

# **DEPARTMENT OF COMPUTER SCIENCE**

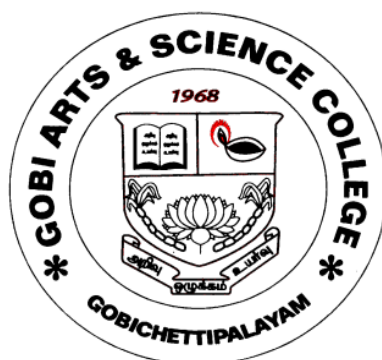
**PGDCA (COMPUTER APPLICATIONS)**

**(Students admitted during 2020-2021 Onwards)**

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

## **SYLLABUS**

**I & II SEMESTER**



## **GOBI ARTS & SCIENCE COLLEGE**

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

**KARATTADIPALAYAM POST,  
GOBICHETTIPALAYAM - 638453  
ERODE DISTRICT.**

## **GOBI ARTS & SCIENCE COLLEGE (Autonomous)**

### **Vision**

Social and Economic upliftment of the people of this area through value based quality Education.

### **Mission**

Committed to serve the society with humility and trust, devoid of exploitation; to impart value based higher education, particularly to the socially and economically deprived sections of this area; to make students of this institution worthy citizens of our glorious motherland.

## **DEPARTMENT OF COMPUTER SCIENCE**

### **Vision**

To inculcate better programming skills among rural area students.

### **Mission**

To impart value based technical education and educate students towards the design and development of software products for the benefit of computer industry and society.

**GOBI ARTS & SCIENCE COLLEGE (AUTONOMOUS) : GOBICHETTIPALAYAM**

**SCHEME OF EXAMINATIONS - PGDCA (COMPUTER APPLICATIONS) (20 BATCH)**

No.	Course Code	Course	Total Hours	Hrs/ Exam	Maximum Marks		Total Marks	Credits
					CIA	EOS		
<b>SEMESTER - I</b>								
1	19P3DC01	PRINCIPLES OF INFORMATION TECHNOLOGY	60	3	40	60	100	5.0
2	19P3DC02	DIGITAL COMPUTER FUNDAMENTALS & ARCHITECTURE	60	3	40	60	100	6.0
3	19P3DC03	PROGRAMMING IN C & C++	60	3	40	60	100	6.0
4	19P3DCPA	PROGRAMMING LAB - I : (OFFICE AUTOMATION TOOLS & TALLY)	60	3	40	60	100	4.0
5	19P3DCPB	PROGRAMMING LAB - II : (C & C ++)	60	3	40	60	100	4.0
<b>SEMESTER - II</b>								
6	19P3DC04	COMPUTER NETWORKS	60	3	40	60	100	5.0
7	19P3DC05	RELATIONAL DATA BASE MANAGEMENT SYSTEM	60	3	40	60	100	6.0
8	19P3DC06	VISUAL BASIC	60	3	40	60	100	6.0
9	19P3DCPC	PROGRAMMING LAB - III : (VISUAL BASIC)	60	3	40	60	100	4.0
10	19P3DCPD	PROGRAMMING LAB - IV : (RELATIONAL DATA BASE MANAGEMENT SYSTEM)	60	3	40	60	100	4.0

**TOTAL CREDITS: 50**

## BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN

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

### I. END OF SEMESTER (EOS) EXAMINATIONS:

#### 1. Theory: 60 Marks

Knowledge Level	Section	Marks	Description	Total
K1, K2, K3, K4, K5	Answer 5 out of 8	$5 \times 12 = 60$	Descriptive/Detailed	60

#### 2. Practical Examinations: 60 Marks

Knowledge Level	Section		Total
	Practical	Record work	
K3	50	10	60
K4			
K5			

### II. CONTINUOUS INTERNAL ASSESSMENT (CIA):

#### 1. Test – I & II: 40 Marks (Theory)

Knowledge Level	Section	Marks	Description	Total
K1, K2, K3, K4, K5	Answer 2 out of 4	$2 \times 20 = 40$	Descriptive/Detailed	40

#### 2. Practical Internal Assessment: 40 Marks

Knowledge Level	Components		Lab Performance	Total
K3, K4, K5	Test 1	30	10	40

#### Components of Continuous Internal Assessment (CIA)

Components	Calculation	CIA Total
Test 1 & Test 2	$\frac{\text{Test 1} + \text{Test 2}}{2}$	40

## **PROGRAMME SPECIFIC OBJECTIVES**

The students will be able to do, on successful completion of programme,

1. Gain sound technical foundation in computer science theory and open source programming languages and the ability to apply computer related technologies to practical problems.
2. Acquire independent thinking, possess problem-solving skills and become technically competent to pursue higher studies.
3. Exhibit professional leadership qualities, good communication, team work, social and professional skills.
4. Utilize emerging technological tools, learn, adapt and successfully write effective procedural coding, meeting the needs of technical and societal challenges.
5. Equip students to critically analyze existing systems at multiple levels and develop innovative solutions that cater to the dynamic nature of information technology industries.

