

**DEPARTMENT OF COMPUTER SCIENCE**

**RATHINAM COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)**

**Rathinam Techzone, Pollachi Road, Eachanari, Coimbatore – 641021**



Syllabus for

**M.Sc. Computer Science**

(I , II, III & IV Semester)

2015 – 2016 Batch onwards

**Advanced Learners Course papers - applicable for 2014-2015 Batch onwards**

## RATHINAM COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

Scheme of curriculum for M.Sc. Computer Science  
for the Batch admitted during 2015-2016

Board of Studies – Computer Science (PG)

Sem	Part	Type	Sub. Code	Subject & Paper	HRS/ week	CIA	ESE	Max mark	Exam Hours	Credit
I	III	Theory	15MC S13A	Paper I : Advanced Computer Architecture	5	25	75	100	3	4
I	III	Theory	15MC S13B	Paper II : Analysis Design of Algorithm	5	25	75	100	3	4
I	III	Theory	15MC S13C	Paper III : Object Oriented Analysis and Design & C++	6	25	75	100	3	4
I	III	Theory	15MC S13D	Paper IV: TCP / IP Protocol	6	25	75	100	3	4
I	III	Practical	15MC S13P	Practical - I :Object Oriented Analysis and Design & C++	4	40	60	100	3	4
I	III	Practical	15MC S13Q	Practical - II – TCP / IP Lab	4	40	60	100	3	4
I	ALC	Theory	<b>ALC1</b>	Advanced Learner Course – 1	-	-	100	100	3	2#
II	III	Theory	15MC S23A	Paper V : Advanced Software Engineering	6	25	75	100	3	4
II	III	Theory	15MC S23B	Paper VI : Android Application Development	6	25	75	100	3	4
II	III	Theory	15MC S23C	Paper VII – Information Storage and Management	5	25	75	100	3	4
II	III	Theory	15MC S23D	Paper VIII - Information Security and cyber Law	4	25	75	100	3	4
II	III	Theory	ELE1	Elective – I	5	25	75	100	3	4
II	III	Practical	15MC S23P	Practical - III - Android Application Development Lab	4	40	60	100	3	4
II	ALC	Theory	<b>ALC2</b>	Advanced Learner Course – 2	-	-	100	100	3	2#
III	III	Theory	15MC S33A	Paper IX – Big Data Analytics	5	25	75	100	3	4
III	III	Theory	15MC S33B	Paper X - Web Technology	5	25	75	100	3	4
III	III	Theory	15MC S33C	Paper XI – Cloud Infrastructure Services	5	25	75	100	3	4
III	III	Theory	ELE2	Elective – II	5	25	75	100	3	4
III	III	Practical	15MC S33P	Practical - IV- Hadoop Lab	4	40	60	100	3	4
III	III	Practical	15MC S33Q	Practical - V - Web Technology Lab	4	40	60	100	3	4
III	III	Practical	15MC S33V	Practical – VI - Mini-Project	2	10	40	50	-	2
III	ALC	Theory	<b>ALC3</b>	Advanced Learner Course –3	-	-	100	100	3	2#
IV	III	Theory	ELE3	Elective – III	5	25	75	100	3	4
IV	III	Theory	ELE4	Elective – IV	5	25	75	100	3	4
IV	III	Practical	15MC S43V	Practical – VII - Project work & Viva Voce	20	100	100	200	-	8
IV	ALC	Theory	<b>ALC4</b>	Advanced Learner Course – 4	-	-	100	100	3	2#
<b>TOTAL</b>						<b>895</b>	<b>1355</b>	<b>2250</b>		<b>90</b>

# - optional Credit / Subject – Advanced Learner Course.

Electives for M.Sc. Computer Science

Subject	Title of the Paper	Elective Group - Semester
1	Operating System	Elective – I – Semester- II
2	Microprocessor and its Applications	Elective – I – Semester- II
3	Principles of Multimedia	Elective – I – Semester- II
1	Grid Computing	Elective – II – Semester- III
2	Mobile Hardware & Services	Elective – II – Semester- III
3	Cryptography	Elective – II – Semester- III
1	Multimedia Databases	Elective – III – Semester- IV
2	Web Services	Elective – III – Semester- IV
3	Server Administration	Elective – III – Semester- IV
4	Digital and Social Marketing	Elective – IV – Semester- IV
5	iPhone Programming	Elective – IV – Semester- IV
6	Bio Metrics	Elective – IV – Semester- IV

**List of Advanced Learner Courses**

Semester	Subject Options
<b>I</b>	PC Hardware and Trouble Shooting
	Compiler Design
	Problem Solving Techniques
<b>II</b>	Open Source Tools
	Pro C
	Multimedia Tools – Flash & 3D Studio Max
<b>III</b>	Parallel Processing
	Artificial Intelligence and Expert Systems
	Animation using Maya
<b>IV</b>	Soft Computing
	Content Management System
	Social Web Mining

## **Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper I : Advanced Computer Architecture</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Core</b>

Introduction : Provides an overview of how computer works also the fundamentals of the Memory design and Instruction Processing is outlined.

Objective: Computer architecture is the science and art of selecting and interconnecting hardware components to create a computer that meets functional, performance and cost goals. This course qualitatively and quantitatively examines computer design tradeoffs.

**Unit - I: Fundamentals of Computer Design:** Introduction – Classes of computers – Defining Computer Architecture – Trends in technology – Trends in power Integrated circuits – Trends in costs – Dependability.

**10 Lectures**

**Unit – II : Instruction-Level Parallelism and Its Exploitation:** Instruction-Level Parallelism: Concepts and Challenges - Basic Compiler Techniques for Exposing ILP - Reducing Branch Costs with Prediction - Overcoming Data Hazards with Dynamic Scheduling - Hardware-Based Speculation - Exploiting ILP Using Multiple Issue and Static Scheduling .

**12 Lectures**

**Unit – III: Multiprocessors and Thread-Level Parallelism:** Introduction - Symmetric Shared-Memory Architectures - Performance of Symmetric Shared-Memory Multiprocessors - Distributed Shared Memory and Directory-Based Coherence - Synchronization: The Basics.

**13 Lectures**

**Unit – IV: Memory Hierarchy Design:** Introduction - Eleven Advanced Optimizations of Cache Performance - Memory Technology and Optimizations - Protection: Virtual Memory and Virtual Machines

**12 Lectures**

**Unit – V: Storage Systems:** Introduction - Advanced Topics in Disk Storage - Definition and Examples of Real Faults and Failures - I/O Performance, Reliability Measures, and Benchmarks - A Little Queuing Theory - Designing and Evaluating an I/O System

**13 Lectures**

### **Text Book :**

1. John L. Hennessey and David A. Patterson, “Computer architecture – A quantitative approach”, Morgan Kaufmann / Elsevier Publishers, 4<sup>th</sup> edition, 2007.
2. David E. Culler, Jaswinder Pal Singh, “Parallel computing architecture: A hardware/software approach”, Morgan Kaufmann /Elsevier Publishers, 1999.

### **Reference:**

1. Modern Processor Design: Fundamentals of Superscalar Processors, John Shen and Mikko Lipasti, McGraw-Hill, 2005.
2. Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw Hill, New Delhi, 2003.

## **Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper II : Analysis Design of Algorithm</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

**Introduction:** This course applies design and analysis techniques to numeric and nonnumeric algorithms which act on data structures. Analysis of algorithms is concerned with the resources an algorithm must use to reach a solution.

**Objective :** The main objective of this course is to make the student familiar with subjects concerning algorithm complexity. The objective of this course is to study paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.

**Unit - I : Introduction:** Algorithm Definition – Algorithm Specification – **Performance analysis:** Space complexity – Time complexity – Asymptotic Notations. **Elementary Data Structures:** Stack and Queues – Trees – Graphs

**15 Lectures**

**Unit – II : Divide and Conquer:** General method – Binary Search – Finding the maximum and minimum - Merge Sort – Selection. **The Greedy Method:** The General Method – Knapsack Problem – Job sequencing with deadlines – Minimum cost spanning trees – Optimal merge patterns.

**15 Lectures**

**Unit – III: Dynamic Programming:** The general method – Multi stage graphs - All pairs shortest paths – Optimal binary Search trees – 0/1 Knapsack – The travelling Sales persons problem – Flow shop scheduling.

**15 Lectures**

**Unit – IV: Traversal and Search Techniques:** Techniques for Binary trees – Techniques for graphs – Connected components and Spanning trees. **Backtracking:** The General Method – 8-queens problem – Sum of subsets – Hamiltonian Cycles – Knapsack Problem

**15 Lectures**

**Unit – V: Branch and Bound:** General method, applications – Travelling Sales Person problem – 0/1 Knapsack problem : LC Branch and Bound Solutions – FIFO Branch and Bound Solutions.

**15 Lectures**

### **Text Book :**

1. Ellis Horowitz, Satraj Sahni and S Rajasekharam, Fundamentals of Computer Algorithms, Galgotia publishers
2. Parag Himanshu Dave, Himanshu BhalchandraDave, Design and Analysis algorithms Pearson Publication

### **Reference:**

1. M.T. Goodrich, Robert Tamassia, Algorithm design: Foundations, Analysis and Internet examples, Wiley student Edn, John Wiley & sons
2. T H Cormen, C E Leiserson, and R L Rivest, Introduction to Algorithms, 2<sup>nd</sup> Edn, Pearson Education

## **Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper III : Object Oriented Analysis and Design &amp; C++</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

**Introduction :** Provides an overview of Object Oriented Analysis and Design Concepts using C++.

**Objective:** The student learns the importance of Object oriented concepts in developing Software.

### **Unit - I:**

**Object-Oriented Analysis and Design** – Building Models – Software Design – The Modelling Language – The process – The Vision – Requirement Analysis - Design

**12 Lectures**

### **Unit – II :**

What is C++? - Programming Paradigms - Procedural Programming - Modular Programming - Data Abstraction – Object Oriented Programming – Types and Declaration – Pointers – Arrays – Structures – Statement - Functions

**12 Lectures**

### **Unit – III:**

Classes – Efficient User defined types – objects - Operator Overloading – Operator function – a Complex number type – conversion operators – Friends – Essential operators – Function call – Increment and decrement – A String class - Derived Classes – Abstract Class – Design of class Hierarchies – Class Hierarchies and abstract classes– Class Hierarchies

**12 Lectures**

### **Unit – IV:**

**Implementing Class Design in C++** - Translating class diagrams into C++ - Standard Classes – Template Classes – Utility Classes – Associations – Aggregations – Generalizations – Translating Interaction diagrams into C++ - Implementing collaboration diagrams and Sequence Diagrams in C++.

