

# **DEPARTMENT OF COMPUTER SCIENCE**

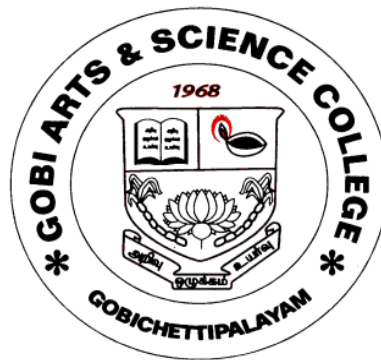
**M.C.A. (COMPUTER APPLICATIONS)**

**(Students admitted during 2019-2020 Onwards)**

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

## **SYLLABUS**

**III & IV 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.**

## 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              | A (Answer All)        | $10 \times 1 = 10$ | MCQ                  | 60    |
| K2              | B (Either or Pattern) | $5 \times 4 = 20$  | Short answers        |       |
| K3 & K4         | C (Answer 3 out of 5) | $3 \times 10 = 30$ | Descriptive/Detailed |       |

#### 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: 30 Marks (Theory)

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

#### 2. Test –III: (Model Exam)

| Knowledge Level | Section               | Marks              | Description          | Total                                   |
|-----------------|-----------------------|--------------------|----------------------|---|
| K1              | A (Answer All)        | $10 \times 1 = 10$ | MCQ                  | 60 Marks<br>converted<br>to 40<br>Marks |
| K2              | B (Either or Pattern) | $5 \times 4 = 20$  | Short answers        |   |
| K3 & K4         | C (Answer 3 out of 5) | $3 \times 10 = 30$ | Descriptive/Detailed |   |

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

| Knowledge Level | Components |    | Calculation                               | Lab Performance | Total |
|-----------------|------------|----|---|-----------------|-------|
| K3, K4, K5      | Test 1     | 30 | $\frac{\text{Test 1} + \text{Test 2}}{2}$ | 10              | 40    |
|                 | Test 2     | 30 |   |                 |       |

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

| Components  |                 | Calculation                                     | CIA Total |
|---|-----------------|---|-----------|
| Test 1 & Test 2   | 30              | $30 + 40 + 30 = \frac{100 \times 40}{100} = 40$ | 40        |
| Test 3  | 40              |   |           |
| Assignment+ Seminar+ Quiz / GD / Poster Presentation / Book Review / Field Visit Report | $10+10+10 = 30$ |   |           |

|                        |          |                             |                       |      |
|------------------------|----------|-----------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>     | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA10 | <b>Course Title:</b>        | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Open Source Scripting Tools | <b>Semester:</b>      | III  |
|                        |          |                             | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To understand the fundamentals of Python programming, Classes and objects and Database connectivity.
- To know the basic Perl programming to write simple scripts.

### Course Outcomes (CO)

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

| Knowledge Level    | CO Number | Course Outcome   |
|--------------------|-----------|--|
| K1, K2             | CO1       | Realize and comprehend the basic concepts of Python.   |
| K1, K2, K3         | CO2       | Define and demonstrate the use of Classes and Objects and write OOPS based Python programs.              |
| K1, K2, K3, K4, K5 | CO3       | Make database connectivity in Python programming language.   |
| K1, K2, K3         | CO4       | Utilize and implement Perl Script with modules, arrays and hash functions.                               |
| K1, K2, K3, K4, K5 | CO5       | Deploy the operators, control structures, regular expressions and files in Perl and write Perl programs. |

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

### SYLLABUS

| Unit | Content  | No. Of Hours |
|------|--|--------------|
| I    | <b>Introduction to Python:</b> Variables, Names and Objects, Numbers, Strings. <b>Lists, Tuples, Dictionaries and Sets:</b> Lists, Tuples, Dictionaries, Sets.   | 12           |
| II   | <b>Text Strings:</b> Format, Regular Expressions. <b>Functions, Arguments, Anonymous Functions, Generators, Decorators, Namespaces and Scope. Objects and Classes:</b> Class, Inheritance, <i>Override a Method*</i> , Add a Method, Self, Attributes.   | 12           |
| III  | <b>Relational Databases:</b> SQL, DB-API, SQLite, MySQL, PostgreSQL, SQLAlchemy. <b>NoSQL Data Stores:</b> The dbm Family, Memcached, Redis, Other NoSQL. Full-Text Databases.   | 12           |
| IV   | <b>PERL:</b> Introduction, Perl Scripts - The Script, Getting a Handle on Printing- The Print, Printf Function, <b>NAME:</b> Perl variables, Scalars, Arrays, Hashes, <b>ARRAY Functions, HASH Functions.</b>  | 12           |
| V    | <b>OPERATORS:</b> Types, <b>CONTROL STRUCTURES:</b> Decision making, Repetition with loops, <b>REGULAR EXPRESSIONS:</b> Modifiers, operators, <b>GETTING A HANDLE ON FILES:</b> User defined handles, Passing Arguments, <b>SUBROUTINES:</b> Calling function, Passing Arguments, Call by reference. | 12           |

<\* - Self Study>

**Text Books:**

1. Bill Lubanovic, “*Introducing Python*”, O'Reilly, 2015, Unit (I, II, III).
2. Ellie Quigley, “*Perl*”, Fourth Edition, Dorling Kindersley Publishers, Pearson Education, 2009 (UNIT - IV, V).