## **PROGRAMME SPECIFIC OUTCOMES (PSO)**

**PSO1:** Acquire sound knowledge in the basic concepts of computing and information technology including theory and programming acquainting with contemporary trends in computer applications.

**PSO2:** Gain familiarity in latest trends in various subjects of computer applications and develop innovative solutions.

**PSO3:** Utilize emerging technological tools and write coding, meeting the needs of technical and societal challenges.

**PSO4:** Solve a range of problems using office productivity applications, and adapt quickly to new software releases.

**PSO5:** Equip the students with skills required for designing, developing applications in Information Technology.

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC01	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Principles of Information Technology	<b>Semester:</b>	I
			<b>Credits:</b>	5.0

### Course Objective

#### The course aims

- To learn how to design digital circuits by simplifying the Boolean functions.
- To identifying the functional units in a digital computer system.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1</b>	<b>CO1</b>	Understand the fundamentals of computers, input and output devices
<b>K1,K2</b>	<b>CO2</b>	To master the function of each element of a memory hierarchy
<b>K2,K4</b>	<b>CO3</b>	Be familiar with Algorithm, Flowchart and Programming Languages
<b>K2,K3</b>	<b>CO4</b>	To gain knowledge on operating system concepts that includes architecture, algorithms and protocols
<b>K2,K5</b>	<b>CO5</b>	Identify the basic hardware and software requirements for multimedia development and to get familiar with internet concepts

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

### SYLLABUS

Unit	Content	No. of Hours
<b>I</b>	Computer Basics – Introduction - Evolution of Computers – Generations of Computers – Classification of Computers – The Computer system – Applications of Computers. Input Output Media – Introduction – Types of Input Devices – Types of Output Devices – Computer Terminals.	<b>12</b>
<b>II</b>	Computer Memory and Storage – Introduction – Memory Hierarchy – Random Access Memory (RAM) – Read Only Memory (ROM) – RAM, ROM, and CPU Interaction – Types of Secondary Storage Devices – Magnetic Type – Magnetic Disk – Types of Magnetic Disk – Optical Disk – Types of Optical Disks – Magneto – Optical Storage Devices – Mass Storage Devices.	<b>12</b>
<b>III</b>	Computer Programming and Languages – Introduction – Algorithm – Flowchart – Pseudo code – Program Control Structures – Programming Paradigms – Programming Languages – Generations of Programming Languages.	<b>12</b>
<b>IV</b>	Computer Software – Introduction – Categories of Software – Operating System – Introduction – Evolution of Operating System – Types of Operating System – Functions of Operating Systems	<b>12</b>

<b>V</b>	Multimedia Essentials – Introduction – Building Blocks of Multimedia – Multimedia System – Multimedia Applications – Virtual Reality. The Internet – Introduction – Evolution of Internet – Basic Internet Terms – Getting Connected to Internet – Internet applications – Data over Internet.	<b>12</b>
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**Text Book:**

1. Introduction to Information Technology, IITL Education Solutions Limited, PEARSON Education, 2008

**Reference Books:**

1. Rizwan P. Ahmed, “*Introduction to Information Technology*”, Marghan Publications, 2016.
2. Saravanakumar R., Parameshwaran R., Jayalakshmi T., “*A TextBook of Information Technology*”, S.Chand & Company Ltd., 2007.
3. Alex Leon, Mathews Leon, Leena Leon, “*Introduction to Information Technology*”, Vijay Nicole Imprints Private Limited, Chennai, 2013.

**E-references:**

1. [https://www.tutorialspoint.com/computer\\_fundamentals/computer\\_input\\_devices.htm](https://www.tutorialspoint.com/computer_fundamentals/computer_input_devices.htm)
2. <https://lecturenotes.in/materials/14323-computer-fundamentals>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC02	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Digital Computer Fundamentals & Architecture	<b>Semester:</b>	I
			<b>Credits:</b>	6.0

### Course Objective

#### The course aims

- To learn how to design digital circuits by simplifying the Boolean functions.
- To identifying the functional units in a digital computer system.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1</b>	<b>CO1</b>	Explain Fundamental Concept the Decimal Number Systems
<b>K1,K2</b>	<b>CO2</b>	Explain Basic circuit concepts and Laws of boolean algebra to simplify circuits
<b>K2,K4</b>	<b>CO3</b>	Understand the concepts of Flip-Flops and its functions
<b>K2,K3</b>	<b>CO4</b>	Identify and illustrate basic organization of computer
<b>K2,K5</b>	<b>CO5</b>	Illustrate I/O devices and Peripherals

