DEPARTMENT OF COMPUTER SCIENCE

B.Sc. COMPUTER SCIENCE

(Students admitted during 2019-2020 Onwards)

(Under CBCS with Outcome Based Education (OBE) Pattern)

SYLLABUS

V & VI SEMESTER

GOBI ARTS & SCIENCE COLLEGE

(Govt. Aided Autonomous Co-educational Institution, Affiliated to
Bharathiar University, Coimbatore, Accredited with 'A' Grade by NAAC (4th cycle)
and Recognised as a STAR College by DBT, Government of India)

KARATTADIPALAYAM POST,

GOBICHETTIPALAYAM - 638453

ERODE DISTRICT.

BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

K1-Remember; **K2**- Understanding; **K3**- Apply; **K4**-Analyze; **K5**- Evaluate

I. END OF SEMESTER (EOS) EXAMINATIONS:

1. Part I, II & III-Theory: 70 Marks

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	15 × 1 = 15	MCQ	70
K2	B (Either or Pattern)	5 × 5 = 25	Short answers	
K3 & K4	C (Answer 3 out of 5)	3 × 10 = 30	Descriptive/Detailed	

2. Practical Examinations: 70 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	60	10	70
K4			
K5			

II. CONTINUOUS INTERNAL ASSESSMENT (CIA):

1. Test – I & II: 30 Marks (Theory)

Knowledge Level	Section	Marks	Description	Total
K1	A (Answer All)	10 × 1 = 10	MCQ	30
K2	B (Answer 2 out of 3)	2 × 5 = 10	Short answers	
K3 & K4	C (Answer 1 out of 2)	1 × 10 = 10	Descriptive/Detailed	

2. Practical Internal Assessment: 30 Marks

Knowledge Level	Section		Total
	Test	Lab Performance	
K3	20	10	30
K4			
K5			

Components of Continuous Internal Assessment (CIA)

Components		Calculation	CIA Total
Test 1	30	$\frac{\text{Test 1 + Test 2}}{2}$	30
Test 2	30		

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS11	Course Title:	Batch:	2019
Total Hours:	60	Java Programming (Common for CS, CA, IT, CT)	Semester:	V
			Credits:	4.5

Course Objective

The course aims

- To learn object orient programming fundamentals and the characteristics of Java language.
- To learn the syntax, semantics and use of basic Java programming language constructs.
- To know the syntax and use of utilities, applets, simple graphics methods and image loader.
- To develop stand alone applications and applet programs in Java.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1	CO1	Understand the fundamentals of object-oriented Programming and basic constructs of Java such as data types, operators and arrays.
K1, K2, K3	CO2	Understand the syntax and use of control statements, classes and inheritance to write programs.
K2, K1, K3	CO3	Obtain knowledge about concepts, syntax and use of packages, interfaces, threads and exception handling for writing programs.
K1, K2	CO4	Learn the use, syntax and implementation of Java utilities.
K3, K4, K5	CO5	Gain knowledge to develop applications using applets and simple graphics methods.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**OBJECT ORIENTED FUNDAMENTALS AND JAVA REVOLUTION:** Object Oriented Programming – Encapsulation – Inheritance – Polymorphism – Java Genesis – Characteristics – Java Programming Techniques – Reserved Words – Identifiers Literals – Operators – Separators – Variables – Types – Arrays – Operator Precedence.	**12**
II	**FLOW – CONTROL AND CLASSES:** If – Else – Break – Switch – Return Statements – Looping – While – Do While – For – Comma Statements – Continue – Classes – Declaration – Object References – Instance Variables – New Operator – Method Declaration – Method Calling – this Operator Constructors – Methods Overloading – Inheritance – Super Class – Dynamic Method Dispatch – Final Static – Abstract Classes.	**12**
III	**PACKAGES AND INTERFACES:** Packages – The Package Statement – Import Statement – Interface Statement – Implements Statement – Constructors – String Creation – String Concatenation – Character Extraction – Exception Handling Fundamentals – Types – Uncaught Exceptions – Nested try Statement – The Java thread Model Priorities – Thread API Summary.	**12**

IV	**UTILITIES AND APPLETS:** Dictionary Class – Hash Tables – String Tokenizer – Runtime – System Class – Comparison – Input and Output – File Directory – ***Filename Filter**** - File Streams.	**12**
V	**Applets:** HTML Applet Tab – Order of Applet initialization – Sizing Graphics – Simple Graphics Method – Draw line – Draw Arc – Font Manipulation – Simple Image Loader –***Image Observer**** – Summary.	**12**

<* - ***Self study***>

Text Book:

Partick Naughton (1996), "The Java Hand Book", Tata McGraw Hill Pvt. Ltd.

Reference Books:

1. E Balagurusamy (2015), Programming with Java A Primer", 5th edition, McGraw Hill Publisher (India).
2. C. Muthu (2008), "Programming with Java", Second edition, Tata McGraw Hill Pvt. Ltd (India).
3. R. Krishnamoorty, S. Prabhu (2006), "Internet and Java programming", New Age International Pvt. Ltd.

E-references:

1. https://www.edureka.co/blog/java-tutorial/
2. https://www.tutorialspoint.com/java/java_basic_syntax.htm
3. https://www.geeksforgeeks.org/java-applet-basics/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	H	M
CO2	H	M	S	H	S
CO3	S	M	S	H	S
CO4	S	H	S	M	H
CO5	S	H	S	H	S

S - Strong; **H** - High; **M** - Medium; **L** - Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS12	Course Title:	Batch:	2019
Total Hours:	60	Software Engineering (Common for CS, IT, CT)	Semester:	V
			Credits:	4.5

Course Objective

The course aims

- To make the students to understand the basic concepts of software engineering and software development process.
- To understand the concept of project management and project planning activities.
- To know the concept of software requirements and software maintenance.

Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
K1, K2	CO1	Remember and understand the software engineering process.
K1, K2	CO2	Understand and describe the concept of project management process and planning estimation.
K1, K2, K3	CO3	Remember the building block of software requirements and software design process.
K1, K2, K3	CO4	Describe the concept of software implementation and software testing.
K1, K2, K3	CO5	Understand the concepts of software quality, software maintenance process.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	INTRODUCTION TO SOFTWARE ENGINEERING: Software – Software Crisis – What is software Engineering? – Evolution of Software Engineering Methodologies – Software Engineering Challenges – SOFTWARE PROCESS: Software Process – Phased Development Life Cycle – Software Development Process Models.	**12**
II	SOFTWARE PROJECT MANAGEMENT: Project Management Essentials – What is Project Management? – Project Management Team – Project Life Cycle – Project Management Process – PROJECT PLANNING AND ESTIMATION: Project Planning Activities – Software Metrics and Measurements – Project Size Estimation – Effort Estimation Techniques – Staffing and Personnel Planning – Project Scheduling and Milestones-Task Identification-Work Breakdown Structure.	**12**
III	REQUIREMENTS ENGINEERING: Software Requirements – Requirement Engineering Process – Requirement Analysis – Requirements Specification – Requirement Validation. SOFTWARE DESIGN: Software Design Process – Characteristic of Good Software Design –Design Principles – Modular Design – Software Architecture – Design Methodologies – Structured Design.	**12**
IV	IMPLEMENTATION: Coding Principles – Coding Styles – Coding Errors – WARE TESTING: Testing Fundamentals – Black Box Testing – ***White Box Testing**** –	**12**

	Levels of Testing.	
V	SOFTWARE QUALITY AND RELIABILITY: Software Quality Concepts – Software Quality Factors – Verification and Validation - Software Quality Assurance – Quality Control – Best Practices of Software Engineering – Software Reliability. SOFTWARE MAINTENANCE: Software Change – Software Evolution – ***Software Maintenance**** – Maintenance Cost – Software Reuse.	**12**

<* - ***Self Study***>

Text Book:

Ugrasen Suman, *"Software Engineering Concepts and Practices",* Cengage Learning, First Edition, 2013. (Unit I - V).

