Course Title: Advanced Database Management System
Course No: CSC-401 **Full Marks:** 60 + 20 + 20
Credit Hours: 3 **Pass Marks:** 24 + 8 + 8

Nature of Course: Theory (3Hrs.) + Lab (3Hrs.)

Synopsis: To study the concept of advanced database techniques

Goals: To study the further advanced database techniques beyond the fundamental database techniques which were covered in the sophomore year (fourth semester) BCScIT course, and thus to acquaint the students with some relatively advanced issues. At the end of the course students should be able to: critically assess new developments in database technology, Interpret and explain the impact of emerging database standards, evaluate the contribution of database theory to practical implementations of database management systems.

Course Contents:

Unit 1: The Relational Model of Data and RDBMS Implementation Techniques 5 Hrs.

Theoretical concepts, Relational model conformity and Integrity, Advanced SQL programming, Query optimization, Concurrency control and Transaction management, Database performance tuning, Distributed relational systems and Data Replication, Security considerations

Unit 2: The Extended Entity Relationship Model and Object Model: 6 Hrs.

The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

Unit 3: Emerging Database Management System Technologies 18 Hrs.

Object Oriented database concepts; Object Relational database concepts; Active database concepts; Temporal database concepts; Spatial database concepts and architecture; Deductive databases and Query processing; Mobile Databases; Geographic Information Systems.

Unit 4: New database applications and environments 8 Hrs.

Data Warehousing and Data Mining, Multimedia; Mobility; Multidatabases; Native XML databases (NXD), Internet

Unit 5: Database Related Standards 8 Hrs.

SQL standards, SQL 1999, SQL: 2003, Object Data Management Group (ODMG) version 3.0 standard, Standards for interoperability and integration e.g. Web Services, SOAP, XML related specifications, e.g. XQuery, XPath.

Laboratory Projects: The course involves a mini project using any one of the popular Commercial Object-Oriented DBMS software such as Oracle, MS SQL Server etc, along with any MVC software development framework.

Reference Books:

1. Elmasri and Navathe, Fundamentals of Database Systems, Pearson Education
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill
3. Korth, Silberchatz, Sudarshan , Database System Concepts, McGraw-Hill.
4. Peter Rob and Coronel, Database Systems, Design, Implementation and Management, Thomson Learning.
5. C. J. Date & Longman, Introduction to Database Systems, Pearson Education

Prerequisite: Be familiar with at least one OO programming language such as .Net or C++ or Java, Fundamentals of DBMS, SQL

Homework Assignments: Homework assignments can be given according to the course covered throughout the semester.

Computer Usage: Windows or Linux based PC or workstation, Commercial OODBMS software package and MVC software development framework installed at the server.

Category Content: Science Aspects: 60%
Design Aspects: 40%

Course Title: Internet Technology
Course no: CSC-402 Full Marks: 60+20+20
Credit hours: 3 Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Study on internet protocols, client/server applications and web services. Designing and applications of internet and intranet system.

Goal: This course deals on the practical application of internetworking technologies to private intranets for information management and public internets for electronic commerce students will learn theoretical details, strategies for designing sites, techniques for creating their technical infrastructures, methods for developing content, and techniques for site deployment and management.

Course Contents:

1. Introduction **5Hrs.**

1.1. History and Development of Internets and Intranets
1.2. IANA, RIR/NIR/LIR and ISPs for internet number management
1.3. Internet Domain and Domain Name System
1.4. Internet Access Overview
1.5. Internet Backbone Networks: Optical Backbone, Marine Cables, Teleports, Satellite and Terrestrial Links

2. Internet Protocol Overview **6Hrs.**

2.1. TCP/IP and the IP Layer overview
2.2. IPv4 and IPv6 Address Types and Formats
2.3. IPv4 and IPv6 Header Structure
2.4. Internet RFCs

3. Protocols and Client/Server Applications **6Hrs.**

3.1. Standard Protocols: SMTP, E-mail Message (RFC22), PGP, POP, IMAP, HTTP, FTP
3.2. N-Tiered Client/Server Architecture
3.3. Universal Internet Browsing
3.4. Multiprotocol Support

4. HTTP and the Web Services **8Hrs.**

4.1. HTTP, Web Servers and Web Access
4.2. Universal naming with URLs
4.3. WWW Technology: HTML, DHTML, WML, XML
4.4. Tools: WYSIWYG Authoring Tools
4.5. Helper applications: CGI; PERL, JAVA, JAVA SRIPTS, PHP, ASP, .NET Applications
4.6. Introduction to AJAX (Programming)
4.7. Browser as a rendering engine: text, HTML, gif and jpeg