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

### SYLLABUS

Unit	Content	No.of Hours
<b>I</b>	<b>Number Systems</b> : Review of Decimal Number System-Binary Number System-Binary to decimal conversion-Decimal to Binary conversion- Hexadecimal Number System-Hexadecimal to Decimal Conversion-Decimal to Hexadecimal Conversion-Hexadecimal to binary conversion-Binary to Hexadecimal conversion – Octal Number System- Decimal to Octal Conversion-Octal to Binary conversion-Binary to Octal Conversion. <b>Binary Arithmetic</b> : Binary addition-Binary subtraction – 1's, 2's, 9's and 10's complements. <b>Binary Codes</b> : BCD Codes – 8421, Excess 3, Gray codes.	<b>12</b>
<b>II</b>	Logic gates and Logic Circuits: Basic Logic Gates (NOT, OR, AND, NAND, NOR, EX-OR and EX-NOR) – <b>Boolean Algebra</b> : Laws of Boolean algebra. <b>K map</b> : 2,3 and 4 variables - Don't care conditions . <b>Arithmetic Circuit</b> : Half & Full Adder – Half & Full Subtractor.	<b>12</b>
<b>III</b>	<b>Combination Circuits Application</b> : Multiplexers -Demultiplexers. <b>Flipflops</b> : SR Flipflop – D Flipflop – JK Flipflop –T Flip flop. <b>Registers</b> – Shift Registers.	<b>12</b>
<b>IV</b>	General Register Organization – Stack Organization – Instruction formats – addressing modes – Data Transfer & Manipulation – Program control – Interrupts.	<b>12</b>
<b>V</b>	<u>Input – Output Organization</u> : Peripheral Devices – Interface – Asynchronous Data Transfer: Strobe Control – Handshaking – Asynchronous serial data transfer : UART – DMA – IOP : IOP communication	<b>12</b>

**Text Books:**

1. Vijayendran V, "Digital Fundamentals", S. Viswanathan Private Limited, 2013. (UNIT I, II & III)
2. M. Morris Mano, "Computer System Architecture", PHI, 2007, Third Edition. (UNIT IV, V)

**Reference Books:**

1. M. Morris Mano, "Digital Logic and Computer Design", PHI, 2008.
2. John P Hayes, "Computer Architecture and Organization", Tata McGraw Hill.

**E-references:**

1. <https://www.geeksforgeeks.org/computer-organization-and-architecture-tutorials/>
2. [https://www.tutorialspoint.com/computer\\_logical\\_organization/digital\\_number\\_system.htm](https://www.tutorialspoint.com/computer_logical_organization/digital_number_system.htm)

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC03	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Programming in C & C++	<b>Semester:</b>	I
			<b>Credits:</b>	6.0

### Course Objective

#### The course aims

- To understand and use the basic programming constructs of C/C++.
- To manipulate various C/C++ data types, such as arrays, strings and pointers.
- To write small –scale C/C++ program using the above skills.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1,K2</b>	<b>CO1</b>	To gain the basic the strength of C language and supporting statements for simple programs.
<b>K1,K2</b>	<b>CO2</b>	Understand different data structure and implements program using data structure
<b>K2,K4</b>	<b>CO3</b>	Understand the application area of pointers and to gain knowledge in file management
<b>K2,K3</b>	<b>CO4</b>	Understand the basic concept of OOP and familirize to write simple c++ programe
<b>K3,K5</b>	<b>CO5</b>	Using OOPs concept namely Inheritance and Polymorphism applied to design c++ program

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

### SYLLABUS

Unit	Content	No.of Hours
<b>I</b>	<b>Constants, Variables, and Data Types:</b> Introduction – Character Set – C Tokens – Keywords and Identifiers – Constants – Variables – Data Types – Declaration of Variables – Declaration of Storage class – Operators and Expressions: Arithmetic Operators – Relational Operators – Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators Special Operators – Evaluation of Expressions – Managing Input and Output Operators.	<b>12</b>
<b>II</b>	<b>Decision Making and Branching :</b> Simple if Statement – The if...else Statement – Nesting of if...else Statements – The Else if Ladder – The Switch Statement – The ?: Operator – The Goto Statement – Arrays.	<b>12</b>
<b>III</b>	Principles of Object – Oriented Programming – Tokens, expressions and Control Structures – Functions in C++.	<b>12</b>

<b>IV</b>	Classes and Objects – Constructors and Destructors – Operator Overloading and Type Conversions.	<b>12</b>
<b>V</b>	<b>Inheritance</b> : Extending Classes – Pointers, Virtual Functions and Polymorphism – Managing Console I/O Operation.	<b>12</b>

**Text Books:**

1. Balagurusamy. E, “*Programming in ANSI C*”, Third Edition, Tata McGraw – Hill Publishing Company Limited, (UNITS I & II) 2007
2. Balagurusamy. E, “*Object Oriented Programming C++*”, Third Edition, Tata McGraw – Hill Publishing Company Limited.(UNITS III, IV, & V) 2007

**Reference Books:**

1. Herbert Schildt, “*The Complete Reference C*”, Fourth Edition, McGraw Hill Education (India) Pvt, Ltd., 2009.
2. Alok Kumar Jagadev, Amiya Kumar Rath, Satchidananda Dehwri, “*Object Oriented Programming using C++*”, PHI, 2007.
3. Mahapatra. P. B, “*Programming in C*”, First Edition, S.Chand & Company Ltd., 2009.

