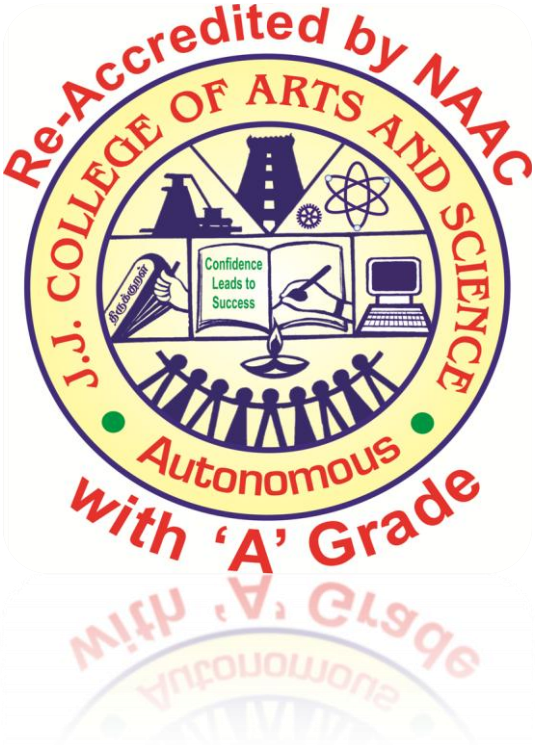
J.J.COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

DEPARTMENT OF INFORMATION TECHNOLOGY



M.Sc. Information Technology – SYLLABUS
(from 2019 – 2020 onwards)

J.J College of Arts and Science (Autonomous), Pudukkottai – 622 422
M.Sc. – Information Technology (Course Structure under CBCS)
(For the Candidates admitted from academic year 2019 – 2020)

Semester		Paper Code	Course	Title	Instruct Hours/ Week	credit	Exam Hours	Marks		Total
								Internal	External	
I		P1R1ITCC1	CC - 1	Mobile Communications	5	5	3	25	75	100
		P1R1ITCC2	CC - 2	Open Source Technology	5	5	3	25	75	100
		P1R1ITCC3	CC - 3	OOAD AND UML	5	5	3	25	75	100
		P1R1ITCC4	CC - 4	Relational DataBase Management Systems	5	5	3	25	75	100
		P1R1ITEC1:1/ P1R1ITEC1:2/ P1R1ITEC1:3	EC - 1	Elective Course-1 (Taken from list of Electives)	5	3	3	25	75	100
		P1R1ITCC5P	CC - 5	Open Source Technology Practical	5	5	3	40	60	100
					30	**28**				**600**
II		P2R1ITCC6	CC - 6	Advanced Java Programming	5	5	3	25	75	100
		P2R1ITCC7	CC - 7	Client Server Computing	5	5	3	25	75	100
		P2R1ITCC8	CC - 8	Cloud Computing	5	5	3	25	75	100
		P2R1ITCC9	CC - 9	Data Mining and Warehousing	5	5	3	25	75	100
		P2R1ITEC2:1/ P2R1ITEC2:2/ P2R1ITEC2:3	EC - 2	Elective Course-2 (Taken from list of Electives)	5	3	3	25	75	100
		P2R1ITCC10P	CC - 10	Advanced Java Programming Practical	5	5	3	40	60	100
					30	**28**				**600**

III		P3R1ITCC11	CC - 11	Distributed Technology	5	5	3	25	75	100
		P3R1ITCC12	CC - 12	Internet of Things	5	5	3	25	75	100
		P3R1ITEC3:1/ P3R1ITEC3:2/ P3R1ITEC3:3	EC - 3	Elective Course-3 (Taken from list of Electives)	5	3	3	25	75	100
		P3R1ITEC4:1/ P3R1ITEC4:2/ P3R1ITEC4:3	EC - 4	Elective Course-4 (Taken from list of Electives)	5	3	3	25	75	100
		P3R1ITCC13P	CC - 13	Distributed Technology and PHP Practical	5	5	3	40	60	100
		P3R1ITCC14	CC – 14	Software Project Management	5	5	3	25	75	100
					30	**26**				**600**
IV		P4R1ITCC15PW	CC - 15	Project work		8				100
						13				**100**
TOTAL CREDITS/MARKS						**90**				**1900**

Elective Courses:

Any Four to be chosen as EC1, EC2, EC3, and EC4

Elective Course 1:

P1R1ITEC1:1 - Web Technology
P1R1ITEC1:2 - Human Computer Interaction
P1R1ITEC1:3 - Computer Graphics

Elective Course 2:

P2R1ITEC2:1 - Network Security
P2R1ITEC2:2 - Embedded System
P2R1ITEC2:3 - Artificial Intelligence and Expert System

Elective Course 3:

P3R1ITEC3:1 - Pervasive Computing
P3R1ITEC3:2 - Mobile Computing
P3R1ITEC3:3 - Software Testing

Elective Course 4:

P3R1ITEC4:1 - Grid Computing
P3R1ITEC4:2 - Digital Image Processing
P3R1ITEC4:3 - Big Data Analytics

Programme Specific Outcomes – M.Sc. Information Technology

- **Students will be able to identify, analyze and understand problems related to I.T and finding valid conclusions.**
- **Students will be able to have career as Software Engineer.**
- **Students will be able to have career as Web Developer.**
- **Students will be able to have career as Software Tester and I.T Analyst.**

CORE COURSE 1 –MOBILE COMMUNICATIONS – P1R1ITCC1

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- To impart knowledge in Mobile Communications
- To understand the need for CDMA and GSM
- To know about different types of MAC
- To understand the concept of wires LAN

UNIT I: Need for Mobile Computing (13 Hours)

Introduction: Applications– Simplified Reference Model – Wireless Transmission: Multiplexing – Spread Spectrum - Cellular Systems – Medium Access Control:SDMA-FDMA-TDMA-CDMA- Comparisons

UNIT II: Communication Systems (13 Hours)

Telecommunications Systems: GSM – System Architecture –Localization and calling – Handover - Security – UMTS System Architecture–UTRAN-Handover -Satellite Systems

UNIT III: Wireless LAN (12 Hours)

Advantages and Disadvantages-InfraRed vs Radio Transmission-Infrastructure and ad-hoc networks-IEEE 802.11:System Architecture –Protocol Architecture – Bluetooth:User Scenarios-Architecture

UNIT IV: Mobile Network Layer (12 Hours)

Mobile IP: Goals –Entities and terminology-IP Packet Delivery –Mobile Ad-hoc Networks – Routing:Differences between wired and ad-hoc networks-DSDV-DSR

UNIT V: Support for mobility (11 Hours)

World Wide Web:HTTP-HTML-Wireless Application Protocol: Architecture – WDP – WML-WML Script – WirelessTelephonyApplication.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book

1. Jochen Schiller, "Mobile Communications", Pearson Education, Delhi,2000.
   Unit I: [Chapters 1,2,3] Unit II: [Chapters 4,5] Unit III: [Chapter 7] Unit IV:[(Chapter 8] Unit V : [Chapter 10]

Reference Book

1. The Wireless Application Protocol: Writing Application for the Mobile Internet", Sandeep Singhal,et al. 2018

Course Outcome:

- The Students would have understood the Mobile Communications.
- They should have created knowledge in WAP.
- They should have improved the details of WLAN.