Reference Books:

1. Roger S. Pressman, *"Software Engineering: A Practitioners Approach",* Tata McGraw Hill Publications, Fourth Edition, 1997.
2. Timothy C.Lethbridge & Robert Laganière, "Object-Oriented Software Engineering: Practical Software Development using UML and Java", Tata McGraw-Hill, Second Edition, 2005.
3. P. Jalote, "*An Integrated Approach to Software Engineering"*, Narosa Publication House, Third Edition, 2008.

E-references:

1. https://www.guru99.com/what-is-software-engineering.html
2. https://en.wikipedia.org/wiki/Software_engineering
3. https://www.tutorialspoint.com/software_engineering

Mapping with Programme Specific Outcomes

CO \ **PSO**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	S	M	H	M	H
CO2	H	M	S	H	L
CO3	M	S	S	S	L
CO4	M	S	M	M	S
CO5	H	H	H	H	H

S - Strong; **H** - High; **M** - Medium; **L** - Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS13	Course Title:	Batch:	2019
Total Hours:	60	Relational Database Management Systems (Common for CS, CT)	Semester:	V
			Credits:	4.5

Course Objective

The course aims

- To educate students with fundamental concepts of RDBMS, models, different database languages.
- To design and develop a relational database system with appropriate functionality to process data with constraints data integrity and avoid data redundancy.
- To learn SQL and use normal forms to reduce anomalies in relations.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2	**CO1**	Gain good understanding of Database Architecture and entity-relationship modelling.
K1, K2, K4	**CO2**	Get knowledge about normalization techniques and relational algebra & Calculus to design a relational database system effectively.
K1, K2, K3	**CO3**	Able to describe and use the basic SQL commands efficiently.
K1, K2, K3	**CO4**	Demonstrate the concept of SQL objects like indexes, sequences, views and synonyms in SQL.
K1, K2, K3	**CO5**	Explore about PL/SQL techniques.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 –** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	INTRODUCTION: RDBMS Terminology – The Relational Data Structure - Relational Data Integrity – Codd's Rules. DATABASE ARCHITECTURE AND DATA MODELING: Conceptual, Physical and Logical Database Models – ***Database Design**** – Design Constraints – ***Functional Dependencies****. ENTITY RELATIONSHIP MODELING: E-R Model – Components of an E-R Model, E-R Modeling Symbols.	**12**
II	DATA NORMALIZATION: Introduction – First(1NF), Second(2NF), Third(3NF), Boyce-Codd Normal Form(BCNF), Fourth(4NF), Fifth(5NF) Normal Forms, ***Denormalization****, RELATIONAL ALGEBRA AND RELATIONAL CALCULUS: Relational Algebraic operations: union, intersection, difference, ***Cartesian Product****, select, project, rename, join, division. – Tuple Relational Calculus, Domain Relational Calculus.	**12**
III	SQL PLUS: Menus – commands – Editing the Command Line – The Describe Command – The COLUMN Command- Basic SQL: SQL Language Basics – The SELECT Command – ***Data Types**** – Expressions and operators – ***Functions**** – The INSERT Command – The UPDATE Command – The DELETE Command.	**12**
IV	DATA INTEGRITY: Types – ***Integrity Constraints****. CREATING AND MANIPULATING TABLES: The CREATE TABLE Command – Modifying Tables – Deleting a Table. INDEXES: Creating Indexes – Changing an Index. SEQUENCES: The create sequence command – ***Pseudo columns**** – Deleting,	**12**

	Changing, using Sequence. VIEWS: How a view works? – Creating a View – Deleting a View – Replacing a View. SYNONYMS: Creating, Renaming and Removing Synonyms.	
V	PL/SQL: Blocks – ***Control Structures**** – Integrating SQL in a PL/SQL Program. TRIGGERS: Components – Types – Creating, Modifying, Enabling/Disabling a Trigger, Deleting, Replacing a Trigger – STORED PROCEDURES AND FUNCTIONS: Creating, Executing, Deleting a Stored Procedure – Functions, Cursors – ***Transactions****.	**12**

<* - *Self Study*>

Text Books:

1. Alexis Leon & Mathews Leon, *"Database Management Systems"*, Vikas Publishing House Pvt. Ltd., (Unit I, II), 1999.
2. Jose A. Ramalho, *"Learn Oracle 8i"*, BPB publications. (Unit III, IV, V)**,** 2000.

Reference Books:

1. Raghu Ramakrishnan, Johannes Gehrke, *"Database Management Systems"*, McGraw Hill., 2009.
2. Ramez Elmasri, Shamkant B. Navathe, *"Database Systems [Models, languages, Design and Application programming]"*, Pearson Education, 6th edition.
3. Ivan Bayross, *"SQL, PL/SQL The Programming Language of Oracle"*, BPB Publications Pvt. Ltd, 3rd Revised Edition, 2005.

E-references:

1. https://www.w3schools.com/sql/sql-intro.asp/beginner-sql-tutorial.com/sql - comands.htm
2. https://www.tutorialspoint.com/sql/sql_tutorial.pdf
3. https://searchsqlserver.techtarget.com/definition/database-management-system

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	M	M
CO2	S	S	H	H	M
CO3	S	S	S	H	H
CO4	S	S	H	M	M
CO5	S	S	M	H	M

S - Strong; **H -** High; **M -** Medium; **L –** Low

Programme Code:	B.Sc.	**Programme Title:**	Computer Science	
Course Code:	19UACS14	**Course Title:**	**Batch:**	2019
Total Hours:	60	Elective - I: Computer Networks (Common for CS, BCA, IT and CT)	**Semester:**	V
			Credits:	4.5

Course Objective

The course aims

- To acquire basic knowledge in networking environments and its applications in the area of business and others.
- To learn about how to use network software and hardware with network environment.
- To learn about networks layers.
- To learn about network protocol and internet using networks.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K2, K4	**CO1**	Understand the basics knowledge about computer networks and public switched telephone networks
K2,K3	**CO2**	Understand the fundamentals of elementary data link protocol and sliding window protocols
K1, K2, K3, K5	**CO3**	Know about various operations of algorithms in networks
K2, K3, K4	**CO4**	Learn about various types of protocol and layers
K2, K4, K5	**CO5**	Acquire knowledge about computer networks domain name system and electronic mail using internet.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5 -** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**INTRODUCTION** – Uses of Computer Networks – Network Hardware – Network software – Reference models –PHYSICAL LAYER – Guided transmission media, the Public switched telephone network.	**12**
II	**DATA LINK LAYER –** Data link layer design Issues – Elementary data link protocols – Sliding window protocols.	**12**
III	**NETWORK LAYER –** Network layer design issues – Routing algorithms – Congestion control algorithms.	**12**
IV	**TRANSPORT LAYER –** ***The transport service**** – Elements of transport protocols – The internet transport protocols: UDP	**12**
V	**THE APPLICATION LAYER –** DNS – The Domain Name System – ***Electronic Mail**** – The World Wide Web.	**12**