**E-references:**

1. <https://www.tutorialspoint.com/cplusplus/>
2. <https://www.w3schools.in/cplusplus-tutorial/>
3. <https://www.tutorialspoint.com/cprogramming/>

**Mapping with Programme Specific Outcomes**

CO \ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO1</b>	S	M	M	S	M
<b>CO2</b>	S	S	M	S	M
<b>CO3</b>	S	S	S	M	M
<b>CO4</b>	S	S	M	S	S
<b>CO5</b>	S	M	S	M	S

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DCPA	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Programming Lab - I: (Office Automation Tools & Tally)	<b>Semester:</b>	I
			<b>Credits:</b>	4.0

### Course Objective

#### The course aims

- To understanding the feature of Word, Excel, Access, PowerPoint.
- To develop the knowledge of how to represent real-life accounting problems using Tally Software.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K3,K4</b>	<b>CO1</b>	Recognize when to use each of the Microsoft Office programs and tally software to infer professional business documents.
<b>K3,K4</b>	<b>CO2</b>	Use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards.
<b>K3,K4,K5</b>	<b>CO3</b>	Design and illustrate documents using formatting and drawing tools
<b>K4,K5</b>	<b>CO4</b>	To familiarize in creating spreadsheets and presentation
<b>K4,K5</b>	<b>CO5</b>	To gain practical Knowledge on tables and queries

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

#### List of Programs:

1. Type a paragraph and perform the following actions.
  - (i) Bold (ii) Italic (iii) Underline (iv) Font type (v) Font size (vi) Spell check (vii) Line Spacing viii) Center heading (ix) Page number (x) Header & Footer.
2. Design an wedding invitation card using libreoffice.
3. Using mailmerge send letters to the staff members intimating the re-opening date using libreoffice.
4. Maintain a workbook of two semesters of your class and perform manipulation.
5. Maintain a workbook of two semesters of your class and consolidate the mark sheets.
6. Draw a pie chart and a column chart for a mark sheet.
7. Create a database to maintain, student address & marks with the following conditions.
  - i) Roll number should be primary key.
  - ii) Name should not be empty.

8. Create a student database & sort information in  
(i) ascending & descending order of name ii) descending order of gender.
9. Create an employee database and display the selected fields using queries.
10. Create an employee database and generate report.
11. Design a presentation for anti-plastic awareness rally.
12. Design a presentation with five slides for a product of your choice including the picture of the product. The presentation should be in normal mode.
13. Design a slide show for the news of TV Channel. The presentation should have the following transactions.  
1. Top down 2. Bottom up 3. Zoom in 4. Zoom out
14. From the following particulars of prepare ledger accounts of Mr.Chandran for the period of december-2008.

Particulars	Amount
cash balance	80,000
bought goods for cash	25,000
purchased goods on credit from guru	6,000
sold goods to somu on credit	8,000
paid guru	6,000
cash received from somu	8,000
paid trade expenses	10,000
commission received	8,000

15. From the following particulars Prepare the ledger account of Mrs. Lalitha for the month of August – 2008

Particulars	Amount
cash in hand	46,000
paid into bank	12,000
cash sales	24,000
credit sales to mani	3,000
printing charges	3,000
cheque received from natasan	250
divided received	2,000
computer purchased	38,000
cash received	3,000
cash withdraw from bank	2,000

**Text Book:**

MS Office 97, Russel A. Stultz, First Indian Edition 1997, BPB Publications.

**Reference Book:**

1. Teach Yourself window's 98 in 24 hours-Perry Greg-Techmedia.

**E-references:**

1. <https://www.tutorialspoint.com/word/>
2. <https://edu.gcfglobal.org/en/subjects/office/>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DCPB	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Programming Lab - II: (C & C++)	<b>Semester:</b>	I
			<b>Credits:</b>	4.0

### Course Objective

#### The course aims

- To Understanding the feature of C++ supporting object oriented programming.
- To develop the knowledge of how to represent real-life entities of problems in system design.
- To implement inheritance and file operations.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K2,K3,K4</b>	<b>CO1</b>	Apply the basic knowledge on Object Oriented concepts
<b>K3,K4</b>	<b>CO2</b>	To develop applications using Object Oriented Programming Operators and Functions
<b>K3,K4,K5</b>	<b>CO3</b>	Design the class structures as fundamental, modular building block and demonstrate the differences between traditional imperative design and object-oriented Design
<b>K3,K4,K5</b>	<b>CO4</b>	Illustrate the role of inheritance, polymorphism and building reusable code
<b>K1,K5</b>	<b>CO5</b>	Evaluate small/medium scale C++ programs with pointers and understand the file handling and error handling mechanisms in C++

