIVES	The goal of this course is to provide an introduction to the theory and practice of computer graphics. The course will assume a good background in programming in C or C++ and a background in mathematicsincluding familiarity with the theory and

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the programâ€™s student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Understanding the basic concepts of Computer Graphics and generating algorithms.
CO 2	Exploring the different attributes types along with the basic transformations.
CO 3	Able to understand about the principles of 2D Viewing concepts along with the various clipping levels.
CO 4	To easy recognize and find the way for Designing Models.
CO 5	To create an significance in Animation process
Pre-requisites	To Understand about various aspects of graphical representation using 3d, 4d animation techniques

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

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	3	3	2	3	2	2	1	3	1	1	1	3	1	3
CO2	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO3	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO4	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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	INTRODUCTION TO COMPUTER GRAPHICS			Periods	12
	GUI - Video Display Devices - CRT - Raster and Random scan displays - Input Devices - Hard Copy Devices - Line Drawing Algorithm - DDA Algorithm - Line Function - Circle Generating Algorithm.				
Unit - II	ATTRIBUTES OF OUTPUT PRIMITIVES			Periods	12
	Line Attributes - Curve Attributes - Color and Gray Scale Levels -Area Fill Attributes - Character Attributes - Bundled Attributes. TWO DIMENSIONAL GEOMETRIC TRANSFORMATIONS: Basic Transformations - Matrix Representations -Composite Transformation - Translation - Rotation - Scaling - Reflection and Shear.				
Unit - III	TWO DIMENSIONAL VIEWING			Periods	12
	Viewing Pipeline - Viewing Functions - Point Clipping and Line Clipping - Cohen Sutherland Line Clipping - Polygon Clipping - Sutherland - Hodgeman Clipping - Curve and Text Clipping - ExteriorClipping.				
Unit - IV	GUI AND INTERACTIVE INPUT METHODS			Periods	12
	Input of Graphical Data - Input Functions - Picture Construction Techniques. COLOR MODELS: XYZ - RGB - YIQ - CMY Color Models.				
Unit - V	MULTIMEDIA			Periods	12
	Images and Graphics. VIDEO AND ANIMATION: Computer Based Animation - Basic Concepts - Animation Languages - Methods of Controlling Animation - Display of Animation - Transmission of Animation - Comments.				
	Total Periods				60

Text Books	
1	COMPUTER GRAPHICS"-Donald Hearn And M. Puelin Baker- SECOND EDITION
2	"MULTIMEDIA COMPUTING, COMMUNICATIONS & APPLICATIONS", Ralf Steinmetz & Klara Nahrstedt.
References	
1	"MULTIMEDIA SYSTEM DESIGN", Prabhat K, Andleigh & Kiran Thakrar.
E-References	
1	https://www.javatpoint.com/computer-graphics-tutorial

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**UCS**	Regulations	**2020-2021**
Department	**Computer Science**			Semester		**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSE02	GRID COMPUTING	4	4		3	25	75	100

COURSE OBJECTIVES	To understand the concept of grid computing To know the application of grid computing. To understanding the technology and tool kits to facilitated the grid computing To understand the Grid computing processor architecture that combines com

POs	PROGRAMME OUTCOME
PO 1	To develop problem solving abilities using a computer
PO 2	To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	To imbibe quality software development practices
PO 4	To create awareness about process and product standards
PO 5	To train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Understand the basic concepts of system software, hardware and evolution of computer graphics.
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To understand the concept of Grid activities and infrastructure
CO 2	To learn Grid computing organization and their roles
CO 3	Apply Grid computing applications
CO 4	Understand Grid computing technologies
CO 5	Apply Grid computing tool kits in applications
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	2
		PO 2	2
		PO 3	2
CO 2	2	PO 4	6
		PO 5	2
		PO 6	3
CO 3	4	PO 7	3
		PO 8	4
		PO 9	2
CO 4	2	PO 10	2
		PO 11	4
		PO 12	3
CO 5	4	PO 13	2
		PO 14	4
		PO 15	2

