PG DEPARTMENT OF COMPUTER APPLICATIONS				
M.Sc. Information Technology				
SEM	**SUB CODE**	**SUBJECTS**	**HOURS**	**CREDITS**
I	18PIT11	Problem Solving Techniques using C	5	4
	18PIT12	Introduction to Information Technology	5	4
	18PIT13	Web Technologies	5	4
		Elective – I	5	5
	18PITP11	Practical - I : C- Programming and Web Technologies	5	4
	18JPIT11	Project - I : C- Programming / Web Technologies	5	4
		Total	**30**	**25**
II	18PIT21	Object Oriented Programming using Java	5	4
	18PIT22	Relational Database Management System	5	4
	18PIT23	Software Testing	5	4
		Elective – II	5	5
	18PITP22	Practical - II: Java Programming and RDBMS	5	4
	18JPIT22	Project - II : Java Programming / RDBMS	5	4
		Total	**30**	**25**
III	NC	Mobile Application Development	4	4
	NC	Open Source Technologies	4	4
		Elective-III	5	5
		Elective-IV	5	5
	NC	Human Rights	2	2
	NC	Practical - III : Android Applications and Web Development using PHP	5	5
	NC	Project - III : Android Applications or Web Development using PHP	5	5
		Total	**30**	**30**
IV	NC	Academic Interface Program	15	5
	NC	Main Project	15	5
		Total	**30**	**10**
TOTAL			**120**	**90**
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		

YEAR - I	PROBLEM SOLVING TECHNIQUES USING C	18PIT11
SEMESTER - I		HRS/WK - 5
MAIN - 1		CREDIT - 4

Objective:
To inculcate primary programming skills among the students.

UNIT - I **[15 Hrs]**
Introduction: Introduction to C – Constants, Variables, Data types – Operators and Expressions.

UNIT - II **[15 Hrs]**
Input / Output and Control Structures : Managing Input and Output operations – Decision Making and Branching – Decision making and Looping.

UNIT - III **[15 Hrs]**
Arrays and Functions: Arrays – Character Arrays and Strings – User defined Functions – Built-in-Functions.

UNIT - IV **[15 Hrs]**
Structures and Pointers: Structures and unions – Pointers – Pointers with Arrays – Pointers with structures.

UNIT - V **[15 Hrs]**
File Management and Graphics: File management - Dynamic memory allocation – Preprocessors – Graphics in C.

TEXT BOOK :
E. Balagurusamy, Programming in ANSI C, Sixth Edition, McGraw-Hill.

REFERENCE BOOKS:

1. R. S. Bichkar, Programming with C, University Press, 2012 McGraw Hill, 2012.
2. Byron S. Gottfied - Schaum's outline Theory and problems of programming with C. Tata McGraw Hill Publications.
3. Yeshwanth Kanethkar -Let us C, BPB Publications.
4. K. R. Venugopal, S. R. Prasad -Mastering C – Tata McGraw Hill Pub.

YEAR - I	INTRODUCTION TO INFORMATION TECHNOLOGY	18PIT12
SEMESTER - I		HRS/WK - 5
MAIN - 2		CREDIT - 4

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

UNIT – I **[15 Hrs]**

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 **[15 Hrs]**

Computer Software: System software - application software – firmware. **Programming languages classification:** machine language - assembly language and high-level language. **Evolution of programming languages:** first generation - second generation - third generation and fourth generation languages. **Language translator:** Compiler - Interpreter and Assembler. **Operating System:** Definition – Job - Objective and evolution of operating system - Types of operating systems.

UNIT - III **[15 Hrs]**

Network Communication: Definition – Criteria - advantages and limitations of computer networking - Communication process - Communication types - Types of computer network - Network topology - LAN and other network related protocols - OSI model - TCP/IP model - Networking Components.

UNIT - IV **[15 Hrs]**

Network Applications: Introduction about Internet - Internet basics - Internet protocols - Internet addressing - Browser –WWW - E-mail – telnet – ftp – application - benefits and limitation of internet - electronic conferencing - teleconferencing.