- **Note: ICT classes include and Self study**

CORE COURSE 2 – OPEN SOURCE TECHNOLOGY - P1R1ITCC2

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- Explain the importance of Operating Systems.
- Explain the concept of UNIX Utilities.
- Give the detailed Programming concept in Shell.
- Explain the role of Vi Editor.
- Analyze the features and operations of various Shell Programming Essentials commands and Filters.

UNIT I: UNIX ARCHITECTURE (13 Hours)

UNIX Architecture- Features of UNIX- Locating Commands- Internal and External Commands- Command Structure. General Purpose Utilities: Cal, date, echo, printf, bc, script- Mail Basics – Mailx, passwd, who, uname, tty, and stty.

UNIT II: The File System (13 Hours)

The File – What's in a File Name? – The Parent – Child Relationship – HOME variable – pwd, cd, mkdir, rmdir – Absolute Pathnames – Relatives Pathnames – ls Listing Directory – UNIX File System – The Vi editor.

UNIT III: Handling Ordinary File System (12 Hours)

Handling Ordinary Files: cat, cp, rm, mv, more, wc, od, cmp, comm., diff. Compressing and Archiving Files – gzip and gunzip – tar: the archival program – zip and unzip. Basic File Attributes: ls –l, -d option, File Permissions – chmod – Directory Permissions.

UNIT IV: The Shell (12 Hours)

The Shell's Interpretive Cycle – Shell Offering – Pattern Matching – Escaping and Quoting – Redirecting – Pipes – tee – Shell variable – Process basics – ps – system process – nice – Killing Processes with Signals – at and batch – cron – time.

UNIT V: Simple Filters (11 Hours)

Simple filters - pr – head – tail – cut – paste – sort – uniq – tr. Filters using regular expression – grep and sed. Essential shell programming: read, using command line argument – exit – if – test – case – expr – logical operators – while – for – trap.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text book:

1. UNIX Concepts and Applications Sumitabha Das, 4th edition, Mc Graw Hill Education,2012[Unit-1 :(Chapters 2,3); Unit-2 : (Chapters 4,7); Unit-3 (Chapters 5,6); Unit-4 (Chapters 8,9);Unit-5 (Chapters12,13,14]

Reference Book:

1. Basic of OS, UNIX and Shell Programming – ISRD Group, TATA McGraw Hill, 2018.

Course Outcome:

- The Students would have created knowledge in UNIX shell Programming
- They should have improved the Knowledge in Shell Utilities
- They should have created the filter knowledge

CORE COURSE 3 - OOAD AND UML – P1R1ITCC3

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- Develop a working understanding of formal object-oriented analysis and design processes.
- Develop an appreciation for and understanding of the risks inherent to large-scale software development.
- Learn (through experience!) techniques, processes, and artifacts that can mitigate these risks.
- Develop the skills to determine which processes and OOAD techniques should be applied to a given project.
- Develop an understanding of the application of OOAD practices from a software project management perspective

UNIT I: Overview **(13 Hours)**

Structured approach to system construction: SSADM/SADT - An overview of object oriented systems development & Life cycle

UNIT II: Introduction to UML **(13 Hours)**

Various object oriented methodologies – Introduction to UML

UNIT III: Use cases **(12 Hours)**

Object oriented analysis – Use cases- Object classification, relationships, attributes, methods

UNIT IV: Object oriented Design **(12 Hours)**

Object oriented design – Design axioms – Designing classes – Layering the Software design: - data access layer, User interface layer, Control/business logic layer

UNIT V : Models **(11 Hours)**

UML - Examples on: Behavioral models – Structural models – Architectural models from real world problems.

UNIT VI: Latest Learning (For CIA only) **(4 Hours)**

Latest development related to the course during the semester concerned.

TEXT BOOKS:

1. Bahrami Ali, Object oriented systems development, Irwin McGrawHill, 2005 (First 4 units covered here).

2. Booch Grady, Rumbaugh James, Jacobson Ivar, The Unified modeling language – User Guide, Pearson education, 2006 (ISBN 81-7758-372-7) (UNIT -5 covered here).

REFERENCES:

1.Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.2017

2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.2018

Course Outcome:

- The Students would have improved the knowledge in UML concepts
- They would have acquired the Class and Objects concepts
- They should have developed knowledge in Use Cases

CORE COURSE 4 - RELATIONAL DATABASE MANAGEMENT SYSTEMS – P1R1ITCC4

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- Explain the main advantages of modern database management systems over file systems.
- Design, create, and query relational databases to satisfy user requirements.
- Design, build and deploy database-backed applications with dynamic website front-end.
- Implement data access control mechanisms for database and application security.
- Analyze the ethical issues and responsibilities related to records management and its impact on privacy, discrimination, etc. and its local and global impact on society.

UNIT I: Introduction to database systems and Architecture (13 Hours)

Introduction to database systems: Basic concepts and definitions-Data dictionary-database- Database system- Data administrator- Database administrator-File oriented system versus Database systems- Database system architecture.

UNIT II: Relational Query Language and ER model (13 Hours)

Relational Query Language: SQL –QBE. ER model: Introduction – Basic concepts – Conversion of ER model into relations –Problem with ER model – ER diagram symbols.

UNIT III: Database Design and Normalization (12 Hours)

Introduction to database design: introduction-software development life cycle-Database development life cycle-Normalization: introduction-normalization-normal forms-BCNF-4NF-5NF.

UNIT IV: Transaction Processing (12 Hours)

Transaction Processing: introduction, Transaction concepts, Concurrency control, Locking and Timestamp methods for concurrency control, Database Recovery System-Database Security.

UNIT V: Object oriented Databases (11 Hours)

Object oriented databases: Introduction, Object oriented data model, object oriented database, object oriented DBMS, Object data management group-object relational databases - Distributed database systems.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book:

1. Database Systems– S.K.Singn,Published by Dorlong Kindersley(India) Pvt Ltd Unit I-Chapter 1,2 Unit II-Chapters 5,6 Unit III - Chapter 8,10 Unit IV-Chapter 12,13,14 Unit V- Chapter 15,16,18.

REFERENCE BOOK:

1. Fundamentals of Database System, 7th Edition, – Elmasri, Navathe, Pearson Publication, 2018

Course Outcome:

- The Students would have developed the knowledge in SQL
- They should have improved talent in Normalization form
- They would have developed the knowledge in OODB

CORE COURSE 5 – OPEN SOURCE TECHNOLOGY PRACTICAL – P1R1ITCC5P

1. Write and execute Shell Programme to perform Arithmetic Calculations.
2. Write and execute Shell Programme to find out biggest number of given three numbers.
3. Write and execute Shell Programme to prepare the Student Mark list.
4. Write and execute Menu driven Shell Programme to perform the following process 1. Who 2. Cal 3. ls 4. Date 5. time.
5. Write and execute Menu driven Shell Programme to perform the following process 1.cat 2. Cp 3. rm 4. wc 5. mv.
6. Write and execute Shell Programme to prepare the Employees Payroll.
7. Write and execute Shell Programme to perform Ascending and Descending order.
8. Write and execute Shell Programme to find out even or odd number.
9. Write and execute Shell Programme to find out prime number or not.
10. Write and execute Shell Programme to find out factorial value of given number.
11. Write and execute Shell Programme to check a given string is palindrome or not.