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	1	2	1	1	1	2	2	1	1	2	1	2
CO2	3	3	3	1	3	2	2	1	3	3	1	2	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	3	2	1	3	1
CO4	3	3	3	1	3	2	2	1	3	3	1	2	3	1	3
CO5	1	1	1	1	1	2	2	3	1	1	3	2	1	3	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			
	GRID COMPUTING	Periods	12
Unit - I	Introduction - Early and Current Grid activities - Grid Business areas - Grid Applications - Grid Infrastructure		
	GRID COMPUTING INITIALIVES	Periods	12
Unit - II	Grid Computing Organizations and their Roles: Organization s developing Grid standards, best practice guidelines, Global grid forum (GGM), Grid Computing Toolkits and the frameworks - Grid based solutions to solve computing. The Grid computing Anatomy: Grid Architecture - Relationship to other distributed Technologies. The Grid computing Road map.		
	GRID COMPUTING APPLICATIONS	Periods	12
Unit - III	Merging the Grid Services Architecture with the Web Devices Architecture: Service oriented Architecture - E-Web service, SOAP .Service message description Mechanisms - Relationship between web service and grid service.		
	GRID COMPUTING TECHNOLOGIES	Periods	12
Unit - IV	Open grid service architecture - Use cases that drive the OGSA - Sample use cases - The OGSA platform components - Open grid service infrastructure (OGSI) - OGSA Basic Services.		
	GRID COMPUTING TOOL KITS	Periods	12
Unit - V	Globus GT3 Toolkit - Architecture - Programming model, - A Sample implementation - High level services: Introduction - Information service Index services - Resource information provider Services - Resource management service - Data Management service.		
	Total Periods		60

Text Books	
1	"Grid Computing", Joshy Joseph & Craig Fellenstein, PHI, 2nd Edition, 2013
References	
1	"Grid and Cloud Computing", D.Janakiram, TMH, 1st Edition, 2010
E-References	
1	www.gridcomputing.com.
2	www.cloudbus.org/reports
3	www.redbooks.ibm.com

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

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Programme	**B.Sc**	Programme Code		**UCS**	Regulations	**2020-2021**
Department	**Computer Science**			Semester		**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U5CSE03	SOFTWARE ENGINEERING	4	4		3	25	75	100

COURSE OBJECTIVES	To inculcate knowledge on Software engineering concepts in turn gives a roadmap to design a new software project.
POs	PROGRAMME OUTCOME
PO 1	To develop problem solving abilities using a computer
PO 2	To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	To imbibe quality software development practices
PO 4	To create awareness about process and product standards
PO 5	To train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Understand the basic concepts of system software, hardware and evolution of computer graphics.
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	Understanding the basic concepts of Software Engineering.
CO 2	To Understanding about the various process models and Agile development.
CO 3	Able to understand about the principles in software engineering and requirements.
CO 4	Understanding clearly about the new methodologies used in modeling.
CO 5	To easy recognize and find the way for Designing Models.
Pre-requisites	Basics concepts of computer system 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	1	PO 1	2
		PO 2	2
		PO 3	2
CO 2	2	PO 4	6
		PO 5	2
		PO 6	3
CO 3	4	PO 7	3
		PO 8	4
		PO 9	2
CO 4	4	PO 10	2
		PO 11	4
		PO 12	3
CO 5	5	PO 13	2
		PO 14	4
		PO 15	2

