### PG DEPARTMENT OF COMPUTER APPLICATIONS

**M.Sc. Information Technology**

<table>
<thead>
<tr>
<th>SEM</th>
<th>SUB CODE</th>
<th>SUBJECTS</th>
<th>HOURS</th>
<th>CREDITS</th>
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<tr>
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<td>18PIT11</td>
<td>Problem Solving Techniques using C</td>
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**ELECTIVE I**

|     | 18EPIT14 | 1. E-Commerce                               | 5     | 5       |
|     | NC      | 2. Management Information Systems           |       |         |

**ELECTIVE II**

|     | 18EPIT24 | 1. Cloud Computing                          | 5     | 5       |
|     | NC      | 2. Big Data Analytics                       |       |         |

**ELECTIVE III**

|     | NC      | 1. Internet of Things                       | 5     | 5       |
|     | NC      | 2. Ethical Hacking                          |       |         |

**ELECTIVE IV**

|     | NC      | 1. Distributed Operating Systems            | 5     | 5       |
|     | NC      | 2. Artificial Intelligence                 |       |         |
Objective:
To inculcate primary programming skills among the students.

UNIT - I
Introduction: Introduction to C – Constants, Variables, Data types – Operators and Expressions.

UNIT - II

UNIT - III
Arrays and Functions: Arrays – Character Arrays and Strings – User defined Functions – Built-in-Functions.

UNIT - IV

UNIT - V

TEXT BOOK:

REFERENCE BOOKS:
Objective:
To make the students to acquire the basic knowledge about Information technology.

UNIT – I
Introduction to Computers: Computer system concepts - characteristics of computer-generations and types of computer - components of computer system - Booting process-classification of digital computer system - organization of computers - Input and Output devices - Storage devices.

UNIT – II

UNIT - III

UNIT - IV

UNIT – V
Latest IT Trends: E-Commerce - M-Commerce - Artificial Intelligence - Computational Intelligence - Geographic Information System (GIS) - Data Mining. Role of IT in different Areas: Education, Industry, Banking, Marketing, Public Services and others.

TEXT BOOK:
V. Rajaraman, Computer Fundamentals, PHI.
REFERENCE BOOKS:
5. ITL ESL, Introduction to computer Science, Pearson Education.
Objective:
To inculcate knowledge of web technological concepts and functioning of Internet.

UNIT - I
HTML: Introduction: Structure of HTML-tag and elements- attributes Tells us about elements- basic text formatting- presentational- phase elements- lists- basic link- adding images, flash, video and audio to a webpage- basic table elements and attributes- creating a form with the <form> element- form controls, frames: The <frameset> elements- the <frame> element.

UNIT - II

UNIT - III
JavaScript: How to add a script to your pages- the document object model- variables- operators- functions- conditional statements- looping- form validation and enhancement- Java Script libraries- meta tags-HTML5.

UNIT - IV

UNIT - V
ASP.NET: Difference between ASP and ASP.net- architecture of ASP.net- difference between code behind window and aspx file- Ad_ rotator-validation control-calendar controls- ADO.net object model- architecture of ado.net- working with crystal report.

TEXT BOOKS:
1. Jon Duckett, Beginning HTML, XHTML, CSS and JavaScript, Wiley Publishing Inc.

REFERENCE BOOKS:
2. Laura Lemay, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS & Javascript, Web Publishing.
Objective:
To learn the potential of electronic business for future development and the development of the 'Information Society' and ethical issues facing business organizations in their daily use of the Internet.

UNIT - I
Introduction to E-Commerce: The Revolution is just beginning - A brief History. Understanding Ecommerce: Organizing Themes.

UNIT - II

UNIT - III

UNIT - IV
E-Commerce Marketing concepts, online retailing and services , Consumer Online: The Internet audience and Consumer behavior - Basic Marketing Concepts - Internet marketing technologies - B2C and B2B E-Commerce marketing and Business strategies - The retail sector - Analyzing the viability of online firms - E-Commerce in auction: E-tailing Business Models - Common Themes in Online retailing - The service sector: offline and online - Online financial services - Online travel services - Online career services.

UNIT - V
Social Networks, Auctions and Portals: Social Networks and Online Communities - Online auctions - E-Commerce Portals.
TEXT BOOK:

REFERENCE BOOKS:
2. P.T. Joseph, E-Commerce: An Indian Perspective, PHI.
Objective:
To understand the concepts Management Information Systems and their Applications.