5. Designing Internet Systems and Servers **8Hrs.**

5.1. Designing of Internet System Network Architecture
5.2. Choice of platforms

5.3. Server Concepts: WEB, Proxy, RADIUS, MAIL
5.4. Cookies
5.5. Load Balancing: Proxy Arrays
5.6. Server Setup and Configuration Guidelines
5.7. Security and System Administration Issues, Firewalls and Content Filtering

6. Internet and Intranet Systems Development 6Hrs.

6.1. Introductions
6.2. Benefits and drawbacks of intranets
6.3. Protocols, Structure and Scope of Networks
6.4. Intranets Resource Assessments: Network Infrastructure, Clients and Server Resources
6.5. Intranet Implementation Guidelines
6.6. Content Design, Development, Publishing and Management
6.7. Intranet Design with Open source Tools: DRUPAL, JUMLA
6.8. Tunneling Protocols: VPN

7. Internet and Intranet Applications 6Hrs.

7.1. General Applications: Email, WWW, Gopher, Online Systems
7.2. Multimedia and Digital Video/Audio Broadcasting: Video/Audio Conferencing, Internet Relay Chat (IRC)
7.3. Broadband Communications, Policy, xDSL and Cable Internet
7.4. VoIP, GoIP and IP Interconnection
7.5. Datacenters and Data warehousing, packet clearing house
7.6. Unified Messaging Systems
7.7. Fundamental of e-Commerce
7.8. Concept of Grid and Cloud Computing

Laboratory Work: Laboratory should include features like packet capturing and analysis, design of internet/intranet system, proxy administration, firewall configuration and management, VPN, implementation of IRC, Content development with JUMLA/DRUPALmentioned in the syllabus.

Reference books:

1 Computer Networks; Andrew S. Tanenbaum, Prentice Hall India limited, New Delhi, 2010.
2 Internet and Intranet Engineering; Daniel Minoli, MGraw-Hill India Limited, New Delhi, 2009.
3 Internetworking with TCP/IP; Comer, D.E and Stevens

Course Title: Advanced Java Programming
Course Code: CSC-403 Full marks: 60+20+20
Credit Hours: 3 Pass Marks: 24+8+8

Nature of the course: Theory (3 Hrs.) +Lab (3 Hrs)

Course Synopsis: A study in Java language techniques beyond the introductory course. Emphasis will include, GUI and event-driven programming, Database Connectivity, Socket Programming, Remote Method Invocation and Servlets and JSP Technology

Goal: The purpose of this course is to present the concept of GUI programming and JDBC, Socket programming and remote objects, and JSP Technology. Since software components are best learned by implementation, each student will complete a project independently which will involve the design and implementation three software components.

Course Contents:

Unit 1: Programming in Java 8 Hrs.

1.1 Introduction to Java: Java Architecture, Advantages of Java, PATH and CLASSPATH variables, Compiling and Running Java Programs
1.2 Class and Object: Creating Classes, Interfaces, Creating Objects, Access Modifiers, Arrays, Packages, Inheritance
1.3 Exception Handling and Threading: Try, Catch, Finally, Throws, Creating Multithreaded Programs, Thread Life Cycle
1.4 File IO: Byte Stream Classes (FilleInputStream and FileOutputStream), Character Stream Classes(FileReader and FileWriter), RandomAccessFile Class

Unit 2: User Interface Components with Swing 10 Hrs.

2.1 Swing and MVC Design Patterns: Design Pattern, MVC Pattern, MVC Analysis of Swing Buttons
2.2 Layout Management: Border Layout, Grid Layout, Gridbag Layout, Group Layout, Using No Layout managers, Custom layout Managers
2.3 Text Input: Text Fields, Password Fields, Text Areas, Scroll Pane, Label and Labeling Components
2.4 Choice Components: Check Boxes, Radio Buttons, Borders, Combo Boxes, Sliders
2.5 Menus: Menu Building, Icons in Menu Items, Check box and Radio Buttons in Menu Items, Pop-up Menus, Keyboard Mnemonics and Accelerators, Enabling and Design menu Items, Toolbars, Tooltips
2.6 Dialog Boxes: Option Dialogs, Creating Dialogs, Data Exchange, File Choosers, Color Choosers
2.7 Components Organizers: Split Panes, Tabbed Panes, Desktop Panes and Internal Frames, Cascading and Tiling
2.8 Advance Swing Components: List, Trees, Tables, Progress Bars

Unit 3: Even Handling 4 Hrs.