<* - ***Self Study***>

Text Book:

Andrew S. Tanenbaum, "*Computer Networks*", Prentice Hall of India, Fourth Edition, 2007. [UNITS I – V]

Reference Books:

1. Larry Peterson & Bruce S.Davie, *"Computer Networks a Systems Approach"*, Elsevier, Fourth Edition, 2007.
2. Douglas E.Comer, *"Computer Networks and Internets",* Pearson Education, Fourth Edition, 2004.
3. William Stallings, *"Computer Networking with Internet Protocols and Technology"*, Pearson Education, First Impression, 2007.
4. Uyless Black, *"Computer Networks",* PHI learning private limited, Second Edition, 2010.

E-references:

1. https://www.geeksforgeeks.org/computer-network-tutorials
2. https://www.tutorialspoint.com/data_communication_computer_network/index.html
3. https://www.softwaretestinghelp.com/computer-networking-basics

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	M	H
CO2	H	H	S	H	S
CO3	S	S	M	M	M
CO4	H	S	M	H	S
CO5	H	S	H	S	M

S - Strong; **H** - High; **M** - Medium; **L** - Low

Programme Code:	B.Sc.	**Programme Title:**	Computer Science	
Course Code:	19UACSPG	**Course Title:**	**Batch:**	2019
Total Hours:	60	Major Core Programming Lab - VII: (Java Programming) (Common for CS, CA, IT,CT)	**Semester:**	V
			Credits:	2.5

Course Objective

The course aims

- To gain knowledge about basic Java language syntax and semantics to write Java programs.
- To write programs for the concepts of object oriented programming include classes, inheritance, packages, interfaces and exception handling and applet programming.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	**CO1**	Write programs using simple data types.
K1, K2, K5	**CO2**	Write programs using classes, control statements, arrays and strings.
K1, K2, K3, K5	**CO3**	Write programs using inheritance, interface and exception handling.
K1, K2, K3, K4, K5	**CO4**	Write programs for thread creation and implementation.
K3, K4, K5	**CO5**	Write programs for utilities and applets.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

SYLLABUS	
1. 2. 3.	Write a java program to find the number of odd, even and prime numbers. Write a java program to display Floyd's triangle upto the given limit. Write a java program to (i) Display the number in reverse order (ii) Find the sum of the digits.
4. 5. 6.	Write a java program to count the number of vowels in the given string. Write a java program to arrange the given set of names in alphabetical order. Write a java program to find matrix multiplication for the given numbers.
7. 8. 9.	Write a java program to perform arithmetic and scientific operations. Write a java program to perform stack operation using Interface. Write a java program to display any two subject marks and sports marks of the student and find the total marks using Interface.
10. 11. 12.	Write a java program to handle different Exceptions. Write a java program for i) Assigning thread priority ii) Executing thread methods yield(), stop() and sleep(). Write a java program for traffic light simulation using Applet.
13. 14. 15.	Write a java program to display digital clock using Applet. Write a java program to display different fonts using Applet. Write a java program using File to get the string and display it using Byte stream classes.

Text Book:

Partick Naughton (1996), "The Java Hand Book", Tata McGraw Hill Pvt. Ltd.

Reference Books:

1. E Balagurusamy (2015), Programming with Java A Primer", 5th edition, McGraw Hill Publisher (India).
2. C. Muthu (2008), "Programming with Java", Second edition, Tata McGraw Hill Pvt. Ltd (India).
3. R. Krishnamoorty, S. Prabhu (2006), "Internet and Java programming", New Age International Pvt. Ltd.

E-references:

1. https://www.edureka.co/blog/java-tutorial/
2. https://www.tutorialspoint.com/java/java_basic_syntax.htm
3. https://www.geeksforgeeks.org/java-applet-basics/

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	H	M
CO2	H	M	S	H	S
CO3	S	M	S	H	S
CO4	S	H	S	M	H
CO5	S	H	S	H	S

S-Strong; **H**-High; **M**- Medium; **L**-Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPH	Course Title:	Batch:	2019
Total Hours:	60	Major Core Programming Lab - VIII: (RDBMS)	Semester:	V
			Credits:	2.5

Course Objective

The course aims

- To understand MYSQL Commands to work with tables in a database.
- To create SQL queries with different features.
- To make the students to know about the various concept of PL/SQL.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	CO1	Remember the DDL, DML commands and write simple commands using them.
K1, K2, K3, K5	CO2	Understand foreign key and nested query concepts and apply them for tables.
K1, K2, K5	CO3	Understand PL/SQL concept and write programs using PL/SQL commands.
K2, K4, K5	CO4	Analyze Trigger, sequence, exception handling concepts and apply them for tables.
K2, K3, K4, K5	CO5	Analyze and write program using functions, stored procedure and tables.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

SYLLABUS	
1.	Write SQL commands to create table for employee details, alter table, update and delete values in that table.
2.	Write a SQL command to create table and write queries with built- in functions for the following constraints. 1. Comparison, logical and set operators 2. Sorting and grouping operators built- in functions for ceil, sysdate 3. Minus, square, round, length, count and sum.
3.	Create a table called ‘product’ with the following details: **S.No.** **Field Name** **Data made of** **Constraints** 1. Product code First characters ‘P’ other 3 characters are digits Should not be empty and should be made of unique values

	2. Product name Alphabets Should not be empty 3. Qty on hand 9999 Should not be empty 4. Cost price(RS**)** 9999.99 Format Should not be empty 1. Insert at least 15 records for that table. 2. List of all products having 'a' as the second letter in their names. 3. List the Product codes and names where the Cost price is greater than Rs.100/- 4. List the Product codes where the quantity on hand is more than 50. 5. List the Product Name, Qty on hand, Cost price and the Total cost price of each product.
4.	Create a table SSLC mark (Regno, Name, Tamil mark, English mark, Maths mark, Science mark, Social science mark) with the necessary integrity constraints. Write SQL statements to 1. Find the topper in the class. 2. Find the names of the students who have scored more than 90 percent marks in each subject. 3. Find the Names of student who have scored centum in Maths. 4. List the Names and total marks of students who have scored more than 75 in the Maths and Science subjects put together. 5. List the names of the students and their marks in the language who have scored more than 60% in each of the language papers.
5.	Create two tables one called EMP and another called DEPT with EMP having Employee Number, Employee Name, Department Number, Salary, Commission, Manager Number and the DEPT table with Department Number, Department Name and Department Location. Write SQL queries to: 1. List the names of all the employees having salary of atleast Rs.5000/- 2. List the names of employees and also the names of their managers. 3. List the names of all employees with manager name as "Ram". 4. List the names of all employees whose total earning is more than Rs.7500/- 5. List the details of employees working in the production department. 6. List all the programmers working in Chennai. 7. List the names of all employees whose salary is greater than the average salary of their department. 8. List the names of all the managers. 9. List the names of the Accounts department whose salary is either Rs.2500 or Rs.5000/- 10. List the names, salaries of employees of the Accounts department who are not earning any Commission.
6.	Write a PL/SQL program to find and display the number of ones, tens, hundreds and thousands in the given number.
7.	Write a PL/SQL program to find the number of occurrences of a character in the given string.
8.	Write a PL/SQL program to check Armstrong number condition for 3 digits numbers and Ramanujam number condition for 4 digits number.

