140CA0301   OPERATING SYSTEMS

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:

This course provides basic knowledge and skills in operating, managing and maintenance of various types of Operating Systems.

OBJECTIVES:

- Creating awareness on process management. CPU scheduling, memory management and file system of an Operating system.
- Impart information on implementing the system components including system call synchronization primitives.
- Understanding the design of the Linux operating system.
- Familiarize with the various inter process communication.

UNIT I   INTRODUCTION   9

Evolution of OS - Operating Systems Structures: System Components – Operating System Services – Process Concepts – Process Scheduling –Operations on Processes – Cooperating Processes – Inter Process Communication – Threads.

UNIT II SCHEDULING & DEADLOCK   9

CPU Scheduling– Scheduling Algorithms – Process Synchronization: Critical Section Problems – Synchronization Hardware– Semaphores. Deadlock - System Model – Deadlock Characterization – Methods for Handling Deadlocks - Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlocks.

UNIT III   MEMORY MANAGEMENT   9

Memory Management - Background – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging – Virtual Memory: Demand Paging – Page Replacement – Thrashing.

UNIT IV FILE MANAGEMENT   9

File Concept-Access Methods-Directory Structure-File System Structure-File System Implementation – Directory Implementation – Allocation Methods-Free Space Management- Disk Structure – Disk Scheduling-Disk Management-Swap–Space Management.

UNIT V CASE STUDY   9

Linux History -Design Principles-Kernel Modules-Process Management-Scheduling-Memory management- File Systems –Input and Output-Interprocess Communication-Windows 7

TEXT BOOK:

1.AviSilberschatz, P.B.Galvin, G.Gagne, Operating System Concepts, Ninth Edition, John Wiley& Sons, 2012.

REFERENCE BOOKS:

1.   William Stallings, Operating Systems, Internals and Design Principles, SixthEdition,Pearson Education, 2009.
2. H M Deitel, P J Deitel and D R Choffnes, Operating Systems ,Third edition, Pearson Education,2011

140CA0302   **SOFTWARE ENGINEERING**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:

The aim of this course is to impart the systematic approach to the design, development, testing and maintenance of a software system.

OBJECTIVES:

- Provide an insight into the processes of software development.
- Understand and practice the various phases such as analysis, design, development, testing.
- Construct various UML models including use case diagrams, class diagrams, interaction diagrams, statechart diagrams and activity diagrams using the appropriate notation.
- Learn the Software testing strategies and techniques with software maintenance

UNIT I INTRODUCTION   8
Introduction to Software Engineering – A Generic Process Model – Prescriptive Process Models:Waterfall, Incremental, Prototyping, and Spiral Model – The Unified Process – Agile Development:Agile Process – Extreme Programming (XP) – Adaptive Software Development – Scrum.

UNIT II SOFTWARE REQUIREMENTS   10
Modeling Principles – Understanding Requirements – Requirements Modeling: Scenario–Based, Data, Class–Based, Flow–Oriented, Behavioral Modeling.

UNIT III SOFTWARE DESIGN   9
Design Concepts – Design Models – Architectural Design: Software Architecture – Architectural Styles– Architectural Design – Component Level Design: Component – Designing Class Based and Traditional Components.

UNIT IV UNIFIED MODELING LANGUAGE   9
Introduction – Development Process – Use case – Class diagram - Sequence Diagram -Package Diagram - State Machine Diagram - Activity Diagram - Collaboration Diagram – Interaction Diagram

UNIT V TESTING AND MAINTENANCE   9
Testing Strategies- Strategic Approach- Issues- Test Strategy for Conventional Software- Validation Testing- System Testing- Testing fundamentals -White box testing – Basis path testing – Control structure testing – Black box testing-Model based testing- Software Configuration Management (SCM) – SCM Repository –SCM Process – Software Maintenance and Supportability.

TEXT BOOKS:
1. Roger Pressman S., Software Engineering: A Practitioner's Approach, Tata McGraw Hill, Seventh Edition, 2010.(Unit I,II,III,V).
2. Martin Fowler, UML Distilled, Pearson Education ,Third Edition,2003(Unit IV).

REFERENCE BOOKS:
1. Ian Sommerville, Software Engineering, Pearson Education, Ninth Edition, 2010.
2.Pfleeger and Atlee, Software Engineering, Pearson Education, Fourth Edition, 2009

140CA0303　　　　　　　　**JAVA PROGRAMMING**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
Learn the concepts of Java Programming and develop real time applications.

OBJECTIVES:

- Reuse software through a collection of predefined classes and own packages.
- Develop custom applications using Collections.
- Develop networking applications using RMI.
- Design and implement Servlet and JSP programs with database.
- Develop an application using JavaFX.

UNIT I JAVA FUNDAMENTALS & CLASSES　　　　　　　　　　　　　**9**
Java Fundamentals: Features of Java- OOPs concepts- Java virtual machine- Reflection byte codes-
Byte code interpretation- Data types, variable, arrays, expressions, operators, and control structures-
Objects and classes.Java Classes: Abstract classes- Static classes- Inner classes- Packages -
Wrapper classes- Interfaces- this –super- Access control.

UNIT II EXCEPTION HANDLING, IO PACKAGE AND MULTITHREADING　　　　　　**9**
Exception handling: Exception as objects- Exception hierarchy- Try catch finally- Throw, throws.

IO package: Input streams- Output streams- Object serialization- Deserialization- IO files -Filter and
pipe streams.Multi threading: Thread Life cycle- Multi threading advantages and issues- Simple thread
program- Thread synchronization.

UNIT III JDBC & COLLECTIONS　　　　　　　　　　　　　　　　　**9**
Database Connectivity: JDBC architecture- Establishing connectivity and working with
connectioninterface- Working with statements- Creating and executing SQL statements- Working with
Result Set. **Collections:** Introduction - Collections Overview - Class Array - Interface Collection and
Collections–Lists - Collections Algorithms – Sets - Maps.

UNIT IV-SERVLET & JSP　　　　　　　　　　　　　　　　　　**9**
Servlet: Servlet Overview and Architecture, Interface Servlet and the Servlet Life Cycle,
Handling HTTP get Requests, Handling HTTP post Requests, Redirecting Requests to Other
Resources, Session Tracking, Cookies, Session Tracking with HttpSession.
Java   Server Pages (JSP): Introduction, JavaServer Pages Overview,   A First Java   Server Page
Example, Implicit Objects, Scripting, Standard Actions, Directives, Custom Tag Libraries.

UNIT V JAVAFX　　　　　　　　　　　　　　　　　　　　　**9**
JavaFX: Overview - Understanding the JavaFX Architecture–Hello World, JavaFX Style–Creating
aForm in JavaFX – Fancy Forms with JavaFX CSS – Using FXML to Create a User Interface –
Animation and Visual Effects in JavaFX.

TEXT BOOKS:
1. H. M.Deitel, P. J. Deitel, S. E. Santry, Advanced Java 2 Platform Howto program, Prentice
   Hall, 2007. (Unit I to Unit IV)
2. Jasper Potts, Nancy Hildebrandt, Joni Gordon, Cindy Castillo, JavaFX Getting Started with
   JavaFX, Release 8, Oracle, 2014. (Unit V)

REFERENCE BOOKS:
1. Antonio Goncalves, Beginning Java EE 7, Apress publication, 2013.
2. Herbert Schildt,The Complete Reference JAVA2, Fifth edition, Tata McGraw-Hill, 2006.
3. H. M.Deitel, P. J. Deitel, Java How to Program, Ninth Edition, Prentice Hall, 2014.