**12 Lectures**

### **Unit – V:**

Inheritance – Benefits of Inheritance – Object Oriented Linked Lists – Abstract Classes – Virtual Destructors – Polymorphism through Method Overloading – Memory Management – Multiple Inheritance - **Memory Management** - Memory Leaks – Allocating Arrays – Stray, Dangling and Wild Pointers – Pointers and Exceptions

**12 Lectures**

### **Text Book :**

1. Bjarne Stroustrup, "The C++ Programming Language", Third Edition AT&T Labs Murray Hill, New Jersey, AddisonWesley (Unit – II, III)
2. Jessey Liberty, "C++ Unleashed (UML)", Sams Publication, 1999.

### **Reference:**

1. Herbert Schildt, "The Complete Reference - C++", 3rd Edition, Mc-Grawhill Publication.
2. Stephen Prata, "C++ Primer Plus", Sams Publishing, 2005

**Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Practical - I : Object Oriented Analysis and Design &amp; C++</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Practical</b>

List of Programs

1. Program to create and manage class and objects for Employee.
2. Program for illustrating copy constructor and destructor
3. Program to illustrate Inheritance
4. Program for overloading ++ and -- operator
5. Program to overload a binary operator using friend function
6. Program to overload a function using polymorphism
7. Give the Use case diagram for ATM with Class and implement it using C++.
8. Give the Collaboration diagram for College Fee collection process with Class and implement it using C++.
9. Program to illustrate the Sequence diagram and its implementation in C++.
10. Program to demonstrate Memory Management.
11. Program to demonstrate pointers in Matrix Multiplication

## **Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper IV : TCP / IP Protocol</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

Introduction: - Through this course, the students able to gain the knowledge on TCP / IP Protocols. Also they can learn the how computer communicates in a secured way.

Objective: - To provide an overview of the protocols used for computer communication. TCP and IP are the core protocol used in all sort of communication.

**Unit - I:** Introduction – A brief history – Protocols and standards – Standards organization – Internet standards – Internet administration – Protocol layers – The OSI Model – TCP/IP Protocol Suite – Addressing. Underlying Technologies – Wired Local Area Networks – Wireless Lans – Point-to-Point WANS – Switched WANS – Connecting Devices – Network Layer – switching – Packet switching – Network layer services – other network layer issues. **15 Lectures**

### **Unit – II:**

IPv4 Addresses – Introduction – Classful addressing – Classless addressing – Special Addresses – NAT – Delivery and Forwarding of IP Packets : Delivery – Forwarding – Structure of a Router.

**15 Lectures**

### **Unit – III:**

IPV4 – Datagrams – Fragmentation – Checksum – IP over ATM – Security – IP Package - Address Resolution Protocol (ARP) : Address Mapping – ARP Protocol – ATMARP – ICMPv4 : Messages – ICMP Package. Mobil IP – Addressing – Agents – Three phases – Inefficiency in Mobile IP – Unicast Routing Protocols – RIP – OSPF – BGP – Multicasting and Multicast Routing Protocols – IGMP.

**15 Lectures**

### **Unit – IV:**

Transport Layer – Services – Protocols – User Datagram – UDP Services – UDP Package – TCP – TCP Services – TCP Features – Segment – TCP Connection – State transition diagram – Flow control – Error control – congestion control.

**15 Lectures**

### **Unit – V:**

Application Layer – Introduction to the Application Layer – Client-server Paradigm – Peer-to-Peer paradigm – Host Configuration : DHCP – DHCP operation – Configuration – DNS – Resolution – Compression – Security of DNS- Telnet – FTP – WWW and HTTP – email.

**15 Lectures**

### **Text Book :**

1. Behrouz A. Forouzan, “TCP / IP Protocol Suite”, Fourth Edition, 2010, Tata McGrawhill.

### **Reference:**

1. Andrew S. Tanenbaum, “Computer Networks”, Fifth Edition, 2003.
2. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Third Edition, Morgan Kauffmann Publishers Inc., 2003.
3. Matthew G Naugle, “Illustrated TCP / IP”, 1998, Wiley Computer Publishing.



**Semester – I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Practical - II : TCP / IP Lab</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Practical</b>

List of Programs

1. Configuring Internet IP address
2. Assigning IP address using CIDR
3. Creating an echo-client-server
4. Building client for TIME protocol
5. Capture and decode Ethernet frame
6. Decode header fields of IP datagram
7. Decode header fields of TCP header
8. controlling a computer with Remote login
9. Remote Login and accessing the software
10. To configure a DNS Server
11. Configuration of FTP Server.
12. Reassemble IP fragments into complete datagram
13. Extract data from TCP stream
14. Configure & run RIP software

## **Semester – II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper V : Advanced Software Engineering</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

### **Introduction :**

Software engineering is the study and an application of engineering to the design, development, and maintenance of software.

**Objective:** To provide basic understanding of software product, software design and development process, software project management and design complexities etc. At the end of the course student should be equipped with well understanding of software engineering concepts.

**Unit - I: Software processes:** Software process models - Process activities - Coping with change - The rational unified process. **Agile software development:** Agile methods - Plan-driven and agile development - Extreme programming - Agile project management.

15 Lectures

**Unit – II: Requirements engineering:** Functional and non-functional requirements - The software requirements document - Requirements specification - Requirements engineering processes - Requirements elicitation and analysis - Requirements validation - Requirements management. **Design and implementation:** Object-oriented design using the UML - Design patterns - Implementation issues - Open source development

15 Lectures

**Unit – III: Dependability and security:** Dependability properties - Availability and reliability – Safety – Security. **Security engineering:** Security risk management - Design for security - System survivability.

15 Lectures

**Unit – IV: Software reuse:** The reuse landscape - Application frameworks - Software product lines - COTS product reuse. **Component-based software engineering:** Components and component models - CBSE processes - Component composition.

15 Lectures

**Unit – V: Distributed software engineering:** Distributed systems issues - Client–server computing - Architectural patterns for distributed systems - Software as a service. **Service-oriented architecture:** Services as reusable components - Service engineering - Software development with services.

15 Lectures

### **Text Book :**

1. Ian Sommerville, “Software engineering”, Seventh Edition, Pearson Education Asia, 2007
2. Roger S. Pressman, “Software Engineering – A practitioner’s Approach”, Sixth Edition, McGraw-Hill International Edition, 2005.

### **Reference:**

1. James F.Peters and Witold Pedrycz,”Software Engineering, An Engineering Approach”, Wiley-India.
2. Watts S.Humphrey,”A Discipline for Software Engineering”, Pearson Education, 2007.

## **Semester – II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper VI : Android Application Development</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

### Introduction :

Learn to create Android programs using Java, and create the app.

### Objective :

To Build Android apps - Explain the differences between Android and other mobile development environments - Understand how Android applications work, their life cycle, manifest, Intents, and using external resources - Design and develop useful Android applications

**Unit - I: Developing Spectacular Android Applications:** Need of Develop for android - Android Programming Basics - Hardware Tools - Software Tools. **Prepping Development Headquarters:** Assembling Toolkit - Tuning Up the Hardware - Installing and Configuring Support Tools - Getting the Java Development Kit - Acquiring the Android SDK - Getting the Total Eclipse - Getting Acquainted with the Android Development Tools.

15 Lectures

**Unit – II: First Android Project:** Starting a New Project in Eclipse - Deconstructing Project - Setting Up an Emulator - Creating Launch Configurations - Running the Hello Android App - Understanding Project Structure. **Designing the User Interface:** Creating the Silent Mode Toggle Application - Laying Out the Application - Developing the User Interface - Adding an Image to Application - Creating a Launcher Icon for the Application - Adding a Toggle Button Widget - Previewing the Application in the Visual Designer.

15 Lectures

**Unit – III: Coding Android Application:** Understanding Activities - Creating the First Activity - Working with the Android Framework Classes – Installing and reinstalling the Application - Responding to Errors.

15 Lectures

**Unit – IV: Understanding Android Resources:** Understanding Resources - Working with Resources. **Turning the Application into a Home-Screen Widget:** Working with App Widgets in Android - Working with Pending Intents - Creating the Home-Screen Widget - Placing the Widget on the Home Screen.

15 Lectures

**Unit – V: Turning Publishing the App to the Android Market:** Creating a Distributable File - Creating an Android Market Account - Pricing the Application - Getting Screen Shots for the Application - Uploading the Application to the Android Market - Watching the Installs Soar.

15 Lectures

### **Text Book :**

1. Donn Felker, “Android Application Development for Dummies”, Wiley Publishing, Inc.
2. Reto Meier, “PROFESSIONAL Android 4 Application Development”, John Wiley & Sons, Inc.

### **Reference:**

1. Wei-Meng Lee,” Beginning Android™ Application Development”, Wiley Publishing, Inc..

2 Neil Smyth, “Android Studio Development Essentials”, Techotopia, 2014

**Semester – II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper VII - Information Storage and Management</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Core</b>

**Introduction :**

Information storage is a central pillar of information technology. A large quantity of digital information is being created every moment by individual and corporate consumers of IT. This information needs to be stored, protected, optimized, and managed.