9.	Write a PL/SQL program to display names of the employees in the employee table whose names are palindrome.
10.	Write a PL/SQL program with recursive concept to create a set of value for ROLL NO using a sequence and store the generated ROLL NO in the ROLL NO field of the student table.
11.	Write a Trigger to store the deleted records of the Department table in to a record table.
12.	Write a PL/SQL program to raise divide by Zero Exception.
13.	Write a PL/SQL program for fixing the salaries of employee using functions.
14.	Write a PL/SQL program to calculate the commission payable to employee of the employee table using stored procedures.
15.	Write a PL/SQL program to split the SSLC mark sheet table into two tables with one containing the names of passed students and the other one containing the names of failed students.

Text Books:

1. Alexis Leon & Mathews Leon, *"Database Management Systems"*, Vikas Publishing House Pvt. Ltd., 1999.
2. Jose A. Ramalho, *"Learn Oracle 8i"*, BPB publications, 2000.

Reference Books:

1. Raghu Ramakrishnan,Johannes Gehrke,*"Database Management Systems"*, McGraw Hill., 2009.
2. Ramez Elmasri, Shamkant B. Navathe, *"Database Systems [Models, languages, Design and Application programming]"*, Sixth edition, Pearson Education, 2013.
3. Ivan Bayross, *"SQL, PL/SQL the Programming Language of Oracle"*, Third Revised Edition, BPB Publications Pvt. Ltd, 2005.

E-references:

1. http://www.leon-leon/ds/edbms
2. http://www/pearsoned.co.in/Atulkahate
3. https://www.w3schools.com/sql/sql-intro.asp/beginner-sql-tutorial.com/sql-comands.htm

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	H	L
CO2	S	S	H	H	M
CO3	M	S	H	S	H
CO4	H	M	H	M	S
CO5	S	H	M	H	S

S-Strong; H-High; **M**- Medium; **L**-Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS15	Course Title:	Batch:	2019
Total Hours:	90	Elective - II: Web Design (Common for CS, BCA, IT, CT)	Semester:	VI
			Credits:	4.5

Course Objective

The course aims

- To learn the syntax, semantics and applications of web design languages which include HTML, JAVASCRIPT and DHTML.
- To learn the syntax and use of XML documents.
- To develop static and dynamic websites.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2, K3, K5	**CO1**	Obtain knowledge to create website using the various elements of HTML which include text, list, table, image, hyperlink and form tags.
K1, K2, K3, K4	**CO2**	Develop a website using the programming constructs of JavaScript.
K2, K3, K4	**CO3**	Gain knowledge about Form, String, Math & Date objects, User defined objects of JavaScript.
K2, K3, K4	**CO4**	Create dynamic and attractive WebPages using CSS properties of dynamic HTML.
K1, K2, K3, K5	**CO5**	Gain knowledge about XML for describing data using DTD, CSS and XSL style sheets.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	INTRODUCTION TO HTML - Hyper Text Markup Language, HTML Tags, Structure of HTML program, Titles and Footers, Text Formatting, Heading Styles, Text styles and other text effects. Lists - Adding Graphics to HTML documents - Tables - Linking documents - Frames - Forms - Sample programs.	**18**
II	INTRODUCTION TO JAVASCRIPT - JavaScript in web pages, Advantages of Java script, Writing Java script into HTML, Basic Programming Techniques, Operators and expressions in Java script, Java Programming Constructs, Condition Checking, ***Loops****, Built-in and User Defined Functions, Placing text in a Browser, Dialog boxes - Sample programs.	**18**
III	THE FORM OBJECT - Methods, Properties & methods of Form elements, Text, Password, Button, Submit, Reset, Checkbox, Radio, TextArea, Select & Option elements. Built-in objects in JavaScript - String, Math & Date objects. User defined objects- creating a user defined object, Instances, Objects within Objects.	**18**

IV	DYNAMIC HTML - Cascading Style Sheets (CSS) - ***Font attributes****, Color and background attributes, Text attributes, Border attributes, Margin attributes, List attributes - Class - using the <SPAN> tag-External style sheets - using the <DIV> tag - Sample programs.	**18**
V	INTRODUCTION TO XML – Introduction, XML Fundamentals, Document Type Definitions, XML Parsers, Entities. Document Type Definitions (DTD) – Internal DTD, External DTD, Element declarations, Attributes, Creating Attribute Lists, DTD symbols, Entities. XML Style Sheets (XSL) – Introduction, Cascading Style Sheets, eXtensible Style Sheet Language (XSL), Presenting Data in the Tabular Format. Sample programs.	**18**

<* - *Self Study*>

Text Books:

1. Ivan Bayross, "*Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP***"**, BPB Publications, Fourth Edition, 2010. [UNITS – I - IV]
2. A.K.Saini and Sumit Tuli, "*Mastering XML*", EXCEL BOOKS Pvt. Ltd., First Edition, 2002. [UNIT V]

Reference Books:

1. Ravinder Singh, Amit Gupta, "*Magic with HTML, DHTML & JAVASCRIPT*", University Science Press, First Edition, 2009.
2. C. Xavier, "*World Wide Web Design with HTML*", Tata McGraw Hill Education Pvt. Ltd., Thirteenth Reprint, 2010.
3. Ann Navarro, Chuck White, "*Mastering XML*", BPB Publication, First Indian Edition, 2000.

E-references:

1. https://www.w3schools.com>html
2. https://www.tutorialspoint.com/xml/xml_overview.htm
3. https://www.javatpoint.com/javascript-tutorial

Mapping with Programme Specific Outcomes

CO \ **PSO**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	L	H	H	M
CO2	H	M	S	H	S
CO3	S	M	S	H	S
CO4	S	H	S	M	H
CO5	S	H	S	H	S

S - Strong; **H** - High; **M** - Medium; **L** – Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UECS01	Course Title:	Batch:	2019
Total Hours:	90	Major Skill Based Paper: Computer Graphics (Common for CS, BCA, IT and CT)	Semester:	VI
			Credits:	4.5

Course Objective

The course aims

- To provide comprehensive introduction about computer graphics system.
- To design algorithms and two dimensional transformations.
- To facilitate the students elaborately know about computer graphics techniques in C programming.
- To implement the computer graphics techniques to solve the variety of graphics problems.