**Reference Books:**

1. Mike McGrath, “*Python – in easy steps*”, McGraw Hill Education (India) Private Limited, 2013. Ltd., 2012.
2. Wesley J. Chun, “*Core Python Programming*”, Second Edition, Pearson Education, Inc, 2010.
3. Martin C. Brown, “*The Complete Reference – Perl*”, Second Edition, Tata McGraw Hill Edition, 2006.
4. Clinton Pierce, “*Perl – In 24 Hours*”, SAMS Techmedia, 2006.

**E-references:**

1. [https://www.tutorialspoint.com/python/python\\_basic\\_operators.htm](https://www.tutorialspoint.com/python/python_basic_operators.htm)
2. [https://www.tutorialspoint.com/python/python\\_database\\_access.htm](https://www.tutorialspoint.com/python/python_database_access.htm)
3. <https://www.tutorialspoint.com/perl/>
4. <http://sandbox.mc.edu/~bennet/perl/leccode/index.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           | M           | M           | H           | S           |
| <b>CO2</b>      | S           | S           | H           | S           | S           |
| <b>CO3</b>      | S           | S           | S           | S           | S           |
| <b>CO4</b>      | S           | M           | H           | H           | S           |
| <b>CO5</b>      | S           | S           | S           | S           | S           |

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

|                        |          |                           |                       |      |
|------------------------|----------|---------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>   | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA11 | <b>Course Title:</b>      | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Client / Server Computing | <b>Semester:</b>      | III  |
|                        |          |                           | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To learn the basic concepts of Client/Server Computing.
- To understand the concepts of different types of servers which include Database, Transaction, Groupware, Object and Web Servers.
- To develop applications using Client/Server architecture.

### Course Outcomes (CO)

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

| Knowledge Level | CO Number | Course Outcome  |
|-----------------|-----------|---|
| K1, K2          | CO1       | Describe the concept of various types of servers, Client / Server building blocks and operating system services             |
| K1, K2, K3      | CO2       | Explain the concept, architecture of SQL Database Servers and Data warehouse.   |
| K1, K2, K3      | CO3       | Understand the concept of Transaction Server, Groupware Server and its components.  |
| K1, K2, K3      | CO4       | Acquire the knowledge of Object Server concepts, CORBA Architecture and OLE technologies.                                   |
| K2, K3, K4, K5  | CO5       | Gain knowledge about Web Server concepts and develop applications with Client (Front-End) and Server (Back-End) components. |

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

| SYLLABUS |  |              |
|----------|--|--------------|
| Unit     | Content  | No. Of Hours |
| I        | <b>INTRODUCTION TO CLIENT/SERVER COMPUTING:</b> What is Client/Server, File Servers, Database Servers, Transaction Servers, Groupware Servers, Object Servers, Web Servers, Middleware, Fat Servers/Clients, 2 Tier versus 3 Tier. <b>CLIENT/SERVER BUILDING BLOCKS:</b> Building block Arrangements, Inside the Building block. <b>CLIENT, SERVER AND OPERATING SYSTEMS:</b> Operating Systems, Base Services, Extended Services, Server Scalability, RPC, Messaging and Queuing. | 12           |
| II       | <b>SQL DATABASE SERVERS:</b> SQL Database Server Architectures, Stored Procedures, Triggers and Rules. <b>DATA WAREHOUSES:</b> What is OLTP, DSS, EIS, The Data Warehouse.   | 12           |
| III      | <b>CLIENT / SERVER TRANSACTION PROCESSING:</b> ACID Properties, Transaction Models. <b>TPMONITORS:</b> Transaction Processing Monitors, Transaction Management Standards. <b>CLIENT/SERVER GROUPWARE:</b> Introduction to Groupware, Components of Groupware.  | 12           |

|           |  |           |
|-----------|--|-----------|
| <b>IV</b> | <b>CLIENT/SERVER DISTRIBUTED OBJECTS AND COMPONENTS:</b> Benefits of Distributed Objects, Components, Super Components, 3 Tier Client/Server Object Style. <b>CORBA:</b> CORBA style, CORBA Distributed object, OMG'S Object management architecture, Object Request Broker (ORB), Anatomy of a CORBA 2.0 ORB, CORBA Object Services and Common Facilities. <b>OLE/DCOM:</b> OLE and OLE Constituent Technologies.           | <b>12</b> |
| <b>V</b>  | <b>WEB CLIENT/SERVER:</b> Web Client/Server Interaction, URL, HTML Tutorial, HTTP Request and Response Format, HTML 2.0 Web Based Forms, CGI, Web Security. <b>DISTRIBUTED SYSTEM MANAGEMENT:</b> Distributed System Management platforms, Components of an Open DSM platform. <b>DISTRIBUTED SYSTEM MANAGEMENT STANDARDS:</b> Internet's SNMP, SNMP's limitations, OSI Management Framework, OSI Management Protocols CMIP. | <b>12</b> |

**Text Book:**

Robert Orfali, Dan Harkey, Jeri Edwards, "CLIENT SERVER SURVIVAL GUIDE", Galgotia Publications Pvt. Ltd., Second Edition Reprint, 2010 (Units I to V).

**Reference Books:**

1. Patrick Smith, Steve Guengerich, "Client/Server Computing", Second Edition, PHI Learning Pvt. Ltd., 2012.
2. Dawna Travis Dewire, "Client/Server Computing", McGraw Hill Education (India) Pvt. Ltd., 2013.
3. Joel P. Kanter, "Understanding Thin-Client/Server Computing", Prentice Hall of India Pvt. Ltd., 2001.
4. Subhash Chandra Yadav, Sanjay Kumar Singh, "An Introduction to Client/Server Computing", New Age International Publisher, 2009.