CORE COURSE 6 – ADVANCED JAVA PROGRAMMING – P2R1ITCC6

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- To develop programming skill and to solve scientific problems using java Programming.
- To enable the students to understand the core and advanced principles of the Java Language and use visual tools to produce well designed, effective applications and applets.
- Develop distributed applications using RMI .
- Develop server side programs in the form of servlets

UNIT I: JAVA FUNDAMENTALS (13 Hours)

JAVA language- Introduction-Character set-Tokens-Constants-Variables-Operators and Expressions-Library Methods-Strings-Control Statement: If Statement-Switch Statement-While Statement-Do While Statement-For Statement.

Unit II: JDBC Classes (13 Hours)

Introduction – Establishing a connection – Creation of Data Tables – Entering data into the tables – Table updating –Use of Prepared statement – Obtaining metadata – Using Transactions – Scrollable Result sets.

Unit III: Remote Method Invocation (12 Hours)

Introduction – Remote Interface – java.rmi.Server Package – The Naming class – RMISecurityManager class – RMI Exceptions – Steps involved in creating RMI Client and Server Classes.

Unit IV: JAVA Servlet (12 Hours)

Introduction – Life cycle of a servlet – A simple servlet – Retrieving the values of parameters – Retrieving the values of initialization parameters – Cookies – Creating a cookie and sending it to the client – Retrieving the stored cookies – Session Tracking.

Unit V: Swing Controls (11 Hours)

Introduction – JApplet – JLabel – JButton – JTextField – JTextArea- JCheckBox – JRadioButton – JComboBox – JList - JMenu.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Books

1. Programming with Java –C.Muthu. Unit I(Chapter 1,2,3)Unit II(Chapter 18)- Unit III(Chapter 20) –Unit IV(Chapter 19) unit V(Chapter11), Vijay Nicole publications, Second Edition, 2011

References

1. Mastering JAVA11 – Dr. Edward Lavieri, Packt Publication, 2018.
2. Peter Haggar, "Practical Java: Programming Language Guide", AddisonWesley Pub Co, 1st Edition, 2015

Course Outcome:

- The Students would have understood the OOPs Concepts
- They should have improved the knowledge in JDBC
- They should have created the knowledge in Servlet

CORE COURSE 7 – CLIENT SERVER COMPUTING – P1R1ITCC7

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- To provide the foundation knowledge of middleware, particularly object-oriented Middleware
- understand the motivation of using middleware;
- understand the basic theories underlying the design of middleware;

UNIT I: Client / Server Concepts (13 Hours)

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General Middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

UNIT II: Ejb Architecture (13 Hours)

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III: Ejb Applications (12 Hours)

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

UNIT IV: CORBA (12 Hours)

CORBA – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

UNIT V: COM (11 Hours)

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – Interface Pointers – Object Creation, Invocation , Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling – Remoting.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002. (Unit 1)

2. Tom Valesky,"Enterprise Java Beans",Pearson Education, 2002.(Unit 2 & 3)

3. Jason Pritchard,"COM and CORBA side by side", Addison Wesley,2000 (Unit 4 & 5)

4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002. (Unit 5)

REFERNCES

1. Mowbray,"Inside CORBA", Pearson Education, 2017.

2. Jeremy Rosenberger," Teach yourself CORBA in 14 days", Tec media, 2018

Course Outcome:

- The Students would have understood the CORBO concepts
- They should have created knowledge in COM
- They would have improved the knowledge in EJB

CORE COURSE 8 - CLOUD COMPUTING – P2R1ITCC8

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**
Objectives:

- **To impart fundamental concepts in the area of cloud computing.**
- **To impart knowledge in applications of cloud computing.**
- **Understanding the systems, protocols and mechanisms to support cloud computing.**
- **Understanding the hardware necessary for cloud computing.**

UNIT I: Cloud Computing Basics and Benefits (13 Hours)

Overview: Applications- Intranet and the cloud – First Movers in the cloud – Organization and Cloud Computing: Benefits – Limitations – Security concerns –Regulatory issues.

UNIT II: Cloud Computing With the Titans (13 Hours)

Google - EMC – NetApp – Microsoft – Amazon – Salesf1orce.com - IBM.

UNIT III: Business Case for the Cloud (12 Hours)

Cloud Computing Services - How those applications help our Business – Deleting the Data Centre – Salesforce.com – Thomson Reuters – Hardware and Infrastructure: Clients – Security – Network – Services.

UNIT IV: Accessing the Cloud (11 Hours)

Platforms – Web applications – Web API – Web Browsers - Cloud storage – Storage Providers.

UNIT V: Best Practices (12 Hours)

Standards: Application – Client – Infrastructure – Service- Best practices and the cloud computing: Analyze the service- Best practices – How cloud computing might evolve.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK

Cloud Computing - A Practical Approach by Anthony T. Velte, Toby J.Velte , Robert Elsenpeter, Tata McGraw-Hill Edition-2010. Unit-1: chapters 1, 2 Unit-2: chapter 3 Unit-3: chapters 4, 5 Unit-4: chapters 6, 7 Unit-5: chapters 8, 14.

REFERENCE BOOK

Cloud Computing by Kris Jamsa, Jones & Bartlett student edition,2018.

Course Outcome:

- The Students would have understood the Web API
- They should have improved the knowledge in Standard infrasture
- They should have developed talent in Cloud

CORE COURSE 9 –DATA MINING AND WAREHOUSING – P2R1ITCC9

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

Objectives:

- To learn about fundamentals of Data Mining.
- To impart knowledge in various Data Association techniques.
- To understand how to consolidate huge volume of data in one place efficiently.
- Understanding the concept of Data warehousing.

UNIT I: Overview & Association Rule Mining (13 Hours)

Introduction -Data Mining process – Applications – Techniques – Practical Examples – Future – Guidelines – Limitations – Data mining software – Association Rule mining: Basics – The Task and a Naïve algorithm- Improving the efficiency of the Apriori algorithm – Apiriori-TID – Direct Hashing and Pruning – Dynamic Item set Counting –FP Growth – Performance evaluation of algorithms.

UNIT II: Classification & Cluster analysis (13 Hours)

Introduction – Decision Tree – Building a decision tree – Split Algorithm (Information Theory) – Split Algorithm(Gini index) – Overfitting and Pruning – Decision tree rules – summary – Naïve Bayes method – Estimating predictive accuracy of classification methods – Improving accuracy – other evaluation criteria – Classification software – Cluster Analysis: Introduction – Desired features – Types of cluster analysis methods – Partitional methods – - Hierarchical methods – Density based methods – Dealing with large Databases – Quality and validity of Cluster analysis methods – Cluster analysis software.