Course Outcomes (CO)

Knowledge Level	CO Number	Course Outcomes
K1, K2	CO1	Design algorithms and two dimensional transformations.
K1, K2, K3, K5	CO2	Familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.
K1, K2, K3	CO3	Actively involving in design, development and testing of modeling, rendering, shading and animation.
K1, K2, K4, K5	CO4	Implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques.
K2, K4	CO5	Practical knowledge about color modeling and its application procedures.

K1 - Remember; **K2** - Understanding; **K3** - Apply; **K4** - Analyze; **K5** – Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**Overview Of Graphics Systems**: Video Display Devices – Input Devices. **Output Primitives**: Points & Lines – Line Drawing Algorithm – DDA Algorithm – Bresenham's Line Algorithm – Circle Generating Algorithms.	**18**
II	**Two Dimensional Geometric Transformations:** Basic Transformations - Matrix Representations & Homogeneous Co-ordinates - Composite Transformations: Translations, Rotations, Scalings – General Pivot-Point Rotation, Fixed Point Scaling - Reflection and Shear Transformations. **Two Dimensional Viewing:** The Viewing Pipeline – Window to Viewport Coordinate Transformation. Clipping Operations – Point Clipping – Line Clipping – Cohen-Sutherland Line Clipping – **Polygon Clipping**: Sutherland-Hodgeman Polygon – Curve Clipping – Text Clipping – Exterior Clipping. Interactive Picture Construction Techniques.	**18**
III	**Three Dimensional Concepts:** Three Dimensional Display Methods. Three Dimensional Object Representations: Polygon Surfaces - Curved Lines and	**18**

	Surfaces. **Three Dimensional Geometric And Modelling Transformations**: Translation – Rotation – Coordinate Axes Rotations – General Three Dimensional Rotations – Scaling - Reflection and Shear Transformations.	
IV	**Visible-Surface Detection Methods**: Classification of Visible-Surface Detection Algorithm – Back-Face Detection – Depth-Buffer Method - Scan-Line Method - Depth-Sorting Method - Area-Subdivision Method - Octree Method - ***Curved Surfaces****.	**18**
V	**Color Models And Color Applications:** Properties of Light - Standard Primaries and the Chromaticity diagram - Intuitive Color Concepts - RGB Color Model – YIQ Color Model – ***CMY Color Model**** - HSV Color Model – HLS Color Model.	**18**

<* - *Self study*>

Text Book:

Donald Hearn & M. Pauline Baker, "*Computer Graphics*", Prentice Hall of India, Second Edition, 2003.

Reference Books:

1. Roy A.Plastock, Gorden Kalley, "Theory *& Problems of Computer Graphics*", Schaum's Outline Series, 1987.
2. R.K.Chauvan, Abhishek Taneja, "*Computer graphics & Multimedia*", Galgotia Publications Pvt Ltd, 2009.
3. D.P.Mukherjee, Debasish Jana, "*Computer Graphics Algorithms and Implementations",* PHI Learning Private Ltd, 2010.
4. Edward Angel, "*Interactive Computer Graphics – A Top Down Approach using OpenGL*", Pearson Publications, Fifth Edition, 2013.

E-references:

1. https://www.tutorialspoint.com/computer_graphics/index.htm
2. https://www.javatpoint.com/computer-graphics-tutorial
3. https://www.programmingsimplified.com/c-graphics-programming-tutorial

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	H	H	M
CO2	S	S	H	S	S
CO3	H	H	S	S	H
CO4	H	M	S	S	H
CO5	S	M	H	M	L

S - Strong; **H** - High; **M** - Medium; **L** - Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPI	Course Title:	Batch:	2019
Total Hours:	60	Major Core Programming Lab - IX: (Web Design) (Common for CS, BCA, IT and CT)	Semester:	VI
			Credits:	2.5

Course Objective

The course aims

- To develop static web design using HTML.
- To develop dynamic web design using DHTML and JavaScript Language.
- To develop XML programs using CSS and XSL style sheets.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K3, K4	**CO1**	Create static web pages using HTML text level, list, table, hyperlinks, frames and forms Tags.
K3, K4, K5	**CO2**	Develop scripting programs using simple JavaScript programming constructs.
K3, K5	**CO3**	Write JavaScript program using objects.
K3, K4, K5	**CO4**	Add various styles in web documents using Internal & External style sheets.
K3, K4, K5	**CO5**	Develop XML applications to structure the document using DTD, CSS and XSL style sheets.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate

SYLLABUS	
	HTML
1.	Write a HTML program to design an invitation card using text level tags.
2.	Write a HTML program to display transfer certificate application form using list tag.
3.	Write a HTML program to display a student mark sheet using table tag.
4.	Write a HTML program to design Gobi Arts & Science College website using hyperlinks.
5.	Write a HTML program to design a website for product advertisement using frames.
6.	Write a HTML program to design student Bio-data using forms tag.
	JAVASCRIPT
7.	Write a JavaScript program to display stars based on the user input.
8.	Write a JavaScript program to ask a question & accept an answer using Dialog Boxes.
9.	Write a JavaScript program to display Current Date and Time.
	DHTML
10.	Write a DHTML program to design a webpage for super market offers using Internal Style Sheet.
11.	Write a DHTML program to design a web page for company profile using External Style Sheet.
12.	Write a DHTML program to display dynamic content based on the mouse place operations.
	XML
13.	Write a XML program to display bank details using XSL style sheet.

14.	Write a XML program to display employee details using CSS style sheet.
15.	Write a XML program to display book details using CSS style sheet.

Text Books:

1. Ivan Bayross, "*Web Enabled Commercial Application Development Using HTML, JavaScript, DHTML and PHP*", BPB Publications, Fourth Edition, 2010. [UNITS – I - IV]
2. A.K.Saini and Sumit Tuli, "*Mastering XML*", EXCEL BOOKS Pvt. Ltd., First Edition, 2002. [UNIT V]

Reference Books:

1. Ravinder Singh, Amit Gupta, "*Magic with HTML, DHTML & JAVASCRIPT*", University Science Press, First Edition, 2009.
2. C. Xavier, "*World Wide Web Design with HTML*", Tata McGraw Hill Education Pvt. Ltd., Thirteenth Reprint, 2010.
3. Ann Navarro, Chuck White, "*Mastering XML*", BPB Publication, First Indian Edition, 2000.