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

1. Write a C program to find the number of occurrences of a particular digit.
2. Write a C program to read a positive integer and print its binary equivalent.
3. Write a C program to calculate the mean, standard deviation & variance of a given number.
4. Write a C program to sort the given 'N' numbers using the orders.
5. Write a C program to sort the given 'N' names in Alphabetical order.
6. Write a C program to find the numbers of characters, words & lines in a given text
7. Write a C program to perform concatenation of two strings.
8. Write a C program to find the binomial co-efficient of a given number.
9. Write a C program to find the addition of two matrices using function.
10. Write a C program to find the roots of a quadratic equation.
11. Write a C++ program to perform arithmetic operation using inline function.
12. Write a C++ program to find the volume of different shapes using function overloading.
13. Write a C++ program to calculate the addition of private data using friend function.

14. Write a C++ program to display employee details using virtual function.
15. Write a C++ program to print Fibonacci series using copy constructor.
16. Write a C++ program to perform complex arithmetic operation using operator overloading.
17. Write a C++ program to find linear search using abstract class.
18. Write a C++ program to find age calculation using this pointer.
19. Write a C++ program to print electricity bill using multiple inheritance.
20. Write a C++ program to find student mark list using hybrid inheritance.

**Text Book:**

1. E. Balagurusamy, “*Object Oriented Programming With C++*”, Six Edition, Tata McGraw Hill, 2013.

**Reference Books:**

1. Ananthi Sheshasaayee, G Sheshasaayee,”*Object Oriented Programming With C++*”, Margham Publication, First Edition, 2001.
2. Bjarne Stroustrup, “*The C++ Programming Language*”, Addison Wesley, Fourth Edition, 2013

**E-references:**

1. <https://en.cppreference.com/w/>
2. [https://www.tutorialspoint.com/cplusplus/cpp\\_references.htm](https://www.tutorialspoint.com/cplusplus/cpp_references.htm)
3. <https://www.javatpoint.com/cpp-tutorial>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC04	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Computer Networks	<b>Semester:</b>	II
			<b>Credits:</b>	5.0

### Course Objective

#### The course aims

- To understand the state-of-the-art in Network protocols, architecture and applications.
- To focus on Physical layer to Application layer.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1,K2</b>	<b>CO1</b>	Understanding the functions of each layer in OSI model
<b>K1,K2</b>	<b>CO2</b>	Interpret the functions of datalink layer
<b>K2,K3,K4</b>	<b>CO3</b>	Classify the routing protocols and analyze how to assign the IP address for the given network
<b>K1,K2,K4</b>	<b>CO4</b>	Analyse the services of transport layer
<b>K2,K5</b>	<b>CO5</b>	Understand and summarize the functions of application layer

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

### SYLLABUS

Unit	Content	No.of Hours
<b>I</b>	<b>DATA COMMUNICATIONS:</b> Components – Direction of Data flow – Networks – Components and Categories – Types of Connections – Topologies – Protocols and Standards – ISO/OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding Modems	<b>12</b>
<b>II</b>	<b>DATALINK LAYER:</b> Error – detection and correction – Parity – LRC – CRC – Hamming code – Flow Control and Error control: stop and wait – go back N ARQ – selective repeat ARQ – sliding window techniques – HDLC.LAN: Ethernet IEEE802.3, IEEE802.4-FDDI, SONET – Bridges.	<b>12</b>
<b>III</b>	<b>TRANSPORT LAYER:</b> Internet – Packet Switching and Datagram approach – IP addressing methods – sub netting – Routing – Distance Vector Routing – Link State Routing – Routers.	<b>12</b>
<b>IV</b>	<b>NETWORK LAYER:</b> Duties of transport layer – Multiplexing – Sockets – User Datagram protocol (UDP) – Transmission Control protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.	<b>12</b>
<b>V</b>	<b>APPLICATION LAYER:</b> Domain Names Space (DNS) – SMTP, HTTP, WWW- Security – Cryptography.	<b>12</b>

**Text Book:**

Nithyanandan, Grace Mary and Eswari, “*Computer Networks*”, Sams Publishers, First Edition, 2008.

**Reference Book:**

Andrew S Tanenbaum, “*Computer Networks*” 5th Edition.