UNIT III: Web Data Mining (12 Hours)

Introduction – Web mining – Web Terminology and characteristics – Locality and Hierarchy in the web – Web content mining – Web usage mining – Web structure mining – Web mining software – Search Engines: Introduction – Difference between Web search and information retrieval – Characteristics of search engines – Functionality – Architecture – Ranking of web pages – Search query mining – Individual privacy and Query data mining.

UNIT IV: Data Warehousing (12 Hours)

Introduction – Operational Data stores – Data warehouses – Data warehouse Design – Guidelines for Data warehouse implementation – Data warehouse metadata – Software for ODS and Data warehousing.

UNIT V: Information Privacy (11 Hours)

Online analytical processing (OLAP): – Introduction – OLAP – Characteristics – Motivations – Multidimensional view and Data cube – Implementations – Operations – Guidelines – OLAP software – Information Privacy: Basics principles – Privacy legislation – Uses and misuses of Data mining – Primary aims – Pitfalls of Datamining.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book:

1. G. K. Gupta, Introduction to Data mining with case studies, Pretince Hall India, 2006.

Unit 1- Chapters 1,2; Unit 2 – Chapters 3,4; Unit 3 – Chapters 5,6; Unit 4 – Chapters 7, Unit 5 – Chapters 8, 9.

Reference Book:

1. K.P. Soman & Shyam and V.Ajay, Insight to Data Mining Theory and Practice, Pretice Hall of India, 2018.

Course Outcome:

- The Students would have understood the Data Mining Concepts
- They should have improved the knowledge in Cluster Analysis
- They would have developed depth knowledge in OLAP

CORE COURSE 10- ADVANCED JAVA PROGRAMMING PRACTICAL
P2R1ITCC10P

1. Write Java program to sort the given Array.

2. Write a Java program to find the area of rectangle using Constructor.

3. Create a JApplet using swing control, which will create the Biodata.

4. Write a JDBC program to create a table, insert, delete and update records.

5. Write a program in Java to retrieve the records from the database using JDBC.

6. Write a program in Java to implement a client/server application using RMI.

7. Write a Servlet program to count the number of visitors to a web page.

8. Write a Servlet program to create mark statement.

9. Write a Swing program to place the images.

10. Write a Swing program to find out the biggest number of given three numbers.

CORE COURSE 11 -DISTRIBUTED TECHNOLOGY – P3R1ITCC11

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

Objectives:

- To impart knowledge in understanding .NET Framework.
- Understanding the nature of Distributed applications.
- Learning advanced ASP.NET controls.
- Learning database connectivity.
- Developing a simple distributed application.

UNIT I: Understanding .NET Framework (13 Hours)

Client Server Architecture – 2 Tier Architecture – 3 Tier Model and N Tier Model – Dot Net Architecture

UNIT II: Getting Started with ASP .NET (13 Hours)

ASP .Net: Introduction – Architecture – ASP .Net Runtime – Internet Information Services – Visual Web Developer – web server – ASP .Net Parser – Assemblies- Page Class.

UNIT – III: Building Form with Web Controls (12 Hours)

Web server Controls – HTML Controls – AD Rotator and Calendar Controls – Validation Controls – Security Management.

UNIT- IV: ASP .Net and ADO .Net (12 Hours)

ASP .Net and ADO .Net – System. Data – SQL Client and XML Namespaces – Provider Objects and Consumer Objects.

UNIT V: Provider Objects and Consumer Objects (11 Hours)

Provider Objects and Consumer Objects – disconnected Data Access – Grid View – Form View

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXTBOOK:

1. "ASP .Net Bible" Hungry Minds by Mridula Parishal and et al.[**unit: I** – Chapter 1 – **Unit II:** Chapter 2 – **Unit III:** Chapter 3,4,5,6 –**Unit IV :** chapter 8,9,13 – **unit V:** chapter 12]

REFERENCE BOOK:

The Complete Reference ASP.NET, Mathew McDonold,McGraw Hill Education, 2018.

Course Outcome:

- The Students would have understood the ASP.NET Frameworks
- They should have developed the ASP.NET project
- They would have improved the ADO.NET concepts

CORE COURSE 12- INTERNET OF THINGS – P3R1ITCC12

Hours/Week: 6 **Max. Marks:100**

Total Hours: 75 **Credit:5**

Objective:

- **To make students understand the significance of IoT.**
- **To teach the students to learn IoT Domain.**
- **To bring up the students to learn about the exclusive characteristics of IoT.**

UNIT I : Introduction to IoT (13 Hours)

Definition – Characteristics of IoT – Physical Design of IoT – Logical design of IoT – IoT Enabling Technology – IoT levels.

UNIT II : Domain specific IoT (13 Hours)

Home automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health – Life Style.

UNIT III: IoT and M2M (15 Hours)

Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT - Software defined Networks – Networks function virtualization – SNMP – Network operator Requirements.

UNIT IV : Developing IoT (15 Hours)

IoT Design Methodology – Motivation for using Python – IoT Systems – Logical design using Python – Python Date types and Data Structures – Control Flow.

UNIT V: IoT Concepts (15 Hours)

Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of interest for IoT.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK

Internet of Things – A Hands on approach – Arshdeep Bahga, Vijay Madigeth. Universityies Press, 2014.Unit-1: chapters 1, Unit-2: chapters 2 Unit-3:chapters 3,4,Unit-4:chapters5,Unit-5:chapters 5

REFERENCE BOOK:

Designing the Internet of things, Adiran McEwen & Hakim Cassimally, 2018.

Course Outcome:

- The Students would have understood the IoT.
- They should have developed the knowledge in IoT.
- They would have improved the knowledge in Python.

CORE COURSE 13-DISTRIBUTED TECHNOLOGY PRACTICAL

P3R1ITCC13P

1. Design ASP .Net web from using Html server Controls to enter job Seeker's details

2. Apply appropriate validation techniques in E-Mail registration form using Validation controls.

3. Create a web application using ADO .Net that uses which performs basic data manipulations: (i) Insertion (ii)Updating (iii) deletion (iv) Selection Hint: Do Operations using Ms-Access.

4. Create an application using Data grid control to access information's from table in MS-Access

5. Create an application using Data List control to access information's from table in SQL Server and display the result in neat format. Case studies (Must include basic database operations such as Insertion, deletion, Modification, Selection and Searching.

6. Develop a .NET Program AD Rotator.

7. Develop a .NET Program to create a Calculator.

8. Create and developing a College Website.

9. Create and developing a Company website.

10. Create and develop a Job Search Portal.

CORE COURSE 14 – SOFTWARE PROJECT MANAGEMENT – P4R1ITCC14

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVE:

- To understand the basics of software project management.
- To understand the software management, project management, process frame work.
- To get the knowledge about management disciplines.
- To gain the knowledge about project control.
- To get the knowledge about risk management.

UNIT I: Introduction to Software Project Management (13 Hours)

Introduction – Why is Software Project Management importance – What is a Project? – Activities covered by SPM – Planes, Methods and Methodologies – Some ways of catgorzing Software Project - Stakeholders – Projects success and failure – What is Management – Management Control.

