SOFTWARE ENGINEERING

Course Code: MCA 401 **Credit Units: 03**

Course Objective:

Students in this course should be able to explain and apply a broad range of concepts from software engineering, spanning all aspects the software engineering process. They should be able to recognize, define, and make correct use of generally accepted software engineering terminology.

Course Contents:

Module I: Introduction
Evolution of Software Engineering, Software Problems, Issues Involved In Software Engineering, Fundamental Qualities of a Software Product, Approaches to Software Engineering, Planning the development Process

Module II: Software Life Cycle Models
Development/Product Life-Cycle Model, Kinds of Software Life-Cycle Model Project Management Concepts, Project Management Activities

Module III: Software Requirement Specification
Requirement Engineering, Requirement elicitation, Requirement analysis, requirement documentation, Case Study.

Module IV: Software Project Planning
Size Estimation, Cost Estimation, Models, COCOMO, COCOMO II, Putnam Resource allocation model, Software Risk Management.

Module V: Software Design
Software Designing Principles Various Strategies, Module Level Concepts, Structured Design Methodologies

Module VI: Software Metrics
Software Metrics, Token Count, Data Structure Metrics, Information Flow Metrics and Metrics analysis.

Module VII: Software Reliability
Basic Concepts, Software quality, software reliability models, Capability maturity models, ISO 9000.

Module VIII: Software Testing
Testing Process, Some terminology, Functional Testing, Structural Testing, Levels of Testing, Debugging and Testing Tools.

Module IX: Software Maintenance
Maintenance Process, Maintenance Model, Estimation of maintenance cost, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management and Documetation.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- Software Engineering, A Practitioner's Approach, Roger S. Pressman,
- Software Engineering, K.K. Agarwal, Yogesh Singh, New Age International Publishers
- An Integrated Approach to Software Engineering, Pankaj Jalote, Narosa Publication

References:

- Software Engineering Concepts, Richard Fairley

INTERNET AND JAVA PROGRAMMING

Course Code: MCA 402 **Credit Units: 04**

Course Objective:

This course will introduce the essential topics of Internet Programming predominately with the Java programming language. Students will design and write interactive WWW pages using Java, HTML, CGI, VRML programming languages. Students will develop software that manipulates different forms of data such as hypertext, graphics, video, and sound. Advanced interactive/executable web pages will be developed.

Course Contents:

Module I: Introduction
Basics of computer communication, OSI Model of ISO, LAN, WAN, Internet, Evolution of Internet, Internet Applications, TCP/IP, Introduction to RFC, Addressing in Internet – IP and Domains, Internet Service Providesrs, Types of connectivity such as dial-up, leased, VSAT etc., Internet Server and Client modules on various Operating Systems

Module II: Introduction to World Wide Web
Evolution of World Wide Web, Basic features, WWW browsers, WWW servers, HTTP & URL's

Module III: WWW Browsers
Basic features, Netscape Communicator, Internet Explorer, Internet Explorer

Module IV: HTML
Document Overview, Header Element, Lists Hypertext Links, Visual Markup, URLs
Images, Forms, Tables, Special Characters

Module V: Introduction to JAVA Programming
Introduction to Java, Java features, An Overview of Java, Data Types, Variables, Arrays, Operators, and Control Statements.

Module VI: Java with Object Orientated Features
Introducing Classes, A Closer look at Methods and Classes, Inheritance, Packages and Interfaces, Exception Handling, Multithreaded Programming, I/O, and Applets.

Module VII: The Java Library
String Handling, Exploring java lang, Input/Output: Exploring java. io, Networking, and Event Handling.

Module VIII: GUI in Java
Introducing the AWT: Working with Windows, Layout Managers, and Images.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- Patrick Naughtn and Herbert Schildt The Complete Reference, Java 2, TMH
- Douglas E.Cmer, Computer Networks & Internet, Pearson.

References:

- The Internet :By- Douglas E.Cmer: TMH

ENTERPRISE RESOURCE PLANNING

Course Code: MCA 404 **Credit Units: 04**

Course Objective:

The objective of the course is to give an introduction to Enterprise Resource Planning, its benefits, ERP systems, ERP Implementation Methodology, ERP Architectures. It also focuses on concepts of Extended ERP, Supply Chain Management and Customer Relationship Management.