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	1	2	1	1	1	2	2	1	1	2	1	2
CO2	3	3	3	1	3	2	2	1	3	3	1	2	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	3	2	1	3	1
CO4	1	1	1	1	1	2	2	3	1	1	3	2	1	3	1
CO5	1	1	1	2	1	1	1	2	1	1	2	1	1	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	SOFTWARE AND SOFTWARE ENGINEERING	Periods	12
	The nature of software - Software Engineering-software process-software engineering practice-software myths		
Unit - II	PROCESS MODELS	Periods	12
	Generic process models-prescriptive process models-specialized process models-unified process. AGILE DEVELOPMENT: Agile process-Extreme programming-Agile process models-		
Unit - III	PRINCIPLES THAT GUIDE PRACTICE	Periods	12
	core principles-Framework activity. UNDERSTANDING REQUIREMENTS: Requirements Engineering-Eliciting requirements.		
Unit - IV	REQUIREMENT MODELING	Periods	12
	Design concepts - Design model. ARCHITECTURAL DESIGN: Software Architecture-Architecturalstyles-Architectural design. COMPONENT LEVEL DESIGN: Designing class based components-Designing Traditional components-component based development.		
Unit - V	TESTING STRATEGIES	Periods	12
	Testing strategy for conventional software-Object Oriented - Validation Testing - System Testing - Software Testing Fundamentals-White-Box Testing-Black-box Testing.		
	Total Periods		60

Text Books	
1	Roger S.Pressman, "Software Engineering A Practitioner's Approach"-Mc Graw Hill International, 7th Edition 2010. (Chapter 1, 2, 3, 4, 5, 8, 9, 10,17,18)
References	
1	"Fundamentals of Software Engineering" – Rajib Mall, 2nd edition, PHI
2	"SOFTWARE ENGINEERING" – Stephen Schach, 7th edition, TMH.
E-References	
1	www.en.wikipedia.org

Signature of BOS Chairman

VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)

Elayampalayam, Tiruchengode-637 205.

Programme	**B.Sc**	Programme Code		**UCS**		Regulations	**2020-2021**
Department	**Computer Science**			Semester			**5**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSE04	E-COMMERCE	5	5		3	25	75	100

COURSE	To learn about the business over internet, and to promote and encourage use of computers
OBJECTIVES POs	PROGRAMME OUTCOME
PO 1	To develop problem solving abilities using a computer
PO 2	To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	To imbibe quality software development practices
PO 4	To create awareness about process and product standards
PO 5	To train students in professional skills related to Software Industry
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Understand the basic concepts of system software, hardware and evolution of computer graphics.
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To understand the growth of internet,advantages and diaadvantages of commerce
CO 2	To understand the Characteristics of address system,ISP
CO 3	Analyze the concept of E-marketing and E-Advertising
CO 4	Analyze the Concepts of E-Security and firewall concept
CO 5	To know about the mobile commerce
Pre-requisites	Computer Networks

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

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	1	2	1	1	1	2	2	1	1	2	1	2
CO2	3	3	3	1	3	2	2	1	3	3	1	2	3	1	3
CO3	1	1	1	1	1	2	2	3	1	1	3	2	1	3	1
CO4	2	2	2	1	2	3	1	2	2	2	2	3	2	2	2
CO5	1	1	1	3	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			
	History of E-commerce:	Periods	12
Unit - I	Emergence of the internet: Commercial use of internet -Growth of the Internet-Origins of the web-Advantages of E-commerce-Disadvantages of E-commerce-the information Technology ACT 2000. Business models for E-commerce: B2B, B2C, C2C, C2B E-business model: Brokerage model: characteristics -Advantages of the Brokerage model-price discovery mechanisms		
	Enabling Technologies of the World Wide Web	Periods	12
Unit - II	Internet client server Applications: Telnet -FTP-Chat on the web-MIME. Networks and internet: Internet protocol suite-IP address system-Domain Name-URLs-Defining URLs-IPVs-TCP. Internet service Provider (ISP): Architecture of public access provide-NAPs and ISPs - terms related to ISPs-Broadband Technologies-Types of Broadband Technologies		
	E-marketing	Periods	12
Unit - III	Traditional Marketing-Identifying Web presence Goals-Achieving web presence Goals-uniqueness of the web-site adhesion: Content, Format and Access-Maintaining a website-metrics defining internet units of measurement. E-advertising: Means of Advertising -Conductions Online Market research-market segmentation- Data mining & market research.		
	E-security	Periods	12
Unit - IV	Security on the internet-Network and security risks-How are sites hacked?-Security incidents on the internet -Security and E-mail- Network and web based security. Business risk management issues: The firewall concept-Firewall Components-Benefits of an Internet Firewall-Secure physical Infrastructure. E-Payment System: Classification of new payment system-Digital signature.		
	Information system for mobile commerce	Periods	12
Unit - V	Mobile Commerce-Wireless Applications -Wireless Spectrum-Technologies for mobile Commerce-Wireless Technologies. Legal and Ethical Issues: Computer as targets for crime-privacy is at risk in the internet age-cookies and privacy-Phishing - copyright-internet Gambling-Threats to children.		
	Total Periods		60