**E-references:**

1. <https://www.tutorialspoint.com/Structure-of-a-Client-Server-System.html>
2. <https://nptel.ac.in/courses/108107029/>

**Mapping with Programme Specific Outcomes**

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

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

|                        |          |                                   |                       |      |
|------------------------|----------|-----------------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>           | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA12 | <b>Course Title:</b>              | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Design and Analysis of Algorithms | <b>Semester:</b>      | III  |
|                        |          |                                   | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To solve a given problem using an algorithm.
- To understand various algorithm design and implementation.
- To analyze the efficiency of algorithm and apply in real time applications.

### Course Outcomes (CO)

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

| Knowledge Level   | CO Number  | Course Outcome   |
|-------------------|------------|--|
| <b>K1, K3</b>     | <b>CO1</b> | Get knowledge about algorithms and determines their time complexity. Demonstrate specific search and sort algorithms using divide and conquer technique. |
| <b>K2, K3, K4</b> | <b>CO2</b> | Gain good understanding of Greedy method and its algorithm.  |
| <b>K3, K4</b>     | <b>CO3</b> | Able to describe about graphs using dynamic programming technique.   |
| <b>K2, K3, K4</b> | <b>CO4</b> | Explore the traversal and searching technique and apply it for trees and graphs.   |
| <b>K2, K3, K4</b> | <b>CO5</b> | Demonstrate the concept of backtracking & branch and bound technique.  |

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

### SYLLABUS

| Unit       | Content  | No. of Hours |
|------------|--|--------------|
| <b>I</b>   | <b>Introduction:</b> What is an algorithm?, Algorithm specification, performance analysis - <b>Divide and Conquer:</b> General method, Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Strassen's matrix multiplication. | <b>12</b>    |
| <b>II</b>  | <b>The Greedy method:</b> The General method, Knapsack problem, Job sequencing with deadlines, Minimum cost spanning tree: Prim's algorithm, Kruskal's algorithms. Optimal storage on tapes, Single source shortest paths.                       | <b>12</b>    |
| <b>III</b> | <b>Dynamic programming:</b> The general method, Multistage graphs, All Pairs shortest paths, 0/1 Knapsack, Reliability Design, The Traveling Sales Person problem, Flow shop scheduling.   | <b>12</b>    |
| <b>IV</b>  | <b>Basic Traversal and search Techniques:</b> Techniques for binary trees, Techniques for graphs, Connected components and Spanning trees, Biconnected components and DFS.   | <b>12</b>    |
| <b>V</b>   | <b>Backtracking:</b> The general method, The 8 Queen problem, Sum of subsets, Graph coloring, Hamiltonian cycles, Knapsack problem - <b>Branch and Bound:</b> 0/1 Knapsack problem, Traveling salesperson problem.                               | <b>12</b>    |

**Text Book:**

Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran, “*Fundamentals of computer algorithms*”, Galgotia publications Pvt. Ltd, (UNIT - I to V)

**Reference Books:**

1. Anany Levitin, “*Introduction to the Design And Analysis Of Algorithms*”, Pearson Education Pvt Ltd, 2013.
2. Kaushal Kishor Rastogi, “*Design And Analysis Of Algorithms*”, First Edition, Global Academic Publishers.
3. R Manjula Devi, R Devi Priya, R C Suganthe, “*Design And Analysis Of Algorithms*”, Charulatha publishers.

**E-references:**

1. [https://www.tutorialspoint.com/design\\_and\\_analysis\\_of\\_algorithms/](https://www.tutorialspoint.com/design_and_analysis_of_algorithms/)
2. [http://ignou.ac.in/userfiles/SandeepFINAL\\_Unit1\\_Intro\\_21-03-2013.pdf](http://ignou.ac.in/userfiles/SandeepFINAL_Unit1_Intro_21-03-2013.pdf)
3. <https://www2.cs.duke.edu/courses/fall08/cps230/Book.pdf>

**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           | M           |
| <b>CO2</b>      | S           | H           | M           | L           | L           |
| <b>CO3</b>      | S           | H           | M           | L           | L           |
| <b>CO4</b>      | S           | H           | H           | M           | L           |
| <b>CO5</b>      | S           | M           | M           | L           | L           |

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

|                        |          |                                     |                       |      |
|------------------------|----------|-------------------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>             | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA13 | <b>Course Title:</b>                | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Elective - II:<br>Operating Systems | <b>Semester:</b>      | III  |
|                        |          |                                     | <b>Credits:</b>       | 4.0  |

### Course Objective

#### The course aims

- To study the basic concepts and functions of operating systems. Understand the structure and functions of OS. Learn about Processes, Threads and Scheduling algorithms. Understand the principles of concurrency and Deadlocks.
- To learn various memory management schemes. Study I/O management and File systems. Learn the basics of Linux system and perform administrative tasks on Linux Servers.