**Objective :**

Learn to make informed decisions about storing, managing, and protecting digital information in classic, virtualized, and cloud environments. Benefited in preparing Information Storage Associate (EMCISA) Certification.

**Unit - I:** Introduction to Information Storage and Management: Information Storage - Evolution of Storage Technology and Architecture - Data Center Infrastructure - Key Challenges in Managing Information - Information Lifecycle. Storage System Environment: Components of a Storage System Environment - Disk Drive Components - Disk Drive Performance - Fundamental Laws Governing Disk Performance - Logical Components of the Host - Application Requirements and Disk Performance.

12 Lectures

**Unit – II:** Data Protection: RAID: Implementation of RAID - RAID Array Components - RAID Levels - RAID Comparison - RAID Impact on Disk Performance - Hot Spares. Intelligent Storage System: Components of an Intelligent Storage System.

12 Lectures

**Unit – III:** Intelligent Storage Array - Concepts in Practice: EMC CLARiiON and Symmetrix. Direct-Attached Storage and Introduction to SCSI: Types of DAS - DAS Benefits and Limitations - Disk Drive Interfaces - Introduction to Parallel SCSI - SCSI Command Model.

12 Lectures

**Unit – IV:** Storage Area Networks: Fibre Channel: Overview - The SAN and Its Evolution - Components of SAN - FC Connectivity - Fibre Channel Ports - Fibre Channel Architecture – Zoning - Fibre Channel Login Types - FC Topologies - Concepts in Practice: EMC Connectrix.

12 Lectures

**Unit – V:** Introduction to Business Continuity: Information Availability - BC Terminology - BC Planning Lifecycle - Failure Analysis - Business Impact Analysis - BC Technology Solutions. Backup and Recovery: Backup Purpose - Backup Considerations - Recovery Considerations - Backup Methods - Backup Process - Backup and Restore Operations - Backup Topologies - Backup in NAS Environments.

12 Lectures

**Text Book :**

1. G. Somasundaram, Alok Shrivastava “Information Storage and Management - Storing, Managing, and Protecting Digital Information”, Wiley Publishing, Inc.

**Semester - II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper VIII - Information Security and Cyber Law</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Core</b>

Introduction : This course teaches the students on enforcing the security in information and tackling cyber law related issues

Objective : To provide a brief introduction on Threats related to security – Architecture design for security – types of attacks and how to secure our information.

**Unit - I:**

Information Security Overview – Risk Analysis – Compliance with Standards, Regulations, and Law – Secure Design Principles.

**12 Lectures**

**Unit – II:**

**Data Security** – Securing Unsecured Data – Information Rights Management – Encryption – Storage Security

**12 Lectures**

**Unit – III:**

**Network Security** – Secure Network Design – Network Device Security – Firewalls – Wireless Network Security

**12 Lectures**

**Unit – IV:**

**Computer Security** – Operating System Security Models – Unix Security – Windows Security – Virtual Machines and Cloud Computing

**12 Lectures**

**Unit – V:**

**Application Security** – Secure Application Design – Writing Secure Software – J2EE Security

**12 Lectures**

**Text Book :**

1. Mark Rhodes-Ousley, “Information Security – The Complete Reference”, Mc Graw-Hill Education, 2013.
2. Nong Ye, “Secure Computer and Network Systems- Modeling, Analysis and Design”, John Wiley & Sons Ltd, 2008
3. RONALD L. MENDELL, MS, CISSP, CLI, “DOCUMENT SECURITY -Protecting Physical and Electronic Content”, CHARLES C THOMAS • PUBLISHER, LTD, 2007

**Reference:**

1. Vincent Nestler, Wm. Arthur Conklin, Gregory White, Matthew Hirsch, “Principles of Computer Security”, The McGraw-Hill Education, 2011.

**Semester - II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Practical – III – Android Application Development Lab</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Practical</b>

List of Programs

1. Getting Started with Mobile App Development
2. creating a Hello World program Experiment with the most basic features and mobile application interaction concepts (lists, text boxes, buttons, radio boxes, soft buttons, graphics, etc)
3. Create a following menu items in mobile application program.
  - a. cut
  - b. copy
  - c. paste
  - d. delete
  - e. select all
  - f. unselect all
4. Create a menu in mobile application which has the following options:
  - a. cut - can be on/off
  - b. copy - can be on/off
  - c. paste - can be on/off
  - d. delete - can be on/off
  - e. select all - put all 4 options on
  - f. unselect all - put all 4 options off
5. Create a mobile slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program should returns to the first slide.
6. Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you have your class for saving and reading record sets.
7. Encryption/decryption with key pair
8. Malware-Game
9. Malware-Trojan
10. Database Security

**Semester - III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper IX – Bigdata Analytics</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Core</b>

Introduction: This paper is for students who'd like to understand more advanced tools used to wrangle and analyze big data. In this course you will be guided in basic approaches to querying and exploring data using higher level tools built on top of a Hadoop Platform.

Objective: The basics of Analytics – Concepts , Data preparation – merging, managing missing numbers sampling , Data visualisation, Basic statistics. Lots of practise to ensure that we are very comfortable handling an Analytics project on BigData

**Unit - I: Big Data - From the Business Perspective :**What is Big Data – Characteristics of Big Data – Data in the Warehouse and Data in Hadoop - Why is Big Data Important – Why IBM for Big Data.

**12 Lectures**

**Unit – II : Big Data – From the Technology Perspective :** All about Hadoop – The History of Hadoop – Components of Hadoop – Application Development in Hadoop – Getting your Data into Hadoop.

**12 Lectures**

**Unit – III: Getting Started with Big Data Analytics -** Changing Focus with Big Data – The role of the Data Analyst – Implementing Big Data Analytics within an Organization Using Alteryx – Blending Data form Multiple Sources – Looking at Alteryx Designer Desktop.

**12 Lectures**

**Unit – IV: Analyzing Big Data in Context :** Focus on Context, Not Just Integration – Combining Big Data with spatial Data – leveraging External Data Provider Resources. **Getting Value form predictive Analytics ad Big Data :** Why do Predictive Analytics on Big Data ? – Moving Predictive Analytics to the From Predictive analysis.

**12 Lectures**

**Unit – V: Humanizing Big Data Analytics :** Putting Big Data in the Hands of Those Who Need it – Humanizing Bata Design Principles – Humanizing Big Data Analytics Workflow – Considering Consumerization of Big Data Analytics – Getting an Alteryx Analytics Gallery Overview – Publishing Data and Analytics to Cloud Service – Focusing on Consuming Applications – The Best Platform for Strategic Analytics.

**12 Lectures**

**Text Book :**

1. Understanding Big Data(Analytics for Enterprise Class Hadoop and Streaming Data) , Chris Eaton, Dirk Deroos, Tom Deutsch, George Lapis, Paul Zikopoulos (Unit – I, II)
2. Big Data Analytics for Dummies, Michael Wessler, OCP & CISSP (Unit – III, IV, V)

**Reference:**

1. Big Data Analytics using Splunk, Peter Zadrozny and Raghu Kodali, Apress 2013.

### **Semester – III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper X - Web Technology</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Core</b>

**Introduction :** Technologies that are fundamental to understanding communication between web browsers and servers as well as how information is displayed by browser

**Objective:** The fundamental of web technology is given with hands-on training. The student able to learn how to program and develop an web application.

**Unit - I: Web Essentials: Clients, Servers, and Communication.** The Internet-Basic Internet Protocols -The World Wide Web-HTTP request message-response message-Web Clients Web Servers-Case Study. **Markup Languages: XHTML.** An Introduction to HTML History-Versions-Basic XHTML Syntax and Semantics-Some Fundamental HTML Elements-Relative URLs-Lists-tables-Frames-Forms-XML Creating HTML Documents. **12 Lectures**

**Unit – II :** Style Sheets: CSS-Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML Style Rule Cascading and Inheritance-Text Properties. Client-Side Programming: The JavaScript Language-History and Versions Introduction to JavaScript in Perspective-Syntax-Variables and Data Types-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects - JavaScript Debuggers **12 Lectures**

**Unit – III: Host Objects : Browsers and the DOM-**Introduction to the Document Object Model DOM History and Levels-Intrinsic Event Handling-Modifying Element Style-The Document Tree-DOM Event Handling-Accommodating Noncompliant Browsers Properties of window-Case Study. **12 Lectures**

**Unit – IV: Server-Side Programming: Java Servlets-** Architecture -Overview-A Servlet-Generating Dynamic Content-Life Cycle- Parameter Data-Sessions-Cookies- URL Rewriting-Other Capabilities-Data Storage Servlets and Concurrency. **12 Lectures**

**Unit – V: Separating Programming and Presentation: JSP Technology-**Introduction-JSP and Servlets-Running JSP Applications Basic JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm-Case Study-Related Technologies. **12 Lectures**

#### **Text Book :**

1. Jeffrey C. Jackson, "Web Technologies--A Computer Science Perspective", Pearson Education, 2006.

#### **Reference:**

1. Robert. W. Sebesta, "Programming the World Wide Web", Fourth Edition, Pearson Education, 2007.Deitel,
2. Deitel, Goldberg, "Internet & World Wide Web How To Program", Third Edition, Pearson Education, 2006.
3. Marty Hall and Larry Brown,"Core Web Programming" Second Edition, Volume I and



II, Pearson Education, 2001.

**Semester – III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Paper XI – Cloud Infrastructure and Services</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Core</b>

Introduction : A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Objective: To provide basic knowledge about Cloud computing, Classic Data Center, Cloud Infrastructure and Cloud services and management.

**Unit - I:** Journey to the Cloud: Essential Cloud Characteristics - Building Cloud Infrastructure - Understand Existing Infrastructure- Classic Data Center - Virtualize the Infrastructure. Classic Data Center (CDC): Application - DBMS.