140CA0304   **DATA STRUCTURES & ALGORITHMS**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week
Total hours: 60
Credit: 4

AIM:
Imparting knowledge on the design and applications of linear, tree and graph structures .To provide an understanding of various algorithm design and analysis techniques and to provide an in-depth knowledge in problem solving techniques and data structures.

OBJECTIVES:
- Facilitate the choice of data structures that effectively model the information in a problem
- Impart the skills to analyze the efficiency of algorithms
- Provide an understanding of appropriate structures for efficient searching and access of data.
- Provide knowledge of the systematic way of solving problems and to improve the competency in solving specific problems

UNIT I INTRODUCTION   **9+3**
ADT - Linked Lists (Singly, Doubly and Circular) Implementation – Array, Pointer- Stack: Definition and Examples, Representing Stacks - Queues: Queue and its Representation – Applications of Stack, Queue and list.

UNIT II BASIC DATA STRUCTURES   **9+3**
Trees – General- Binary Tree - Binary Search trees- AVL Trees, B-Trees – Implementations – Tree Traversals. Hashing – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing.

UNIT III SORT AND SEARCH STRUCTURES AND HEAPS   **9+3**
General Background: Insertion Sort- Shell Sort- Quick Sort - Radix Sort - Merge Sort - Basic Search Techniques – Linear, Binary Search. Heap –Binary Heap – Leftist Heaps – Binomial Heaps – Fibonacci Heaps – Skew Heaps.

UNIT IV GRAPHS AND THEIR APPLICATIONS   **9+3**
Graphs – Representation – Topological Sort - Shortest Path Algorithm -Dijkstra's algorithm- Network Flow Problem – Minimum Spanning Tree – Prim's Algorithm - Kruskal's Algorithm – Graph Traversals – Applications of Depth–First Search.

UNIT V ALGORITHM DESIGN TECHNIQUES   **9+3**
Design Techniques – Greedy Algorithm- - Divide and Conquer – Dynamic Programming – Randomized Algorithms – Backtracking Algorithms

TEXT BOOK:
1. M. A. Weiss, Data Structures and Algorithm Analysis in C,Second Edition, Pearson Education Asia, 2011.

REFERENCE BOOKS:
1. Data Structures using C, ISRD Group, Second Edition, McGraw Hill 2013.
2. T.H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, Introduction to algorithms, Third Edition, Prentice Hall of India Ltd, 2009.
3. V. Aho, J. E. Hopcroft, and J. D. Ullman, Data Structures and Algorithms, Pearson Education, Reprint Edition 2006.
4. Tanenbaum A.S., Langram Y and Augestien M.J. Data Structures using C and C++,Second Edition, Prentice Hall of India, 2004.

140CA0305   DATABASE MANAGEMENT SYSTEMS

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week
Total hours: 60
Credit: 4

AIM:
Develop an understanding in the students on the role of database concepts and to design
and implement real information systems.

OBJECTIVES:
- Interpret the different data models and basic concepts of Database.
- Impart knowledge on database creation, manipulation and complex SQL queries of relational databases.
- Analyze the concepts of data storage, querying and query optimization.
- Discover the implementation of the concepts of advanced and recent databases and its applications.

UNIT I INTRODUCTION TO RELATIONAL DATABASES   9+3

Database System Applications – Purpose of Database systems – View of Data – Database Languages – Relational Databases – Database Design – Data Storage and Querying – Transaction Management – Database Architecture – Database Users and Administration - Structure of Relational Databases – Database Schema – Keys – Schema Diagrams – Relational Query Languages – Relational Operations.

UNIT II SQL   9+3

Overview of the SQL Query Language – SQL Data Definition – Basic Structure of SQL Queries –
Additional Basic Operations – Set Operations   - Aggregate Functions – Nested Sub queries -
Modification of the Database - Join Expressions – Views – Transactions – Integrity Constraints – SQL data types and Schemas – Authorization – Accessing SQL from a programming language – Functions and Processing – Triggers – Relational Algebra – Tuple relational calculus – Domain relational calculus.

UNIT III DATABASE DESIGN   9+3

Entity Relationship model – constraints – Entity Relationship Diagrams – Features of Good Relational Designs – Atomic Domains and First Normal Form – Decomposition using Functional Dependencies – Functional Dependency Theory – Algorithms for Decomposition – Decomposition using Mutivalued dependencies.

UNIT IV DATA STORAGE AND QUERYING   9+3

RAID – Ordered Indices – B+ Tree Index Files – B+ Tree Extensions – Multiple Key Access – Static Hashing – Dynamic Hashing – Measures pf Query Cost – Selction Operations – Sorting – Join Operations – Overview of Query Optimization – Transformation of Relational Expressions – Estimating Statistics of Expression Results – Choice of Evaluation Plans.

UNIT V CASE STUDY   9+3

Introduction to PostgreSQL - User Interfaces – SQL Variations and Extensions – Transaction Management – Storage and Indexing – Query Processing and Optimization – System Architecture.

TEXT BOOK:
1. Abraham Silberschatz, Hentry F.Korth and S.Sudharssan, Database System Concepts, Sixth Edition, Tata McGraw Hill, 2011.

REFERENCE BOOKS:
1. Raghu Ramakrishna & Johannes Gerhrke, Database Management System, McGrawHill,Third Edition, 2003.
2. C. J. Date, An Introduction to Database Systems, Eigth Edition, Addison-Wesley, 2003.
3. Ramez Elmasri and Shamkant B.Navathe, Fundamental Database Systems, Third Edition, Pearson Education, 2010.

140CA0307　　　　　　**JAVA PROGRAMMING LABORATORY**

Category: Technical
Mode of Delivery: Practical –4 Hrs/Week;
Total hours: 45
Credit: 2

AIM:
Develop the ability of the students to design and write programs for implementing real time applications using Java Programming.

LIST OF EXPERIMENTS:
1. Develop a program for the following concepts:
   - ☐ A manager thread and N worker threads
   - ☐ Manager starts workers but wants them to hold before doing real work until it says go.
   (Multithread and Exception Handling)

2. Develop a database program for Student Mark Statement (atleast five subjects) and generate the following reports:
   a. To display the overall report with total marks and CGPA.
   b. To display the subject-wise minimum and maximum marks.
   c. To display the student-wise ranking.
   (JDBC and Exception Handling)

3. To develop an application for small tables (files) with unique keys. To create a class for each of those small tables and load the data in to a java collection. This object will read the file and load the data in to another java collection. To fetch the data from this collection by the key values.

4. Create a servlet which does online shopping for books having following functions in it.
   a. Add Items to the shopping cart
   b. Delete Items from shopping cart
   c. Display selected Items.

5. Create JSP code to accept product details and store in database table. If the product is already inserted, display the appropriate message to insert another product. The following reports have to generate.
   a. To display overall product details.
   b. To display only given product details.