### Course Outcomes (CO)

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

| Knowledge Level | CO Number | Course Outcome  |
|-----------------|-----------|---|
| K1, K2          | CO1       | Understand the fundamental components, concepts, history and system calls of operating system.  |
| K2, K3, K4      | CO2       | Understand various process states in an operating system and its implementation using mutual exclusion primitives.  |
| K1, K2, K4, K5  | CO3       | Understand the problems of deadlock and analyze deadlock prevention and recovery techniques along with the design of real storage management strategies.                                |
| K1, K3, K4, K5  | CO4       | Learn and analyze various processor scheduling policies and evaluate the algorithms. Realize the disk performance optimization technique and learn the concepts of file systems design. |
| K1, K2, K4      | CO5       | To understand Linux basic concepts, system administration and requirement for the linux system administrator setups and domain name services.   |

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

| SYLLABUS |   |              |
|----------|---|--------------|
| Unit     | Content   | No. of Hours |
| I        | Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor - Multicore Organization - Operating system overview-objectives and functions - Evolution of Operating System - Computer System Organization- Operating System Structure and Operations- System Calls - System Programs Operating System Generation and System Boot. | 12           |
| II       | Process Concept - Process Scheduling – Operations on Process - Interprocess Communication – Threads Overview - Multicore Programming - Multithreading Models - Windows 7 Thread and SMP Management - Process Synchronization - Critical Section Problem - Mutex Locks – Semaphores – Monitors - CPU Scheduling and Deadlocks.   | 12           |

|            |   |           |
|------------|---|-----------|
| <b>III</b> | Main Memory-Contiguous Memory Allocation – Segmentation – Paging – Virtual Memory Demand Paging - Page Replacement – Allocation – Thrashing - Allocating Kernel Memory.   | <b>12</b> |
| <b>IV</b>  | Mass Storage Structure Overview - Disk Scheduling and Management - File System Storage File Concepts - Directory and Disk Structure – Sharing and Protection - File System Implementation - File System Structure – Directory Structure - Allocation Methods - Free Space Management - I/O System.    | <b>12</b> |
| <b>V</b>   | Linux System - Basic Concepts - System Administration - Requirements for Linux System Administrator - Setting up a LINUX Multifunction Server - Domain Name System - Setting Up Local Network Services – Virtualization - Basic Concepts - Setting Up Xen - VMware on Linux Host and Adding Guest OS. | <b>12</b> |

**Text Book:**

Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, 9th Edition, John Wiley and Sons Inc., 2012.

**Reference Books:**

1. William Stallings, “Operating Systems – Internals and Design Principles”, 7th Edition, Prentice Hall, 2011.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Addison Wesley, 2001.
3. Charles Crowley, “Operating Systems: A Design-Oriented Approach”, Tata McGraw Hill Education”, 1996. 20
4. D M Dhamdhare, “Operating Systems: A Concept-Based Approach”, Second Edition, Tata McGraw-Hill Education, 2007.

**E-references:**

1. <https://www.studytonight.com/operating-system/cpu-scheduling>
2. [https://www.tutorialspoint.com/operating\\_system](https://www.tutorialspoint.com/operating_system)
3. <https://www.slideshare.net/rajendraprasadalladi/operating-system-overview-concepts-ppt>
4. <https://www.geekforgeeks.org/gate-notes-operating-system-process-management-introduction/>
5. <https://www.cs.uic.edu/~jbell/CourseNotes/OperatingSystems/>

**Mapping with Programme Specific Outcomes**

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

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

|                        |          |                         |                       |      |
|------------------------|----------|-------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b> | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA14 | <b>Course Title:</b>    | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | .NET Programming        | <b>Semester:</b>      | IV   |
|                        |          |                         | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To understand the fundamentals of ASP.NET Framework and C# Programming.
- To learn the concepts of State Management, Validation, ADO.Net and design web pages using data source control.

### 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> | Understand the fundamentals of .Net Framework and C# Programming.   |
| <b>K1, K2, K3</b>         | <b>CO2</b> | Remember the ASP.Net fundamentals and work with directives and web server controls.   |
| <b>K3, K4, K5</b>         | <b>CO3</b> | Acquire knowledge about Validation Controls, Session Management and write appropriate .Net programs.                            |
| <b>K2, K3, K4, K5</b>     | <b>CO4</b> | Learn how to apply different ADO.Net objects for connecting a back end with asp server controls, write programs and analyze it. |
| <b>K1, K2, K3, K4, K5</b> | <b>CO5</b> | Design, develop and host web pages applying various data source controls.   |

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

### SYLLABUS

| Unit       | Content   | No. of Hours |
|------------|---|--------------|
| <b>I</b>   | <b>THE .NET FRAME WORK:</b> Languages, CLR, Namespace, Assemblies, <b>ASP.NET:</b> File Types, Stages in ASP.NET request, Code behind, global.asx files, Web.config files, <b>C#.NET Programming:</b> Variables, Data Types, Scope, Conditional Structure, Loop Structure, Functions and Subroutines.                       | <b>12</b>    |
| <b>II</b>  | <b>ASP.NET FUNDAMENTALS:</b> Page Directives, Page Events, Cross Page Posting, <b>ASP.NET SERVER CONTROLS:</b> Types of Server controls, Building, Working and Applying styles to server controls, <b>WEB SERVER CONTROLS:</b> TextBox, Button, HyperLink, ListBox, Radio Button, Calender, Adrotator - Events and methods. | <b>12</b>    |
| <b>III</b> | <b>VALIDATION SERVER CONTROLS:</b> Client side Validation, <i>Validation controls*</i> , Regular Expressions, Programming with Validation, <b>STATE MANAGEMENT:</b> Session states, Understanding session object in ASP.NET, Query strings, Cookies, Hidden Field, ViewState, Programming with state Management.            | <b>12</b>    |
| <b>IV</b>  | <b>DATA MANAGEMENT WITH ADO.NET:</b> Common ADO.NET operations, ADO.NET Namespace and Classes, Objects - Connection, Command, Data  | <b>12</b>    |

|   |  |    |
|---|--|----|
|   | Reader, DataSet, Data Tables using parameters, Programming with ADO.NET.   |    |
| V | <b>DATA BINDING: Data Source controls</b> – Sql Data source control, <b>DATA SOURCE CONTROL CATCHING:</b> Storing Connection, <b>USING BOUND LIST CONTROLS WITH DATA SOURCE CONTROL: Grid View-</b> Templates, Paging, Using Template field columns, Editing, Deleting, <b>List view binding, Form view binding,</b> Programs for binding. | 12 |

<\* - Self Study>

**Text Books:**

1. THE COMPLETE REFERENCE ASP.NET, MATHEW MAC DONALD, Tata McGraw Hill Publishing, Edition, 2002 (UNIT-I).
2. PROFESSIONAL ASP.NET 4 IN C# AND VB, BILL EVJEN, SCOTT HANSELMAN & DEVIN RADER, Wiley Publishing, Reprint- 2011 (UNIT II-V).