UNIT – V **[15 Hrs]**

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:

1. Dennis P. Curtin, Kim foley, KunalSen and Cathleen Morin, Information Technology - The Breaking Wave, Tata-McGraw Hill Publications, 2005.
2. Leon and Leon, Fundamentals of IT, Leon Tec World.
3. Alexis Lean and Mathews Leon, Fundamentals of Information Technology, Vikas Publication House, Delhi.
4. Cyganski, Information Technology - inside and outside, Pearson Publication.
5. ITL ESL , Introduction to computer Science, Pearson Education.

YEAR – I	WEB TECHNOLOGIES	18PIT13
SEMESTER - I		HRS/WK - 5
MAIN - 3		CREDIT - 4

Objective:
To inculcate knowledge of web technological concepts and functioning of Internet.

UNIT - I **[15 Hrs]**
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 **[15 Hrs]**
CSS: Introduction CSS-CSS properties: Controlling text- text formatting- text pseudo code classes- selectors, links: background- lists- tables- outlines- positioning and layout with CSS, design issues: typography - navigation- tables – forms.

UNIT - III **[15 Hrs]**
Java Script: 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 **[15 Hrs]**
ASP.NET: data types- variables- arrays- properties- namespace - method- interface- delegation- button- textbox- timer –checkbox- radio button - menu.

UNIT – V **[15 Hrs]**
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.
2. Harvey M. Deitel, Paul J. Deitel, C# Programmers, Second Edition, Pearson Education.

REFERENCE BOOKS:

1. E. Balaguruswamy, Programming with C#, Second Edition,Tata McGraw Hill Publications.
2. Laura Lemay, Rafe Colburn, Jennifer Kyrnin, Mastering HTML, CSS & Javascript, Web Publishing.
3. Matthew Macdonald, ASP.NET: The Complete Reference Paperback.

YEAR - I	E-COMMERCE	18EPIT14
SEMESTER - I		HRS/WK - 5
ELECTIVE - I(1)		CREDIT - 5

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 **[15 Hrs]**
Introduction to E-Commerce: The Revolution is just beginning - A brief History. **Understanding Ecommerce:** Organizing Themes.

UNIT - II **[15 Hrs]**
E-Commerce business models and concepts: E-commerce Infrastructure - E-Commerce Business Models - Major Business to Consumer(B2C) Business Models - Major Business to Business(B2B) Business Models - Business Models in emerging E-Commerce Business Areas. **How the Internet and Web change the Business:** Strategy, Structure and Process, **The Internet and World Wide Web:** The Internet - Technology background - The Internet Today - The Internet II - The Future Infrastructure - The World Wide Web - The Internet and the Web - Features.

UNIT - III **[15 Hrs]**
Building an E-Commerce Web site, Security and Payment: A systematic approach - The E-Commerce Security Environment - Security Threats in the E-Commerce Environment - Technology Solution - management policies - Business procedures and public laws - Payment System - E-Commerce payment system - Electronic billing presentment and payment.

UNIT - IV **[15 Hrs]**
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 **[15 Hrs]**
Social Networks, Auctions and Portals: Social Networks and Online Communities - Online auctions - E-Commerce Portals.

TEXT BOOK:

L. Kenneth C. Laudon, E-Commerce: Business, Technology, Society, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. David Whiteley, E - Commerce: Strategy, Technologies and Applications, Information System Series, McGraw Hill Education.
2. P.T. Joseph, E-Commerce: An Indian Perspective, PHI.

YEAR - I	MANAGEMENT INFORMATION SYSTEMS	
SEMESTER - I		HRS/WK - 5
ELECTIVE - I(2)		CREDIT - 5

Objective:
To understand the concepts Management Information Systems and their Applications.

UNIT - I [**15 Hrs]**
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 [**15 Hrs]**
Information systems for business operations: Business IS – marketing, manufacturing, human resource, accounting and financial information systems – transaction processing system – management information and decision support systems.

UNIT - III [**15 Hrs]**
Managing information technology: Managing information resource and technologies – global IT management – planning and implementing business change with IT.

UNIT - IV [**15 Hrs]**
Enterprise Resource Planning (ERP): an overview – benefits of ERP – ERP and related technologies – business process reengineering – data warehousing – data mining – online analytical processing – supply chain management.