E-references:

1. https://www.w3schools.com>html
2. https://www.tutorialspoint.com/xml/xml_overview.htm
3. https://www.javatpoint.com/javascript-tutorial

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H
CO2	S	S	S	H	S
CO3	H	M	M	M	H
CO4	S	H	S	H	M
CO5	H	S	H	H	H

S-Strong; **H**-High; **M**- Medium; **L**-Low

Programme Code:	B.Sc.	**Programme Title:**	Computer Science	
Course Code:	19UECSPJ	**Course Title:**	**Batch:**	2019
Total Hours:	60	Major Skill Based Practical: Programming Lab - X : (Computer Graphics) (Common for CS, BCA, IT and CT)	**Semester:**	VI
			Credits:	2.5

Course Objective

The course aims

- To provide a comprehensive study of graphics concepts using C programming language.
- To facilitate the students elaborately know about computer graphics techniques in C programming.
- To implement the computer graphics techniques to solve the variety of graphics problems.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K3, K4	**CO1**	Apply and Analyze the core concepts of computer graphics.
K3, K5	**CO2**	Analyze interactive computer graphics using C graphics packages and apply graphics primitives and attributes.
K3, K5	**CO3**	Evaluate the coordinate attributes and apply with coordinate spaces, coordinate conversion and transformations of graphics objects.
K3, K4, K5	**CO4**	Apply, Analyze and Evaluate 2D & 3D geometrical transformations and its representations.
K3, K5	**CO5**	Apply and Analyze the color models and its applications.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 –** Evaluate

SYLLABUS	
1. 2. 3.	Write a C program to plot a Line using DDA Line Drawing Algorithm. Write a C program to plot a Line using Bresenham's Line Drawing Algorithm. Write a C program to plot a Circle using Bresenham's Circle Drawing Algorithm.
4. 5. 6.	Write a C program to plot a Circle using Mid-Point Circle Drawing Algorithm. Write a C program to display a Man Walking using Stick Simulation. Write a C program to Clip a Line Using Line Clipping Algorithm
7. 8. 9.	Write a C program for Flag Hoisting. Write a C program for Text Animation. Write a C program to display different shapes.
10. 11. 12.	Write a C program for Eye Blinking. Write a C program to display a Chess Board. Write a C program to display a clock.
13. 14. 15.	Write a C program for 2D Translation. Write a C program for 2D Rotation about fixed point. Write a C program for 2D Scaling about fixed point.

Text Book:

Donald Hearn & M. Pauline Baker, "*Computer Graphics*", Prentice Hall of India, Second Edition, 2003.

Reference Books:

1. Roy A.Plastock, Gorden Kalley, "Theory *& Problems of Computer Graphics*", Schaum's Outline Series, 1987.
2. R.K.Chauvan, Abhishek Taneja,"*Computer graphics & Multimedia*", Galgotia Publications Pvt Ltd, 2009.
3. D.P.Mukherjee, Debasish Jana, "*Computer Graphics Algorithms and Implementations",* PHI Learning Private Ltd, 2010.
4. Edward Angel, "*Interactive Computer Graphics – A Top Down Approach using OpenGL*", Pearson Publications, Fifth Edition, 2013.

E-references:

1. https://www.tutorialspoint.com/computer_graphics/index.htm
2. https://www.javatpoint.com/computer-graphics-tutorial
3. https://www.programmingsimplified.com/c-graphics-programming-tutorial

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	S	M
CO2	H	S	S	S	S
CO3	S	S	H	M	S
CO4	S	S	S	S	H
CO5	M	H	M	M	L

S-Strong; **H**-High; **M**- Medium; **L**-Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACS16	Course Title:	Batch:	2019
Total Hours:	90	Programming with PHP (Common for CS, BCA, IT, CT)	Semester:	VI
			Credits:	4.5

Course Objective

The course aims

- To understand the syntax and semantics of the PHP Scripts and MYSQL Database.
- To develop and implement various types of dynamic web pages in the PHP Scripts.
- To apply the PHP Scripts in the appropriate applications.

Course Outcomes (CO)

Knowledge Level	CO Number	Course Outcomes
K1, K2	CO1	Remember the PHP Scripts along with MySQL and understand the components of PHP and various operators.
K2, K3, K5	CO2	Understand the various techniques of scripts, functions and how it is implemented in website developing.
K2	CO3	Working with Date and Time functions in PHP and also investigate the object and String functions.
K2, K3, K5	CO4	Be aware of the dynamic web page with HTML Forms and PHP Script.
K2, K3, K4	CO5	Know about the Files, directories and creating and using Images in PHP Scripts.

K1 - Remember; **K2** - Understanding; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	Introduction of PHP: What is PHP? Advantages of PHP –**PHP Language structure:** The Building blocks of PHP – Variables – Data types – type casting – Operator and Expressions – Constants - **Introduction to MYSQL:** Data types – table creation - insert, select, replace, update and delete commands – using where in your Queries.	**18**
II	**Flow control function in PHP:** Switching Flow–***Loops****–code block and browser output. **Working with Arrays:** Array definition-Creating Arrays–Array Related Functions–**Working with Function:** Definition-Calling functions-Defining a function-returning values from user defined functions-variable scope-static statement-more about arguments-testing for existence of a function.	**18**
III	**Working with Strings, Date and Time:** Formatting strings with PHP – Investigating strings in PHP – Manipulating strings with PHP – using Date and Time functions– **Working with objects:** Creating an object – properties of object – object methods – constructors - Object Inheritance.	**18**
IV	**Working with forms:** ***Creating a simple input form**** – Accessing form – combining HTML and PHP code on a single page – using hidden fields to save	**18**

	state – redirecting the user – sending mail on form submission - working with file uploads – **Working with cookies and user sessions:** Introducing cookies – setting a cookies– Deleting a cookie – session function – starting a session - working with session variables – passing session IDs - Destroying sessions and unsetting variables.	
V	**Working with files and Directories:** Including files with include() – validating files - Creating and Deleting file – opening a file for writing, reading and appending – reading from files – Writing or appending to a file - working with directories - Opening pipes to and from processes using popen()- Running commands with exec(), system() or passthru() – **Working with images:** Image creation process – Drawing a new image – Creading pie charts - modifying existing images – using images created by scripts.	**18**

<* - *Self study*>

Text Book:

Julie C. Meloni, "*PHP, MYSQL and Apache*", Dorling Kindersley (India) Pvt. Ltd., 2005. (Unit I – V)

Reference Books:

1. Jeremy Allen & Charles Hornberger, "*PHP, Apache, MySQL Web development*", Wiley Publications, First Edition, 2006.
2. Vikram Vaswani, "*A Beginner's Guide PHP*", Tata McGraw Hill Education Pvt. Ltd., Fourth Edition, 2005.
3. Steven Holzner, "*PHP: The Complete Reference*", Tata McGraw Hill Education Pvt. Ltd., First Edition, 2008.
4. Sheldon Moes, "*Beginning MYSQL*", Wiley Publications, Fourth Edition, 2005.