UNIT II: Project Evaluation and Programming Management: (13 Hours)

A Business Case - Project portfolio Management – Evaluation of Individual Project – Cost-Benefits Evaluation Techniques – Risk Evaluation – Programme Management – An overview of Project Planning – Introduction to stepwise Project Planning.

UNIT III: Software Processes and Process Models (12 Hours)

Choice of Process model – Structure versus speed of delivery – the water fall model- The spiral model - Software Prototyping – other ways of categorizing prototype – Incremental delivery - DSDM – Rapid applications development.

UNIT IV: Software Effort Estimation (12 Hours)

The bases foe software estimating - Software Effort Estimation Techniques – Bottom up estimating – top doFunction point analysis – function points mark II – COSMIC full function points – COCOMO II : A Parametric productivity model – Cost estimation.

UNIT V: Risk Management (11 Hours)

Risk Management: Introduction – Risk – Categories of Risk – A Framework for Dealing with Risk – Risk Identification – Risk Assessment – Risk Planning – Risk Management – Evaluating Risk to Schedule – Applying the PERT Technique – Monte Carlo Simulation – Critical Chain Concepts.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOKS: Software Project Management, bob Hughes & Mike Cotterell, ISBN: 9780070619852) 2006 edition **(Unit I:Chapter 1,Unit II: Chapter 2,3 Unit III: Chapter 4, Unit IV: Chapter 5. Unit V:Chapter 7)**

REFERENCE BOOK:

1. Software Engineering, Roger S.Pressman ,TMH Publications 2006
2. Handbook of Software Engineering, Cha, Sungdeok, Taylor, Richard N.Kang, Kyo. C, Springer Publications, 2019.

Course Outcome:

- The Students would have understood the Software Project Model.
- They should have improved the knowledge in Software Testing.
- They would have developed the depth knowledge in Risk analysis.

ELECTIVE COUSE 1:1 – WEB TECHNOLOGY

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

Objectives:

- Understanding the functions of various protocols.
- Learn How to create dynamic web pages.
- Learning about E-commerce concepts.
- Learning basics of .NET technology.

UNIT-I: OSI Model **(13 Hours)**

OSI Model – Internetworking concepts – IP, ARP, RARP, ICMP, TCP, UDP protocols and their internal details.

UNIT-II: Protocols **(13 Hours)**

DNS, SMTP/Email, FTP, TFTP, WWW, HTTP, TELNET protocols and their details – Introduction to electronic commerce.

UNIT-III: Introduction to Web technology **(12 Hours)**

Introduction to Web technology – Dynamic web pages – Active web pages.

UNIT-IV: User sessions in E-commerce **(11 Hours)**

User sessions in E-commerce – Electronic commerce Transaction Management – Electronic commerce Security issues – Online payment processing mechanisms.

UNIT-V: Technology for E-commerce **(12 Hours)**

Middleware and Component technology for E-commerce – Electronic data interchange – Case study: Online shopping with ASP – Overview of .NET technology.

UNIT VI: Latest Learning (For CIA only) **(4 Hours)**

Latest development related to the course during the semester concerned.

TEXT BOOK:

1. Godbole Achyut S. , Kahate, Atul, Web technologies, Tata McGrawHill, 2003(ISBN 0-07-047298-x) [Unit-1 :(Chapters 1,2,3,4); Unit-2 : (Chapters 5,6,7); Unit-3 (Chapters 8,9,10); Unit-4 (Chapters 11,12,13,14) ; Unit-5 (Chapters 15,16,Appendix- A,B)

REFERENCE BOOK:

1.”Frontiers of e-commerce” by Ravi kalakota and Andrew B.Whinston-Pearson Edu, 2018

Course Outcome

- The Students would have understood the Web Technology
- They should have created knowledge in Protocols and E-Commerce
- They should have improved the details of ASP.NET

ELECTIVE COURSE 1:2 – HUMAN COMPUTER INTERACTION

Hours/Week: 5 **Max. Marks: 100**
Total Hours: 65 **Credit: 5**

OBJECTIVE:

- To understand the basics of human-computer interaction.
- To understand the interaction design basics.
- To get the knowledge about HCI in the software process.
- To gain the knowledge about cognitive models.
- To gain the knowledge about task analysis.

UNIT I : (13 Hours)

The Interaction: Introduction: Models of interaction-Frameworks and HCI-Ergonomics-Interaction styles-Elements of the WIMP interface-interactivity-The context of the interaction-Experience, engagement and fun**.**

UNIT II : (13 Hours)

Interaction design basics: Introduction-what is design? – The process of design-User focus-Scenarios-Navigation design-Screen design and layout-Iteration and prototyping.

UNIT III : (12 Hours)

HCI in the software process: Introduction-The software life cycle-Usability engineering-Iterative design and prototyping-Design rationale.

Design rules: Introduction-Principles to support usability-Standards-Guidelines-Golden rules and heuristics-HCI patterns.

UNIT IV : (11 Hours)

Cognitive Models: Introduction-Goal and task hierarchies-Linguistic models-The challenge of display-based systems-Physical and device models-Cognitive architectures.

Communication and collaboration models: Introduction-Face-to-face communication-Conversation-Text-based communication-Group working.

UNIT V : (12 Hours)

Task analysis: Introduction-Differences between task analysis and other techniques-Task decomposition-knowledge-based analysis-Entity-relationship-based techniques-Sources of information and data collection-Uses of task analysis. **Dialog notations and design:** What is dialog?-Dialog design notations-Diagrammatic notations-Textual dialog notations-Dialog semantics-Dialog analysis and design.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

1.Alan Dix, Janet Finlay, Gregory D.Abowd, Russell Beale, "Human-Computer interaction" 3rd edition, Pearson Education.

Unit-1 : Chapter-1 Unit-2 : Chapter-5 Unit-3 : Chapter-6,7 Unit-4 : Chapter-12,14 Unit-5 : Chapter-15,16

REFERENCE BOOK:

1. " Human Computer Interaction fundamental", Andrew sears Julie A.Jacko,2019.

Course Outcome:

- The Students would have understood the HCI
- They should have created knowledge in WIMP
- They should have improved the details of task analysis

ELECTIVE COURSE 1:3 – COMPUTER GRAPHICS

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

OBJECTIVE:

- To understand the basics of computer graphics.
- To understand the attributes of output primitives.
- To get the knowledge about GUI & interactive input methods.
- To understand the geometric and modeling transformation.
- To understand the concept of color models.

UNIT I : **(13 Hours)**

Overview of Computer System: Display devices –Hard copy devices-Interactive input devices-Display Processor-Graphics Software-Output primitives-Line drawing algorithms-Initializing lines –Line commends-Fill areas-Circle generation algorithms-Area functions-Cell array.

UNIT II : **(13 Hours)**

Attributes of output primitives: Line style-Color and intensity-Area filling algorithm-Character attributes-Inquiry function-Bundled attributes-Two dimensional transformations-Basic and composite transformations-Translation-Rotation –Scalling- Matrix representations.