**E-references:**

1. <https://www.tutorialspoint.com/asp.net>
2. <https://www.w3schools.com/asp.net>

**Mapping with Programme Specific Outcomes**

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

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

|                        |          |                         |                       |      |
|------------------------|----------|-------------------------|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b> | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA15 | <b>Course Title:</b>    | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Graphics & Multimedia   | <b>Semester:</b>      | IV   |
|                        |          |                         | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To build an understanding of the fundamental concepts of Computer Graphics & Multimedia.
- To familiarize with the working principles of various displaying and drawing techniques.
- To apply the various algorithms to display pictures.

### 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> | Design algorithms and two dimensional transformations.   |
| <b>K1,K2, K3</b>  | <b>CO2</b> | Familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.                      |
| <b>K1, K2, K3</b> | <b>CO3</b> | Actively involving in design, development and testing of modelling, rendering, shading and animation.                        |
| <b>K1, K2, K3</b> | <b>CO4</b> | Describe Multimedia Applications, System Architecture, Evolving Technologies, Defining Objects and Data Interface Standards. |
| <b>K2, K3</b>     | <b>CO5</b> | Working with Multimedia Input / Output Technologies.   |

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

| SYLLABUS   |  |              |
|------------|--|--------------|
| Unit       | Content  | No. of Hours |
| <b>I</b>   | <b>OUTPUT PRIMITIVES:</b> Introduction – Overview of computer graphics – Output primitives: Line – Circle and Ellipse Drawing Algorithms – Attributes of output primitives – Two Dimensional Geometric Transformations – Two Dimensional Clipping and Viewing. | <b>12</b>    |
| <b>II</b>  | <b>THREE DIMENSIONAL CONCEPTS:</b> Three Dimensional concepts – Three Dimensional object representations – Three Dimensional Geometric and Modeling Transformations – Three Dimensional Viewing.   | <b>12</b>    |
| <b>III</b> | <b>COLOR MODELS AND ANIMATION:</b> Visible – Surface Detection Methods: Back-Face, Depth-Buffer, A-Buffer Scan-Line. Depth-Sorting, BSP-Tree and Octree Methods – Color Models: RGB, CMY, HSV and HLS Color Models – Computer Animation.                       | <b>12</b>    |
| <b>IV</b>  | <b>MULTIMEDIA SYSTEMS DESIGN:</b> Introduction – Multimedia Applications – Multimedia System Architecture – Evolving Technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data Interface Standards – Multimedia Databases.       | <b>12</b>    |
| <b>V</b>   | <b>MULTIMEDIA INPUT/OUTPUT TECHNOLOGIES:</b> Key Technology issues – Pen Input – Video and Image Display Systems – Digital Voice and Audio – Digital Camera – Videos Images and Animation – Full Motion Video.   | <b>12</b>    |

**Text Books:**

1. Donald Hearn and M.Pauline Baker, “*Computer Graphics C Version*”, Pearson Education, 2003 (Units I to III)
2. Prabhat K. Andleigh and Kiran Thakrar, “*Multimedia Systems Design*”, PHI Learning Pvt. Ltd., 2003 (Units IV and V).

**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*”, 5<sup>th</sup> Edition, Pearson Publications, 2013.

**E-references:**

1. [https://www.tutorialspoint.com/computer\\_graphics/index.htm](https://www.tutorialspoint.com/computer_graphics/index.htm)
2. <https://www.javatpoint.com/Multimedia-tutorial>
3. <https://www.programmingsimplified.com/c-graphics-programming-tutorial>

**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>      | H           | H           | H           | M           | L           |
| <b>CO2</b>      | H           | S           | H           | S           | S           |
| <b>CO3</b>      | S           | S           | M           | H           | S           |
| <b>CO4</b>      | H           | M           | S           | H           | S           |
| <b>CO5</b>      | S           | H           | S           | S           | S           |

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

|                        |          |   |                       |      |
|------------------------|----------|---|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>                           | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA16 | <b>Course Title:</b>                              | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Microprocessors and Assembly Language Programming | <b>Semester:</b>      | IV   |
|                        |          |   | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To enable the students to understand the working of a CPU.
- To let the students interact with the CPU through assembly language programming.
- To help the students to learn about interfacing of peripheral devices.