**12 Lectures**

**Unit – II :** Classic Data Center (CDC): Compute: Examples of Compute System - Server Clustering - Logical Components of Compute, Storage : Storage Device Options - Redundant Array of Independent Disks (RAID) - RAID Techniques - RAID Levels - Intelligent Storage System - Components of an Intelligent

**12 Lectures**

**Unit – III:** Classic Data Center (CDC) : Storage Networking Technologies : Compute to Compute Communication - Compute to Storage Communication: Data Access by Compute - Direct Attached Storage (DAS) - Emergence of Storage Networking Technologies - FC SAN - Components of FC SAN - Fibre Channel Fabric - Port Types – Zoning.

**12 Lectures**

**Unit – IV:** Virtualized Data Center: Compute Virtualization Overview: Need for Compute Virtualization – Hypervisor - Types of Hypervisor - Benefits of Compute Virtualization. Storage Virtualization Overview: Benefits of Storage Virtualization - Virtual Machine Storage: Storage for Virtual Machines - File System for Managing VM Files.

**12 Lectures**

**Unit – V:** Cloud Infrastructure and Management: Cloud Infrastructure and Service Creation: Cloud Infrastructure Framework - Physical Infrastructure - Virtual Infrastructure - Applications and Platform Software - Cloud Infrastructure Management and Service Creation Tools - Cloud Service Management: Overview of Cloud Service Management - Processes in Cloud Service Management - Capacity Management - Performance Management - Problem Management.

**12 Lectures**

**Text Book :**

1. Barrie Sosinsky, "Cloud Computing Bible", Wiley Publishing Inc, 2007.
2. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and

Collaborate Online, Que Publishing, August 2008.

**Semester – III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Practical – IV – Hadoop Lab</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Core</b>

Software Required for Hadoop Lab

[\[jdk\]](#)[\[eclipse\]](#)[\[hadoop 0.20.0\]](#)[\[hadoop-server virtual machine\]](#)[\[VMPlayer\]](#)

List of Practicals

1. Setting up the environment for the Hadoop.
2. Word Count using Hadoop.
3. Map Reduce using Hadoop.
4. Hadoop using Bigdata
5. Implement any one machine learning algorithm for classification / clustering task in BIG data Analytics
6. Design and Implement social web mining application using NoSQL databases, machine learning algorithm, Hadoop and Java/.Net

### **Semester – III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Practical V – Web Technology Lab</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>Core</b>

1. Create a website using HTML Forms
2. Write a java script to validate the following fields in a registration page
  - a. Name (should contains alphabets and the length should not be less than 6 characters)
  - b. Password(should not be less than 6 characters)
  - c. E-mail(should not contain invalid addresses)
3. Design the following static web pages required for online book store.
  - a. Home page: the static home page must contains three pages
  - b. Top frame: logo and college name and links to homepage, login page, registration Page,
  - c. catalogue page and cart page
  - d. Left frame: at least four links for navigation which will display the catalogue of Respective links
  - e. Right frame: the pages to links in the left frame must be loaded here initially it Contains the description of the website
  - f. Registration page and
  - g. Cart page
4. Write an XML file which displaysthe book details that includes the following:
  - a. Title of book
  - b. Author name
  - c. Edition
  - d. Price

Write a DTD to validate the above XML file and display the details in a table (to do this use XSL).
5. Create a web page with all types of Cascading style sheets.
6. Client Side Scripts for Validating Web Form Controls using DHTML
7. Write programs in Java to create applets incorporating the following features:
  - a. Create a color palette with matrix of buttons
  - b. Set background and foreground of the control text area by selecting a color from
  - c. color palette.
  - d. In order to select Foreground or background use check box control as radio
  - e. buttons
  - f. To set background images
8. Write programs in Java using Servlets:
  - a. To invoke servlets from HTML forms
  - b. To invoke servlets from Applets
9. Write programs in Java to create three-tier applications using JSP and Databases
  - a. for conducting on-line examination.
  - b. for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
10. Programs using XML – Schema – XSLT/XSL
11. Program using DOM / SAX
12. Programs using AJAX
13. Consider a case where we have two web Services- an airline service and a travel agent and the travel agent is searching for an airline. Implement this scenario using Web Services and Data base.

### Elective Subjects for Elective – I – Semester - II

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Operating System</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

#### Introduction :

In this course, all the advances that have led to the state-of-the-art operating system covering the topics like operating system functions, concurrency, process control & deadlock, memory management and disk scheduling.

#### Objective :

To provide comprehensive and up-to-date coverage of the major developments in operating system. To cover important theoretical foundations including process synchronization, concurrency, event ordering, mutual exclusion, deadlock, scheduling and i/o management.

**Unit – I: Operating System Objectives and Functions:** The Operating System as a User/Computer Interface – The Operating System as Resource Manager – Ease of Evolution of an Operating System. **The Evolution of Operating Systems:** Serial Processing – Simple Batch Systems – Multi programmed Batch Systems – Time-Sharing Systems. **Process Description and Control:** Process States – Process Description – Process Control.

12 Lectures

**Unit – II: Concurrency:** Principles of Concurrency – Mutual Exclusion – Software support – Dekker’s Algorithm – Mutual exclusion – hardware support. Mutual Exclusion – Operating System support – Semaphore Implementation. **DEADLOCK:** Deadlock Prevention – Deadlock Avoidance – Deadlock Detection.

12 Lectures

**Unit – III: Memory Management: Memory Management Requirements** – Fixed Partitioning – Dynamic Partitioning – Relocation. Simple Paging – Simple Segmentation. **Virtual Memory:** Paging – address translation in a paging system. Segmentation – organization – address translation in a segmentation system - Combined Paging and Segmentation – **Operating System Software:** Fetch Policy – Placement Policy – Replacement Policy – Resident Set Management

12 Lectures

**Unit – IV: Scheduling: Types of Professor Scheduling – Scheduling Algorithms:** Short-Term Scheduling Criteria – FIFO – Round Robin – Shortest process next – Shortest remaining time – Highest response ratio and Feedback Scheduling – Performance Comparison – Fair-Share Scheduling.

12 Lectures

**Unit – V: I/O MANAGEMENT AND DISK SCHEDULING:** The Evolution of the I/O Function – Logical Structure of the I/O Function – I/O Buffering – Disk Scheduling algorithms. **File Management:** Files and File systems – File Structure – File Management Systems – File Directories – File Sharing – Secondary Storage Management: File Allocation.

12 Lectures

#### Text Book :

1. William Stallings, “Operating Systems – Internals and Design Principles”, Pearson Education.
2. H. M. Deitel P. J. Deitel D. R. Choffnes, “Operating Systems”, Pearson Education Inc, 2004

#### Reference:

1. Andrew S. Tanenbaum, “Modern Operating Systems”, Second Edition, Pearson Education,

2004.

2. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.

**Elective Subject for Elective – I – Semester – II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Microprocessor and its Applications</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction :

To provide an insight view of the computer and give an overview of the microprocessor.

**Objective:** To provide an in depth knowledge of the architecture and programming with x86 Microprocessors and its instruction set.

**Unit – I: Basic Concepts: Introduction:** Assembly Language Applications – Virtual Machine Concepts. **Data Representation:** Binary Integers and addition – Integer Storage sizes – Signed Integers – Character Storage. **Boolean Operations:** Truth Table for Boolean function.

12 Lectures

**Unit – II: x86 Processors Architecture:** Basic Concepts – x86 Architecture Details - x86 Memory Management - Components of a Typical Computer – Input Output System.

12 Lectures

**Unit – III: Assembly Language Fundamentals:** Basic elements of a Assembly Language – Adding and subtracting Integers – Assembling, Linking and Running Programs – Defining Data – Symbolic Constants – Real-Address Mode Programming.

12 Lectures

**Unit – IV: Data Transfers, Addressing and Arithmetic:** Data Transfer Instructions – Adding and Subtracting – Data-Related Operators and Derivatives – Indirect Addressing – JMP and LOOP Instructions.

12 Lectures

**Unit – V: Procedures:** Linking to an External Library – The Book's Link Library – Stack Operations – Defining and Using Procedures – Program Design using Procedures.

12 Lectures

**Text Book :**

1. KIP R. IRVINE, "Assembly Language for x86 Processors", Sixth edition, Pearson Education, 2011.
2. M. Rafiquzzaman, "Microprocessors - theory and applications", Prentice Hall India, Revised Edition, 2009, New Delhi.

**Reference:**

1. Ramesh S.Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Penram International Publishing Private Limited, 4<sup>th</sup> Edition.
2. R. Theagarajan, S. Dhanasekaran, S. Dhanapal, "Microprocessor and its Applications", New Age International Publishers, 2008.

### Elective Subjects for Elective – I– Semester - II

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Principles of Multimedia</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction : Principles of Multimedia is essential for the students to learn about the multimedia.

Objective :

To provide basic knowledge on Multimedia and components of Multimedia.

#### Unit - I:

Multimedia Overview: Introduction, Multimedia presentation and production, characteristics of a multimedia presentation, Multiple media, Utilities of multisensory perception, Hardware and software requirements, Uses of multimedia, Promotion of multimedia based contents, steps for creating multimedia presentation. Visual Display Systems: Introduction, cathode Ray Tube (CRT), Video Adapter Card, Video Adapter cable, Liquid Crystal Display (LCD), Plasma Display Panel (PDP).

12 Lectures

#### Unit – II:

Text: Introduction, Types of Text, Unicode Standard, Font, Insertion of Text, Text compression, File Formats. Image: Introduction, Image Types, Seeing colors, color models, Basic steps for Image processing, Scanner, Digital camera, Interface Standards, Image processing software, File formats, Image output on monitor, Image output on printer.

12 Lectures

#### Unit – III:

Audio: Introduction, Fundamentals Characteristics of sound, Elements of Audio systems, Microphone, Amplifier, Loudspeaker, Audio mixer, Musical Instrument Digital Interface(MIDI), MIDI messages, MIDI connections, Sound card, Audio File format and CODECs, Software Audio Players, Audio Recording Systems, Audio and multimedia, Audio Processing software.