6. To create a sample applications using JavaFX.
   (Fancy Design with CSS, User Interface Design with FXML and Animated Shapes)

Total :45 Periods

140CA0308   DATA STRUCTURES & ALGORITHMS LABORATORY

Category: Technical
Mode of Delivery: Practical –4 Hrs/Week;
Total hours: 45
Credit: 2

AIM:

To develop programming skills of the students in the design and implementation of data structures to application oriented problem.

LIST OF EXPERIMENTS:

1. Given the following string: D*RM**CE**TM*C*2018*ODD 2016** Write a method that creates a linked stack, pushes the letters in the above string onto the stack, pops them off as indicated by the *s and discards the number. A letter in the above expression indicates a push onto the stack, an asterisk indicates a pop operation and a number indicates no stack operation. Print out the letters as they are popped and show a screenshot of your program working. You shouldn't print out the * or the numbers.(Stack & Linked List)

2. Write a Program to implement 2 overlapping queues in an array of size N. There are facing in opposite direction to each other. Give IsEmpty(i), Insert(i), Delete(i) and IsFull(i) routines for ith queue(Queue)

3. Data about exam results are stored into a singly linked list. Each list element consists of:
    - student name(50+1 character)
    - student ID (int)
    - course code (int)
    - grade (int)

    The list is not sorted. Write the function that removes students with negative grades (those with grade) from the list. The function returns the number of removed list members. Write the corresponding struct. (Singly Linked List , Sorting)

4. Doubly linked list contains data about students, sorted in a descending order (from head) according to the average grades. Write the function that reverses the order of elements in the doubly linked list.(Doubly Linked List , Traversal)

5. Write a program that prompts the user for the beginning of a word and outputs all the possible words that can complete what the user typed in alphabetical order. For example, one possible user interaction would be:

    Loading Dictionary.
    Standby... Dictionary loaded!
    Start typing a word and hit enter ('quit!' to end)
    algori
    Possible
    completions:
    algorithm
    algorithmic
    Perform the auto completion lookup by storing a dictionary of words. (Searching, File Processing)

6. Write a C program that reads in words from a file, discarding any strings that do not look like words. The words must be stored in alphabetical order in a linked list, with each node holding the word and a count of the number of occurrences of the word. The file name is supplied as a command line argument, and when the file has been read, the words and their occurrence counts are output. (Linked List, Sorting, Searching)

    Sample Output:
    Cannot(1) Char(1) InputFile(2) MyString(1) ReadWordsFromFile(1) Usage(1) Word(3) WordCount(1) a(1) arguments(1) at(2) cerr(2) cout(9) else(5) end(1) error(1) file(1) for(1) if(8) ifstream(1) int(4) is(1) larger(1) linked(1) list(3) not(1) of(1) open(1) out(1) stopped(2) string(2) struct(1) to(1) typedef(1) void(2) while(3) word(1) wordcounter(1)

7. A network of cities is represented in the form of the graph whose details are provided below. The set V consists of all cities and the set E consists of the distances between the cities (in miles) for the respective links:

    a. Construct an undirected graph from the details given below.

        i. V = {Amherst, Boston, Hartford, Newhaven, Natick, Springfield}

        ii. E = {

            1. Amherst--Boston = 90
            2. Boston--Hartford = 100
            3. Amherst--Natick = 80
            4. Boston--Newhaven = 140
            5. Hartford--Newhaven = 40
            6. Newhaven--Natick = 120
            7. Newhaven--Springfield = 70
            8. Hartford--Springfield = 30
            9. }

    b. Compute the shortest path from A to F using Dijkstra's shortest path algorithm.
      (Graph & Traversal)

8. Suppose G is a directed graph with vertices labeled 1 through 8. Adjacent vertices for each vertex are listed as follows

        Vertex Adjacency
        1 2, 4 2 3, 5

        3 2, 4, 5
        4 1, 3
        5 2, 3, 6
        6 5, 7, 8
        7 6, 8
        8 6, 7

    (a) Construct an Adjacency matrix from the given adjacency list.

    (b) Order the vertices as they are visited in a depth-first traversal starting at vertex

    (c) Order the vertices as they are visited in a breadth-first traversal starting at vertex
        (Graph & Traversal)

9. Write a program that generates all integers between 1 and 100, then makes a hash that uses the number itself as the key and the number squared as the value. Ask the user to input a number between 1 and 100, and return the square of that number using the hash. Return an error message if the input number isn't an integer between 1 and 100.(Hashing)

10. Write the program for heap-sort and then illustrate how heap-sort processes the following array in-place: A = {33, 28, 23, 48, 32, 46, 40, 12, 21, 41, 14, 37, 38, 0, 25} In particular, show the content of the array at each main iteration of the algorithm.(Heap Sort)

140CA0309   **DBMS LABORATORY**

Category: Technical
Mode of Delivery: Practical –4 Hrs/Week;
Total hours: 45
Credit: 2

AIM:

To impart knowledge on the implementation of the various DBMS features to the students
using ORACLE, PostgreSQL and MySQL database.

LIST OF EXPERIMENTS:

Project 1: Web based Photos Sharing Portal*(Functions)*
Develop a web-based database application system that provides service to its clients for storing,
sharing, and searching their photos. The system, similar to flickr and PhotoShelter, can be used by its
clients to
> 1. Upload and store photos;
> 2.Enter and update the descriptive information (time, place, persons, caption, series,
> owner, copyright) for photos;
> 3. Specify the access privileges for your friends and/or public to share your photos; and
> search for photos with given words and/or other specified conditions.

Project 2: Web based Tour Planner*(Exceptions)*
Design a tour planner agent that offers the end users with a list of best tour plans against user
provided budget and tour options. The tour options may include the places of visit, the mode of
journey, hotel booking etc.,

Project 3*: Census Database(Cursors)*
The 2016 Census of India will start on February 7, 2016. The goal of this project is to build a database
which can provide various information's based on the census data. The parameters recorded in
census can be found in this site. http://censusindia.gov.in/Metadata/Metada.htm
The system may be interfaced with geographical maps like Google API.

Project 4: Resume consultant portal*(Packages)*

 Design a resume consultant portal which has two different kinds of end users.
Company: The companies may place their recruitment options like job description, candidate
educational profile, experience etc.
Job Seeker: The job seekers may submit their resume to the portal
The consultant finds the resumes that best match the job requirements of the different companies and
sends a notification to the company with a list of suitable applicants.

Project* 5: Indian Railways on Google Earth(Triggers)*
The goal of this project is to integrate any of the Map Web Services like Google Earth, Wikimapia,
TerraServer with the Indian Railway Train Enquiry System at www.indianrailway.gov.in. Two type of
queries should be supported:
(i) Users may specify source and destination on Map Servers. The system should return a page in
Indian railways displaying a list of trains between the nearest railway stations to source and
destinations.
(ii) Users may specify a train number or name, and the systems tracks the route of the train on the
map server with schedule of arrival and departure at different stations.

Recommended Databases: Oracle 11g ,PostgreSQL 6.3,MySQL 5.5

Front End : Java 8 / Visual C# 2013

140CA0401   **COMPUTER NETWORKS**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
The aim of the course is to introduce students to the foundations and principles of computer network with emphasis on networking technologies, architectures, standards, and protocols.