3.1 Introduction: Standard Event Handling, Using Delegated Class, Using Action Commands, Listener Interfaces, Adapter Classes
3.2 Handling Events: Action Events, Key Events, Focus Events, Window Event, Mouse Event, Item Events

Unit 4: Database Connectivity **4 Hrs.**

4.1 Design of JDBC: Driver Types, Typical Uses of JDBC
4.2 JDBC Configuration: Database URLS, Driver JAR Files, Starting Database, Registering Driver class, Connecting to the database
4.3 Executing SQL Statements: Managing Connections, Statements, Result Set, SQL Exceptions, Populating Databse
4.4 Query Execution: Prepared Statements, Reading and Writing LOBs, SQL Escapes, Multiple Results, Scrollable Result Sets, Updateable Result Sets, Row Sets and Cached Row Sets, Transactions.

Unit 5: Network Programming **5 Hrs.**

5.1 Networking Basics: Transmission control Protocol(TCP), User Datagram Protocol (UDP), Ports, IP Address Network Classes in JDK
5.2 Working with URLS: Connecting to URLS, Reading Directly from URLS, InetAddress Class
5.3 Sockets: TCP Sockets, UDP Sockets, Serving Multiple Clients, Half Close, Interruptible Sockets, Sending Email

Unit 6: Java Beans **3 Hrs.**

6.1 Introduction: Creating, Updating and Reading From JAR Files, Java Beans, Advantages of Java Beans, Class vs Beans, BDK and Bean Box
6.2 Java Bean: Creating a Java Bean, Creating a Bean Manifest File, Creating a Bean JAR File, Using a New Bean, Adding Controls to Beans, Giving a Bean Properties, Creating Bound Properties, Giving a Bean Methods, Giving a Bean an Icon

Unit 7: Servlets and Java Server pages **8Hrs.**

7.1 Servelets: Introduction to Servlets,Life cycle of servlets, Java Servlets Development Kit, Creating, Compiling and running servlet, The servlet API (javax.servlet package), Reading the servlet Parameters, Reading Initialization parameter, The javax.servlet.http.Package, Handling HTTP Request and Response (GET / POST Request), Using Cookies, Session Tracking
7.2 Java Server Pages: Advantage of JSP technology (Comparision with ASP / Servlet), JSP Architecture, JSP Access Model, JSP Syntax Basic (Directions, Declarations, Expression, Scriplets, Comments), JSP Implicit Object, Object Scope, Synchronization Issue, Exception Handling, Session Management, Creating and Processing Forms.

Unit 8: RMI and CORBA **3Hrs.**

8.1 Remote Method Invocation: Introduction of RMI, Architecture of RMI, Remote Objects, Creating and Executing RMI Applications
8.2 CORBA: Introduction to CORBA, Architecture of CORBA, Functioning of CORBA Applications, CORBA Services

Laboratory Works: Student should design at least two Projects. Desktop Application (Address Book, Library system etc), Simple network Application (e.g. Chatting Application) or Simple Web Applications (online banking Application, Online Music Application, etc)

Reference Books:

1. Cay Horstmann and Grazy Cornell, Core Java Volume I-Fundamentals, Eighth Edition
2. Cay Horstmann and Grazy Cornell, Core Java Volume II-Advance Features, Eighth Edition

3. Steven Holzner, Java 2 Pagramming-AWT, Swing, XML and Java Beans Black Book, Dreamtech Press
4. Pallvi Jain and Shadab Siddiqui, J2EE Professional Projects, Premier Press

Prerequisites: Any One Course in Object Oriented Programming

Course Title: Project Work
Course no: CSC-404 Full Marks: 100

Credit hours: 3 Pass Marks: 40

Nature of course: Project

Course Synopsis: This course introduces students to the practical environment. Special focus will be given in enabling students with the skills pertaining to the analysis, design, and development, installation, testing and servicing a corporate organization. The course has a practical approach to building real application.