UNIT – V [**15 Hrs]**
ERP implementation: ERP implementation life cycle – implementation methodology – hidden cost – organizing the implementation – vendors, consultants and users contracts with vendors, consultants and employees project management and monitoring – ERP present and future – turbo change the ERP systems – enterprise integration applications – ERP and E-commerce – ERP and Internet.

TEXT BOOK:
James A O'Brien, Management Information Systems for managing IT in the Internetworked Enterprise, 4th Edition, Tata McGraw Hill, New Delhi, 1999.

REFERENCE BOOKS:

1. Alexis Leon, ERP Demystified, McGraw Hill Education.
2. W. S. Jawadekar, Management Information Systems: A Global Digital Enterprise Perspective, McGraw Hill Education.

YEAR - I	C PROGRAMMING AND WEB TECHNOLOGIES	18PITP11
SEMESTER - I		HRS/WK - 5
PRACTICAL - I		CREDIT - 4

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 : [40 Hrs]

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.
8. Process data in files using file I/O functions.
9. Develop C programs using dynamic memory allocation.
10. C program to find binary addition and binary subtraction.

Web Technologies : [35 Hrs]

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.

YEAR – I	C PROGRAMMING / WEB TECHNOLOGIES	18JPIT11
SEMESTER - I		HRS/WK –5
PROJECT – I		CREDIT – 4

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.

YEAR – I	OBJECT ORIENTED PROGRAMMING USING JAVA	18PIT21
SEMESTER - II		HRS/WK – 5
MAIN - 4		CREDIT – 4

OBJECTIVE:
To Impart sound knowledge in Object Oriented Programming using JAVA.

UNIT - I **[15 Hrs]**
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 **[15 Hrs]**
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 **[15 Hrs]**
Working with Windows using AWT Classes : AWT: AWT Hierarchy (Components & Containers) – AWT Controls (Label, TextField, TextArea, CheckBox, Button) – Layouts - Sample Program using AWT Controls. **Applets:** Introduction to Applets – Life Cycle of Applets – Sample program using Applets.

UNIT – IV **[15 Hrs]**
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 **[15 Hrs]**
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 :
H. Schildt, Java2 (The Complete Reference), Fourth Edition, TMH 1999.

REFERENCE BOOKS :

1. Wesley, K. Arnold and J. Gosling, The Java Programming Language, Third Edition, Addison–Wesley, 2000.
2. H. M. Dietel and P. J. Dietel, Java: How to Program, Pearson Education/PHI, Sixth Edition.
3. Iver Horton, Beginning in Java 2, Wrox Publications.
4. Naughton and H. Schildt, Java2 (The Complete Reference), Third Edition, 1999, Tata McGraw-Hill.
5. K. Moss, Java Servlets, Tata McGraw-Hill, 1999.
6. C. S. Horstmann, Gary Cornell, Core Java 2 Vol. I Fundamentals, Pearson Education.
7. C. S. Horstman, Gary Cornell, Core Java 2 Vol. I and Vol. II – 7th Edition. PHI, 2000.
8. D.R. Callaway, Inside Servlets, 1999, Pearson Education, Delhi.

YEAR – I	RELATIONAL DATABASE MANAGEMENT SYSTEMS	18PIT22
SEMESTER - II		HRS/WK – 5
MAIN - 5		CREDIT – 4

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-NULL and 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]**

SQL Concepts: Data types-String functions-Single value functions-Aggregate functions-List functions-Findings Rows with MAX or MIN-Date functions-Conversion functions-Creating a view- Stability of a view-Order by views-Creating a read only view -Grouping Things Together: The use of group by and having-views of Groups-Sub queries-Advanced Sub queries-Outer joins-Natural and inner joins-Union, Intersect, and minus.

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]**

Using SQL*Loader to load data: The Control file-Loading Variable length data-Starting the load-Syntax-Managing the data loads-Tuning Data loads-Using External Tables: Access an external data-External table: Creation-Limitation-Benefits.

Object–Relational Databases: Implementing Types-Object Views- Methods-Collectors (Nested Tables and Varying Arrays)-Using Large Objects-Advanced Object –Oriented Concepts.