OBJECTIVES:
- ☐ Understanding Computer Network concepts and communication models.
- ☐ Understanding the Computer Network architectures and components required for data communication.
- ☐ Analyzing the function and design strategy of physical, data link, network layer and transport layer.
- ☐ Acquiring knowledge of various application Computer Network protocol standards developed for internet.

UNIT I DATA COMMUNICATIONS   9
Data Communications -Components –Data flow – Physical structures - Network types - Network Models ISO/OSI model–TCP/IP Model –Line Coding- Transmission Media

UNIT II DATA LINK LAYER   9
Error - Detection and Correction – Data Link Control-Flow control-Simple Protocol-Stop and Wait Protocol – Ethernet- IEEE 802.3- 802.11 – Connecting Devices -VLAN.

UNIT III NETWORK LAYER   9
Services -Switching concepts – Circuit switching – Packet switching –IP-Datagram-IPv4 Address– Subnetting- Network Address Translation (NAT)-IPv6–ICMP-Routing Algorithms - Distance-Vector Routing- Link-State Routing-BGP.

UNIT IV TRANSPORT LAYER   9
Transport layer –services –Connection establishment – Flow control – Transmission control protocol – Congestion control and avoidance – User datagram protocol. -Transport for Real Time Applications (RTP).

UNIT V APPLICATION LAYER   9
Applications - DNS – SMTP – FTP –WWW - SNMP- Security –RSA- DES -Web security -SSL.

TEXT BOOK:
1. Behrouz A.Forouzan , Data Communications and Networking, Fifth Edition, McGraw Hill, 2013.

REFERENCE BOOKS:
1. William Stallings, Data and Computer Communications, Ninth Edition, Prentice Hall, 2011.
2. Larry L. Peterson & Bruce S. Davie, Computer Networks – A systems Approachll, Fourth Edition, Harcourt Asia / Morgan Kaufmann, 2008.
3. Andrew S.Tannenbaum David J. Wetherall, Computer Networksll Fifth Edition, Pearson Education 2011.
4. James F. Kurose, Keith W. Ross, Computer Networking: A Top-down Approach, Pearson Education, Limited, Sixth Edition,2012.

140CA0402 MOBILE PROGRAMMING

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week
Total hours: 60
Credit: 4

AIM:

The course aims in providing knowledge about the development of iOS 8 native applications for iPhone and iPad with Swift programming.

OBJECTIVES:
    ☐Describe the software features provided by the Swift Programming Language.
    ☐Gain skills using the Swift classes.
    ☐Develop Swift code for iPhone, iPad and Mac OS X.

UNIT I INTRODUCTION TO SWIFT   9+3

Introduction to Programming. -Building Blocks -Model View Controller-Storyboards-Diving into Swift. Creating Variables -Modifying Strings-Collections-Loops-Conditional Statements-Optional- Methods - Return Values -Classes -Properties -Methods -Creating an Object -Accessing Properties - Calling Methods -Subclasses -Inheritance –Overriding-View Controllers.

UNIT II USER INTERFACE DESIGN   9+3
Devices and Auto Layout -More User Interfaces-Rotation and Adaptive Layout-Multiview Applications

UNIT III TAB BARS & TABLE VIEWS   9+3
Tab Bars and Pickers-Introduction to Table Views-Navigation Controllers and Table Views

UNIT IV VIEWS & CONTROLLERS   9+3
Collection View -Using Split Views and Popovers-Application Settings and User Defaults

UNIT V APP STORE SUBMISSION   9+3
Maps and Location-Map Kit-UIImagePickerController-Running on a Device-Certificates-Submitting to the App Store-Managing and Marketing Your App.

TEXT BOOKS:
1. Steve Derico ,Introducing Ios 8 Swift Programming From Idea To App Store, First Edition, O'Reilly Media,2014.(Unit I & V).
2. David Mark , Jack Nutting, Kim Topley , Fredrik Olsson , Jeff LaMarche, Beginning iPhone Development with Swift Exploring the iOS SDK, 2014. (Unit II,III,IV).

REFERENCE BOOKS:
1. Vandad Nahavandipoor, iOS 8 Swift Programming Cookbook, O'Reilly Media,First Edition,2014.
2. Swift Programming Language, Apple Inc.2014.

140CA0403   **WEB APPLICATION DEVELOPMENT**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week; Tutorial – 1 Hr/Week
Total hours: 60
Credit: 4

AIM:
The aim of this course is to introduce the concepts of web application development and the student can able to create and develop their own applications using J2EE and .NET.

OBJECTIVES:
- To acquire knowledge on the usage of recent platforms in developing web applications.
- To understand architecture of Spring and Core technologies.
- To create web applications using Hibernate.
- To create and design own applications using C#.NET with Database.
- To understand and design applications using Silverlight.

UNIT I SPRING INTRODUCTION AND CORE TECHNOLOGIES   **9+3**
Spring Introduction–Introduction –Inversion ofControl (IoC) Container – Aspect Oriented Programming (AOP) – The Middle Tier – The Web Tier – Everything else – Migrating to Spring 2.5.
Core Technologies: The IoC Container – Introduction–Basics-containers and beans–Dependencies – Bean scopes – Customizing the nature of a bean – Bean definition inheritance – Container extension points – The Application Context – Annotation-based configuration.

UNIT II ORM AND WEB MVC FRAMEWORK   **9+3**
Object Relational Mapping (ORM) data access:Introduction–Hibernate–JDO–Oracle Top Link–iBATIS SQL Maps – JPA – Transaction Management.
Web MVC Framework:Introduction–The Dispatcher Servlet–Controllers–Handler mappings–Convention over configuration – Annotation-based controller configuration.

UNIT III .NET OVERVIEW   **8+3**
Introduction - .Net revolution - .Net framework and its architecture – Common Language Runtime (CLR) – Common Type System (CTS) – Common Language Specification (CLS) – Microsoft Intermediate Language (MSIL) – Assembly – Namespaces – Class Libraries.

UNIT IV C#.NET   **9+3**
Overview to C# - C # Compilation and Execution Process – C# Fundamentals (Data types, Operators, Programming constructs) – Inheritance –Sealed Classes – Interface - Overloading – Overriding – Method Hiding – C# Property – Exception Handling.

UNIT V ASP.NET AND SILVERLIGHT   **10+3**
ASP.Net- IIS - ASP.Net Page Life Cycle – ASP Vs ASP.Net - HTML Controls Vs Server side Controls – Validation Controls – Data binding in ASP.Net – Caching – Configuration in ASP.Net (web.config) – Session management – View State in ASP.Net – ASP.Net. Introduction - RIA – Silver light – XAML – App.Xaml – XAP – How Silver light application executes in a web browser.