12 Lectures

#### Unit – IV:

Video: Introduction, Analog video camera, Transmission of video signals, Video signal format, Digital video, Digital Video Standards, PC Video, Video File Format and CODECs, Video editing, Video editing software.

12 Lectures

#### Unit – V:

Animation: Introduction, uses of animation, key frames and Tweening, Types of animation, Computer Assisted Animation, Creating movements, Principle of animation, some Techniques of Animation, Animation on the web, 3D Animation, Special Effects, Creating Animation, Rendering algorithms, Animation software.

12 Lectures

**Text Book :**

1. Principles of Multimedia by Ranjan Parekh- the Tata McGraw Hill companies Sixth Reprint 2008

**Reference:**

1. Multimedia System Design by Prabhat K. Andleigh and Kiran Thakar-PHI-2008s

**Elective Subject for Elective – II– Semester - III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Grid Computing</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction: Grid computing is an infrastructure involving collaboration of computers, databases & network resources available, to perform manipulation of intensive and large scale data set problems.

Objective: To provide basic knowledge about grid computing and its components, standards

**Unit - I:** Introduction: Grid Computing & Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation

**12 Lectures**

**Unit – II :** Grid Benefits & Status of Technology: Motivations – History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors – Economic Value – Challenges.

**12 Lectures**

**Unit – III:** Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View – A Physical View – Service View.

**12 Lectures**

**Unit – IV:** Grid Computing Standards-OGSI: Standardization – Architectural Constructs – Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.

**12 Lectures**

**Unit – V:** Standards Supporting Grid Computing-OGSA: Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.

**12 Lectures**

**Text Book :**

1. A Networking Approach to Grid Computing, Daniel Minoli, Wiley Publication

**Reference:**

1. Grid Computing – A Practical Guide to Technology and Applications, Ahmar Abbas, Charles River Media Publication.
2. Introduction to Grid Computing – Bart Jacob, Michael Brown, Kentaro Fukui, Nihar Trivedi, IBM/redbooks, First Edition, 2005.

**Elective Subject for Elective – II– Semester - III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Mobile Hardware and Services</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction: To enable the students to learn the concepts create a hardware system that allows for long-term physical activity measurement on mobile phones.

Objective: On successful completion of the course the students should have: Understanding of mobile devices internals and capabilities.

**Unit - I: Introduction** – Basic Electronics – Conductor, Insulator, Resistor, Capacitor, Diode, Transistor, LED, Crystal, Fuse, Switch, IC & Protector. Fault Testing and Measuring through multimeter. Tools – Tweezer, Cutter, Nipper, Opener, Soldering & Desoldering

**12 Lectures**

**Unit – II : Introduction of Mobile Phone** – Comparison with Basic Phone – Land line, Cordless, Long range, WLL, CDMA, GSM. SIM Architecture – SIM, PIN, PUK, Locking and unlocking, IMEI, IMSI, TIMSI. Battery & Chargers.

**12 Lectures**

**Unit – III:** SMD rework station – Removing and Installing of SMD type IC & other components. Phone Assembling & Disassembling – Speaker, Ringer, Microphone, Camera, Vibrating Motor checking and replacement technique.

**12 Lectures**

**Unit – IV:** Parts replacing with SMD Rework station – Different fault finding – Ringer fault, speaker fault, microphone fault, camera fault, flex cable, LCD, Keypad fault, Dead Set, Network fault, No charging fault. BGA – Circuit Tracing

**12 Lectures**

**Unit – V:** Handling Phone Software – OS – Phone menu, contact, tones, message Gallery, Downloading – Ring tones, Video Clip, Animation, Games, Mobile Apps, - IR, Bluetooth. Flashing – Factory resetting – phone formatting- Unlocking of various security locks - Software related faults.

**12 Lectures**

**Text Book :**

1. Courseware of Electronic Technology and Telecommunications, Odisha.



**Elective Subject for Elective – II– Semester - III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Cryptography</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

**Introduction:** To Provide a outline on the principles and practice of Cryptography and network security. Basic Issues to be addressed by a network security capability and the Practical applications are explored.

**Objective:** To make the students to understand the principles of encryption algorithms, conventional and public key cryptography.

**Unit - I:**

Introduction – Computer Security Concepts – The OSI Security Architecture – security Attacks – Security Services – Security Mechanisms – A Model for Network Security – Symmetric Ciphers – Classical Encryption Techniques – Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Steganography.

**12 Lectures**

**Unit – II :**

Block Ciphers and The Data Encryption Standard – Block ciphers principles – The Data Encryption Standard (DES) – A DES example – The Strength of DES – Block cipher Design principles – Advanced Encryption Standard – the origin – AES Structure – AES round functions – AES key expansion – An AES Example – AES Implementation.

**12 Lectures**

**Unit – III:**

Block Cipher Operation – Multiple encryption and Triple DES – Cipher Block Chaining Mode – Cipher Feedback mode – Counter Mode – XTS Mode for Block – Oriented Storage Devices – Stream Ciphers – RC4

**12 Lectures**

**Unit – IV:**

Public-Key Cryptography and RSA – Principles of Public-key cyptosystems – The RSA Algorithm – Other public-key cryptosystems – Diffie – Hellman Key Exchange – Elgammal Cryptosystem – Secure Hash Algorithm - Digital Signatures – Elgammal Digital Signature scheme – Digital Signature Standard (DSS)

**12 Lectures**

**Unit – V:**

Network and Internet Security – Transport Level Security – Web Security Issues – Secure Socket Layer (SSL) – Transport Layer Security (TLS) – HTTPS – Secure Shell (SSH) – Wireless Network Security – Electronic Mail Security – IP Security

**12 Lectures**

**Text Book :**

William Stallings, "Cryptography and Network Security: Principals and Practice", Prentice Hall – 5<sup>th</sup> Edition

**Reference:**

Wade Trappe, Lawrence C. Washington, "Introduction To Cryptography with Coding Theory", Pearsons India,

Behrouz A. Forouzan, Debdeep Mukopadhyay, "Cryptography and Network Security", TMH, 2nd

Edition.

**Elective Subject for Elective – III– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Multimedia Databases</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction:

Discusses important topics including how to organize the vast data types, storage and retrieval, and creation and delivery of multimedia presentations.

Objective:

Provide the techniques necessary for working with multimedia databases, including synthetic solutions for the design and deployment of multimedia database systems.

**Unit - I:**

Multimedia Data – Multimedia Data Applications – Accessing different Media Types – operations to be performed on multimedia – Media Types – Text / Document – Image – Video – Audio – Classical data – Multimedia Research Issues – Presentations and Delivery – Relational DBMSs – Selection – Cartesian Product – Join – Intersection - SQL

**12 Lectures**

**Unit – II :**

Object Oriented Databases – Object – Types and Classes – Methods – ODL – OQL – Object Relational Systems – Multidimensional Data Structures – k-D trees – Point Quad Trees – R-Trees.

**12 Lectures**

**Unit – III:**

Image Databases – Raw Images – Image Definitions – Image Database – issues in Image Database – Compressed Image representations – The Discrete Fourier Transform – The Discrete Cosine Transform – Image Processing – Segmentation – Similarity Based Retrieval – Metric Approach – Reducing Dimensionality of Feature Space – The Transformation Approach.

**12 Lectures**

**Unit – IV:**

Alternative Image DB Paradigms – IDBs as Relations – IDBS with Spatial Data Structures – IDBs with Image Transformations. Text/Document Databases – TV Trees.

**12 Lectures**

**Unit – V:**

Video Databases – Organizing content of a single video – video content – video library – Video functions – Indexing video content – Video Segmentation – Video Standards – Audio Databases – Multimedia Databases – Simple Multimedia database – Structured Multimedia database -

**12 Lectures**

**Text Book :**

V. S. Subramanian, “Principles of Multimedia Database Systems”, Elsevier Publishers, 1998.

**Reference:**

1. Elmasri and Navathe Fundamentals of Database Systems, 4th Edition, Addison Wesley, 2003.
2. Prabhakaran, “Multimedia Database Management Systems”, Springer, 1st Edition, 1996.
3. Lynne Dunckley, “Multimedia Databases: An Object-Relational Approach”, Pearson Education, 2003.

**Elective Subject for Elective – III– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Web Services</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

**Introduction:** Web services are changing the way we think about distributed software systems, but there's a limit to what they can do. The core enabling technologies – WSDL, SOAP and UDDI are taught.

**Objective:** The concepts behind the basic web services technologies, and its also includes ebXML and additional web services technologies.

**Unit - I:**

Introducing Web Services – The Basics of Web services – The Next generation of the web – Interacting with Web services – The technology of Web services – XML : The foundation – WSDL – SOAP – UDDI - ebXML – Web services with other technologies.

**12 Lectures**

**Unit – II :**

Describing Information : XML – Instance and Schema – XML Schemas and DTDs – Namespaces – XSLT – XML Specifications – Describing Web Services : WSDL – Basics – Elements – Framework – defining operations on Messages.

**12 Lectures**

**Unit – III:**

Accessing Web Services : SOAP – Example – Specification – SOAP Envelope – Header – Body – Version Control – SOAP Message Processing – Finding Web Services : UDDI Registry – UDDI Organization – Concepts underlying UDDI – UDDI Data Model – UDDI Soap APIs – Using WSDL with UDI -

**12 Lectures**

**Unit – IV:**

An Alternative Approach : ebXML – Overview of ebXML – defining – Deploying – ebXML Specifications

**12 Lectures**

**Unit – V:**

Web Services Architecture : Additional Technologies – SAML – XKMS – WS – Licence and WS-Security. – Xlang – BTP – BEEP – Reliable HTTP - Web services Foundations – Implementing Web Services.

**12 Lectures**

**Text Book :**

Eric Newcomer, "Understanding Web Services", Independent Technology Guides.