Course Contents:

Module I: Introduction
Definition, Evolution of ERP, Characteristics, Features, Components and needs of ERP, ERP Vendors, BPR, System Benefits & Limitations of ERP Packages

Module II: Generic Model of ERP
Generic model of ERP system, Core Modules functionality, Types of ERP architecture, Client Server Architecture, Web-based Architecture, Service Oriented Architecture (SOA)

Module III: Implementation Methodology of ERP
Difficulty in selecting ERP, Approach to ERP selection, Request for Proposal approach, proof-of-concept approach, General Implementation approach of ERP, Vanilla Implementation, Evaluation Criteria of ERP packages, Project Implementation Team Structure

Module IV: Business Process Reengineering
Organizational Change Management, Business Process Change, BPR Methodology, Current BPR Tools, Enabling best technology practices, Benchmarking

Module V: Enterprise Modeling and Integration of ERP
Need to focus on Enterprise Integration/ERP, Information mapping, Role of common shared Enterprise database, System Integration, Logical vs. Physical System Integration, Benefits & limitations of System Integration, ERP's Role in Logical and Physical Integration

Module VI: Introduction to SAP, Oracle APPS
SAP, Integrated SAP Model, SAP Architecture, SAP R/3 System & mySAP, SAP Modules, Oracle Apps, Oracle AIM Methodology, Oracle APPS Modules

Module VII: Supply chain management and ERP
Definition, Supply Chain Council's SCOR Model, Stevens Model of Supply Chain Management, Aims of SCM, SCM Key Drivers, Collaborative Design & Product Development, Benefits of SCM, ERP Vs SCM, Key SCM Vendors

Module VIII: Customer Relationship Management and ERP
CRM Evolution, CRM Delivery Processes, CRM support Processes, CRM Analysis Processes, CRM Components, CRM Packages & Vendors

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

- Enterprise Systems For Management, Luvai F. Motiwalla, Jeff Thompson, Pearson Education.
- Wikipedia Links for SAP, Oracle APPS

MANAGEMENT INFORMATION SYSTEM

Course Code: MCA 405 **Credit Units: 04**

Course Objective:

This course will provide the students with an understanding of the principles of information systems technology and its impact on the strategic goals and direction of the organization. They will learn how MIS concepts are applied in business and how information systems can provide solutions to the entire organization.

Course Contents:

Module I: Introduction

Why Information System, Contemporary Approaches to Information Systems, Types of Systems in organizations, Systems from a Functional Perspective, Organization and Information Systems, Managers, Decision Making and Information Systems, Information Systems and Business Strategy Role of Internet Technology in Management, Electronic Business, Electronic Commerce.

Module II: Ethical and Social Issues

Understanding Ethical and Social Issues, Ethics in information society, Moral Dimensions of Information Systems

Module III: Information Technology Infrastructure

Computer Hardware and Information Technology Infrastructure, Categories of Computers and Computer Systems, Managing Hardware and Software Assets, Total Cost of Ownership, Rent or Build Decisions. Telecommunication and Networks Network Topologies, LANs WANs Network Services and Broadband Technologies.

Module IV: Information Systems

Types of Information Systems for Decision-Making. Decision Support Systems, Executive Information Systems, Transaction Processing Systems, Group Decision Support Systems. Redesigning the organization with Information Systems, Business Process Reengineering

Module V: Information Systems Security and Control

System Vulnerability, Creating Control Environment, Disaster Recovery Planning, Ensuring System Quality, Software Quality Assurance Methodologies and Tools. Case study on ITIL (Information Technology Infrastructure Library)

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

- Management Information Systems, Laudon and Laudon, Prentice Hall International

SOFTWARE PROJECT MANAGEMENT

Course Code: MCA 407 **Credit Units: 04**

Course Objective:

This module will introduce the area of software project management, presenting basic techniques and approaches and aiming to develop a critical awareness of the challenges and shortcomings of the area.

Course Contents:

Module I: Introduction of Software Project Management & Project Planning

What is Software? What is Project? What is Management? Activities covered by software project management, some ways of categorizing software projects, the project as a system, Problems with software projects, Management control, Requirement specification, Information and control in organization, Introduction of Step Wise project planning, Step: 0-4, Step: 5-10 of project planning.

Module II: Risk Management

The nature of Risk, Risk identification, Risk analysis, Risk Examination, Risk Assessment, Reducing Risk, Evaluating risks to the schedule.

Module III: Project Examination

Strategic assessment, Technical assessment, Cost-benefit analysis (no numerical), cost-benefit Examination techniques, Cash flow forecasting, risk Examination.

Module IV: Overview of Appropriate project approach & Software Effort Estimation

Project models, Examples of project models, the basis of software estimation, Problems with over and under estimates, where are estimates done? Software effort estimation techniques: LOC, Function Point (no numerical), COCOMO: a parametric model

Module V: Overview of Management

Levels of management, Management as a control system, Functions of Management, Objectives, Characteristics and Impact of management.

Module VI: Activity Planning & Resource Allocation

Objective of activity planning, when to Plan, Project Schedules, Projects and activities, Sequencing and scheduling activities, Nature of resources, Identifying resource requirements, Scheduling resources, Cost Schedules, Scheduling sequences.