E-references:

1. https://www.www3.com
2. http://www.spoken-tutorial.org
3. https://www.studytonight.com

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	L	M	S
CO2	S	S	M	M	L
CO3	H	S	H	H	H
CO4	S	S	S	S	M
CO5	S	S	M	S	H

S - Strong; **H** - High; **M** - Medium; **L** - Low

Programme Code:	B.Sc.	Programme Title:	Computer Science	
Course Code:	19UACSPK	Course Title:	Batch:	2019
Total Hours:	60	Programming Lab - XI: (PHP) (Common for CS, BCA, IT, CT)	Semester:	VI
			Credits:	2.5

Course Objective

The course aims

- To understand the syntax and semantics of the PHP Scripts and MYSQL Database.
- To develop and implement various types of dynamic webpages in the PHP Scripts.
- To apply the PHP Scripts in the appropriate applications.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2	**CO1**	Remember the PHP Scripts along with MySQL and understand the components of PHP and various operators.
K2, K3, K5	**CO2**	Understand the various techniques of scripts and how it is implemented in website developing.
K2	**CO3**	Working with Date and Time functions in PHP and also investigate the object and String functions.
K2, K3, K5	**CO4**	Be aware of the dynamic web page with combining HTML and PHP.
K2, K3, K4	**CO5**	Learn about the File manipulation, directories and Images in PHP Scripts.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate

SYLLABUS	
1. 2. 3.	Write a PHP program to validate the text box. Write a PHP program to draw different shapes. Write a PHP program to perform the string manipulation.
4. 5. 6.	Write a PHP program to perform the file uploading. Write a PHP program to perform the user registration form using HTML tags. Write a PHP program to display the date and time using AJAX.
7. 8. 9.	Write a PHP program to check the user login. Write a PHP program to create a college website. Write a PHP program for cookies and session concepts.
10. 11. 12.	Write a PHP program to perform the file read, write, open and append operation. Write a PHP program to create a library information using inheritance. Write a PHP program for online examinations.
13. 14. 15.	Write a PHP program to send the mail using mail concept. Write a PHP program for supermarket. Write a PHP program for online recharging.

Text Book:

Julie C. Meloni, "*PHP, MYSQL and Apache*", Dorling Kindersley (India) Pvt. Ltd., 2005.

Reference Books:

1. Jeremy Allen & Charles Hornberger, "*PHP, Apache, MySQL Web development*", Wiley Publications, First Edition, 2006.
2. Vikram Vaswani, "*A Beginner's Guide PHP*", Tata McGraw Hill Education Pvt Ltd., Fourth Edition, 2005.
3. Steven Holzner, "*PHP: The Complete Reference*", Tata McGraw Hill Education Pvt Ltd., First Edition, 2008.
4. Sheldon Moes, "*Beginning MYSQL*", Wiley Publications, Fourth Edition, 2005.

E-references:

1. https://www.www3.com
2. http://www.spoken-tutorial.org
3. https://www.studytonight.com

Mapping with Programme Specific Outcomes

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	L	M	S
CO2	S	S	M	M	L
CO3	H	S	H	H	H
CO4	S	S	S	S	M
CO5	S	S	M	S	H

S-Strong; **H**-High; **M**- Medium; **L**-Low

Question Paper Pattern

(Common for Major, Allied, Allied Optional and Major Optional Papers)

For EOS Examinations: 70 Marks

The Question Paper is to be divided into THREE Sections.

Section-A Carries 15 Marks, Section-B Carries 25 Marks and Section-C Carries 30 Marks.

Section-A Contains 15 Multiple Choice Questions. (15 x 1 = 15 Marks)

Three Questions from each unit. (Q. No: 1 to 15)

Section-B Contains 5 Either or Choice Questions. (5 x 5 = 25)

Each Question carries 5 Marks. Both (a) and (b) from the same unit.

Q. No.: 16 (a) or (b) to 20(a) or (b)

Section-C Contains 5 Questions out of which, 3 Questions are to be answered. (3 x 10 = 30)

Each Question carries 10 Marks. One Question from each unit. Q. No.: 21 to 25

For CIA Examinations: 30 Marks

Section-A: 10 Multiple Choice Questions. (10 x 1 = 10)

Section-B: Two Questions out of Three. (2 x 5 = 10)

Section-C: One Question out of Two. (1 x 10 = 10)

Programme Code:	ALL U.G.	Programme Title:	Major Optional	
Course Code:	19UFCS04	Course Title:	Batch:	2019
Total Hours:	60	Programming Fundamentals	Semester:	V
			Credits:	3.0

Course Objective

The course aims

- To educate students with fundamental concepts of programs.
- To design and develop programs using BASIC language.
- To get idea about Visual Basic fundamentals and write programs.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K2, K3, K5	CO1	Gain good understanding of Programming Languages and Problem Solving.
K2, K3, K4	CO2	Get knowledge about fundamentals of BASIC programming language.
K1, K2, K5	CO3	Able to describe Variables and Evaluate Expression.
K1, K2, K3, K5	CO4	Demonstrate the concept of Control Structure and write programs.
K2, K3, K5	CO5	Learn the basic GUI tools of Visual Basic and write Programs.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 –** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**SOFTWARE:** Programming Languages, Common High Level Language, Program Execution Modes, Problem solving and flowcharts, Problem solving, Flowcharting, Branching, Looping, Connection, hints for Flowcharts.	**10**
II	**IMPORTANCE OF BASIC:** Sample program, Program Analysis, Getting BASIC into the computer, Listing and Editing BASIC programs, Saving and Running programs, Erasing programs.	**10**
III	**CONSTANTS AND VARIABLES:** Character set, Constants, Variables, Naming the Variables, Getting Data into Memory, Restore statement, Expressions in BASIC, ***Arithmetic Expressions****, ***Hierarchy of operations****, Rules of Arithmetic, Evaluation of Expressions, Relational Expressions, Logical Operations.	**15**
IV	Jumping, Branching, Looping, ***Subscripted Variables****, Functions and Subroutines.	**13**
V	**VISUAL PROGRAMMING:** Basic controls, Properties, Methods, Text box, Label box, Command Button, Sample codes.	**12**

<* - ***Self Study***>

Text Books:

1. Balagurusamy, "*programming in BASIC*", TATA McGraw – Hill Publications.
2. Wallece Mary, "*Visual basic 6 Programming*", IDG Books India (p) Ltd.

Reference Books:

1. Suganthi J, Sasi Kala Rani K., "*Fundamentals of Computer Programming"*, Vijay Nicole Imprints Pvt. Ltd.
2. R. S. Salaria, *"A Gate way to Computer Literacy Computer Fundamentals"*, Khanna Publishers.
3. Dr. Narendra Kumar, Shilpi Srivastava, Rajesh Chadhay, Hariom Pancholi, *"Visual Basic"*, Vayu Education of India, 1st Edition, 2011.

E-references:

1. https://www.tutorialspoint.com/computer_programming/computer_programming_basics.htm
2. http://www.truebasic.com/book/export/html/1031
3. https://www.vbtutor.net/lesson3.html

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	H
CO2	S	S	H	H	H
CO3	M	S	H	H	H
CO4	S	S	H	H	M
CO5	S	M	S	H	H

S - Strong; **H -** High; **M -** Medium; **L –** Low

Programme Code:	ALL U.G.	Programme Title:	Major Optional	
Course Code:	19UFCSP4	Course Title:	Batch:	2019
Total Hours:	30	Programming Fundamentals (Lab)	Semester:	V
			Credits:	1.0

Course Objective

The course aims

- To understand the fundamental knowledge on VISUAL BASIC.
- To learn basic level control and flow programming logic.
- To visualize the interaction with by programming concepts.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2, K5	**CO1**	Understand the concept of constants, variables and expression VB and apply.
K1, K2, K3, K5,	**CO2**	Understand and write program using control structure.
K1, K2, K5	**CO3**	Understand and write program using conditional statements.
K2, K4, K5	**CO4**	Apply the subroutine concept in visual basic programs.
K2, K3, K5	**CO5**	Analyze the properties of visual basic tool and apply it.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5** - Evaluate

SYLLABUS	
1. 2. 3.	Write a BASIC program to check the given number is prime or not. Write a BASIC program to calculate sum of digits of the given number. Write a BASIC program to print the multiplication table.
4. 5. 6.	Write a BASIC program to find out the factorial value of a given number Write a BASIC program to find the biggest value among three numbers. Write a BASIC program to find the area circumstances.
7. 8.	Write a VISUAL BASIC program to perform Arithmetic operations. Write a VISUAL BASIC program to check whether the given year is leap year or not.
9. 10.	Write a VISUAL BASIC program to count the occurrence of a character. Write a VISUAL BASIC program change the colour using scroll bar.
11. 12.	Write a VISUAL BASIC program to check the given number is odd or even. Write a VISUAL BASIC program to generate Fibonacci series.