UNIT - I  
Introduction to information systems (IS): why study IS- why business need information technology (IT) – fundamentals of IS concepts – overview of IS – solving business problems with IS – developing IS solutions.

UNIT - II  

UNIT - III  
Managing information technology: Managing information resource and technologies – global IT management – planning and implementing business change with IT.

UNIT - IV  

UNIT – V  

TEXT BOOK:

REFERENCE BOOKS:
1. Alexis Leon, ERP Demystified, McGraw Hill Education.
Objective:
- To enable the students to learn different C Programming concepts.
- To enable the students to learn Web Development and .Net Application Tools.

C- Programming:

1. Create console-based applications using C language.
2. Develop simple console-based programs using C language with features like decision making statements, loops.
3. Write modular programs by using functions.
4. Use preprocessor directives in a program.
5. Use pointers to handle integer arrays.
6. Develop C programs using structures, pointers.
7. Use pointers to handle integer arrays, strings and files.
10. C program to find binary addition and binary subtraction.

Web Technologies:

1. Usage of Simple HTML commands, Graphics and image formats and Background Graphics and Color.
2. HTML Program to demonstrate the Usage of Tables, Frames, Forms, hyperlinks.
3. How to create a simple CSS style sheet using notepad.
4. Write CSS code to apply different style (color, background color).
5. Write a JavaScript function that converts upper case to lower case, and lower case to upper case in one form and display it in another form.
6. Write a JavaScript code block, which validates a username and password.
   a) If either the name or password field is not entered display an error message.
   b) The fields are entered do not match with default values display an error message.
   c) If the fields entered match, display the welcome message in another page.
7. Write Asp.net program to find sum of all digits of a given number and check whether the given number is an Armstrong number and display the result using a popup window.
8. Write a Asp.net program to get substring from a given string and change the color using scroll bar, font size and name using a value entered in a text box.
9. Write an Asp.net program to store the staff’s general information like Staff_id, name, mobile_no, Email_id, DOB., etc., in a database using Validation control and calendar control.
10. Develop a simple database program to prepare a student mark Sheet using ms-access simple applications using ASP.
Objective:
To motivate the students to work in emerging / latest technologies, help the students to develop ability, to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories.

About the Project:
- The project is of 5 hours/cycle for each semester duration and a student is expected to do planning, analysing, designing, coding, and implementing the project.
- The initiation of project should be with the project proposal.
- The synopsis approval will be given by the project guides.

Problem:
- Develop a project by choosing any topic in C Programming or Web Technologies.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be an individual project and a project report should be submitted at the end of the semester. The students shall defend their project in front of experts during practical examinations.
OBJECTIVE:
To Impart sound knowledge in Object Oriented Programming using JAVA.

UNIT - I
Introduction to Classes & Objects in Java: Introduction to Java - Features of Java – Data types – Classes and Objects – Constructors – String Class - Using Super - Abstract class.

UNIT - II
Packages, Interfaces and Threads: Creating Packages – Importing Packages – Interfaces - Defining an Interface, Implementing Interfaces - Exception Handling (Try, Catch, Throw and Throws) –Thread – Multithreading.

UNIT –III

UNIT – IV
Networks & RMI :Networks basics - Socket Programming - Proxy Servers - TCP/IP Sockets -_INet Address - URL - Datagrams – Architecture of RMI – An example program using RMI.

UNIT – V
Database & Java Servlets:JDBC Overview – JDBC Drivers – Connection Class – Command Class – ResultSet Class. Servlet: Servlet Overview – Servlet Terminology – Servlet API – HTTP Servlet Class – Servlet Life cycle – Session Tracking in Servlets (Cookies, Hidden Form Field, URL Rewriting-HTTP Session) - Create a Servlet in NetBeans.

TEXT BOOK:
REFERENCE BOOKS:

3. Iver Horton, Beginning in Java 2, Wrox Publications.
Objective:
To enable the students to learn the various concepts in Relational Database Management system and to impart knowledge on SQL and PL/SQL statements.