**Reference:**

1. Developing Enterprise Web Services - An Architect's Guide-Sandeep Chatterjee, James Webber, Pearson Education- Second Indian Reprint 2005.
2. Understanding SOA with Web Services, Eric Newcomer, Greg Lomow, Pearson Education, First Indian Reprint 2005.

**Elective Subject for Elective – III– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Server Administration</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction:

To enable the students to acquire the knowledge on Server Administration

Objective:

On successful completion of the course the students should be able to:

- Install and maintain a server, Configure a DNS, Backup and restore.

**Unit - I:** Deploying and updating windows server 2012 – Configuring and servicing windows 2012 images – understanding windows images – configuring Windows images – Servicing Windows Images – Automated Deployment of Windows Server 2012 images – Automating Installation – Configuring Answer files – Windows Deployment Services – WDS Requirements – Managing Images – Configuring Transmissions.

**12 Lectures**

**Unit – II :** Managing account policies and service accounts – Implementing domain password and lockout policies – domain user password policies – Account Management tasks – Using fine-grained password policies – Mastering group managed Service accounts – Configuring Name resolution – DNS Zones and Forwarders – WINS and globalnames zones – Advanced DNS options.

**12 Lectures**

**Unit – III:** Administering Active Directory – Domain Controller management – Domain Controller Maintenance – Active directory database optimization – Active directory Metadata cleanup – Active directory snapshots – Active directory Recovery - Active directory recyclebin - Active directory backup

**12 Lectures**

**Unit – IV:** Managing Group policy application and Infrastructure – Group Policy Maintenance – Managing Group Policy Objects – Migrate Group Policy Objects – Delegate GPO Management – Managing Group Policy Application – Group policy settings and preferences – Administrative Templates – Group policy preferences

**12 Lectures**

**Unit – V:** Administering network policies – Network policy server policies – Network access protection enforcement methods – Network access protection infrastructure – Administering remote access.

**12 Lectures**

**Text Book :**

Orin Thomas, “Windows server 2012 – Training Guide”, O’Reilly Media, Inc

**Reference:**

Mark Minasi, Kevin Greene, Christian Booth, Robert Butler, John McCabe, “Mastering Windows Server 2012 R2”, Sybex – A Wiley Brand, 2014.



**Elective Subject for Elective – IV– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Digital and Social Marketing</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction: Provides an overview of Digital Marketing and Social Marketing

Objective: To teach the digital media, this is changing at a phenomenal pace. To Provide practical, real world examples of digital marketing and social marketing successes.

**Unit - I:**

Going Digital – the evolution of Marketing – the changing face of advertising – The technology behind digital marketing – Strategic Thinking – Your window to the digital world – Building an effective website – choosing your domain name – Hosting – Arranging information – writing effective web content – website design.

**12 Lectures**

**Unit – II :**

The search for success – About the engines – optimizing site for the engines – Advertising on the search engines – Black Hat, the darker side of search – universal search – ranking. Website intelligence and return on investment – Testing, Investing, Tweaking, Reinvesting – E-Mail Marketing – planning your campaign – Measuring success.

**12 Lectures**

**Unit – III:**

Social Media and Online consumer engagement – What is social Media – the different forms of social media – the rules of engagement – adding social media to your own site.

**12 Lectures**

**Unit – IV:**

The social feedback cycle – The social web and engagement – The operations and marketing connection – The new role of the customer – Customer Relationships – Build a social business – What is Social Business – Employee as change agents – The social business ecosystem.

**12 Lectures**

**Unit – V:**

Run a Social Business – Social Technology and business decisions – Create a Social Business – Understand the conversation that matter – Social CRM and Decision Support - Social Analytics, Metrics, and Measurement – Social Analytics – Know your influencers – Web Analytics – Business Analytics – Five Essential Tips – Best practices in Social Businesses.

**12 Lectures**

**Text Book :**

1. Damian Ryan and Calvin Jones, “Understanding Digital Marketing”, Kogan Page.
2. Dave Evans and Jake Mckee, “Social Media Marketing”, Sybex, Wiley Publishing Inc.

**Elective Subject for Elective – IV– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>iPhone Programming</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

**Introduction:** To provide an introduction to iPhone Programming using Objective C. It leads to iPhone app development.

**Objective:** Fundamentals, architecture of SDK, are taught to enable the learner to develop the application for iPhone / iOS platform.

**Unit - I:**

Getting Started with iPhone Programming – obtaining the iPhone SDK – Components of the SDK – Architecture of the iPhone OS – Write your first hello world Application – Getting started with Xcode - customizing your application icon

**12 Lectures**

**Unit – II :**

Outlets, Actions, and View Controllers – Basic Code and UI Interactions – View Controllers – Exploring Views – Using the Views – Adding Views Dynamically using code – Understanding View hierarchy – Switching Views – Keyboard Inputs – Using the Keyboard – Customizing the type of inputs – Detecting the presence of the keyboard – Screen rotations – Responding to device rotations – programmatically rotating the screen.

**12 Lectures**

**Unit – III:**

Building different types of iPhone applications – View Controllers – Creating a Window-based application – Switching to another view – Animating the switching of views – Tab Bar Applications – Navigation Based Applications – Creating Utility Applications – Transition Styles – Adding another view to the utility application.

**12 Lectures**

**Unit – IV:**

Displaying and Persisting Data – Using the Table view – Simple table view – Displaying sections – Application Preferences – programmatically accessing the settings values – Data storage using SQLite3 – Creating and opening a databases – File Handling – Understanding the Application folders – using property lists

**12 Lectures**

**Unit – V:**

Advanced iPhone Programming Techniques – Programming Multi-touch Applications – Simple Animations – Accessing the Hardware.

**12 Lectures**

**Text Book :**

1. Wei-Meng Lee, “Beginning iPhone SDK Programming with Objective-C”, Wiley Publishing Inc.

**Reference:**

1. Alasdair Allan, “Learning iPhone Programming”, O’Reilly
2. Joe Conway and Aaron Hillegass, “iPhone Programming”, The Big Nerd Ranch Guide.

3. Chris Adamson and Janie Clayton, "iOS 9 SDK Development", The Pragmatic Bookshelf, 2016.

**Elective Subject for Elective – IV– Semester - IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Bio Metrics</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>Elective</b>

Introduction:

Through this paper, the student learns the advantages and methods of making a document security.

Objective:

To teach the various methods of the Bio Metric features. Securing the system as well as data.

**Unit - I:**

Person Recognition – Biometric Systems – Enrolment and recognition phases – Sensor Module – Feature Extraction Module – Database Module – Matching Module – Biometric Functionalities – Verification and Identification – Biometric System Errors – Design cycle of Biometric Systems

**12 Lectures**

**Unit – II :**

Finger print recognition – Friction Ridge pattern – Fingerprint Acquisition – Feature Extraction – Matching – Fingerprint Indexing – Fingerprint Synthesis – Palmprint

**12 Lectures**

**Unit – III:**

Face Recognition – Image Acquisition – Face Detection – Feature Extraction and Matching – Handling pose, illumination, and expression variations – Heterogeneous face recognition – Face Modelling

**12 Lectures**

**Unit – IV:**

Ear detection – Ear Recognition – Challenges in ear recognition – Gait – Feature extraction and matching – challenges in gait recognition – Hand Geometry – Image Capture – Hand Segmentation – Feature Extraction

**12 Lectures**

**Unit – V:**

Multi Biometrics – Sources of Multiple Evidence – Acquisition Processing Architecture – Fusion Levels – Security of Biometric Systems – Adversary Attacks – Attacks at the user Interface attacks – attacks on Biometric processing.

**12 Lectures**

**Text Book :**

Anil K. Jain, Arun A. Ross, Karthik Nandakumar, "Introduction to Biometrics", Springer, 2011.



### **Advanced Learner Course-Semester-I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>PC Hardware and Troubleshooting</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To give an introduction on the internals of computer.

#### **Objective:**

The student themselves solve the issues in their personal computers and laptops. The student understands the functionality of the computer Components.

#### **Unit - I:**

Introduction – Computer Organization – Number System and Codes – Memory – Arithmetic and Logic Unit – Control Unit – Instruction prefetch – Interrupts – Input/output techniques – Device Controllers – Error detection techniques – Microprocessor – Personal Computer Concepts and Techniques – Advanced System concepts – operating systems.

#### **Unit – II:**

Peripheral Devices – Keyboard – CRT Display Monitor – Printer – Magnetic Storage Devices – Floppy disk drive – Hard Disk Drive – Special Types of Disk drives – Mouse – Modem – Scanner – Digital Camera – Special Peripherals.

#### **Unit – III:**

PC Bus and Motherboard functions – DMA Logic – RAM Logic – ROM Logic – NMI Logic – Time of Day Logic – Keyboard interface – Control bus logic – Address bus logic – data bus logic – Advanced Motherboards – Pentium Motherboards. Printer Controller – Floppy disk controller – Hard disk controller – Display Adapter – Serial Interface – RS232 Interface – UART – USB – Firewire.

#### **Unit – IV:**

Installation and Preventive Maintenance – System Configuration – Pre-Installation Planning – Installation Practice – Routine Checks – PC Assembling and Integration – BIOS Setup – Disk Operating System – Virus – Data Recovery.

#### **Unit – V:**

Trouble Shooting – Computer Faults – Nature of faults – Types of faults – Diagnostic Programs and Tools – Bus faults – Faults Elimination process – Systematic Troubleshooting – Symptoms observation – symptoms analysis – Fault diagnosis – Fault rectification – Troubleshooting levels – POST- PC diagnostic software.

#### **Text Book :**

1. B. Govindarajalu, "IBM PC and Clones : Hardware, Troubleshooting and Maintenance", TMH, 2002.

### **Advanced Learner Course - Semester - I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Compiler Design</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

Introduction :

The student learns how to design a compiler and how the compiler works

Objective :

To understand the structure of compiler, functionality of translator, lexical analysis and Symbol table.