UNIT - V **[15 Hrs]**

Introduction to PL/SQL: Declarations section-Executable commands section-Exception handling section-Cursor Management-Procedures, Functions & Packages-Triggers: Syntax-Types of Triggers: Row level- Statement level-before & after-Instead of Schema-Database level triggers-Enabling & Disabling triggers.

TEXT BOOK:

Kevin Lonely, ORACLE DATABASE 10g - The Complete Reference, Tata McGraw-Hill Publishing Company Ltd 2004.

REFERENCE BOOKS:

1. Michael Abhey, Mike Corey and Ian Abramson, Oracle 9i- A Beginner's Guide, Tata McGraw Hill Publishing Company Ltd.
2. Seyed M.M. (Saied) Tahaghoghi, Hugh Williams, Learning MySQL, O'Reilly Media.

YEAR – I	SOFTWARE TESTING	18PIT23
SEMESTER - II		HRS/WK - 5
MAIN - 6		CREDIT - 4

Objective:
To understand the Concepts of Software Testing and to introduce various Testing Strategies and Testing Tools.

UNIT - I **[15 Hrs]**
Introduction: Principles of Testing- Software Development Life Cycle Models.

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

UNIT - III **[15 Hrs]**
Testing fundamentals & Specialized Testing: Performance Testing-Regression Testing-Testing of Object Oriented Systems-Usability and Accessibility Testing.

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

UNIT - V **[15 Hrs]**
Software Tools: Software Test Automation-Test Metrics and Measurements-Case study: Agile tool.

TEXT BOOK:
Srinivasan Desikan, Gopalasamy Ramesh, Software Testing, Pearson Education 2006.

REFERENCE BOOKS:
1. Louis Tamres, Introducing Software Testing, First Edition, Addison Wesley Publications.
2. Ron Patton, Software Testing, Sams Publishing.

YEAR – I	CLOUD COMPUTING	18EPIT24
SEMESTER - II		HRS/WK – 5
ELECTIVE - II(1)		CREDIT – 5

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]**

Introduction to Cloud Computing : Cloud Computing: Definition, Cloud Architecture, Cloud Storage, Advantages and Disadvantages of Cloud Computing, Companies in the Cloud Today, Cloud Services, **Cloud Types:** The NIST Model, The Cloud Cube Model, Deployment Models, Service Models Cloud **Computing, Service Models:** Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS).

UNIT - II **[15 Hrs]**

Developing Cloud Services : Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

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]**

Using Cloud Services : Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files.

UNIT - V **[15 Hrs]**

Cloud Security and Challenges : Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control Identity management, Access control, Autonomic Security **Cloud computing security challenges:** Virtualization security management virtual threats, VM Security Recommendations, VM--Specific Security techniques, Secure Execution Environments and Communications in cloud.

TEXT BOOKS:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley India publications.
2. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Pearson Publications.

REFERENCE BOOKS:

1. Kailash Jayaswal, Cloud Computing Black Book, Dream tech Press.
2. Thomas Erl, Ricardo Puttini, Zaigham Mahmood, Cloud Computing: Concepts, Technology, and Architecture, Pearson Education India.
3. Dinakar Sitaram, Moving to The Cloud, Elsevier, 2014.
4. Danc. Marinercus, Cloud Computing Theory And Practice, Elsevier, 2013.
5. Judith Hurwitz, Robin Bloor, Marcia Kaufman, and Dr. Fern Halper, Cloud Computing for Dummies, Wiley Publishing, 2010.

YEAR – II	BIG DATA ANALYTICS	
SEMESTER - II		HRS/WK – 5
ELECTIVE - II(2)		CREDIT – 5

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

UNIT - I **[15 Hrs]**

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 **[15 Hrs]**

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 **[15 Hrs]**

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 **[15 Hrs]**

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 **[15 Hrs]**

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:

Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, Professional Hadoop Solutions, Wiley, 2015.