Goal: To develop the skills associated with analysis design and development of meaningful and efficient real world application

Course Contents:

1. Problem Identification
2. Problem Specification
3. Analysis and design
4. System Development
5. Installation and Testing
6. System Maintenance

The content of this course is divided into six different phases; the students will first involve themselves in identifying a problem that needs to be addressed. Such problem needs to be specified precisely and several solutions need to be prescribed, out if which the most viable will be selected. The selected proposed solution now has to be analyzed properly and design. This might involve the use of tools depending upon the nature of the problem and environment.

Text Books: None

Prerequisite: Depending upon types of project

Evaluation Criteria of Project Work.

- Analysis and design
- Presentation skill
- Questions Answer
- Scope of Work / Future Implementation of Project
- Overall documentation of project work

Evaluation of Project Work:

Internal Evaluation (At the mid of project work by supervisor, HOD/coordinator)

Final Evaluation with External (At the end of the project by External, Internal and Supervisor).

Marks Allocation

Supervisor 60

Internal 20

External 20

Total 100

Course Title: Information Retrieval
Course no: CSC-405 Full Marks: 60+20+20
Credit hours: 3 Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Advanced aspects of Information Retrieval and Search Engine

Goal: To study advance aspects of information retrieval and working principle of search engine, encompassing the principles, research results and commercial application of the current technologies.

Course Contents:

Unit 1 Introduction: 2 Hrs.
Introduction, History of Information Retrieval, The retrieval process, Block diagram and architecture of IR System, Web search and IR, Areas and role of AI for IR

Unit 2. Basic IR Models: 4 Hrs.
Introduction, Taxonomy of information retrieval models, Document retrieval and ranking, A formal characterization of IR models, Boolean retrieval model, Vector-space retrieval model, probabilistic model, Text-similarity metrics: TF-IDF (term frequency/inverse document frequency) weighting and cosine similarity.

Unit 3. Basic Tokenizing, Indexing, and Implementation of Vector-Space Retrieval: 4 Hrs.
Simple tokenizing, Word tokenization, Text Normalization, Stop-word removal, Word Stemming (Porter Algorithm), Case folding, Lemmatization, Inverted indices (Indexing architecture), Efficient processing with sparse vectors, Sentence segmentation and Decision Trees

Unit 4. Experimental Evaluation of IR: 4 Hrs.
Relevance and Retrieval**,** performance metrics, Basic Measures of text retrieval (Recall, Precision and F-measure)

Unit 5. Query Operations and Languages: 3 Hrs.
Relevance feedback and pseudo relevance feedback, Query expansion/reformulation (with a thesaurus or WordNet, Spelling correction like techniques), Query languages (Single-Word Queries, Context Queries, Boolean Queries, Natural Language)

Unit 6. Text Representation: 3 Hrs.
Word statistics (Zipf's law), Morphological analysis, Index term selection, Using thesauri, Metadata, Text representation using markup languages (SGML, HTML, XML)

Unit 7. Search Engine: 6 Hrs.

Search engines (working principle), Spidering (Structure of a spider, Simple spidering algorithm, multithreaded spidering, Bot), Directed spidering(Topic directed, Link directed) ,Crawlers (Basic crawler architecture), Link analysis (e.g. hubs and authorities, Page ranking, Google Page Rank), shopping agents

Unit 8. Text Categorization and Clustering: 6 Hrs.

Categorization algorithms (Rocchio; naive Bayes; decision trees; and nearest neighbor), Clustering algorithms (agglomerative clustering; k-means; expectation maximization (EM)) ,Applications to information filtering; organization

Unit 9. Recommender Systems: 3 Hrs.

Personalization, Collaborative filtering recommendation, Content-based recommendation

Unit 10. Information Extraction and Integration: 3 Hrs.

Information extraction and applications, Extracting data from text, Evaluating IE Accuracy, XML and Information Extraction, Semantic web (purpose, Relation to hypertext page), Collecting and integrating specialized information on the web.

Unit 11. Advanced IR Models with indexing and searching text: 4 Hrs.

Probabilistic models, Generalized Vector Space Model, Latent Semantic Indexing (LSI), Efficient string searching, Pattern matching

Unit 12. Multimedia IR 3 Hrs.