Text Books:

1. E. Balagurusamy, "*programming in BASIC*", TATA McGraw – Hill Publications.
2. Wallece Mary, "*Visual basic 6 Programming*", IDG Books India (p) Ltd.

Reference Books:

1. Suganthi J, Sasi Kala Rani K., "*Fundamentals of Computer Programming"*, Vijay Nicole Imprints Pvt. Ltd.
2. R. S. Salaria, "*A Gate way to Computer Literacy Computer Fundamentals"*, Khanna Publishers.
3. Dr. Narendra Kumar, Shilpi Srivastava, Rajesh Chadhay, Hariom Pancholi, "*Visual Basic"*, Vayu Education of India, 1st Edition, 2011.

E-references:

1. https://www.tutorialspoint.com/computer_programming/computer_programming_basics.htm
2. http://www.truebasic.com/book/export/html/1031
3. https://www.vbtutor.net/lesson3.html

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	M	S
CO2	S	M	H	H	M
CO3	S	S	M	H	H
CO4	H	M	H	M	S
CO5	S	S	M	S	S

S-Strong; **H**-High; **M**- Medium; **L**-Low

Programme Code:	ALL U.G.	Programme Title:	Major Optional	
Course Code:	19UFCS02	Course Title:	Batch:	2019
Total Hours:	60	Linux & Shell Programming	Semester:	V
			Credits:	3.0

Course Objective

The course aims

- To understand the basics of Linux Operating System and Bash Shell Scripts.
- To understand the Concepts in Shell Scripts.
- To develop and implement various types of shell programs in the Linux Operating System.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1, K2	**CO1**	Learn and Understand the basic of Linux Operating System, Editors and Shells.
K2, K3, K5	**CO2**	Understand the Linux File techniques and Execute Simple basic shell commands.
K2, K3, K4	**CO3**	Implement the Variables in Bash shell and also investigate the command substitution functions and redirection.
K2, K3, K5	**CO4**	Write programs using Conditional Executions and repetitive in Shell Scripts.
K2, K3, K4	**CO5**	Realize the Date and time function and learn the concepts of file and directories functions.

K1 - Remember; **K2 -** Understanding; **K3 -** Apply; **K4 -** Analyze; **K5 –** Evaluate

SYLLABUS		
Unit	**Content**	**No. of Hours**
I	**Introduction to Linux operating system:** Introduction-the Linux operating system-history-Linux architecture-features and utilities-shell available in Linux-Creating files using the vi editor: Editor available with Linux-The vi editor.	**12**
II	**Managing files and directories:** The Linux file system-Directory commands in Linux-Basic Linux commands: password, man, find, who, sh, grep, wc and exit.	**12**
III	**Automating tasking using shell scripts:** Introduction-Variables-local and global variables-Command substitution-Redirection-Pipes-***Test and [] commands****.	**12**
IV	**Using execution in shell scripts: conditional** Conditional execution-IF, ELSE IF, Case…easc constructs. Managing repetitive: while, until, for constructs-Linux with C programs.	**12**
V	File commands-date & time commands-The directories Command, ***Break and continue commands****-Functions.	**12**

<* - *Self Study*>

Text Book:

NIIT,"**OPERATING SYSTEM LINUX**",-Prentice-hall of India Pvt. Ltd 2003.

Reference Books:

1. Neil Mathew & Richard Stones, "Beginning Linux Programming", Wiley India Pvt. Ltd., 4th Edition, 2007.
2. Bill Ball, "Using Linux", PHI Ltd Publication, 5th Edition, - 2000.

E-references:

1. https://www.studytonight.com
2. https://www.tutorialspoint.com
3. https://www.www3.com
4. http://www.spoken-tutorial.org

Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	L	M	S
CO2	S	S	M	M	L
CO3	S	S	H	H	H
CO4	S	S	S	S	M
CO5	S	S	M	S	H

S - Strong; **H** - High; **M** - Medium; **L –** Low

Programme Code:	ALL U.G.	Programme Title:	Major Optional	
Course Code:	19UFCSP2	Course Title:	Batch:	2019
Total Hours:	30	Linux & Shell Programming (Lab)	Semester:	V
			Credits:	1.0

Course Objective

The course aims

- To understand the syntax and semantics of the Bash Scripts and to develop and implement various types of programs in the Bash Scripts.
- To understand the Operating Systems Concepts in the Bash Shell Scripts and execute programs.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

Knowledge Level	CO Number	Course Outcome
K1,K2	**CO1**	Introduce the shell Scripts and understand the components.
K2,K3	**CO2**	Understand the simple techniques of scripts and how it is implemented.
K2,K3	**CO3**	Work with Date and Time functions in Shell scripts and also investigate the Palindrome functions.
K2,K3	**CO4**	Apply the Calendar and Simple String Functions in Shell Scripts
K3,K4,K5	**CO5**	Analyse and Evaluate the Simple Applications with Shell Scripts.

K1 – Remember; **K2** – Understanding; **K3** – Apply; **K4** – Analyze; **K5 -** Evaluate

SYLLABUS	
1.	Write a Linux shell program to find the biggest among 3 number.
2.	Write a Linux shell program to find the Factorial of given number.
3.	Write a Linux shell program to display the Fibonacci series for the given limit.
4.	Write a Linux shell program for sum of digits.
5.	Write a Linux shell program to find the reverse of the given numbers.
6.	Write a Linux shell program to find check whether the given string is palindrome or not.
7.	Write a Linux shell program to display time, date and list using basic Linux commands.
8.	Write a Linux shell program to find length of given string.
9.	Write a Linux shell program to display the calendar.
10.	Write a Linux shell program to display the employee pay bill.
11.	Write a Linux shell program to display the electricity bill.
12.	Write a Linux shell program to display the student mark sheet.

Text Book:

NIIT,"**OPERATING SYSTEM LINUX**",-Prentice-hall of India Pvt. Ltd 2003.

Reference Books:

1. Neil Mathew & Richard Stones, "Beginning Linux Programming", Wiley India Pvt. Ltd., 4th Edition, 2007.
2. Bill Ball, "Using Linux", PHI Ltd Publication, 5th Edition, - 2000.

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Mapping with Programme Specific Outcomes

PSO / CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	L	M	S
CO2	S	S	M	M	L
CO3	S	S	H	H	H
CO4	S	S	S	S	M
CO5	S	S	M	S	H

S-Strong; **H**-High; **M**- Medium; **L**-Low