REFERENCE BOOKS:

1. Chris Eaton, Dirk deroos et al. , Understanding Big data, McGraw Hill, 2012.
2. Tom White, HADOOP: The definitive Guide, O Reilly 2012. 6 IT2015 SRM(E&T) .
3. Vignesh Prajapati, Big Data Analytics with R and Haoop, Packet Publishing 2013.
4. Tom Plunkett, Brian Macdonald et al, Oracle Big Data Handbook, Oracle Press, 2014.
5. http://www.bigdatauniversity.com
6. Jy Liebowitz, Big Data and Business Analytics,CRC press, 2013.

YEAR – I	JAVA PROGRAMMING AND RDBMS	18PITP22
SEMESTER - II		HRS/WK – 5
PRACTICAL - II		CREDIT - 4

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 String Buffer Class.
3. Implementing packages for simple application.
4. Implementing Interfaces in Java.
5. Create an application using AWT Controls.
6. Loading image onto Applet.
7. Chatting application using TCP/IP.
8. To develop a program for factorial of a number using RMI.
9. Create a Login form using Servlet in NetBeans.
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.

YEAR – I	JAVA PROGRAMMING / RDBMS	18JPIT22
SEMESTER - II		HRS/WK – 5
PROJECT - II		CREDIT – 4

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.

YEAR – II	MOBILE APPLICATION DEVELOPMENT	
SEMESTER - III		HRS/WK – 4
MAIN - 7		CREDIT - 4

Objective:
To make the students to acquire mobile application development skills in Android.

UNIT - I **[12 Hrs]**
Introduction : Introduction to Android-Features of Android-Required Tools -First Android Application-Debugging application-Publishing Application.

UNIT - II **[12 Hrs]**
Activities : Styles and Themes, Hiding, Displaying a dialog window, progress dialog. Linking activities using Intents-Fragments-Notifications.

UNIT - III **[12 Hrs]**
Layouts and views : Screen Layouts-Orientation-Basic Views, Progress - Bar View-Picker Views-Listy Views.

UNIT - IV **[12 Hrs]**
Views and Data Persistence: Image Views-Menus with Views-Web View. **Data Persistence:** Saving and Loading user Preferences-Persisting Data to Files.

UNIT - V **[12 Hrs]**
Databases and communication: Creating and using Databases-Content Provider-Creating own Content Providers-SMS Messaging-Sending Email.

TEXT BOOK :
Jerome DiMarzio, Beginning Android Programming with Android Studio, Wrox Publications.

REFERENCE BOOKS:

1. Reto Meier, Professional Android 4 Application Development, Wrox Publications.
2. Jeff McWherter, Scott Gowell, Professional Mobile Application Development, Wrox Publications.

YEAR – II	OPEN SOURCE TECHNOLOGIES	
SEMESTER - III		HRS/WK – 4
MAIN - 8		CREDIT – 4

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

UNIT - I **[12 Hrs]**

Building blocks of PHP: Basic syntax - Variables - Data Types - Operators and expressions- Constants. **Flow Control:** Switch flow- Loops- Code Block- Sending data to the browser-**Working with Arrays:** Arrays- Creating array- Array related Functions-**Working with Function:** Function- Calling Function- Defining Function- Returning the Values from user defined function- Variable Scope- Argument.

UNIT - II **[12 Hrs]**

Working with Strings, Date and Time Functions: Formatting String with PHP- Date and Time Function- String Manipulation and Investigating Strings with PHP-**Working with Forms:** Creating form- Handling form- Validating form data- Accessing form data- use of Hidden fields to save State- Redirecting user- file Upload-**Working with Cookies and User Session:** Introduction of Cookie- Setting a Cookie with PHP-Introduction of Session and Improving Session Security- Starting a Session- Working with Session Variables- Passing Session Id in the query String- Destroying Session and Unsetting Variables.

UNIT - III **[12 Hrs]**

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 **[12 Hrs]**

Working with Directories: Directory related function- $DIR object in PHP-**Working with Images:** Image related function- Miscellaneous function-**Introduction To OOP:** The basic- auto loading objects- Class- Extends- Constructs- Scope Resolution Operator- Parent- serializing object- The magic objects sleep and awake- reference inside the constructor- comparing objects- Visibility- overloading- object interface- pattern- magic method.