Introduction, multimedia data support in commercial DBMSs, Query languages, Trends and research issues

Laboratory Works: The laboratory should contain all the features mentioned in a course

Samples

1. Program to demonstrate the Boolean Retrieval Model and Vector Space Model
2. Program to find the similarity between documents
3. Tokenize the words of large documents according to type and token.
4. Segment the documents according to sentences
5. Implement Porter stemmer
6. Try to build a stemmer for Nepali language
7. Build a spider that tracks only the link of nepali documents
8. Group the online news onto different categorize like sports, entertainment, politics
9. Build a recommender system for online music store

Reference Books:

1. Modern Information Retrieval, Ricardo Baeza-Yates, Berthier Ribeiro-Neto.
2. Information Retrieval; Data Structures & Algorithms: Bill Frakes

Homework Assignment:	Assignment should be given from the throughout the semester.
Computer Usage:	No specific
Prerequisite:	Server side programming language like PHP, JSP, ASP.Net (Any One) and with good concept on any programming languages
Category Content:	Science Aspect: 25%
Design Aspect:	75%

Course Title: Database Administration
Course no: CSC 406 Full Marks: 60+20+20
Credit hours: 3 Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: DBA Roles, DB backup, restoration and recovery, Tuning of database

Goal: The course covers about: principles of DBA Roles, DB backup, restoration and recovery, Tuning of database and overall DB administration which could be useful for administrator in the future.

Course contents:

Unit 1 **5 Hrs**

Introduction: DBMS architecture and data independence, DBA roles and responsibilities, SQL *PLUS Overview: SQL Plus Fundamentals, Producing more readable outputs, Accepting values at urntime, Using iSQL *Plus.

Unit 2 **5 Hrs**

Control and Redo Log Files: Managing the control files, Maintaining and monitoring redo log files.

Unit 3 **10 Hrs**

Managing Users and Security: Profiles, Managing users, managing privileges, managing roles, querying role information, Database Security and Auditing, Creating and managing DB's , tables, indexes, triggers, views, stored procedures, Advanced Stored Procedures, analysis and integration services.

Unit 4 **10 Hrs**

Backup and Recovery Overview, Database backup, restoration and recovery, defining a backup and recovery strategy, Testing the backup and recovery plan, parallel instance recovery , recovering from non-critical loses

Unit 5 **5 Hrs**

Database corruption, automatic database management, automatic storage management, RMAN

Unit 6 **10 Hrs**

Introduction to performance tuning: brief overview of Tuning methodology, general tuning concepts, AADM (Automatic Database Diagnostic Monitor) and SQL Tuning Advisor.
Virtual Private Database: policy types, selective columns, column masking.

Laboratory works: labs should cover all the chapters using Oracle/SQL-Server or any other database server tools.

Reference Books:

1. C.J. Date, Database Systems, Addison Wesley, 2000
2. Introduction to Database Administration, by O'reilly
3. ORACLE DBA handbooks

Course Title: Network and System Administration

Course no: CSC-407 Full Marks: 60+20+20

Credit hours: 3 Pass Marks: 24+8+8

Nature of course: Theory (4 Hrs.) + Lab (3 Hrs.)

Course Synopsis: Provides the concept of network and system administration

Goal: The class concentrates on the network and system administration, and covers subjects ranging from initial installation of OS to day-to-day administrative tasks such as Network and Server Configurations, management of user accounts and disk space, and even imparting the trouble-shooting skills future system administrators will need to cope with unexpected behaviour.

Course Contents:

1 Networking Overview 4Hrs.

1.1 History
1.2 Protocol Standards
1.3 Reference Model (OSI, TCP/IP)
1.4 Windows and Linux Networking Basics
1.5 Switching and Routing basics

2 Server Administration Basics 6Hrs.

2.1 Server and Client Installation
2.2 Boot Process and Startup Services:Xinetd/Inetd
2.3 Managing accounts: users, groups and other privileges
2.4 File Systems and Quota Management
2.5 Job Scheduling with cron, crontab, anacron and system log analysis
2.6 Process controlling and management
2.7 Online Server upgrade/update process
2.8 Administering Database Server (MySQL)

3 Network Configuration Basics 4Hrs.

3.1 IPv4 and IPv6 addressing
3.2 Network Interface Configuration
3.3 Diagnosing Network startup issues
3.4 Linux and Windows Firewall configuration
3.5 Network troubleshooting commands

4 **Dynamic Host Configuration Protocol (DHCP) 4Hrs.**

4.1 DHCP Principle
4.2 DHCP Server Configuration
4.3 DHCP Options, Scope, Reservation and Relaying
4.4 DHCP Troubleshooting