UNIT - I [15 Hrs]
SQL Basics: Introduction to RDBMS – Normalization: First Normal form-Second Normal form-Third Normal form-Creating a Table-Integrity Constraints- Creating, Modifying and Dropping -Select, from, where and Order by-Logic and Value: Single value tests-LIKE-NOT NULL-Simple tests against a list of values-Combining logic-Dropping tables-Altering a table: Adding or modifying a column-Changing Data: insert-multiple inserts-update-merge-delete-rollback-commit and Save point.

UNIT - II [15 Hrs]

UNIT - III [15 Hrs]
Advanced SQL Concepts: Decode and Case: if, then, else-Decode and Case-Creating a table from a table-Using Partitioned Tables: Creating a Partitioned Table-Creating Sub partitions-Indexes-Clusters-Sequences.
Users, Roles and Privileges: Creating a user-Password Management-Standard Roles-Format for grant command-Revoking privileges-What users can Grant: Moving to another user -Create synonym-Create a role-Granting privileges to a role-Granting a role to another role-Adding password to a role-Removing password from a role -Enabling & Disabling roles-Revoking privileges from a role-Drop a role.

UNIT - IV [15 Hrs]
Object-Relational Databases: Implementing Types-Object Views- Methods-Collectors (Nested Tables and Varying Arrays)-Using Large Objects-Advanced Object –Oriented Concepts.
UNIT - V


TEXT BOOK:

REFERENCE BOOKS:
2. Seyed M.M. (Saied) Tahaghoghi, Hugh Williams, Learning MySQL, O'Reilly Media.
Objective:
To understand the Concepts of Software Testing and to introduce various Testing Strategies and Testing Tools.

UNIT - I [15 Hrs]

UNIT - II [15 Hrs]
Testing techniques: Unit testing-Integration Testing-System and Acceptance Testing - White Box Testing-Black Box testing.

UNIT - III [15 Hrs]

UNIT - IV [15 Hrs]
Test Planning and Reporting: Test Planning- Management-. Execution and Reporting.

UNIT - V [15 Hrs]

TEXT BOOK:

REFERENCE BOOKS:
Objective:
To understand the concepts of cloud computing and to make the students to get in touch with the services provided by cloud computing.

UNIT - I [15 Hrs]

UNIT - II [15 Hrs]

UNIT - III [15 Hrs]
Cloud Computing for Everyone: Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT - IV [15 Hrs]

UNIT - V [15 Hrs]
TEXT BOOKS:
1. Barrie Sosinsky, Cloud Computing Bible, Wiley India publications.

REFERENCE BOOKS:
Objective:
To impart knowledge about Big Data Analytics and Hadoop.

UNIT - I
INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

UNIT - II
INTRODUCTION HADOOP : Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT - III
HADOOP ARCHITECTURE : Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT - IV
HADOOP ECOSYSTEM AND YARN : Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New FeaturesNameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

UNIT - V
HIVE AND HIVEQL, HBASE : Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase conceptsAdvanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

TEXT BOOK:

REFERENCE BOOKS:
## Objective:
To get hands on experience in developing Programs using Java applications and to enable students to write SQL queries and work with PL/SQL.

### JAVA:

- **[40 Hrs]**
  1. To find the area and perimeter of a Circle and Rectangle using Buffered Reader Class.
  2. String Manipulation using String and StringBuffer Class.
  3. Implementing packages for simple application.
  4. Implementing Interfaces in Java.
  5. Create an application using AWT Controls.
  7. Chatting application using TCP/IP.
  8. To develop a program for factorial of a number using RMI.
  10. To develop an application for Student Mark List using Servlet with Database (Ms-Access).

### RDBMS:

- **[35 Hrs]**
  1. Writing Basic SQL Statements
  2. Table Constraints
  3. Working with Built-in-functions of SQL.
  4. Joins & Sub queries
  5. Loading data using SQL*loader
  6. PL/SQL blocks.
  7. Exception Handling
  8. Cursors.
  9. Creating Stored procedures, functions and packages.
  10. Triggers.
  11. Working with Abstract Data Types
      i) Types
      ii) Object Views
      iii) Methods
      iv) Nested Tables
      v) Varying arrays.
Objective:
To motivate the students to work in emerging / latest technologies, help the students to develop ability, to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories.

About the Project:
- The project is of 5 hours/cycle for each semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project.
- The initiation of project should be with the project proposal.
- The synopsis approval will be given by the project guides.