UNIT - V **[12 Hrs]**

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:

1. Dave W. Mercer, Allan Kent, Steven D. Nowicki, David Mercer, Dan Squier, Wankyu Choi with Heow Eide-Goodman, Ed Lecky-Thompson, Clark Morgan, Beginning PHP 5, Wrox.
2. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education.

REFERENCE BOOKS:

1. Larry Ullman, PHP and MySQL for dynamic Web Sites: Visual Quickpro Guide, Peachpit Press.
2. Rasmus Lerdorf, Kevin Tatroe, Peter Maclntyre, Programming PHP, O'Reilly Media.
3. Steven Holzner, The Complete Reference PHP, McGraw Hill Education.

YEAR – II	INTERNET OF THINGS	
SEMESTER - III		HRS/WK – 5
ELECTIVE - III(1)		CREDIT – 5

Objective:
To make the students get acquainted with Internet of things.

UNIT - I **[15 Hrs]**

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 **[15 Hrs]**

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 **[15 Hrs]**

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 **[15 Hrs]**

IoT Architecture-State of the Art : Introduction, State of the art, Architecture Reference Model: Introduction, Reference Model and architecture, IoT reference Model.

UNIT - V **[15 Hrs]**

IoT Reference Architecture: Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints: Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. Industrial Automation: Service-oriented architecture-based device integration, SOCRADES: realizing the enterprise integrated Web of Things, IMC-AESOP: from the Web of Things to the Cloud of Things, Commercial Building Automation: Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

TEXT BOOK:

Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, First Edition, Academic Press, 2014.

REFERENCE BOOKS:

1. Vijay Madisetti and Arshdeep Bahga, Internet of Things (A Hands-on Approach), First Edition, VPT, 2014.
2. Francis daCosta, Rethinking the Internet of Things: A Scalable Approach to Connecting Everything, First Edition, Apress Publications, 2013.

YEAR – II	ETHICAL HACKING	
SEMESTER - III		HRS/WK – 5
ELECTIVE-III(2)		CREDIT – 5

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

UNIT - I **[15 Hrs]**

Introduction: Data Theft in Organizations, Elements of Information Security, Authenticity and NonRepudiation, Security Challenges, Effects of Hacking, Hacker – Types of Hacker, Ethical Hacker, Hacktivism - Role of Security and Penetration Tester, Penetration Testing Methodology, Networking & Computer Attacks – Malicious Software (Malware), Protection Against Malware, Intruder Attacks on Networks and Computers, Addressing Physical Security – Key Loggers and Back Doors.

UNIT - II **[15 Hrs]**

Hacking: Web Tools for Foot Printing, Conducting Competitive Intelligence, Google Hacking, Scanning, Enumeration, Trojans & Backdoors, Virus & Worms, Proxy & Packet Filtering, Denial of Service, Sniffer, Social Engineering – shoulder surfing, Dumpster Diving, Piggybacking.

UNIT - III **[15 Hrs]**

Attacks: Physical Security – Attacks and Protection, Steganography – Methods, Attacks and Measures, Cryptography – Methods and Types of Attacks, Wireless Hacking, Windows Hacking, LinuxCryptography – Methods and Types of Attacks, Wireless Hacking, Windows Hacking, Linux Hacking

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:

Patrick Engebretson, The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy, Syngress Basics Series–Elsevier, 2011.

REFERENCE BOOKS:

1. Michael T. Simpson, Kent Backman, James E. Corley, Hands On Ethical Hacking and Network Defense, Second Edition, CENGAGE Learning, 2010.
2. Abraham K. White, The Underground Guide to Computer Hacking, Including Wireless Networks, Security, Windows, Kali Linux and Penetration Testing, CreateSpace Independent Publishing Platform.

YEAR – II	DISTRIBUTED OPERATING SYSTEMS	
SEMESTER - III		HRS/WK – 5
ELECTIVE – IV(1)		CREDIT – 5

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

UNIT - I **[15 Hrs]**
Introduction: Introduction to Distributed Systems, What is a Distributed System?, Hard ware concepts, Software concepts, Design issues.