5 Name Server and Configuration 6Hrs.

5.1 DNS principles and Operations
5.2 Basic Name Server and Client Configuration
5.3 Caching Only name server
5.4 Primary and Slave Name Server
5.5 DNS Zone Transfers
5.6 DNS Dynamic Updates
5.7 DNS Delegation
5.8 DNS Server Security
5.9 Troubleshooting

6 Web and Proxy Server Configuration 6Hrs.

6.1 HTTP Server Configuration Basics
6.2 Virtual Hosting
6.3 HTTP Caching
6.4 Proxy Caching Server Configuration
6.5 Proxy ACL
6.6 Proxy-Authentication Mechanisms
6.7 Troubleshooting

7 FTP, File and Print Server 5Hrs.

7.1 General Samba Configuration
7.2 SAMBA SWAT
7.3 NFS and NFS Client Configuration
7.4 CUPS configuration basics
7.5 FTP Principles
7.6 Anonymous FTP Server
7.7 Troubleshooting

8 Mail Server basics 6Hrs.

8.1 SMTP, POP and IMAP principles
8.2 SMTP Relaying Principles
8.3 Mail Domain Administration
8.4 Basic Mail Server Configuration (Sendmail, postfix, qmail, exim..)
8.5 SPAM control and Filtering
8.6 Troubleshooting

9 Remote Administration and Management 4hrs.

9.1 Router Configuration
9.2 Webmin/usermin
9.3 Team Viewer
9.4 Telnet
9.5 SSH
9.6 SCP, Rsync

Laboratory work: All the features of this course

Samples:

1. Server/Client Installation over VMware Environment
2. Packet Analysis by using TCPDUMP and WIRESHARK
3. Network Practice with Packet Tracer
4. System Administration: User/Group management, File System Management ….
5. Network Configuration: Start/Stop network Service, network interface configuration
6. Firewall Configuration
7. DNS and DHCP Configuration and Troubleshooting
8. Web and Proxy Server Configuration and Troubleshooting
9. Basic Mail Server Configuration and Troubleshooting
10. SAMBA, NFS, CUPS and FTP configuration and Troubleshooting
11. Webmin/SSH configuration

Reference Book:

1. The Practice of System and Network Administration, Second Edition Thomas A. Limoncelli, Christina J. Hogan , Strata R. Chalup
2. Advanced Linux Networking, Roderick W. Smith, Addison-Wesley Professional (Pearson Education), 2002.
3. Linux Network Administrator's Guide, Tony Bautts, Terry Dawson, Gregor N. Purdy, O'Reilly, Third Edition, 2005

Prerequisite: Computer Networking Course

Course Title: Software Project Management
Course no: CSC-408 Full Marks**:** 60+20+20
Credit Hours: 3 Pass Marks**:** 24+8+8

Nature of course: Theory (3Hrs.) +Practical (3Hrs.)

Course Synopsis: Concept of software project, software project management framework

Goal: This course introduces the concepts of Software Project, software project management framework, project evaluation, Software quality assurance and project management and its tools.

Course contents:

Unit-1: Introduction to Software Project Management (SPM) 5 Hrs.

Software engineering problem and software product, software product attributes, Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, Project management cycle, SPM framework, types of project plan

Unit-2: Project Organization, Scheduling and management issues 5 Hrs.

Project life cycle and product life cycle, project planning and scheduling, resource allocation

Unit-3: Project Evaluation & Estimation: 6 Hrs.

Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models. Prototyping, delivery

Unit-4: Activity planning 7 Hrs.

Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks

Unit-5: Resource allocation 4 Hrs.

Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.

Unit-6: Monitoring the control 4 Hrs.

Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control

Unit-7: Managing contracts and people **5 Hrs.**

Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior, organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises.

Unit-8: Software quality assurance and testing **5 Hrs.**

Testing principles and objectives, test plan, types and levels of testing, test strategies, program verification and validation, software quality, SEI-CMM,SQA activities, QA organization structure, SQA plan.

Unit-9: Project management and project management tools **4 Hrs.**
Software configuration management, SCM tasks and roles, Risk management, risk management process, SPM tools.

Laboratory Work: Project on Software Project Management

Reference Books:

1. Software project management-Rajiv Chopra, 2009
2. Software Project Management by Bob Hughes and Mike Cotterell, Latest Publication
3. Software Engineering – A Practitioner's approach, Roger S. Pressman Latest Publication
4. Software Project Management, Walker Royce, 1998, Addison Wesley.
5. Managing Global software Projects, Ramesh, 2001, TMH