TEXT BOOKS:
1. Rod Johnson, Juergen Hoeller, Spring Java/J2EE Application Frameworkll, The Spring Framework – Reference Documentation, Version 2.5.6,Copyright2004-2008 (Unit I,II)
2. Jeff Prosise, Programming Microsoft .NET, Microsoft Press, 2004. (Unit III)
3. Jesse Liberty , Programming C#, Fourth Edition, O'Reilly Media. (Unit IV)
4. Mario Szpuszta, Matthew MacDonald , Pro ASP.NET 4 in C# 2010: Includes Silverlight 2, Third Edition, Apress (Unit V)

REFERENCE BOOKS:
1. David Winterfeldt, Spring by Example, Version 1.5, Copyright © 2008-2015.
2. Seth Ladd and Keith Donald, Expert Spring MVC and Web Flows, APress, Copyright © 2006.
3. Jason Beres, Bill Evjen, Devin Rader , Professional Silverlight 4 Print, December 2012 www.free- ebooks-library.com.
4. David S Plat, Introducing Microsoft .NET, Third Edition, Microsoft Press, 2003.
5. Chris Sells, Jon Flanders, Ian Griffiths, Mastering Visual Studio .Net, Shroff/O'Reilly, 2003.
6. Mike Snell, Lars Powers, Microsoft Visual Studio 2008 Unleashed, Pearson, 2007.
7. Glenn Johnson, Programming Microsoft ADO.NET 2.0 Applications: Advanced Topics, WP Publishers & Distributors Pvt. Ltd., 2005.

140CA0407 MOBILE PROGRAMMING LABORATORY

Category: Technical
Mode of Delivery: Practical –4 Hrs/Week;
Total hours: 45
Credit: 2

AIM:

Creating full-featured apps that are visually appealing, highly interactive and user-friendly, giving the best opportunities to develop business apps.

LIST OF EXPERIMENTS:

1. Design an application for Managing Home Appliances with HomeKit APP.
2. Design an Universal Calculator that works on both the iPad and iPhone .
3. Create an application that presents a list of popular Flickr photo spots and let users pick favorites.
4. Design an application for storing Contacts app.
5. Design an app for Scheduling tasks with iOS Calendar.
6. Design a Passport app displaying a pin in each country visited.
7. Creating a Simple Game with a Custom Picker.

140CA0408 WEB APPLICATION DEVELOPMENT LABORATORY

Category: Technical
Mode of Delivery: Practical –4 Hrs/Week;
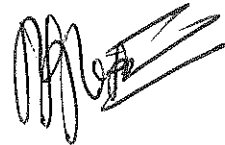**Total hours: 45**
Credit: 2

AIM:
To develop the ability of the students to design and write programs for implementing real time applications using Web Application Development.

LIST OF EXPERIMENTS:

1. Create a simple Spring Application.
2. Create a simple Hibernate database operation.
3. Create a simple Spring Transactional JUnit 4 test of Hibernate transaction.
4. Creating a basic webapp that will handle UTF-8 characters from form input using JSP.
5. Develop a C#.NET application for Voting System.
6. Develop an ASP.NET application for online ticket booking system.
7. Develop a Mobile application using Silver light..

140CA9111   SOFTWARE ARCHITECTURE

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
Students will understand the concepts behind various software systems architectures, how to choose the appropriate architecture and access services provided by that architecture.

OBJECTIVES:
- Understand the role of a software architecture in the development of an enterprise application system
- Examine and compare various architecture view types and styles
- Develop the ability to read and understand the models that are used to document a software architecture
- Explore various aspects of client-server architectures including web architectures.

UNIT I INTRODUCTION   **9**
Architecture business cycle – architectural patterns – reference models – architectural structures, views – Basic Concepts of Software Architecture

UNIT II SOFTWARE ARCHITECTURAL PATTERNS   **9**
Architectural Patterns – Introduction to Styles – Simple Styles - Distributed and Networked Architectures- Architecture for network based applications – Decentralized Architectures

UNIT III DESIGNING FOR NON FUNCTIONAL PROPERTIES   **9**
Understanding Quality Attributes – Functionality and Architecture – Architecture and Quality Attributes – System Quality Attributes – Quality attribute Scenarios in Practice - Introducing Tactics – Availability Tactics – Modifiability Tactics – Performance Tactics - Security Tactics – Testability Tactics – Usability Tactics – Relationship of Tactics to Architectural Patterns – Architectural Patterns and Styles

UNIT IV ARCHITECTURE DESCRIPTION DOCUMENTATION AND EVALUATION   **9**
Early Architecture Description Languages – Domain and Style Specific ADLs – Extensible ADLs - Documenting Software architecture - Architecture Evaluation – ATAM

UNIT V ARCHITECTURE ADAPTATION AND CASE STUDY   **9**
A Conceptual Framework for Architectural Adaptation – Techniques for supporting architecture centric change- The World Wide Web – A Case Study in Interoperability.

                                                             L:45T:0Total:45 Periods

TEXT BOOKS:
1. Richard N.Taylor, Nenad Medvidovic and Eric M.Dashofy, Software Architecture, Foundations, Theory and Practice, Wiley 2010 (Unit II, IV,V).
2. Len Bass, Paul Clements, Rick Kazman, Software Architecture in Practice, Third Edition, Addison-Wesley, 2003 (Unit I,II,IV,V).

REFERENCE BOOKS:
1. Mary shaw and David Garlan, Software Architecture – Perspectives on an emerging discipline, Pearson education, 2008.
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Michael Stal, Pattern Oriented Software Architecture ,Volume 1, 1996.

140CA9112   **DESIGN PATTERNS**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
To enable students to understand the challenges of advanced software design and the issues associated with large-scale software architectures and patterns.

OBJECTIVES:
- ☐ Understanding the knowledge about patterns.
- ☐ Designing patterns that enable the reuse of software architectures.
- ☐ Investigate the development of good design patterns.

UNIT I BACKGROUND ON DESIGN PATTERNS   9

Pattern concept - Pattern taxonomy - Design structures - Design principles- The singleton classifying patterns - Design patterns - The learning process - Studying design patterns - Object oriented approaches - The java foundation classes - Java design patterns – The development challenge

UNIT II DESIGN PATTERN CATALOG   9
Creational patterns - Factory pattern - Abstract factory pattern - Builder pattern - Factory method – Prototype pattern – Singleton pattern - Summary of creational patterns.

UNIT III THE JAVA FOUNDATION CLASSES   9
Installing and using the JFC - Ideas behind swing - The swing class hierarchy - Writing a simple JFC program - Buttons and toolbars -Menus and actions - The JList class - The JTable class - The JTree class.

UNIT IV STRUCTURAL PATTERNS   9
Structural Patterns Adapter - Bridge – Composite – Decorator – Façade – Flyweight – Proxy - Comparison with structural patterns.

UNIT V BEHAVIORAL PATTERNS   9
Behavioral Patterns Chain of responsibility- Command - Interpreter – Iterator – Mediator – Memento – Observer – State – Strategy - Template method – Visitor - Discussion of behavioral patterns.

TEXT BOOK:
1. James W. Cooper, The Design Patterns Java Companions, Addision Wesley Design Patterns Series, 2012

REFERENCE BOOKS:
1. Bruce Eckel, Thinking in Patterns with Java, MindViewInc, 2006.
2. Cay S. Horstmann , Object-Oriented Design and Patterns, John Wiley & Sons, 2005.
3. Dr. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, Design Patterns: Elements of Reusable Object-Oriented Software, Pearson publications Ltd, 2004.

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
The aim of this course is to enlighten the comprehension on the foundations of Human Computer Interaction.