**Unit - I: Introduction:** Language Processors - The Structure of a Compiler - The Evolution of Programming Languages - The Science of Building a Compiler - Applications of Compiler Technology - Programming Language Basics.

**Unit – II: A Simple Syntax-Directed Translator:** Introduction - Syntax Definition - Syntax-Directed Translation – Parsing - A Translator for Simple Expressions.

**Unit – III:** Lexical Analysis - Symbol Table - Intermediate Code Generation. **Lexical Analysis:** The Role of the Lexical Analyze - Input Buffering.

**Unit – IV:** Specification of Tokens - Recognition of Tokens - The Lexical-Analyzer Generator **Lex** - Finite Automata.

**Unit – V:** From Regular Expressions to Automata - Design of a Lexical-Analyzer Generator - Optimization of DFA-Based Pattern Matchers. **Syntax Analysis:** Introduction - Context-Free Grammars - Writing a Grammar.

**Text Book :**

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi and Jeffrey D. Ullman, “Compilers - Principles, Techniques, & Tools”, Pearson Education Inc, Second Edition.
2. Torben Mogensen, “Basics of Compiler Design”, DIKU, University of Copenhagen, 2010.

**Reference:**

1. Seth D. Bergmann, “Compiler Design: Theory, Tools, and Examples”, Rowan University, 2010
2. Niklaus Wirth, “Compiler Construction”, Addison-Wesley Publications, 2005.

### **Advanced Learner Course-Semester-I**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Problem Solving Techniques</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

Introduction :

Provides an insight on solving a problem.

Objective :

The students learns the fundamental on how to solve a problem using Computer.

**Unit - I: Introduction to Computer Problem Solving:** Introduction – The problem solving Aspects – Top – down Design – Implementation of Algorithms – Program Verification – The Efficiency of Algorithms – The analysis of Algorithm.

**Unit – II: Fundamental Algorithms:** Exchanging of values of two variables – Counting – Summation of a set of Numbers – Factorial Computation – Generation of the Febonacci Sequence – Reversing the digits of an integer number – Base conversion – Character to Number Conversion.

**Unit – III: Factoring Methods:** Finding the square root of a number – The Smallest Divisor of and integer – The Greater common divisor of two integers – Generating Prime numbers – Computing the prime factors of an integer – Generation of Pseudo – random Numbers – Raising a number to a Large power – Computing the  $n$ th Fibonacci number.

**Unit – IV: Array Techniques:** Array order reversal – Array – counting of Histogramming – Finding a Maximum number in a set – Removal of duplicates from an Ordered Array – Finding the  $k$  th Smallest Element – Longest Monotone Subsequence.

**Unit – V: Text Processing and Pattern Searching:** Text Line Length adjustment – Left and right justification of text – Keyword searching in Text – Linear Pattern Search – Sublinear Pattern search.

**Text Book :**

1. R.G. Dromey, “How to Solve it by Computers”, Prentice-Hall international series in computer science.
2. Margaret L. Arnold, Linda A. Heyne, James A. Busser, “Problem Solving, *Tools and Techniques for the Park and Recreation Administrator*”, Fourth Edition.

**, Reference:**

1. Steven G. Krantz, “Techniques of Problem Solving”, American Mathematical Society.
2. Colin G Smith, ” Creative Problem Solving Techniques To Change Your Life”.

### **Advanced Learner Course-Semester-II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Open Source Tools</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To provide an overview of the open source tools to web development

#### **Objective:**

The student understands the importance of PHP and MySQL in web development. Also they learnt the how to design and develop a web site using PHP and MySQL.

#### **Unit - I:**

**Dynamic Content and the Web:** HTTP and the Internet - The Components of a PHP Application - Integrating Many Sources of Information - Requesting Data from a Web Page. Installation: Developing Locally - Working Remotely. **Exploring PHP:** PHP and HTML Text - Coding Building Blocks.

#### **Unit – II:**

**PHP Decision-Making:** Expressions - Operator Concepts – Conditionals – Looping. **Functions:** Calling Functions - Defining Functions - Object-Oriented Programming.

#### **Unit – III:**

**Arrays:** Array Fundamentals. **Working with MySQL:** MySQL Database - Managing the Database - Using phpMyAdmin - Database Concepts - Structured Query Language. **More on Databases:** Database Design - Backing Up and Restoring Data.

#### **Unit – IV:**

**Getting PHP to Talk to MySQL:** The Process - Querying the Database with PHP Functions - Using PEAR. **Working with Forms:** Building a Form – Templates. **More on PHP:** String Functions - Date and Time Functions.

#### **Unit – V:**

**Modifying MySQL Objects and PHP Data:** Changing Database Objects from PHP - Manipulating Table Data - Displaying Results with Embedded Links - Presenting a Form to Add and Process in One File - Updating Data – Deleting Data - Performing a Subquery. **Cookies, Sessions, and Access Control:** Cookies - PHP and HTTP Authentication – Sessions - Using Auth\_HTTP to Authenticate.

#### **Text Book :**

Michele E. Davis and Jon A. Phillips, “**Learning PHP and MySQL**”, Second edition, O’Reily Publications.

### **Advanced Learner Course-Semester-II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Pro C</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### Introduction :

To Provide an overview on accessing Database through C (Pro C)

#### Objective :

The students learns the Oracle Pro C / C++ - Precompiler – Database concepts – Embedded SQL .

**Unit - I: Introduction:** Oracle Precompiler – Use of the Oracle Pro\*C/C++ Precompiler – Use of SQL – Use of PL/SQL - Pro\*C/C++ Precompiler Benefits. **Precompiler Concepts:** Key Concepts of Embedded SQL Programming - Steps in Developing an Embedded SQL Application - Guidelines for Programming - Example Tables - A Simple Query - A Simple Query using SQL99 Syntax

**Unit – II: Database Concepts:** Connect to the Database - Advanced Connection Options - Definitions of Transactions Terms - How Transactions Guard Your Database - How to Begin and End Transactions - Using the COMMIT Statement - Using the SAVEPOINT Statement - The ROLLBACK Statement - The RELEASE Option- The SET TRANSACTION Statement - Override Default Locking - Fetch Across COMMITs - Distributed Transactions Handling.

**Unit – III: Data types and Host Variables:** Oracle Datatypes - Host Variables - Indicator Variables - VARCHAR Variables - Cursor Variables - CONTEXT Variables - Universal ROWIDs - Host Structures - Pointer Variables - Globalization Support - NCHAR Variables.

**Unit – IV: Embedded SQL:** Host Variables - Indicator Variables - The Basic SQL Statements - The DML Returning Clause – Cursors - Scrollable Cursors - Optimizer Hints - Fix Execution Plan - The CURRENT OF Clause - The Cursor Statements - A Complete Example Using Non-Scrollable Cursor - A Complete Example Using Scrollable Cursor

**Unit – V: C++ Applications:** Understanding C++ Support - Precompiling for C++. **Oracle Dynamic SQL:** Introduction to Dynamic SQL - Advantages and Disadvantages of Dynamic SQL - When to Use Dynamic SQL - Requirements for Dynamic SQL Statements - How Dynamic SQL Statements are Processed - Methods for Using Dynamic SQL - Using Method 1 - Using Method 2 - Using Method 3 - Using Method 4 - Using the DECLARE STATEMENT Statement - Using PL/SQL - Dynamic SQL Statement Caching.

#### Text Book :

1. Deepti Kamal, “Pro\*C/C++ Programmer’s Guide”, ORACLE Edition, 2008
2. Michael Tuchman, “ProC Document by example Using SAS”, SAS Press.

#### Reference:

1. Kevin D. Smith, “PROC TEMPLATE Made Easy: A Guide for SAS Users”, SAS Institute Inc.
2. Lauren E. Haworth, “PROC TABULATE by Example”, SAS Institute Inc.

## **Advanced Learner Course-Semester-II**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Multimedia Tools – Flash &amp; 3D Studio Max</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

### **Introduction:**

To provide a platform for the students to know the multimedia tools

### **Objective:**

The student learns the concepts of Flash and 3D Studio Max. They are able to create models and animation videos.

### **Unit - I:**

Getting acquainted with Flash 8 – Discovering Flash – understanding what – getting the right start – Taking a look around – Getting help in a Flash – Basic Flash – Setting the stage – choosing the stage color – specifying the frame rate – setting the stage size and adding meta data – grabbing a graphic – understanding vectors and bitmaps – finding graphics – using a template – printing your movie

### **Unit – II:**

Getting Graphic – sharpening pencil – creating shapely shapes – mixing and matching shapes – creating curves with the pen – getting artistic with the brush – pouring on the paint – strokes – ink – drawing precisely – selecting objects – moving, copying and deleting – Transforming fills – Transforming objects – Presenting Text – Creating Layers – working with layers – creating guide layers

### **Unit – III:**

Understanding Symbol types – Creating symbols – Pushing buttons – creating simple buttons – creating complex buttons – Getting animated – Understanding Actions – adding actions to frame, buttons – publishing your flash files.

### **Unit – IV:**

3D studio Max – The workspace – transforming objects using Gizmos – Graphite Modeling tools set – Command panel – Time slider and Track bar – file management – creating first 3ds Max project.

### **Unit – V:**

Modelling in 3ds Max – Units Setup – Importing a CAD drawing – Creating Walls – Creating the doors – Creating the Window – Adding a Floor and Ceiling – Modelling the Couch – Modeling the Lounge Chair – Animation – Animating the Ball – refining the Animation

### **Text Book :**

1. Randi L. Derakhshani, Dariush Derakhshani, "Autodesk 3ds Max 2014 Essentials", Autodesk official press, 2014.
2. Ellen Finkelstein, Gurdy Leete, "Macromedia Flash 8 for Dummies", Wiley Publishing Inc, 2006

### **Advanced Learner Course-Semester-III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Parallel Processing</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

The student learns the advantages of Parallel processing and understands the speed of computing.