Problem:
- Develop a project by choosing any topic in Java Programming or RDBMS.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be an individual project and a project report should be submitted at the end of the semester. The students shall defend their project in front of experts during practical examinations.
Objective:
To make the students to acquire mobile application development skills in Android.

UNIT - I

UNIT - II
Activities: Styles and Themes, Hiding, Displaying a dialog window, progress dialog. Linking activities using Intents-Fragments-Notifications.

UNIT - III

UNIT - IV

UNIT - V
Databases and communication: Creating and using Databases-Content Provider-Creating own Content Providers-SMS Messaging-Sending Email.

TEXT BOOK:

REFERENCE BOOKS:
Objective:
To make the students get acquainted with the basics of PHP and MySQL Programming.

UNIT - I

UNIT - II

UNIT - III
Error Handling and Debugging: General error types and debugging- displaying PHP errors- Adjusting Error Reporting- Creating Custom error handler- PHP debugging techniques- Filter: Types of Filter- Functions of Filter- Validate the data with filter option and sanitize- Working with files: Include Files with INCLUDE- creating and deleting files- opening a file for reading- writing or Appending- Reading from files- Validating Files.

UNIT - IV
UNIT - V

Learning Basic SQL Command: Table Creation- Insert row- Select Command Using Where Clause- Update and Delete Command- Replace Command- String Function- Date and Time Functions- Stored Procedures- Join- Indexing and Sorting query-

Using MySQL with PHP: Connecting to MySQL and selecting the database- executing simple queries- retrieving query results- counting return Records- updating- Record Addition- Viewing Record- and Deletion Record with PHP.

TEXT BOOKS:
2. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education.

REFERENCE BOOKS:
2. Rasmus Lerdorf, Kevin Tatroe, Peter Maclntyre, Programming PHP, O’Reilly Media.
Objective:
To make the students get acquainted with Internet of things.

UNIT - I
**Introduction: M2M to IoT**: The Vision-Introduction, From M2M to IoT- M2M towards IoT- the global context, A use case example, Differing Characteristics.

UNIT - II
**M2M to IoT – A Market Perspective**: Introduction, Some Definitions, M2M Value Chains, IoT Value Chains, An emerging industrial structure for IoT, The international driven global value chain and global information monopolies. M2M to IoT-An Architectural Overview–Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations.

UNIT - III
**M2M and IoT Technology Fundamentals**: devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management.

UNIT - IV

UNIT - V
TEXT BOOK:

REFERENCE BOOKS:
Objectives:
To make the students understand the basic principles, instrumentation and applications of Ethical Hacking.

UNIT - I [15 Hrs]

UNIT - II [15 Hrs]

UNIT - III [15 Hrs]

UNIT - IV [15 Hrs]
Security Defenses: Routers, Firewall & Honeypots, IDS & IPS, Web Filtering, Vulnerability, Penetration Testing, Session Hijacking, Web Server, SQL Injection, Buffer Overflow, Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobile Phone Hacking.

UNIT - V [15 Hrs]
Ethical Hacking - Terminologies: Social Engineering, Host Reconnaissance, Session Hijacking, Hacking - Web Server, Database, Password Cracking, Network and Wireless, Trojan, Backdoor, UNIX, LINUX, Microsoft, Buffer Overflow, Denial of Service Attack.
TEXT BOOK:

REFERENCE BOOKS:
Objective:
To make the students get acquainted with fundamental principles of distributed operating systems.

UNIT - I
Introduction: Introduction to Distributed Systems, What is a Distributed System?, Hardware concepts, Software concepts, Design issues.

UNIT - II

UNIT - III
Synchronization : Synchronization in Distributed System, Clock Synchronization, Mutual Exclusion, Election algorithms, Atomic transactions, Deadlocks in Distributed Systems.

UNIT - IV
Processor allocation and Real Time Systems: Process and processors in Distributed System threads, System Models, Processors allocation, Scheduling in Distributed System, Fault tolerance, Real time Distributed System.

UNIT - V

TEXT BOOK:
Andrew S. Tanenbaum, Distributed Operating Systems, Prentice Hall.

REFERENCE BOOKS:
Objective:
To Study the concepts of Artificial Intelligence and methods of solving problems using Artificial Intelligence.

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
Perception and Action: Real time search – Perception – Action – Robot Architectures – Case study on Robot Architecture.