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

Signature of BOS Chairman

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="7" style="text-align:center">VIVEKANANDHA COLLEGE OF ARTS AND SCIENCES FOR WOMEN (AUTONOMOUS)</td><td></td></tr>
<tr><td colspan="7" style="text-align:center">Elayampalayam, Tiruchengode-637 205.</td><td></td></tr>
</table>

Programme	**B.A**	Programme Code		**UCS**		Regulations		**2020-2021**
Department	**Computer Science**			Semester				**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSE05	ANDROID APPLICATIONS	5	5		3	25	75	100

COURSE OBJECTIVES	To understand the concept of Android Technology. To understand applications of android. To understand android web apps. To learn how to develop apps for Android. Android is a mobile operating system thatpowers all kinds of devices

POs	PROGRAMME OUTCOME
PO 1	To develop problem solving abilities using a computer
PO 2	To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	To imbibe quality software development practices
PO 4	To create awareness about process and product standards
PO 5	To train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal.
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Understand the basic concepts of system software, hardware and evolution of computer graphics.
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffsinvolved in design choices.
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To know the basic concepts of Android and its components
CO 2	To understand different types of Android resources
CO 3	Analyze Android application designing interfaces with layout and screening elements
CO 4	Analyze the concept of Android Data and Storage API
CO 5	Implement Application with DDMS
Pre-requisites	The most basic building block of Android development is the programming language Java andSQL.

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

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	3	3	1	3	2	2	1	3	3	1	2	3	2	3
CO2	3	3	3	1	3	2	2	1	3	3	1	2	3	2	3
CO3	1	1	1	1	1	2	2	3	1	1	3	2	1	2	1
CO4	1	1	1	1	1	2	2	3	1	1	3	2	1	2	1
CO5	1	1	1	1	1	2	2	3	1	1	3	2	1	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	Introduction to Open Source		Periods	12
	What is Open Source - License Issues (MPL, GPL, and LGPL) and Open Source Vs Traditional Development Methodologies. Introduction to Android: Introducing Android - History of Mobile SoftwareDevelopment - Layers of Android - Android SDK - Kinds of Android Components - Building a Sample Android Application.			
Unit - II	Android Application Design Essentials		Periods	12
	Anatomy of an Android Applications - Android Terminologies - Application Context - Actives - Services - Intents - Receiving and Broadcasting Intents - Android Manifest File and its common settings - ManagingApplication resources in a hierarchy - Working with different types of resources.			
Unit - III	Android Application Design Essentials		Periods	12
	User Interface Screen Elements - Designing User Interfaces with Layouts - Drawing and Working with Animation.			
Unit - IV	Using Common Android APIs		Periods	12
	Using Android Data and Storage APIs - Managing data using SQLite - Sharing Data between Applications with Content Providers - Using Android Networking APIs - Using Android Web APIs and Using Android Telephony APIs			
Unit - V	DDMS â€" Debug and Other View		Periods	12
	DDMS - Dalvik Debug Monitor Server - LogCat View - File explorer - Breakpoints and Debug.			
	Total Periods			60