### Course Outcomes (CO)

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

| Knowledge Level       | CO Number  | Course Outcome   |
|-----------------------|------------|--|
| <b>K1, K2, K3</b>     | <b>CO1</b> | Recall the basic components of a microprocessor and interfacing of memory. |
| <b>K2, K3, K4, K5</b> | <b>CO2</b> | Understand and apply the concepts of assembly language programming.        |
| <b>K2, K3, K4, K5</b> | <b>CO3</b> | Analyze the user of interrupts.  |
| <b>K2, K3, K4, K5</b> | <b>CO4</b> | Understand the types of I/O.   |
| <b>K2, K3, K4, K5</b> | <b>CO5</b> | Understand And use the parallel data transfer.                             |

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

| SYLLABUS   |   |              |
|------------|---|--------------|
| Unit       | Content   | No. of Hours |
| <b>I</b>   | Introduction: 8086 Microprocessor, Pin configuration. Memory organization.8086 based system: 8086 minimum mode configuration, 8086 maximum mode configuration, 8086 bus cycle.  | <b>12</b>    |
| <b>II</b>  | 8086 instruction set: Addressing modes of 8086, Instruction Format, Instruction set of 8086: Data Transfer, Arithmetic, Logical, Shift & Rotate, String, Adjustment, Flag Related, Control Transfer & Processor Control                         | <b>12</b>    |
| <b>III</b> | 8086 Interrupts: Interrupt system, Classification of interrupts, Interrupts of 8086, Interrupt pointer table, Interrupt sequence. 8259A PIC: Programming of 8259A, Operating modes of 8259A.  | <b>12</b>    |
| <b>IV</b>  | Serial and Parallel data transfer: Microprocessor controlled data transfer, DMA, Serial transmission, Types of communication system, Serial transmission format, Baud rates. 8251 USART: Block Diagram, Control word, Data transfer operations. | <b>12</b>    |
| <b>V</b>   | Programmable Peripheral Interfacing chips: 8255: Block diagram, Operational description, Mode 0, Mode 1, Mode 2, 8255 interfacing, Interfacing of stepper motor.  | <b>12</b>    |

**Text Book:**

Sunil Mathur, Microprocessor 8086: Architecture, Programming & Interfacing, PHI Learning Pvt Ltd, 2011.

**Reference Book:**

William B. Jones, Assembly Language Programming for the IBM PC, 3rd Edition, Dreamtech Press, 2002.

**E-references:**

1. [https://apkpure.com/8086microprocessor\\_tutorial/org.vivek.cherala.programming8086](https://apkpure.com/8086microprocessor_tutorial/org.vivek.cherala.programming8086)
2. <https://www.javatpoint.com/8086-microprocessor>
3. <https://www.quora.com/How-do-I-understand-microprocessors-8086-in-an-easier-way>

**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           | M           | L           |
| <b>CO2</b>      | S           | S           | M           | M           | L           |
| <b>CO3</b>      | S           | S           | S           | M           | L           |
| <b>CO4</b>      | S           | S           | S           | S           | L           |
| <b>CO5</b>      | S           | S           | M           | S           | S           |

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

|                        |          |  |                       |      |
|------------------------|----------|--|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title:</b>                    | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA17 | <b>Course Title:</b>                       | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Software Engineering and Quality Assurance | <b>Semester:</b>      | IV   |
|                        |          |  | <b>Credits:</b>       | 3.5  |

### Course Objective

#### The course aims

- To describe the phases of software engineering and its techniques.
- To improve the knowledge about software quality management.
- To identify the quality metrics.

### 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 about various software process development models and understand about various metrics for software and its quality.   |
| K1, K2, K3         | CO2       | Learn Software quality measures, maintenance and cost estimation techniques.   |
| K1, K2, K3         | CO3       | Understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies and methods. |
| K1, K2, K3, K4, K5 | CO4       | Design and conduct various types and levels of software quality for a software project.  |
| K1, K2, K3, K4, K5 | CO5       | Know about Quality standards and Metrics.  |

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

### SYLLABUS

| Unit | Content   | No. of Hours |
|------|---|--------------|
| I    | <b>Software characteristics</b> - Software Engineering Layers - Software Process - Process Models - Linear Sequential, Evolutionary and Formal Methods – Software Measurements - Size Oriented, Function Oriented, Extended Function Point Metrics, Metrics for Quality.  | 12           |
| II   | <b>Software Project Planning</b> - Software Scope, Resources - Project Estimation - Problem Based, LOC Based, Process Based Estimation - Estimation Models - COCOMO - Software Quality - Quality Assurance - Software Reviews - Formal Technical Reviews - Statistical Quality Assurance - Software Reliability - SQA Plan  | 12           |
| III  | <b>Software Requirements Analysis</b> - Communication Techniques - Analysis Principles - Software Prototyping - Specification - Software Design Concepts- Effective Modular Design - Cohesion - Coupling- Design - Documentation- Real Time Systems and Design Methods - Data, Architecture, Transform and Transaction Mapping - Interface and Procedural Design. | 12           |
| IV   | <b>Software Quality in Business Context:</b> The Meaning of “Quality” - Defining Quality - The Quality Challenge - Why is Quality Important? - Quality Control V/S  | 12           |

|   |  |    |
|---|--|----|
|   | Quality Assurance - Quality Assurance at each phase of SDLC - Quality Assurance in Software Support Projects - The SQA function - Managing Software Quality in an Organization: Quality Management System: Various Expectations - Quality Assurance: Some diagnostic questions - The need for the SQA group in an organization - Planning for Software Quality Assurance: Software Quality Assurance Plan - Software Quality Assurance: Organizational level initiatives - Quality Planning - Some interesting dilemmas and observations.  |    |
| V | <b>Product Quality and Process Quality:</b> Introduction - Software Systems Evolution - Product Quality - Models for Software Product Quality - Process Quality - Software Measurement and Metrics: Overview - Introduction - Measurement during Software Life Cycle Context - Defect Metrics - Metrics for Software Maintenance - Classification of Software Metrics - Requirements related Metrics - Measurements and Process Improvement - Measurement Principle - Identifying appropriate measures and metrics for projects - Metrics implementation in projects - Benefits of measurement and metrics for project tracking and control - Earned Value Analysis - Planning for Metrics Program- <i>Issues in software measurements &amp; metrics program- Implementation - Object oriented metrics: An overview.</i> | 12 |