TEXT BOOK:

REFERENCE BOOKS:
Objective:
- To enable the students to learn the programming concepts in Android applications.
- To enable the students to build applications in PHP.

**ANDROID APPLICATIONS:**
1. Write android program to change the background of your activity.
2. Write android program to perform all operations using calculators.
3. Write android program to change image displayed on the screen.
4. Write android program to demonstrate action button by implementing on click listener.
5. Write android program to demonstrate countdown timer application.
6. Write android program to demonstrate layouts in an activity.
7. Write android program to display Google Maps in Android.
8. Write android program to reading and writing to a file on SD card.
9. Write android program to read and write to a SQLite database in Android.
10. Write android program to demonstrate content providers in Android.

**PHP:**
1. String and Date functions in PHP.
2. Form creation using POST method.
3. Database Operations using mysql.
4. Login form using session.
5. Class and Object in PHP.
6. Student mark list creation with validation.
8. Develop a simple online shopping cart.
9. Develop a simple bank application.
10. Develop an application for employee pay slip.
Objective:
To motivate the students to work in emerging / latest technologies, help the students to develop ability, to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories.

About the Project:
- The project is of 5 hours/cycle for each semester duration and a student is expected to do planning, analysing, designing, coding, and implementing the project.
- The initiation of project should be with the project proposal.
- The synopsis approval will be given by the project guides.

Problem:
- Develop a project by choosing any topic in Android Applications or Web Development using PHP.

The project proposal should include the following:
- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be an individual project and a project report should be submitted at the end of the semester. The students shall defend their project in front of experts during practical examinations.
Objective:
To make the students to cop-up with the current trends of software industry and to make them to be industry ready.

About the Programme:

The demand for quality students has had the IT companies queuing up at leading colleges and at times even recruiting them even before they graduate. However, there are a few companies that look at colleges as more than being just 'talent pools'.

Tata Consultancy Services (TCS) is one of them. With its 'Tata Academic Interface Programme' the IT major is putting in place internship for students, conducting workshops and getting professionals and their own trainers to address students in their classrooms.
Objective:
To expose the students to industry atmosphere and help them to gain knowledge on software development.

MAIN PROJECT

FORMAT FOR PREPARING MAIN PROJECT REPORT

Arrangement of contents
1. Title Page
2. Bonafide Certificate
3. Acknowledgement
4. Table of contents
5. Abstract
6. Chapters of the Report
7. References
8. Appendices, if any

Appendices should be named as
APPENDIX – A
APPENDIX - B

BINDING SPECIFICATION
● Report should be found using flexible cover of thick white art paper.
● The Spine for the bound volume should be of black calio of 2cms width.
● The Cover should be printed in block letters.

MARGIN SPECIFICATION
Top : 4 cms
Bottom : 3 cms
Left : 4.5 cms
Top : 2.5 cms

PAGE NUMBERING
All Page numbers should be typed without punctuation on the bottom-center portion of the page. The Preliminary pages (table of contents and abstract) should be numbered in lowercase roman literals. Papers of main text, starting with Chapter-1, should be consecutively numbered using Arabic numerals.
CERTIFICATE

This is to certify that the main project report entitled

TITLE OF THE PROJECT

being submitted to

St. Joseph’s College of Arts and Science (Autonomous), Cuddalore – 1

Affiliated to Thiruvalluvar University, Vellore.

By

Mr./Ms. STUDENT’S NAME

for the partial fulfillment for the award of degree of

MASTER OF SCIENCE (Information Technology)

is a bonafide record of work carried out by him/her, under

my guidance and supervision.

Internal Guide

Head of the Department

Submitted for the Viva-Voce examination held on ____________________

Examiners:

1.

2.
Question Paper pattern

THEORY EXAMINATION (MSc(IT))

Continuous Internal Assessment (CIA) 25 Marks

- Two Internal Examinations 15 Marks
- Assignment / Seminar 10 Marks
- Total 25 Marks

External Examination (75 Marks)

Question Pattern

M.Sc(IT)

Time: 3 Hrs Max. Marks: 75

SECTION – A (5 x 5 = 25)

Answer ALL the Questions

Two question from each unit (Either - OR Pattern)

SECTION – B (5 x 10 = 50)

Answer ANY FIVE out of EIGHT

One question from each unit and three questions from important topics with problems and programs