#### **Objective:**

To provide an outline on the parallel processing. Algorithms for parallel processing with example were provide an dept knowledge on parallel processing.

#### **Unit - I:**

Introduction to Prallelism – why parallel processing? – Parallel processing ups and downs – types of parallelism – roadblocks to parallel processing – effectiveness of parallel processing – A taste of parallel algorithms.

#### **Unit – II:**

Parallel Algorithm complexity – Asymptotic complexity – algorithm optimality and efficiency – complexity classes – Parallel Programming paradigms – Models of Parallel processing – SIMD vs MIMD architectures – Global vs Distributed Memory – PRAM shared-memory model.

#### **Unit – III:**

PRAM and Basic Algorithms – PRAM Submodels and Assumptions – Data broadcasting – Semigroup or Fan-In computation – Parallel prefix computation – Ranking the elements of a Linked list – Matrix Multiplications.

#### **Unit – IV:**

Mesh-based Architectures – Sorting on a 2D Mesh or Torus – Mesh-Connected Computers – Shearsort Algorithm – Variants of Simple Shearsort - Routing on a 2D mesh or Torus – Types of Data routing operations – Data routing on a 2D Array- Greedy Routing Algorithms – Wormhole Routing.

#### **Unit – V:**

Implementation Aspects – Shared Memory MIMD Machines – Message Passing MIMD Machines – Data-Parallel SIMD Machines.

#### **Text Book :**

1. Behrooz Parhami, "Introduction to Parallel Processing – Algorithms and Architectures", Kluwer Academic publishers, 2002

### **Advanced Learner Course-Semester-III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Artificial Intelligence and Expert Systems</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### Introduction :

The ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. Providing a knowledge on developing knowledge on understanding the characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

#### Objective :

To provide a the foundation of Artificial Intelligence – To Provide an idea of solving the problems – How to create games and techniques – role of agents.

**Unit - I: Introduction:** Introduction to AI - The Foundations of Artificial Intelligence - The History of Artificial Intelligence - The State of the Art. **Intelligent Agents:** Introduction - How Agents Should Act - Structure of Intelligent Agents – Environments.

**Unit – II: Solving Problems by Searching:** Problem-Solving Agents - Formulating Problems - Example Problems - Searching for Solutions - Search Strategies - Avoiding Repeated States - Constraint Satisfaction Search.

**Unit – III: Informed Search Methods:** Best-First Search - Heuristic Functions - Memory Bounded Search - Iterative Improvement Algorithms.

**Unit – IV: Game Playing:** Introduction: Games as Search Problems - Perfect Decisions in Two-Person Games - Imperfect Decisions - Alpha-Beta Pruning - Games That Include an Element of Chance - State-of-the-Art Game Programs.

**Unit – V: Agents that Reason Logically:** A Knowledge-Based Agent - The Wumpus World Environment - Representation, Reasoning, and Logic - Propositional Logic - An Agent for the Wumpus World.

#### **Text Book :**

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, Second Edition, Pearson Education, 2003.
2. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem solving”, Fourth Edition, Pearson Education, 2002.

#### **Reference:**

1. David Poole, Alan Mackworth, Randy Goebel, “Computational Intelligence : a logical approach”, Oxford University Press, 2004.
2. J. Nilsson, “Artificial Intelligence: A new Synthesis”, Elsevier Publishers, 1998.



### **Advanced Learner Course-Semester-III**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Animation Using Maya</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To provide an outline on the use of Maya in creating Animation.

#### **Objective:**

The student understands the maya software and uses it for creating Animation.

#### **Unit - I:**

Understating the Maya Interface – Exploring Interface Elements – Moving Views and Manipulating objects – Using Maya Windows and Menus – Setting Preferences – Creating your first Animation – using good Scene – File Management – Creating and Animating a Bouncing Ball – Refining Movement in the Graph Editor – Using Animation Principles to improve.

#### **Unit – II:**

Modelling with Polygons – Understanding polygons – Constructing a good model – Getting started and using the Main Modeling Tools – Box Modeling and Building a Character – Creating edge loops – Adjusting vertices, polygons and edges, and adding details – Refining and Cleaning up – Mirroring model – deleting history.

#### **Unit – III:**

Surfacing your character – creating a surface - laying out UVs – Texture Mapping – Getting bent out of a shape – Understanding Blend shapes and How they work – Creating Deformers for your character – Setting up the blend shape interface.

#### **Unit – IV:**

Dem Bones – Understanding how joint works – building joint chains – Connecting the joints in the model – Weighting joints – Rigging your character – Setting the scene – Creating an Environment.

#### **Unit – V:**

Making it Move – Animating character – Setting up maya for animation – Understanding the three-point lighting system – using the Maya lights – lighting the scene – performing light linking – Rendering and Compositing.

#### **Text Book :**

1. Paul Nass, “Autodesk – Maya 2014 Essentials”, Autodesk Official Press, 2014.

### **Advanced Learner Course-Semester-IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Soft Computing</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To discuss and understand the capability of neural networks, fuzzy systems and genetic algorithms to acquire and apply knowledge in an intelligent manner.

#### **Objective:**

To emphasize on learning the design, implementation and application of soft computing methodologies. To give a detailed understanding of how to obtain the solution of cross-disciplinary problems quickly, accurately and acceptably.

#### **Unit - I:**

Neural Networks, Application Scope of Neural Network, Fuzzy Logic, Genetic Algorithm, Hybrid Systems, Soft Computing -**Artificial Neural Network : An Introduction** - Fundamental Concept, Evolution of Neural Networks, Basic Models of Artificial Neural Network, Important Terminologies of ANNs, McCulloch-Pitts Neuron, Linear Separability, Hebb Network

#### **Unit – II:**

**Supervised Learning Network** - Introduction, Perception Networks, Back-Propagation Network, Radial Basis Function Network, Time Delay Neural Network. **Associative Memory Networks** - Introduction, Training Algorithm of Pattern Association, Autoassociative Memory Network, Heteroassociative Memory Network, Bidirectional Associative Memory, Hopfield Networks (Discrete Only)

#### **Unit – III:**

**Unsupervised Learning Networks** - Introduction, Fixed Weight Competitive Nets, Kohonen Self-Organizing Motor Maps, Adaptive Resonance Theory Network. **Special Networks** - Introduction, Simulated Annealing Network, Boltzmann Machine.

#### **Unit – IV:**

**Fuzzy Set Theory** - Fuzzy versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations. **Fuzzy Systems** - Crisp Logic, Predicate Logic, Fuzzy Logic, Fuzzy Rule Based System, Defuzzification Methods, Applications

#### **Unit – V:**

**Fundamentals of Genetic Algorithms** - Genetic Algorithms: History, Basic Concepts, Creation of Offsprings, Working Principle, Encoding, Fitness Function, Reproduction.

#### **Text Book :**

1. S.N. Sivanandam and S.N. Deepa, “Principles of Soft Computing”, Wiley India (P) Ltd

#### **Reference:**

Sudarshan K. Valluru and T. Nageswara Rao, “Introduction To Neural Networks, Fuzzy Logic and Genetic Algorithms, JAICO Publishing House.

### **Advanced Learner Course-Semester-IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Content Management System</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To provide an introduction on Content Management System and how to manage contents in web.

#### **Objective:**

The student learns the professional content management system; At the end of this course the students are able to develop a content management system by their own.

#### **Unit - I:**

Introduction – What is Content – Content and Intellectual Property rights – CMS versus DAM-S and MAM-S – Application Domains – Content Management in Television, radio and media production, non-media organization, advanced media services.

#### **Unit – II:**

Content Management: the problem illustrated – Media and essence handling requirement – Requirements for metadata creation and handling – user requirements example – Content related workflows – workflows in broadcast – workflows in e-commerce – content-related workflows in corporate and other organization

#### **Unit – III:**

Essence – the different forms of essence – Encoding and compression basics – Video – Audio – image, web, text and other essence formats – essence processing

#### **Unit – IV:**

Content Representation and Metadata – Metadata – Metadata access and exchange – Metadata description schemes – Standards for metadata transmission and exchange – File formats

#### **Unit – V:**

Content Management System Architecture – Software design principles – Software architecture – CMS Component software architecture – the core – Content Management system Infrastructure

#### **Text Book :**

Dr Andreas Mauthe, Dr Peter Thomas, “Professional Content Management Systems Handling Digital Media Assets”, Willey, 2004.

### **Advanced Learner Course-Semester-IV**

Subject Code	Subject Title	Lecture	Tutorial	Practical	Credit	Type
	<b>Social Web Mining</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>ALC</b>

#### **Introduction:**

To give an overview on Mining on social web.

#### **Objective:**

The student understands the concept of mining and learns how to extract details from social websites like facebook, twitter etc.,

#### **Unit - I:**

Introduction – Hacking on Twitter Data – Installing python development tools – Collecting and Manipulating Twitter Data – Tinkering with Twitters API – Frequency Analysis and Lexical diversity – Visualizing tweet graphs – Synthesis : Visualizing retweets with protovis.

#### **Unit – II:**

Microformats: Semantic Markup and Common sense collide – XFN and Friends – Exploring social connections with XFN – A Breadth-first crawl of XFN data – Geocoordinates – Slicing and dicing recipes – Collecting restaurant reviews

#### **Unit – III:**

Mailboxes: Oldies but goodies – mbox: the quick and dirty on Unix Mailboxes – mbox+couchDB = relaxed email analysis – Analysing email data

#### **Unit – IV:**

Twitter : Friends, Followers and Setwise operations – RESTful and OAuth-Cladded APIs – A lean, Mean data-Collecting Machine, Constructing Friendship Graphs.

#### **Unit – V:**

LinkedIn: Clustering professional network for fun – Motivation for clustering - clustering contacts by job title – Fetching extended profile information – geographically clustering network.

#### **Text Book :**

Matthey A. Russell, “Mining the Social Web”, O’Reilly, 2011