UNIT III : **(12 Hours)**

GUI &Interactive input methods: Interactive input methods-Physical input methods-Logical classification of input devices-Interactive picture construction techniques-Input functions-Initial values of inputs-Device parameter-Interactive picture-Construction techniques-Virtual reality environments.

UNIT IV : **(12 Hours)**

Geometric and modeling transformations: Translation-Rotation-Scaling-Other transformations functions-3D transformation function-Modeling and coordinates transformation-Projections-Clipping-Hardware implementations-3D viewing functions.

UNIT V : **(11 Hours)**

Color models: Properties os lights-xyzcolr model-CIE chromaticity diagram-Intuitive color concepts-RGB color model- YIQ color model- CMY color model –HSV color model – Conversion between HSV& RGB models- HLS color model –Color Selection Applications.

UNIT VI: Latest Learning (For CIA only) **(4 Hours)**

Latest development related to the course during the semester concerned.

TEXT BOOK:

1.”Computer Graphics” –Donald Hearn and M.Pualine Baker – PHI – 1997-3rd Edition.

Unit I - (Chapter 2&3) Unit II - (Chapter 4&5),Unit III - (Chapter 8),Unit IV - (Chapter 11), Unit V (Chapter 15)

REFERENCE BOOK:

1. “Computer Graphics” – Rick Gulley – McGraw Hill International Edition,2018.

Course Outcome:

- The Students would have understood the Computer Graphics
- They should have created knowledge in 2D and 3D images
- They should have improved the details of Color model

ELECTIVE COURSE 2:1 – NETWORK SECURITY

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVES:

- To understand the basics of Network Security
- To understand the concepts of Encryption and Decryption
- To get the knowledge about RSA Algorithm
- To gain the knowledge about Virus and Intruders

UNIT-I Symmetric Ciphers (13 Hours)

Services, Mechanisms, and Attacks – OSI Architectures – A model for Network Security – Symmetric Cipher Model – Substitution Techniques – Transposition Techniques- Strganography.

UNIT-II Block Ciphers and DES (13 Hours)

Simplified DES – Block Cipher Principle – DES – The strength of DES – Differential and Linear Cryptanalysis – Block Cipher Principles – Block Cipher Modes of Operation – Public key Cryptography and RSA algorithm.

UNIT-III Email Security (12 Hours)

Authentication Applications : Kerberos – X.509 Authentication Services – Electronic Mail Security: PGP – S/MIME.

UNIT-IV IP Security (12 Hours)

IP Security Overview – IP Security Architecture – Authentication Header – Web Security: Web Security Consideration – Secure Sockets layers and Transport Layer security – Secure Electronic Transaction.

UNIT-V Intruders and Malicious Software (11 Hours)

Intruders – Intrusion Detection – Password Management – Malicious Software: Viruses and Related Threats – Virus Countermeasures – Firewalls.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

"Cryptography and Network Security" - William Stalling, 3rd Edition, McGraw Hill.

Unit I Chapter 1,2 Unit II Chapter 3, 9 Unit III Chapter 14,15 Unit IV Chapter 16,17 Unit V Chapter 18,19,20

REFERENCE BOOK:

"Computer Networking" - Michael B White, Tata Mcgraw Hill publications, 2018.

Course Outcome:

- The Students would have understood the Network Security.
- They should have created knowledge in RSA Algorithm
- They should have improved the details of Virus

ELECTIVE COURSE 2:2 – EMBEDDED SYSTEMS

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

OBJECTIVES:

- To understand the basics of embedded system.
- To understand the concepts of device and busses for device networks.
- To get the knowledge about real time OS.
- To gain the knowledge about RTOS.
- To get the knowledge about hardware and software co-design.

Unit-I Introduction to Embedded System (13 Hours)

An embedded system – processer in the system – other hardware units – software embedded into a system. processor and memory organization : Structural units in a processor – processor selection for an embedded system – memory devices – memory selection for an embedded system – direct memory access – processor, memories and I/O devices

Unit-II Devices and Busses for Device networks (13 Hours)

I/O devices – timer and counting devices – device drivers – parallel port device drivers in system – serial port device drivers in system – device drivers for internal programmable timing devices – interrupt service mechanism

Unit-III Real time operating system (12 Hours)

Operating system services – I/O subsystems – network operating system – real time and embedded operating systems – interrupt routines in RTOS environment – RTOS task scheduling models – interrupt latency and response times of the tasks or performance metrics – performance metrics in scheduling models – OS security issues – Mobile OS

Unit-IV RTOS programming tools : micro C/OS-II and Vx works (12 Hours)

Need of a well tested and debugged real operating system – use of µC/OS-II – use of Vx works – case studies of programming with real time operating system

Unit-V Hardware – Software co-design in an embedded system (11 Hours)

Embedded system project management – embedded system design and co-design issues in system development process – design cycle in the development phases for an embedded system – use of software tools for development of an embedded system – issues in embedded system design .

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

"Embedded Systems – Architecture, Programming and Design " by Raj Kamal TMH

Unit I Chapter 1,2 Unit II Chapter 3,4 Unit III Chapter 9 Unit IV Chapter 10,11 Unit V Chapter 12

REFERENCE BOOK:

1. "Embedded Systems Design" by Peter Marwedel, Springer International Edition
2. Embedded Systems Design" by Frank Vahid / Tony Girargis, Wiley Student Edition
3. Foundations of Embedded Systems – Alexander BArkalov, Larysa Titarenko, Malgorzata, Mazurkiewicz – Springer Publications, 2019.

Course Outcome:

- The Students would have understood the Embedded System.
- They should have created knowledge in RTOS.
- They should have improved the details of Hardware and Software Design.

ELECTIVE COURSE 2:3

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVE:

- To understand the basics of artificial intelligence and expert system.
- To understand the searching techniques.
- To understand the two knowledge about knowledge representation.
- To understand the concept of learning.
- To get the knowledge about applications.

Unit I : Introduction **(13 Hours)**

Intelligent Agents – Agents and Environments – Good behavior – The nature of environments – Structure of agents – Problem solving – Problem solving agents – Example problems – Searching for solutions – Uniformed search strategies – Avoiding repeated status – Searching with partial information.

Unit II : Searching Techniques **(13 Hours)**

Informed search and exploration – Informed search strategies – Heuristic function – Local search algorithms and optimistic problems – Local search in continuous spaces – Online search agents and unknown environments – Constrain satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems – Adversarial search – Games – Optimal decisions in games – Alpha-Beta pruning – Imperfect real time decision – Games that include an element of chance.

Unit III : Knowledge Representation **(12 Hours)**

First order logic – Representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic – Inference in first order logic – Prepositional versus first order logic – Unification and Lifting – Forward chaining – Backward chaining – Resolution – Knowledge representation – Ontological Engineering – Categories and Objects – Actions – Simulation and events – Mental events and mental objects.