**E-references:**

1. [https://www.tutorialspoint.com/computer\\_fundamentals/computer\\_networking](https://www.tutorialspoint.com/computer_fundamentals/computer_networking)
2. <https://www.geeksforgeeks.org/computer-network-tutorials/>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC05	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Relational Data Base Management System	<b>Semester:</b>	II
			<b>Credits:</b>	6.0

### Course Objective

#### The course aims

- To Design a Database from understanding an universe of Discourse.
- To Design an ER model, Writing Queries.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1,K2</b>	<b>CO1</b>	Describe and Generalize the major components of DBMS and their function
<b>K1,K3,K5</b>	<b>CO2</b>	Classify and infer Relational algebra and relational calculus
<b>K2,K3,K5</b>	<b>CO3</b>	Able to write SQL commands to create tables and indexes, insert/update/delete data, and query data in a relational DBMS
<b>K2,K3,K5</b>	<b>CO4</b>	Understanding of cursors and able to write SQL commands to create aggregate functions, joins and set operations
<b>K2,K4,K5</b>	<b>CO5</b>	Compare and Construct the concepts of triggers, roles,grant and revoke commands

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

### SYLLABUS

Unit	Content	No.of Hours
<b>I</b>	<b>Introduction</b> – RDBMS Terminology, Relational Data Structure, Relational Data Integrity, Relational Data Manipulation – Database Architecture and Data Modeling – Introduction – Conceptual, Physical and Logical Database Models – Database Design – Design Constraints – Functional Dependencies.	<b>12</b>
<b>II</b>	<b>Relational Algebra and Relational Calculus:</b> Relational Algebra, Relational Algebraic Operations, Relational Calculus – Tuple Relational Calculus, Domain History of SQL – Characteristics of SQL – Advantages of SQL – SQL in Action – SQL Data Types and Literals – Types of SQL Commands – SQL operators – Arithmetic Operations – Comparison Operators – Logical Operators – Set Operators – Operators Precedence.	<b>12</b>
<b>III</b>	<b>Tables, Views and Indexes:</b> Tables – views – Indexes – Queries, and sub Queries – Queries – Sub Queries.	<b>12</b>
<b>IV</b>	<b>Aggregate Function:</b> Introduction – General Rules – COUNT () and COUNT (*) SUM (), ANG (), MAX (), and MIN () – Insert, - Update and Delete Operations: Introductions – INSERT Statement – Bulk Inserts of Data –	<b>12</b>

	UPDATE Statement – DELETE Statement – <b>CURSORS:</b> Introduction – Cursor Operations – Cursor Positions – Cursor Coding Guidelines – <b>Joins and Unions:</b> Joins, Unions.	
V	<b>Triggers :</b> Introduction – Types of Triggers – Triggers Syntax – Combining Triggers Types – Setting Inserted Values – Disabling and Enabling Triggers – Replacing Triggers – Dropping Triggers – Advantages and Limitations of Triggers. <b>Database Security:</b> Management Requirements – Dimensions of Database Security – Data Security Requirements – Integrity, Availability – Database Users – Protecting the Data within Database – Database Privileges – Roles – Granting and Revoking Privileges and Roles – Data Encryption – Database Integrity – Network Security – Protecting Data During Transmission – Authenticating User to the Database – Security Auditing.	12

### Text Book:

1. Alexis Leon and Methews Leon, “*Database Management System*”, Second Edititon ,Vikas publishing House Pvt. Ltd., 1997.

### Reference Books:

1. Ramon A. Mata-Toledo, Pauline K. Cushman, “*Fundamentals of Relational Databases*”, Fourth Reprint, Tata McGraw Hill,2004.
2. Pankaj Agarwal, “*Relational Database Management System*”, First Edition, Vayu Education of India, 2009.
3. Colin Ritche, “*Relational Database Principles*”, Second Edition, Thomson Learning.

### E-references:

1. <https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm>
2. <https://beginnersbook.com/2015/04/rdbms-concepts/>
3. <https://www.studytonight.com/dbms/rdbms-concept.php>

### Mapping with Programme Specific Outcomes

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DC06	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Visual Basic	<b>Semester:</b>	II
			<b>Credits:</b>	6.0

### Course Objective

#### The course aims

- To use a modern IDE to create programs with GUI's and cover visual programming skills needed for modern software development.
- To acquire knowledge and skills for the event-driven model and its interaction with the multitasking operating system.
- To gain ability to develop applications and projects using Visual Basic work environment.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K1</b>	<b>CO1</b>	To get familiar with basics of the MDI, IDE and Visual Basic environment
<b>K1,K2</b>	<b>CO2</b>	To explore different controls, Data Types and Editing Tools
<b>K2,K3,K4, K5</b>	<b>CO3</b>	Learn about the control structures and infer various string, date and time functions
<b>K2,K3</b>	<b>CO4</b>	Understand the usage of arrays and functions
<b>K3,K5</b>	<b>CO5</b>	Usage of Code Modules, OLE and ADO for database connectivity with different databases