### Text Books:

1. Rogger S.Pressman, “*Software Engineering*”, - A practitioner’s approach, McGraw Hill Companies Inc. 1998 (Unit I to III).
2. Nina S. Godbole, “*Software Quality Assurance Principle and Practice*”, Narosa, 2004 (Unit IV & V)

### Reference Book:

1. Milind Limaye, “*Software Quality Assurance*”, Tata Mc Graw Hill, Edition, 2011, ISBN (13): 978-0-07-107252-6.
2. Daniel Galin, “*Software Quality Assurance*”, Pearson Education Edition, 2009, ISBN 978-81-317-2395-1.
3. Kamna Malik, Praveen Choudhary, “*Software Quality*”, Tata Mc Graw Hill Edition, 2010, ISBN-13-978-0-07-024873-1.
4. Ronald Kirk Kandt, “*Software Engineering Quality Practices*”, Auerbach Publications Edition, 2010, ISBN-10:08493-4633-9.

### E-references:

1. <https://en.wikipedia.org/wiki/software-engineering/>
2. <https://www.computerscience.org/software-quality-assurance/>
3. <https://www.predictiveanalyticstoday.com/quality-control/>

### Mapping with Programme Specific Outcomes

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

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

|                        |          |  |                       |      |
|------------------------|----------|--|-----------------------|------|
| <b>Programme Code:</b> | MCA      | <b>Programme Title :</b>                         | Computer Applications |      |
| <b>Course Code:</b>    | 19P3CA18 | <b>Course Title:</b>                             | <b>Batch:</b>         | 2019 |
| <b>Total Hours:</b>    | 60       | Elective - III:<br>Principles of Compiler Design | <b>Semester:</b>      | IV   |
|                        |          |  | <b>Credits:</b>       | 4.0  |

### Course Objective

#### The course aims

- To learn the basic structure of a Compiler.
- To understand the concepts of different types of Grammers and Parsers.
- To learn how to perform code optimization and code generation.

### Course Outcomes (CO)

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

| Knowledge Level       | CO Number  | Course Outcome   |
|-----------------------|------------|--|
| <b>K1, K2, K3</b>     | <b>CO1</b> | Describe the concept of the various phases of compiler and design of lexical analyser. |
| <b>K2, K3, K4</b>     | <b>CO2</b> | Explain the concept of Different types of grammars and parsers.                        |
| <b>K2, K3, K4, K5</b> | <b>CO3</b> | Understand the concept of LR parsers, Parsing Tables and Symbol Tables.                |
| <b>K2, K3, K4, K5</b> | <b>CO4</b> | Acquire the knowledge of syntax-directed translation schemes and Three Address Code.   |
| <b>K2, K3, K4, K5</b> | <b>CO5</b> | Gain knowledge about Code optimization and design code generator.                      |

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

### SYLLABUS

| Unit       | Content  | No. of Hours |
|------------|--|--------------|
| <b>I</b>   | Introduction - The Structure of a Compiler - Compiler writing tools - The Lexical and Syntactic Structure of a language - The role of the Lexical Analyzer - Design of Lexical Analyzers - Regular Expression - Finite automata.             | <b>12</b>    |
| <b>II</b>  | Context - Free Grammars - Derivations and parse tree - Capabilities of Context - free Grammars - Parsers - Shift - reduce parsing - Operators - Precedence Parsing - Top - down parsing - predictive parsers.                                | <b>12</b>    |
| <b>III</b> | LR parsers - The Canonical collection of LR (0) items - Constructing SLR parsing Tables – Symbol Tables - Data Structure for Symbol Tables.  | <b>12</b>    |
| <b>IV</b>  | Syntax - directed translation Schemes - Implementation of Syntax - directed translators - Intermediate Code - postfix notation – Parse tree & Syntax trees – Three address code – Translation of assignment statements – Boolean expression. | <b>12</b>    |
| <b>V</b>   | The Principal source of optimization - Loop optimization - DAG representation of basic blocks – problems in code generation – A simple code generator.   | <b>12</b>    |

**Text Book:**

Alfred V. Aho & Jeffrey D. Ullman, “Principles of Compiler Design”, Narosa Publishing House (Units I to V).

**Reference Books:**

1. Alfred V. Aho, Monica, S. Lam, Ravi Sethi and Jeffrey D. Ullman, “Compilers: Principles, Techniques and Tools”, 2nd Edition.
2. Randy Allen, Ken Kennedy, “Optimizing Compilers for Modern Architectures: A Dependence-based Approach”, Morgan Kaufmann Publishers, 2002.
3. Steven S. Muchnick, “Advanced Compiler Design and Implementation”, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003.
4. Charles N. Fischer, Richard. J. LeBlanc, “Crafting a Compiler with C”, Pearson Education, 2008.

**E-references:**

1. [https://www.tutorialspoint.com/compiler\\_design/compiler\\_design\\_useful\\_resources.htm](https://www.tutorialspoint.com/compiler_design/compiler_design_useful_resources.htm)
2. <https://www.geeksforgeeks.org/compiler-design-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           | S           | H           | M           | H           |
| <b>CO2</b>      | S           | S           | H           | M           | S           |
| <b>CO3</b>      | S           | S           | H           | H           | S           |
| <b>CO4</b>      | S           | S           | H           | H           | H           |
| <b>CO5</b>      | H           | S           | H           | H           | S           |

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

## Question Paper Pattern - P.G. Courses

(Common for Major and Supportive Papers)

### For EOS Examinations: 60 Marks

The Question Paper is to be divided into THREE Sections.