OBJECTIVES:
- Provide comprehension on the foundations of Human Computer Interaction
- Present the design technologies for individuals and persons with disabilities and design effective dialog for HCI
- Provide awareness of mobile HCI and design aspects on mobile
- Suggest guidelines for Creating the user interface with intelligent agents.

UNIT I FOUNDATIONS & DESIGN OF HCI   **10**
Interaction Models – Frameworks – Ergonomics – Styles – Elements – Interactivity – Paradigms. HCI in software process – Software life cycle – Usability engineering – Prototyping – Design Rationale – Design rules – Evaluation Techniques- Universal Design.

UNIT-II MULTIMEDIA UI   **9**
Interactive Design basics – process – scenarios – navigation – screen design – Iteration and prototyping. Multimedia UI :Multimedia User Interface Design - Cognitive Background - Information Architecture - Media Selection and Combination - Interaction and Navigation.

UNIT-III MOBILE HCI   **9**
Mobile Ecosystem: Platforms, Application frameworks- Types of Mobile Applications: Widgets-Applications- Games- Mobile Information Architecture- Mobile 2.0, Mobile Design: Elements of Mobile Design- Tools.

UNIT-IV WEB INTERFACE DESIGN   **8**
Designing Web Interfaces – Drag & Drop, Direct Selection, Contextual Tools- Overlays- Inlays and Virtual Pages- Process Flow.Case Studies.

UNIT-V INTELLIGENT AGENT   **9**
Agents and Multi-Agent Systems- Concepts for Building Agents- Architectural Design: Specifying the Agent Types –Interactions - Detailed Design: Capabilities, Plans and Events-Implementing Agent Systems.

TEXT BOOKS:
1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, Human Computer Interactionll, Third Edition, Pearson Education, 2004.(Unit I & II)
2. Brian Fling, Mobile Design and Development, O'Reilly Media Inc., First Edition , 2009. (Unit III)
3. Bill Scott and Theresa Neil, Designing Web Interfaces, O'Reilly, First Edition, 2009.(Unit IV)
4. Lin Padgham& Michael Winikoff, Developing Intelligent Agents –A practical Guide ,John Wiley & Sons Ltd,2004. (Unit V)

REFERENCE BOOK:
1. Andrew Sears, Julie A. Jacko, The Human Computer Interaction Handbook, Second Edition, Lawrence Erlbaum Associates, New York, 2008.

140CA9114   **CYBER SECURITY**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
The aim of this course is to introduce the concepts of cyber security and also understand the various levels of security mechanism.

OBJECTIVES:
- Understand the basic concepts of computer security and policies.
- Analyze and implement the cryptography and cipher technique concepts.
- An exposure about how to manage their authentication and key management.
- Apply their concepts about intrusion detection, network security and system security in various applications.
- An exposure about how to create their own applications for user security and program security.

UNIT I COMPUTER SECURITY AND NETWORK SECURITY POLICIES   **9**
Overview of Computer Security: Basic Components – threats-policy and mechanism-Assurance-operational issues-human issues. Information and Network Security Policies: Security policies-confidentiality policies-integrity policies-hybrid policies.

UNIT II BASIC CRYPTOGRAPHY AND CIPHER TECHNIQUES   **9**
Basic Cryptography: Classical cryptosystems-public key cryptography-cryptographic checksums. Cipher Techniques: Problems-stream and block ciphers-networks and cryptography-Secure Electronic mail PEM-Security at the Network Layer IPsec.

UNIT III AUTHENTICATION & KEY MANAGEMENT   **9**
Authentication: Basics-passwords-Challenge Response-Biometrics. KEY Management: Key Exchange-cryptographic key infrastructures-storing and revoking keys-digital signatures.

UNIT IV INTRUSION DETECTION, NETWORK SECURITY & SYSTEM SECURITY   **9**
Intrusion Detection: Principles-basic intrusion detection-models-architecture-organization of intrusion detection system-intrusion response. Network Security: Introduction-policy development-network organization. System Security: Introduction-policy-networks-users-authentication-processes-files-retrospective.

UNIT V USER SECURITY & PROGRAM SECURITY   **9**
User Security: Policy-access-files and devices-processes-electronic communications. Program Security: Introduction-Design-refinement and implementation-common security related programming problems-testing, maintenance and operation.

TEXT BOOK:
1. Sathyanarayana S.Venkatramanayya, Introduction to Computer Security, Pearson Education, 2013.

REFERENCE BOOKS:
1. William Stallings, Cryptography And Network Security: Principles And Practice, Fifth Edition, Pearson Education, 2013.
2. Bernard Menezes, Network Security and Cryptography, Cengage Learning, 2011.

Category: General
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
Learn about principles of financial accounting along with the preparation of final accounts.

OBJECTIVES:
- To understand the basic principles of Double entry system, preparation of final accounts and financial ratio analysis.
- To make financial decision through management accounting viz. budgets, requirements of working capital and analysis of capital structure
- To understand the process of estimating the cost of a particular product.
- To ascertain the time value of money and make prepare for investment decision.

UNIT I FINANCIAL ACCOUNTING   9

Meaning and Scope of Accounting – Principles: Concepts – Conventions - Accounting Standards; Final Accounts: Trail Balance - Trading Account - Profit and Loss Account - Balance Sheet – Simple problems – Financial Ratio Analysis – Application of Accounting package software – Software solution to the Simple Problem.

UNIT II MANAGEMENT ACCOUNTING   9

Financial Accounting Vs Management Accounting - Funds Flow Analysis - Cash Flow Analysis - Budgets and Budgetary Control: Meaning – Types - Sales Budget - Production Budget - Cost of Production Budget - Flexible Budgeting - Cash Budget - Master Budget - Zero Base Budgeting-Computerized Accounting.

UNIT III COST ACCOUNTING   9

Cost Accounting Meaning – Objectives - Elements of Cost- Cost Sheet; Marginal Costing and Cost Volume Profit Analysis - Break Even Analysis – Applications – Limitations; Standard Costing and Variance Analysis: Material – Labour – Overhead – Sales - Profit Variances.

UNIT IV INVESTMENT DECISION AND COST OF CAPITAL   9

Objectives and Functions of Financial Management - Risk-Return Relationship - Time Value of Money Concepts; Capital Budgeting: Methods of Appraisal - Cost of Capital Factors Affecting Cost of Capital - Computation for Each Source of Finance and Weighted Average Cost of Capital

UNIT V FINANCING DECISION AND WORKING CAPITAL MANAGEMENT   9
Capital Structure-Factors Affecting Capital Structure-Dividend Policy - Types of Dividend Policy -
Concepts of Working Capital - Working Capital Policies - Factors affecting Working Capital-Estimation of Working Capital Requirements

TEXT BOOKS:
1. S.N.Maheswari, Financial and Management Accounting, Sultan Chand & Sons,FifthEdition,2010.
2. I.M.Pandey, Financial Management, Vikas Publishing House Pvt. Ltd., Ninth Edition, 2009.
3. M.Y.Khan and P.K.Jain, Financial Management, Text, Problems and Cases, Tata McGraw Hill,Fifth Edition, 2008.
4. AswatDamodaran, Corporate Finance Theory and Practice, JohnWiley& Sons, 2008.
5. I.M.Pandey, Management Accounting, Vikas Publishing House Pvt. Ltd., Third Edition, 2009.
6. Brigham, Ehrhardt, Financial Management Theory and Practice Eleventh Edition, Cengage Learning, 2008.
7. Srivatsava, Mishra, Financial Managementll, Oxford University.