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

SYLLABUS		
Unit	Content	No.of Hours
<b>I</b>	Getting Started – Visual Basic Environment – Initial VB Screen – Single Document Interface – Tools Bars and System Control & Components – Use of File, Edit, View, Project, Format, Run And Debug, Tools, Window Menu, Properties Window, Procedure – Image Controls.	<b>12</b>
<b>II</b>	Text Boxes, Labels, Navigating Between Controls, Message Boxes and Girds, Steps In Programming – The Code Window – Editing Tools – Statement in VB – Assignment and property Setting – Data Types, Variables, Strings, Numbers, Constants, Input Box.	<b>12</b>
<b>III</b>	Displaying Information – Controlling program Flow – Repeating Operations – Making Decisions – GOTO. String functions, Date and Time functions.	<b>12</b>
<b>IV</b>	Lists: one Dimensional Arrays – Arrays with More Than One Dimension - Control Arrays- Using Lists, Functions and Procedures – passing By Reference / Passing By Value.	<b>12</b>

<b>V</b>	Code Module – Global Procedure And Global Variables. Data control – ADO – Programming with Data Control – OLE.	<b>12</b>
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**Text Book:**

Gray Cornell, “*Visual Basic 6.0 from the Ground UP*”, Tata McGraw Hill, 1999.

**Reference Books:**

1. Mohammed Azam, “*Programming with Visual Basic 6.0*”, First Reprint, Vikas Publication House Pvt.Ltd, 2016.
2. Krishnan .N, Saravanan .N, “*Visual Basic 6.0 in 30 days*”, Scitech Publications (India) Pvt.Ltd, 2012.
3. Ramesh Bangia, “*Power of Visual Basic 6.0*”, Firewall Media, 2009.
4. Murugan .A, Shymala .K & Grasha Jacob, “*Visual Basic Programming: A Step by step Approach*”, Marghan Publications, Reprint 2016.

**E-references:**

1. <http://www.functionx.com/vb/index.html>
2. <https://www.freetutes.com/learn-vb6/>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DCPC	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Programming Lab – III: (Visual Basic)	<b>Semester:</b>	II
			<b>Credits:</b>	4.0

### Course Objective

#### The course aims

- To use a modern IDE to create programs with GUI's and cover visual programming skills needed for modern software development.
- To acquire knowledge and skills for the event-driven model and its interaction with the multitasking operating system.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K3,K4</b>	<b>CO1</b>	Illustrate the various controls and their properties
<b>K3,K4</b>	<b>CO2</b>	Sketch out the dataTypes ,Operators and expressions in sloving problems
<b>K3,K4,K5</b>	<b>CO3</b>	Apply looping structure, control flow statements and exception handling
<b>K4,K5</b>	<b>CO4</b>	Demonstrate function and procedures
<b>K4,K5</b>	<b>CO5</b>	Summarize the IDE tools for creating project using database

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

1. Write a program to add and remove names in a combobox.
2. Write a program to exchange items in a listboxes.
3. Write a program to display slider demo using slider control.
4. Write a program to changing shapes using menu bar.
5. Write a program change the size of the picture box image.
6. Write a program to find sum of digits of given number.
7. Write a program to display the item using common dialog control.
8. Write a program check the palindrome or not of a given string.
9. Write a program change textbox color using scroll bar.
10. Write a program to store employee details in a database.

**Text Book:**

- Gray Cornell, “*Visual Basic 6.0 from the Ground UP*”, Tata McGraw Hill, 1999.

**Reference Books:**

1. Mohammed Azam, “*Programming with Visual Basic 6.0*”, First Reprint, Vikas Publication House Pvt.Ltd, 2016.
2. Krishnan .N, Saravanan .N, “*Visual Basic 6.0 in 30 days*”, Scitech Publications (India) Pvt.Ltd, 2012.
3. Ramesh Bangia, “*Power of Visual Basic 6.0*”, Firewall Media, 2009.
4. Murugan .A, Shymala .K & Grasha Jacob, “*Visual Basic Programming: A Step by step Approach*”, Marghan Publications, Reprint 2016.

**E-references:**

1. <http://www.functionx.com/vb/index.html>
2. <https://www.freetutes.com/learn-vb6/>

**Mapping with Programme Specific Outcomes**

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

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

<b>Programme Code:</b>	PGDCA	<b>Programme Title:</b>	Computer Applications	
<b>Course Code:</b>	19P3DCPD	<b>Course Title:</b>	<b>Batch:</b>	2019
<b>Total Hours:</b>	60	Programming Lab - IV : (Relational Data Base Management System)	<b>Semester:</b>	II
			<b>Credits:</b>	4.0

### Course Objective

#### The course aims

- To aims to learn the operators, datatypes and aggregate functions.
- To understand queries, subqueries and joins.