UNIT - II **[15 Hrs]**
Inter-Process Communication: Communication in Distributed Systems, Lay red Protocols, ATM networks, The Client – server model, Remote Procedure call, Group communication.

UNIT - III **[15 Hrs]**
Synchronization : Synchronization in Distributed System, Clock Synchronization, Mutual Exclusion, Election algorithms, Atomic transactions, Deadlocks in Distributed Systems.

UNIT - IV **[15 Hrs]**
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 **[15 Hrs]**
File system and Shared memory: Distributed File Systems, Distributed File System Design, Distributed File System implementation, Trends in Distributed File System. Distributed Shared Memory, Introduction.

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

REFERENCE BOOKS:

1. Mukesh Singhal, Niranjan Shivaratri, Advanced Concepts in Operating Systems, McGraw Hill Education.
2. Pradeep K. Sinha, Distributed Operating Systems: Concepts and Design, Wiley-IEEE Press.

YEAR - II	ARTIFICIAL INTELLIGENCE	
SEMESTER -III		HRS/WK - 5
ELECTIVE – IV (2)		CREDIT - 5

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

UNIT - I **[15 Hrs]**

Introduction to Artificial Intelligence: The AI problems – The underlying Assumption – What is an AI technique? – The level of the model – Criteria for success – Problems, Problem spaces and Search: Defining the problem as a state space search – production systems – problem characteristics – production system characteristics – Issues in the design of search programs.

UNIT - II **[15 Hrs]**

Heuristic Search Techniques: Generate and test – Hill Climbing – Best First Search (A* Search) – Problem Reduction (AO * Algorithm) – Constraint Satisfaction – Means-Ends Analysis – Knowledge Representation Issues: Representation and Mappings – Approaches to Knowledge Representation – Issues in Knowledge Representation.

UNIT - III **[15 Hrs]**

Using Predicate logic: Representing simple facts in logic – Representing Instance and ISA Relationships – Computable functions and Predicates – Resolution – Natural Deduction - Representing knowledge using Rules: Procedural versus Declarative knowledge – Logic programming – Forward versus Backward Reasoning.

UNIT - IV **[15 Hrs]**

Natural Language Processing: Introduction – Syntactic processing – Semantic Analysis – Learning : What is Learning? – Rote Learning – Learning from Examples: Induction – Explanation based Learning – Discovery – Analogy – Formal Learning theory – Neural net learning and Genetic learning.

UNIT - V **[15 Hrs]**

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

TEXT BOOK:

Elaine Rich, Kevin Knight, Artificial Intelligence, Tata McGraw Hill, Second Edition.

REFERENCE BOOKS:

1. Elaine Rich, Artificial Intelligence, McGraw Hill International Editions, 1983.
2. Patrick Henry Winston, Artificial Intelligence, Third Edition, Addison-Wesley.

YEAR – II	ANDROID APPLICATIONS AND WEB DEVELOPMENT USING PHP	
SEMESTER - III		HRS/WK – 5
PRACTICAL -III		CREDIT - 5

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.
7. Electricity bill preparation.
8. Develop a simple online shopping cart.
9. Develop a simple bank application.
10. Develop an application for employee pay slip.

YEAR – II	ANDROID APPLICATIONS OR WEB DEVELOPMENT USING PHP	
SEMESTER - III		HRS/WK – 5
PROJECT - III		CREDIT - 5

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.

YEAR – II	ACADEMIC INTERFACE PROGRAM	
SEMESTER - III		HRS/WK – 15
AIP		CREDIT - 5

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.

YEAR-II	FINAL PROJECT	
SEMESTER - IV		HRS/WK-15
MAIN PROJECT		CREDIT - 5

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.

TITLE PAGE

TITLE OF THE PROJECT

A project report
submitted for the partial fulfillment for
the award of degree of

Master of Science (Information Technology)

by
STUDENT'S NAME
(Register Number)

under the Guidance of

GUIDE'S NAME
Designation, Department

College Logo

PG DEPARTMENT OF COMPUTER APPLICATIONS

ST. JOSEPH'S COLLEGE OF ARTS & SCIENCE (AUTONOMOUS), CUDDALORE-1

Month and Year

CERTIFICATE

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