140CA9116   DATA MINING AND DATA WAREHOUSING

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
The aim is to introduce the techniques and concepts of data mining and data warehousing to be implemented in real time systems.

OBJECTIVES:
- ☐ Imparting the concepts and techniques of data mining.
- ☐ Developing skills in data mining tools for solving practical problems.
- ☐ Implementation of algorithms, models and systems for technological advancements in the area of Data Mining.
- ☐ Exposure of real world experience to undergo independent study and research

UNIT I INTRODUCTION TO DATA WAREHOUSE   9

Data Warehousing and Business Analysis: - Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools –Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis.

UNIT II DATA MINING & DATA PREPROCESSING   9

Data Mining: - Data Mining Functionalities – Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation. Association Rule Mining: Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint-Based Association Mining.

UNIT III CLASSIFICATION & PREDICTION   9

Classification and Prediction: - Issues Regarding Classification and Prediction – Classification by Decision Tree-Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT IV CLUSTERING   9

Cluster Analysis: - Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.

UNIT V SPATIAL DATA ANALYSIS   9

Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

TEXT BOOK:
1. Jiawei Han &Micheline Kamber, Data Mining: Concepts and Techniques, Third Edition, Morgan Kaufmann Publishers, 2011.

REFERENCE BOOKS:
1. Alex Berson & Stephen J. Smith, Data Warehousing, Data Mining & OLAP, Tata McGrawHill,2008.
2. Usama M.Fayyad, Gregory Piatetsky ,Shapiro Padhrai Smyth & Ramasamy Uthurusamy, Advances In Knowledge Discovery and Data Mining, The M.I.T Press, 2012.
3. Ralph Kimball, The Data Warehouse Life Cycle Toolkit, John Wiley & Sons, Second Edition, 2008.
4. Sean Kelly, Data Warehousing in Action, John Wiley & Sons Inc., 2007.
5. Pang-Ning Tan, Michael Steinbach and Vipin Kumar Introduction to Data Mining, Pearson Education, 2007.

AGILE SOFTWARE DEVELOPMENT

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:

To gain knowledge on Agile methods for software development and attain an in-depth knowledge of applying SCRUM for product development.

OBJECTIVES:
- Overview of Agile Methods and extreme programming for software development
- Introduce the concepts SCRUM Technology
- To have an in-depth knowledge on applying SCRUM for agile-based software development including practices, individuals and team work

UNIT I AGILE METHODOLOGY   **8**
Understanding Success-Beyond deadlines-importance of Organizational Success-Agile model - classification of agile methods –Road to Mastery-Find a mentor

UNIT II EXTREME PROGRAMMING(XP)   **10**
Method overview – lifecycle – XP Team-XP concepts –practicing XP –Thinking –collaborating-Releasing-Development .Mastering Agility :XP values and principles: commonalities – About values, principles and practices .Improve the process.

UNIT III SCRUM PRACTICES AND INDIVIDUALS   **10**
Individual Roles – Scrum Master – Product Owner – Changed Roles: Analysts, Project Managers, Architects, Functional Managers, Programmers, DB Administrators, Testers, User Experience Designers - Technical Practices – Strive for Excellence - Test-driven development – Refactoring – Collective Ownership – Continuous Integration – Pair Programming –Design: Intentional yet Emergent Guiding the Design

UNIT IV SCRUM TEAMWORK   **8**
Team Structures – Small Team Productivity – Feature Teams – Component Teams – Guidelines for Good Team Structure – Team Responsibility – Foster Team Learning – Self Organizing Team – Influencing Evolution: Selecting Environment, Defining Performance, Manage Meaning, Energizing the System.

UNIT V SCRUM SPECIFICATION   **9**
Product Backlog – Documents to Discussions – Written Documentation Disadvantages – User Stories Progressively Refine Requirements – Emergent Requirements – Backlog Iceberg – Refining User Stories – Specify by Example.

TEXTBOOKS:
1. James Shore and Shane Warden ,The Art of Agile Development, O'Reilly Media,2007. (Unit I & II).
2. Mike Cohn, Succeeding with Agile: Software Development Using Scrum, Addison-Wesley Professional, First Edition, 2009. (Unit III to V.)

REFERENCE BOOKS:
1. Craig Larman, Agile and Iterative Development A Manager's Guide Pearson Education 2004.
2. Alistair Agile Software Development series Cockburn - 2007
3. Elisabeth Hendrickson, Agile Testing Quality Tree Software Inc 2008.

140CA9118   UNIX & NETWORKING PROGRAMMING

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
Impart the skills of introducing the techniques and concepts of Unix& Networking concepts in real time systems

OBJECTIVES:
- Learn the environment of UNIX and to implement the concepts of networks.
- Impart the interprocess communication between files.
- Enlighten about the sockets programming.

UNIT I INTRODUCTION TO UNIX AND FILE SYSTEM   9
Unix Architecture and Command Usage - General Purpose Utilities – File System – Handling Ordinary Files – Basic File Attributes – Essential Shell Programming – File I/O – Files and Directories – System Data Files and Information: Password File – Group File – Login Accounting.

UNIT II PROCESSES   9
Process Environment – Process Control – Process Relationships: Terminal Logins – Network Login – Process Groups – Session – Job Control – Signals.

UNIT III INTERPROCESS COMMUNICATION   9
Introduction – Message Passing (SVR4) – Pipes – FIFO – Message Queues – Semaphores – Shared Memory.

UNIT IV SOCKETS   9
Introduction – Transport Layer – Socket Introduction – Elementary TCP Sockets – UDP Sockets – Socket Options – Name and Address conversions.

UNIT V APPLICATIONS   9
Debugging Techniques – TCP Echo Client Server – UDP Echo Client Server – Ping – Trace Route – Client Server Applications like File Transfer and Chat.

TEXT BOOKS:
1. W. Richard Stevens, -Advanced Programming in the UNIX Environment, Addison Wesley, New Delhi, 2008.(Unit I to III)
2. Unix Network Programming, Volume 1: The Sockets Networking API - Volume-1-The-Sockets-Networking-API, Addison-Wesley Professiona1 2011.(Unit IV & V).

REFERENCE BOOKS:
1. Maurice J. Bach, Design of the Unix Operating System‖, Prentice Hall, New Delhi,2007.
2. Meeta Gandhi,Tilak Shetty & Rajiv Shah , The C_ Odyssey Unix –The OpenBoundless C, FirstEdition, BPB Publications,1992.

140CA9119   SERVICE ORIENTED ARCHITECTURE

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:
The aim of this course is to provide basic knowledge about XML, Web Services and key technologies for web services.

OBJECTIVES:
- ☐ Provide fundamental concepts of Service Oriented Architecture
- ☐ Understand XML structure, presentation and transformation technologies
- ☐ Gain knowledge about SOAP, UDDI and WSDL to create web services
- ☐ Impart information on various WS-* specification standards

UNIT I SOA BASICS   9
Roots of SOA – Characteristics of SOA - Comparing SOA to client-server and distributed internet architectures – Anatomy of SOA- components in an SOA interrelate - Principles of service orientation – Service Layers.