### Course Outcomes (CO)

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

Knowledge Level	CO Number	Course Outcome
<b>K2,K3,K4</b>	<b>CO1</b>	Understand features and data types in SQL server
<b>K1,K3,K4</b>	<b>CO2</b>	Create and manipulate databases for various applications
<b>K3,K4,K5</b>	<b>CO3</b>	Use procedures and joins for performing complex operation on databases
<b>K4,K5</b>	<b>CO4</b>	Create subqueries using various operators
<b>K4,K5</b>	<b>CO5</b>	To gain practical knowledge on PL/SQL for various application

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

1. Create a table called 'Product' with the following details:

Sl No	Field Name	Data made of	Constraints
1	Product	First character is '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

- Enter the at least 15 records for the table.
  - List of all products having 'a' as the second letter in their names.
  - List the Product codes and names where the Cost price is greater than Rs. 100/-
  - List the Product codes where the quantity on hand is more than 50.
  - List the Product Name, Qty on hand, Cost price and the Total cost price of each product.
2. Write a PL/SQL programs to find and display the number of ones, tens, hundreds and thousands in the given number.

3. Create two tables one called EMP and the other 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:

- List the names of all the employees having a salary of at least Rs. 5000
  - List the names of the employees and also the names of their managers.
  - List the names of all employees whose managers are “Ram”.
  - List the names of all employees whose total earnings is more than Rs. 7500
  - List the details of employees working in the Production department
  - List all the Programmers working in Chennai
  - List the names of all employees whose salary is greater than the average salary of their department.
  - List the names of all the managers.
  - List the names of the Accounts department whose salary is either Rs. 2500 or Rs. 5000
  - List the names, salaries of employees of the Accounts department who are not earning any commission.
4. Write a PL/SQL program to display names of the employees in the Employee table whose names are palindrome.
  5. Write a PL/SQL program to calculate the commission payable to employees of the employee table using stored procedures.
  6. Write a PL/SQL program for fixing the salaries of employee using functions.
  7. Write a PL/SQL program to find the number of occurrences of a character in the given string.
  8. Write a recursive program to create a set of values for RollNo using a sequence and store the generated RollNo in the RollNo field of the Student table.
  9. Create the table SSLCMark (Regno, Name, Tamil Marks, English Marks, Maths Marks, Science Marks and Social Science Marks) with the necessary integrity constraints. Write SQL statements to
    1. find the topper in the class
    2. find the names of the student who have scored more than 90 percent marks in each subject.
    3. find the names of students 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 languages who have scored more than 60% in each of the language papers.
  10. Write a PL/SQL program to split the SSLCMarksheet table into two tables with one containing the names of passed students and the other containing the names of failed students.

11. Create the table Electricity (customer no, name, customer type, open meter reading, close meter reading) for at least 10 Customers. Also generate the EB bill for the following conditions:

If customer type is 'Home'

1. If the number of units is less than or equal to 100, the charge per unit is Rs. 0.50.
2. If the number of unit is between 101 to 200, the charge per unit is Rs. 0.75 for units above 100.
3. If the number of units is above 300, the charge per customer is Rs. 1.00 for units above 300.

If customer type is 'Commercial'

1. For units less than or equal to 200, the charges are Rs. 1.50 per unit.
2. For units above 200, the charges are Rs. 2.00 per unit.

For the 'Industry' category, the charges are

1. For the first 500 units, Rs 4.00 per unit and if the units are above 500, Rs. 5.00 for all the units consumed.

12. Write PL/SQL program to check whether the given year is a leap year
13. Write a PL/SQL program to generate a user-defined exception for trying to insert a tuple with blank employee name in the employee table.
14. Write a PL/SQL program to raise divide by zero exception.
15. Write a PL/SQL program to check Armstrong number condition for 3 digit numbers and Ramanujam number condition for four digit numbers.
16. Write a trigger to store the deleted records of the Department table in the Deleted Records tables.

#### **Text Book:**

1. Ramez Elmarsi, Shamkant B. Navathe, "*Database Systems Models, Languages, Design and Application Programming*", Sixth Edition, Pearson Education, 2013

#### **Reference Books:**

1. Ragu Ramakrishnan, Johannes Gehrke, "*Database Management Systems*", Second Edition, McGraw Hill, 2000.
2. Shio Kumar Singh, "*Database Systems, Concepts, Designs and Application*", Second Edition, Pearson Education, 2013.

#### **E-references:**

1. <https://nptel.ac.in/courses/106105175/2>
2. <https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm>
3. <https://beginnersbook.com/2015/04/rdbms-concepts/>
4. <https://www.guru99.com/relational-data-model-dbms.html>

### Mapping with Programme Specific Outcomes

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

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

**PGDCA**  
**Question Paper Pattern**

**For EOS Examinations: 60 Marks**

Answer Any 5 out of 8 Questions. (5 x 12 = 60)

**For CIA Examinations: 40 Marks**

Answer Any 2 out of 4 Questions. (2 x 20 = 40)