Unit IV : Learning **(12 Hours)**

Learning from observations – forms of learning – Inductive learning – Learning decision trees – Ensemble learning – Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming – Statistical learning methods – Learning with complete data – Learning with hidden variable – EM algorithm – Instance based learning – Neural networks – Reinforcement learning – Passive reinforcement learning - Active reinforcement learning – Generalization in reinforcement learning

Unit V: Applications (11 Hours)

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction – Probabilistic language processing – Probabilistic language models – Information retrieval – Information extraction – Machine translation.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

1. Stuart Russell, Peter Norvig, "Artificial Intelligence- A modern Approach", 2nd edition, Pearson education / Prentice Hall of India, 2004.
   Unit-I chapter 2(2.1,2.2,2.3,2.4) 3(3.1,3.2,3.3,3.4,3.5,3.6)
   Unit-II chapter 4(4.1,4.2,4.3,4.4,4.5,4.6) 5(5.1,5.2,5.4) 6(6.1,6.2,6.3,6.4,6.5)
   Unit-III chapter 8(8.1,8.2,8.3,8.4) 9(9.1,9.2,9.3,9.4,9.5) 10(10.1,10.2,10.3,10.4)
   Unit-IV chapter 18(18.1,18.2,18.3,18.4) 19(19.1,19.2,19.3,19.4,19.5)
   20(20.1,20.2,20.3,20.4) 21(21.1,21.2,21.3,21.4)
   Unit-V chapter 22(22.1,22.2,22.3,22.4,22.5,22.6,22.7,22.8) 23(23.1,22.2,23.3,23.4)

REFERENCE BOOK :

1. Nils J.Nilsson, Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt.Ltd., 2000
2. Elaince Rich and Kevin Knight, "Artificial Intelligence",3rd edition, Tata McGraw-Hill, 2018.

Course Outcome:

- The Students would have understood the AI.
- They should have created knowledge in Expert System.
- They should have improved the details of Decision Making.

ELECTIVE COURSE 3:1 – PERVASIVE COMPUTING

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVE:

- To understand the basics of pervasive computing.
- To understand the device technology.
- To understand the concept of device connectivity.
- To gain the knowledge about WAP and Beyond.
- To get the knowledge about personal digital assistant.

Unit I: Pervasive Computing (13 Hours)

Pervasive Computing : Past, Present and Future – Pervasive Computing Market – M-Business – Application examples: Retail, Airline check-in and booking – Health care – Car information system – E-mail access via WAP and voice.

Unit II : Device Technology (13 Hours)

Device technology : Hardware – Human machine interfaces – Biometrics – Operating Systems – Java for Pervasive devices.

Unit III : Device Connectivity (12 Hours)

Device Connectivity : Protocols – Security – Device management – Web application concepts: WWW architecture – Protocols – Transcoding – Client authentication via internet.

Unit IV : WAP and Beyond (12 Hours)

WAP and Beyond : Components of WAP architecture – WAP infrastructure – WAP security issues – WML – WAP push – Products – i-mode –Voice technology : Basics of speech recognition – Voice standards – Speech applications – Speech and Pervasive Computing.

Unit V: Personal Digital Assistant (11 Hours)

PDA : Device categories – PDA operation systems – Device Characteristics – Software components – Standards – Mobile Applications – PDA Browsers – Pervasive web application architecture : Background – Development of pervasive computing web applications – Pervasive application architecture.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK :

1. Pervasive Computing, Technology and Architecture of Mobile Internet Applications, Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaech & Klaus Rindtorff, Pearson Education,2006.

Unit I - Chapter 1 2, Unit II - Chapter 3, Unit III Chapter 4,5 Unit IV - Chapter 6,7 Unit V Chapter 8,10

REFERENCE BOOK :

1. Pervasive Computing and Networking, Mohammad S.Obaidat, Mieso Denko, and Isaac Woungang, Wiley, 2018.

Course Outcome:

- The Students would have understood the Pervasive Computing
- They should have created knowledge in PDA
- They should have improved the details of WAP

ELECTIVE COURSE 3:2 –MOBILE COMPUTING

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- Understand the nature of Android.
- Explain the concepts of Android APPs.
- Explain the technologies required to make Android.

Unit I: Introduction to Android **(13 Hours)**

Getting to know Android – Android Development Environment – Android Development Environment for real Applications – starts up code, M J Android Applications.

Unit II: Debugging **(13 Hours)**

Debugging Android Applications – The ApiDemos Application – Signing and publishing an application.

Unit III: SQL Connection **(12 Hours)**

SQLiteo databases and content providers – Location and Mapping.

UnitIV: Views **(12 Hours)**

Building a View – A widget bestiary.

Unit V: Drawing **(11 Hours)**

Drawing a 2D and 3D graphics – simple phone calls.

UNIT VI: Latest Learning (For CIA only) **(4 Hours)**

Latest development related to the course during the semester concerned.

TEXTBOOK

”Android – Application Development” by R. Roger, J Lombardo, Z Mednieks and B. Meike, O. Reilly, Shrof Publishers & Distributors Pvt Ltd, New Delhi, 2010.Unit I(Chapter 1,2)- Unit II(Chapter 3,4)- Unit III(Chapter 5,6,7)- Unit IV(Chapter 8)- Unit V(Chapter 9,10).

REFERENCE BOOK

The Busy Coder’s Guide to “Android Development” –Mark .L. Murphy, Commons Ware Publication, 2018

Course Outcome:

- The Students would have understood the Android.
- They should have created knowledge in Android Games.
- They should have improved the details of Android Drawing.

ELECTIVE COURSE 3:3 – SOFTWARE TESTING

Hours/Week: 5 **Max. Marks:100**
Total Hours: 65 **Credit:5**

Objectives:

- To impart knowledge in Software development life cycle
- To understand the need for software testing in software industries
- To know about different types of testing.
- To differentiate functional and nonfunctional testing.
- Description of software tools required for software testing

UNIT I: Principles of testing and Software life cycle (13 Hours)

Principles of testing: Context of testing in producing software –A test in time-Automation syndrome-Software development life cycle models: Phases of software project-quality, quality assurance and quality control-testing, verification and validation-life cycle models.

UNIT II: White box and Black box testing (13 Hours)

White box testing: What is White box testing -Static testing-Structural testing-Black box testing: What is Black box testing –Why we need Black box testing –When to do Black box testing - How to do Black box testing.

UNIT III: Integration, System and Acceptance testing (12 Hours)

Integration testing: What is Integration testing- Integration testing as a type pf testing-Integration testing as a phase of testing. System and Acceptance testing: Overview-Why we need System testing-Functional testing and non-functional testing.

UNIT IV: Performance testing (12 Hours)

Performance testing: Introduction-Factors governing performance testing-Methodology for performance testing-Tools for performance testing-Process for performance testing

UNIT V: Regression testing (11 Hours)

Regression testing: What is Regression testing –Types of Regression testing- When to do Regression testing-How to do Regression testing

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Book

Software testing - Principles and practices by Srinivasan Desikan and Gopalaswamy Ramesh-Pearson Education-2006.Unit I –chapter 1,2 Unit II- chapter 3,4 Unit III- chapter 5,6
Unit IV-chapter 7 Unit V- chapter 8

Reference

Handbook of Software Engineering, Cha, Sungdeok, Taylor, Richard N.Kang, Kyo. C, Springer Publications, 2019.