Text Books	
1	"Android Wireless Application Development", Lauren Darcey and Shane Conder, Pearson Education, 2nd Edition, 2011.
2	"Android in Action", W. Frank Ableson, Robi Sen, Chris King, Manning Publications Co., 2nd Edition, 2011.
References	
1	"Android Essentials", Chris Haseman, A Press Publications, 2008.
2	"The Android Developers Cookbook Building Applications with the Android SDK", James Steele, Nelson To, Addison Wesley Publications, 2011.
E-References	
1	www.developer.android.com
2	www.android.com
3	www.source.android.com

Signature of BOS Chairman

Programme	**B.Sc**	Programme Code		**101**	Regulations	**2020-2021**
Department	**Computer Science**			Semester		**6**

Course Code	Course Name	Periods per Week			Credit	Maximum Marks		
		L	T	P	C	CA	ESE	Total
20U6CSE06	MIDDLEWARE TECHNOLOGIES	5	0	0	3	25	75	100

COURSE OBJECTIVES	To understand the concept of Client Server computing. To understand the importance of CORBA, XML and ADO.NET Middleware technologies are often employed to eliminate the pain of integration.

POs	PROGRAMME OUTCOME
PO 1	Develop problem solving abilities using a computer
PO 2	Build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO 3	Imbibe Quality Software Development practices
PO 4	Create awareness about process and product standards
PO 5	Train students in professional skills related to Software Industry.
PO 6	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO 7	Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks
PO 8	An ability to function effectively on teams to accomplish a common goal
PO 9	An understanding of professional, ethical, legal, security, social issues and responsibilities
PO 10	Ability to understand and analyze a given real-time problems and propose feasible computing solutions
PO 11	An ability to analyze the local and global impact of computing on individuals, organizations, and society
PO 12	Evaluate and use appropriate tools and techniques in developing application activities
PO 13	Understand the basic concept of computer architectures, including computer hardware and networking.
PO 14	Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.
PO 15	Ability to communicate effectively in both verbal and written form in industry and society.

COs	COURSE OUTCOME
CO 1	To understand the concept of client server computing
CO 2	To know the concept of CORBA with Java
CO 3	To understand the concept of C# and .NET Platform
CO 4	To build C# application with XML
CO 5	To understand the types of core CORBA
Pre-requisites	basic knowledge about computer networks

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

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	3	2	1	1	1	2	1	1	1	2	1	2
CO2	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO3	2	2	2	1	2	3	1	2	2	1	1	1	2	1	2
CO4	1	1	1	1	1	2	2	3	1	1	1	2	1	2	1
CO5	1	1	1	1	1	2	2	3	1	1	1	2	1	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	Introduction to client server computing	Periods	12
	Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.		
Unit - II	CORBA with Java	Periods	12
	Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA - style, The object web: CORBA with Java.		
Unit - III	Introducing C# and the .NET Platform	Periods	12
	Understanding .NET Assemblies; Object - Oriented Programming with C#; Callback Interfaces, Delegates, and Events.		
Unit - IV	Building c# applications	Periods	12
	Type Reflection, Late Binding, and Attribute - Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.		
Unit - V	Core CORBA / Java	Periods	12
	Two types of Client/ Server invocations - static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA - The portable count, the dynamic count multicount.		
	Total Periods		60

Text Books	
1	"Client/Server programming with Java and CORBA Robert Orfali and Dan Harkey", John Wiley & Sons ,SPD, 2nd Edition, 2010
2	"The Complete Reference C# 4.0", Herbert Schildt, TMH Publishers, 2010
3	"Java programming with CORBA", G.Brose, A Vogel and K.Duddy, Wiley â€" Dreamtech, India John wiley and sons, 3rd Edition, 2003
References	
1	"Middleware for Communications", Qusay H. Mahmoud, John Wiley and Sons, 2004.
2	"JavaTM Programming with ORBATM: Advanced Techniques for Building Distributed Applications", Gerald Brose, Andreas Vogel, Keith Duddy, Wiley, 3rd edition, 2004.
E-References	
1	www.en.wikipedia.org
2	www.mulesoft.com
3	www.apprenda.com

Signature of BOS Chairman