Section-A Carries 10 Marks, Section-B Carries 20 Marks and Section-C Carries 30 Marks.

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

Two Questions from each unit. (Q. No: 1 to 10)

Section-B Contains 5 Either or Choice Questions. (5 x 4 = 20)

Each Question carries 4 Marks. Both (a) and (b) from the same unit.

Q. No.: 11 (a) or (b) to 15(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.: 16 to 20

### For CIA Examinations: 40 Marks

**CIA Test I and II Question Paper Pattern:** (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)

### Components of Continuous Internal Assessment (CIA)

| Components  |               | Calculation                                     | CIA Total |
|---|---------------|---|-----------|
| Test 1 & Test 2   | 30            | $30 + 40 + 30 = \frac{100 \times 40}{100} = 40$ | 40        |
| Test 3 (Model Exam)   | 40            |   |           |
| Assignment + Seminar + Quiz / GD / Poster Presentation / Book Review / Field Visit Report | 10+10+10 = 30 |   |           |

|                        |          |  |                  |      |
|------------------------|----------|--|------------------|------|
| <b>Programme Code:</b> | ALL P.G. | <b>Programme Title:</b>                | Supportive Paper |      |
| <b>Course Code:</b>    | 19P4CS01 | <b>Course Title:</b>                   | <b>Batch:</b>    | 2019 |
| <b>Total Hours:</b>    | 90       | Relational Database Management Systems | <b>Semester:</b> | III  |
|                        |          |  | <b>Credits:</b>  | 3.0  |

### Course Objective

#### The course aims

- To equip the participants with the relevant quantitative tools and techniques for application in solving managerial problems.
- To understand the role of the DBMS & RDBMS in the organization.
- To understand the concepts include aspects of database design, database languages and database system implementation.

### 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> | Describe the fundamental elements of DBMS & RDBMS.              |
| <b>K2</b>       | <b>CO2</b> | Understand the architecture and process of the oracle database. |
| <b>K3</b>       | <b>CO3</b> | Attain a good practical understanding of the SQL.               |
| <b>K4</b>       | <b>CO4</b> | Enhance programming skill and techniques using PL/SQL.          |
| <b>K5</b>       | <b>CO5</b> | Understand the basic concepts of database security.             |

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

| SYLLABUS   |   |              |
|------------|---|--------------|
| Unit       | Content   | No. of Hours |
| <b>I</b>   | <b>Introduction to Database Management System (DBMS):</b> History of Database Management Systems-Why Database-Characteristics of Database Management systems. <b>Types of DBMS:</b> The Relational Model-The Hierarchical Model-The Network Model. <b>Introduction to Relational Database Management System (RDBMS):</b> RDBMS terminology-Relational Data Integrity. <b>Principles of Normalization:</b> First Normal Form - Second Normal Form - Third Normal Form - Fourth Normal Form - Fifth Normal Form.  | <b>18</b>    |
| <b>II</b>  | <b>The oracle Architecture:</b> Databases - Table spaces – Files – Instances - Tables and Columns - Table Constraints - Users - Schemas - Indexes - Clusters - Views - Sequences - Procedure - Functions - Packages - Triggers - Database Links. Internal Memory Structures - Process Structures - External Structures and Architecture. <b>Hardware Configuration Considerations:</b> StandAlone Hosts - Stand Alone Hosts with Disk Arrays - StandAlone Hosts with Disk Shadowing - StandAlone Hosts with Multiple Databases - Networked Hosts - Networks of Databases - Clustered Servers. | <b>18</b>    |
| <b>III</b> | <b>Introduction to SQL:</b> Characteristics of SQL - Types of SQL - Oracle Data types. <b>SQL Operators and Conditions:</b> Arithmetic – Character – Comparison - Logical and Set Operators. <b>Table:</b> Creating a Table - character width and number precision -  | <b>18</b>    |

|           |   |           |
|-----------|---|-----------|
|           | Constraints in create table - Check constraint - Dropping tables - altering tables. <b>SQL Commands:</b><br>DDL - DCL - DML - Transaction Control - Session Control - System Control - Embedded SQL.  |           |
| <b>IV</b> | <b>PL/SQL:</b> PL/SQL Blocks - Variables & Constants - Character Set – Datatypes - PL/SQL Structures. Triggers - Snapshots - Synonyms.  | <b>18</b> |
| <b>V</b>  | <b>Database Security:</b> Managing Database Users - Authentication of Users - Creating Users. <b>Roles:</b> Creating Roles - System Defined Roles - Altering & Dropping Roles - Granting & Revoking Roles. <b>Privileges:</b> System Privileges - Object Privileges. Backup & Recovery. | <b>18</b> |

#### Text Books:

1. Alexis Leon, “*ORACLE 7*”, The application Development Handbook, Comdex Computer Publishing.
2. Tom Leurs, “*Essential Oracle 7.0*” - Prentice Hall of India Pvt. Ltd.

#### Reference Books:

1. George Koch & Kevin Loney, “*Oracle 7.0-Complete Reference*”, Tata Mc Graw Hill.
2. Elnasri Navathe & Addison Wesley “*Fundamentals of Database Systems*”.

#### E-references:

1. <https://www.w3schools.com>
2. <https://www.beginnersbook.com>
3. <https://www.en.m.wikipedia.com>

#### Mapping with Programme Specific Outcomes

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

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