Course Outcome:

- The Students would have understood the Software Testing
- They should have created knowledge in Testing Techniques
- They should have improved the details of Black and White box testing

ELECTIVE COURSE 4:1 - GRID COMPUTING

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

Objectives:

- To impart knowledge in Grid Computing
- To understand the need for Grid Technology
- To know about Cluster Grid
- To understand the concept of OGSA

UNIT-1: **(13Hours)**

IT infrastructure Evolution: Introduction: Microprocessor Technology-Optical networking technology- Storage Technology-Wireless Technology-Sensor Technology-World Wide Web-Open source movement. **Productivity paradox and information system:** Productivity paradox-return on technology investment-Multi Storey Bureaucracy-consolidation-Outsourcing.

UNIT-2: **(13Hours)**

Business value of Grid Computing: Grid computing business value analysis-Risk analysis-Grid Market place. **Grid computing technology-An overview**: High performance computing- Cluster computing-peer-to-peer computing-Internet computing-Grid computing-Types of Grids.

UNIT-3: **(12 Hours)**

Desktop Grids: Background-desktop grids defined-desktop grid challenges-desktop grid technology-desktop grid suitability-The Grid server-Role of grids in an enterprise computing infrastructure-Practical use of Desktop grid. **Cluster Grids:** Clusters- HPC Grids: Five steps to scientific insight-Application and architecture. HPC application development environment - production to HPC reinvented-HPC grids.

UNIT-4: **(12Hours)**

Data Grids: Data Grids-Alternatives to Data Grids-Avaki Data Grid-Data Grid architecture-The open Grid services architecture: An analogy for OGSA-The Evolution to OGSA-Convergence-OGSA overview-Building on the OGSA platform.

UNIT-5: **(11Hours)**

Creating and managing Grid Services: Services and the Grid-Converting Existing software-Service Discovery-Operational requirements-Tools and tool kits-Support in UDDI-UDDI and OGSA.

UNIT 6: Latest Learning (For CIA only) **(4 Hours)**

Latest development related to the course during the semester concerned.

TEXT BOOK: Grid Computing- A practical guide to Technology and applications by Ahmer Abbas.[Chapters: Unit 1- 1 and 2 Unit 2- 3 and 4, Unit 3- 5, 6 and 7, Unit 4- 8 and 9, Unit 5 – 10,11]

REFERENCE BOOK:

Grid Computing-The servy Manager's Guide-pawel plaszczak and Richard wellner.jr.2018

Course Outcome:

- The Students would have understood the Grid Computing.
- They should have created knowledge in OSGA
- They should have improved the details of Desktop Grid.

ELECTIVE COUSE 4:2 – DIGITAL IMAGE PROCESSING

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVE:

- This course gives the knowledge of effectively storing images, extracting interesting Patterns from an image and discriminate between different classes of images.
- This may lead to the confidence in developing image processing applications.

UNIT I: Digital Image Fundamentals (13 Hours)

Elements of digital image processing - visual perception-mach band effect -Image sampling and quantization-Basic relationship between pixels. Fourier Transform, Matrix Theory Results, Block Matrices and Kronecker Products.

UNIT II: Image Transforms (13 Hours)

2-D orthogonal transforms, 1-D and 2-D DFT, Cosine, Sine, Walsh, Hadamard, Haar, Slant, Karhunen-loeve, Singular Value Decomposition transforms.

UNIT III: **Image Enhancement (12 Hours)**

Point operations - contrast stretching, clipping and thresholding density slicing, Histogram equalization, modification and specification, spatial operations - spatial averaging, low pass, high pass, band pass filtering, direction smoothing, medium filtering, color image enhancement.

UNIT IV: Image Restoration (12 Hours)

Image observation models, sources of degradation, inverse and Wiener filtering, geometric mean filter, non linear filters and constrained least squares filtering.

UNIT V: **Image Compression (11 Hours)**

Need for data compression – Error free compression: variable length coding, bit plane coding, LZW coding . Lossy compression: Transform coding, wavelet coding. Compression standards: Binary image compression standard, still image compression standards and video compression standards.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

Text Books:

1.Rafael C.Gonzalez and Richard E.woods., "Digital Image Processing", 2nd Ed,2009

[Unit-1 :(Chapters 1,2); Unit-3 (Chapter 3); Unit-4 (Chapter 5), Unit-5 (Chapter 8)]

2. E.S. Gopi , "Digital Image Processing using MATLAB**",** Scitech publications, 2008

Unit-2: Chapter 2

References:

1. Anil K. Jain, "Fundamentals of Digital Image Processing", PHI, 1995.
2. Sid Ahmed M.A., "Image Processing", McGraw Hill Inc, 1995.
3. Munesh C.Trivedi, Dr. Sanjay M. Shah"Digital Image Processing", Addison Wesley, 2018.

Course Outcome:

- The Students would have understood the DIP.
- They should have created knowledge in Line drawing Algorithm.
- They should have improved the details of 3D image.

ELECTIVE COURSE 4:3 – BIG DATA ANALYTICS

Hours/Week: 5 **Max. Marks:100**

Total Hours: 65 **Credit:5**

OBJECTIVE:

- To understand the basics of Big Data.
- To understand the Digital data.
- To gain the knowledge Big data analytics.

UNIT I : Introduction (13 Hours)

Types of Digital Data – Classification of Digital Data – Introduction to Big data – Characteristics of Data – Evolution of Big data – Definition of Big Data – Challenges with Big data.

UNIT II : Big Data Analytics (13 Hours)

What is Big data analytics? – Classification of Analytics – Data Science – Data Scientist – Terminologies used in Big Data Environment – few top analytics tools.

UNIT III : Big data technology (12 Hours)

NoSQL: – typres of NoSQL – Advantages of NoSQL – use of NoSQL in Industry – NoSQL vendors – SQL versus NoSQL – NEWSQL- Comparison of SQL, NoSQL and NEWSQL.

UNIT IV : Hadoop (12 Hours)

Features of Hadoop – Hadoop Distribution – Hadoop vs SQL – Introducing Hadoop – Distributed Computing Challenges – Hadoop Overview – Use case of Hadoop – HDFS – Processing Data with Hadoop.

UNIT V : Hadoop Ecosystem (11 Hours)

Pig,Hive,Sqoop,Hbase – Introduction to MongoDB – Introduction to Cassandra – Introduction to MAPREDUCE.

UNIT VI: Latest Learning (For CIA only) (4 Hours)

Latest development related to the course during the semester concerned.

TEXT BOOK:

Big Data Analytics – Wiley, 2015 Wiley India Pvt. Ltd.

Unit I –(Chapter 1, Chapter 2); Unit II – (Chapter 3);Unit III –(Chapter 4); Unit IV-(Chapter 4,5);Unit V – (Chapter 6,7,8)

REFERENCE BOOKS:

Data Analytics and Big Data, Soraya Sedkaoui, ISTE, Wiley, 2018.

Course Outcome:

- The Students would have understood the Big Data.
- They should have created knowledge in Hadoop.
- They should have improved the details of NoSQL.