UNIT II XML AND WEB SERVICES   9
XML structure – Elements – Creating Well-formed XML - Name Spaces – Schema Elements, Types, Attributes – XSL Transformations – Parser –Web Services Overview – Architecture.

UNIT III WEB SERVICES STANDARDS: 9
WS-Coordination overview -WS-Addressing language basics-WS-Reliable Messaging language basics-WS-Policy language basic-WS-Security language basics

UNIT IV WSDL, SOAP and UDDI   9
WSDL - Overview Of SOAP – HTTP – XML-RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns And Faults – SOAP With Attachments – UDDI.

UNIT V SOA in J2EE and .NET   9
SOA platform basics – SOA support in J2EE – Platform overview- Primitive SOA support- Support for service-orientation principles- Contemporary SOA support- SOA support in .NET- Platform overview- Primitive SOA support- Support for service-orientation principles- Contemporary SOA support

TEXT BOOKS:
1. Thomas Erl, Service-Oriented Architecture: Concepts, Technology, and Design, Pearson Education, 2006. (Unit I, III, V).
2. Frank. P.Coyle, XML, Web Services and The Data Revolution, Pearson Education,2007(Unit II,IV)

REFERENCE BOOKS:
1.Sandeep Chatterjee, James Webber, Developing Enterprise Web Services. An Architect's Guide, Pearson Education, 2005.
2.Newcomer, Lomow, Understanding SOA with Web Services, Pearson Education, 2005.
3.Dan woods and Thomas Mattern, Enterprise SOA designing IT for Business Innovation O'Reilly, First Edition, 2006.

140CA9120   **VIRTUALIZATION TECHNIQUES**

Category: Technical
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM

Develop a focused technology view targeted at Virtualization with a focus on Computing and Networking virtualization

OBJECTIVE

- ☐ Analyze the different computing Virtualization tools and techniques.
- ☐ Understand the layers of Network Virtualization.
- ☐ Evaluate the different storage mechanisms & their platforms.

UNIT I OVERVIEW OF VIRTUALIZATION   10

Basics of Virtualization - Virtualization Types – Desktop Virtualization   – Network Virtualization – Server and Machine Virtualization – Storage Virtualization – System-level or Operating Virtualization – Application Virtualization-Virtualization Advantages – Virtual Machine Basics – Taxonomy of Virtual machines - Process Virtual Machines – System Virtual Machines – Hypervisor - Key Concepts

UNIT II SERVER CONSOLIDATION   8

Hardware Virtualization – Virtual Hardware Overview - Sever Virtualization – Physical and Logical Partitioning - Types of Server Virtualization – Business cases for Sever Virtualization – Uses of Virtual server Consolidation – Planning for Development – Selecting server Virtualization Platform

UNIT III NETWORK VIRTUALIZATION   10

Design of Scalable Enterprise Networks - Virtualizing the Campus WAN Design – WAN Architecture - WAN Virtualization - Virtual Enterprise Transport Virtualization–VLANs and Scalability - Theory Network Device Virtualization Layer 2 - VLANs Layer 3 VRF Instances Layer 2 - VFIs Virtual Firewall Contexts Network Device Virtualization - Data- Path Virtualization Layer 2: 802.1q - Trunking Generic Routing Encapsulation – Ipsec L2TPv3 Label Switched Paths - Control-Plane Virtualization–Routing Protocols- VRF - Aware Routing Multi-Topology Routing.

UNIT IV VIRTUALIZING STORAGE   8

SCSI- Speaking SCSI- Using SCSI buses – Fiber Channel – Fiber Channel Cables – Fiber Channel Hardware Devices – iSCSI Architecture – Securing iSCSI – SAN backup and recovery techniques – RAID – SNIA Shared Storage Model – Classical Storage Model – SNIA Shared Storage Model – Host based Architecture – Storage based architecture – Network based Architecture – Fault tolerance to SAN – Performing Backups – Virtual tape libraries.

UNIT V VIRTUAL MACHINES PRODUCTS   9

Xen Virtual machine monitors- Xen API – VMware – VMware products – Vmware Features – Microsoft Virtual Server – Features of Microsoft Virtual Server

TEXT BOOKS:
1. William von Hagen, Professional Xen Virtualization, WroxPublications,January,2008.(Unit I & V)
2. Chris Wolf , Erick M. Halter, Virtualization: From the Desktop to the Enterprise,APress 2005.(Unit II)
3. Kumar Reddy, Victor Moreno, Network virtualization, Cisco Press, July, 2006.(Unit III)
4. James E. Smith, Ravi Nair, Virtual Machines: Versatile Platforms for Systems and Processes, Elsevier/Morgan Kaufmann, 2005.(Unit I)
5. David Marshall, Wade A. Reynolds, Advanced Server Virtualization:VMware and Microsoft Platform in the Virtual Data Center, Auerbach Publications, 2006.(Unit IV)

REFERENCE BOOKS:
1. Dan Kusnetzky,Virtualization : A Managers Guide,Oreilly,First Edition,2011.
2. David Chisnall ,The Definitive Guide to the Xen Hypervisor Prentice Hall Open Source Software Development Series,2008.

140CA9121   **HEALTH CARE MANAGEMENT**

Category: General
Mode of Delivery: Lecture –3 Hrs/Week;
Total hours: 45
Credit: 3

AIM:

To know about creating and maintaining health care information systems

OBJECTIVES:
- ☐ Understand the basic concepts of health care system.
- ☐ Ensure access of clinical information system on the fly
- ☐ Understand IT governance and assessment of health care information system

UNIT I INTRODUCTION   9
Introduction to health care information – Health care data quality – Health care
information regulations, laws and standards.

UNIT II HEALTH CARE INFORMATION SYSTEMS   9
History and evolution of health care information systems – Current and emerging use of clinical
information systems – system acquisition – System implementation and support.

UNIT III INFORMATION TECHNOLOGY   9
Information architecture and technologies that support health care information systems – Health care
information system standards – Security of health care information systems.

UNIT IV MANAGEMENT OF IT CHALLENGES   9
Organizing information technology services – IT alignment and strategic planning – IT governance
and management.

UNIT V IT INITIATIVES   9
Management's role in major IT initiatives – Assessing and achieving value in health care information
systems. Case study

TEXT BOOK:
1.Karen A Wager, Frances Wickham Lee, John P Glaser, Managing Health Care Information
  Systems: A Practical Approach for Health Care Executives, Wiley publications, Third Edition, 2013.

REFERENCE BOOKS:
1. Marion J. Ball, Charlotte Weaver, Joan Kiel ,Healthcare Information Management Systems: Cases,
   Strategies, and Solutions, Springer, Third Edition ,2010.
2. Rudi Van De Velde and Patrice Degoulet, Clinical Information Systems: A Component based
   approach, Springer 2005.
3. Kevin Beaver,Healthcare Information Systems, Second Edition Best Practices, CRC Press,2002.
4. Marion J. Ball Healthcare Information Management Systems: A Practical Guide Springer-Verlag
   GmbH, 1995.