Module VII: Monitoring and Control & Managing people and organizing team

Creating the framework, collecting the data, Visualizing progress and change control, Organizational structure and behaviour, selecting right person for a job, motivation, leadership, working in a group.

Module VIII: Software Quality

Place of s/w quality in project planning, importance of s/w quality, Defining s/w quality, ISO 9126, ISO 9000, ISO 9003, Practical s/w quality measures, Product versus process quality management, External standards, Techniques to help enhance s/w quality, CMM Model, Concept of Six Sigma

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Text:

- Software Project Management (Second Edition), BOB Hughes and Mike Cotterell, TMH

References:

- Software Engineering – David Gustafson (Schaum's Series)
- Software Engineering – Pressmen

ROUTING PROTOCOLS AND CONCEPTS

Course Code: MCA 409 **Credit Units: 03**

Course Objective:

The goal of CCNA Exploration Routing Protocols and Concepts course is to develop an understanding of how a router learns about remote networks and determines the best path to those networks. This course includes both static routing and dynamic routing protocols.

Course Contents:

Module I: Intro to Routing and Packet Forwarding
Introduction, Inside the Router, CLI Configuration and Addressing, Building the Routing Tables, Path Determination and Switching Functions.

Module II: Static Routing
Introduction, Routers and Network, Router Configuration Review, Exploring Directly Connected Networks, Static Routes with "Next Hop" , Addresses ,Static Routes with Exit Interface, Summary and Default Static Routes, Managing and Troubleshooting Static Routes.

Module III: Introduction to Dynamic Routing Protocols
Introduction, Classifying Dynamic Routing Protocols, Metrics, Administrative Distance, Routing Protocols and Subneting Activities.

Module IV: Distance Vector Routing Protocols
Introduction to Distance Vector Routing Protocols, Network Discovery, Routing Table Maintenance, Routing Loops, Distance Vector Routing Protocols Today.

Module V: RIP Version - I
Introduction, RIP v1,Distance Vector, Classful Routing Protocols, Basic RIPv1 Configuration, Verification and Troubleshooting, Automatic Summarization, Default Route and RIP v1.

Module VI: VLSM and CIDR
Introduction, Classful and Classless Addressing, VLSM, CIDR, VLSM and Route Summarization Activity.

Module VII: RIP Version - II
Introduction, RIPv1 Limitations, Configuration RIPv2, VLSM & CIDR, Verifying & Troubleshooting RIPv2.

Module VIII: The Routing Table – A Close Look
Introduction, the Routing Table Structure, Routing Table Lookup Process, Routing Behaviour.

Module IX: EIGRP
Introduction to EIGRP, Basic EIGRP Configuration, EIGRP Metric Calculation, DUAL, More EIGRP Configuration.

Module X: Link State Routing Protocols
Introduction, Link State Routing, Implementing Link State Routing Protocols.

Module XI: OSPF
Introduction to OSPF, Basic OSPF Configuration, The OSPF metric, OSPF and Multi-access Networks, More OSPF Configuration.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Text

- Cisco Networking Academy Programme CCNA 1 & 2 Companion Guide, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Lab Companion, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Engineering General, 3rd Edn by Pearson Education
- CISCO CCNA-Exploration 4.0, Module 2, Pearson Education.

EMERGING TECHNOLOGIES - I

Course Code: MCA 410 **Credit Units: 03**

Course Objective:

The course objective is to learn the latest and emerging technologies ('Cache' in this semester) in the Information Technology Field. Here students will learn the new database technology that is object oriented database technology (Post Relational DBMS).

Course Contents:

Module I: Introduction to Cache Objects
Objectives of classes, Typographic Conventions, Requirements, Namespace, Datasets, Creating a Namespace, Cache Cube, Creation and formatting of physical file.

Module II: Working with class
How to make a class, specification of class, Changing Namespace, Introduction to Property, Adding property.

Module III: Query and Index Handling
Introduction to query, How to create a query, Creating an Index , compilation, How to access data using Cache Object Script, Viewing the database, Introduction to OpenID, Save, write methods, Storing data in the global.

Module IV: Populating a class
Generating random data for the class, Searching the databases, Embedded Objects, Introduction to searching the database using query, populating an Index, Testing a Query, Embedded and Serial Object, Validations.

Module V: References, Working with Pre-defined Values
Introduction to Reference Object, how to work with Pre-defined values, Calculating the fields when the record is updated, Storing a picture, Creating List, Working with Arrays, Introduction to collections, Formatting data for output, Making Relationship.

Module VI: Cache with Visual Basic
VB Form Wizard, Cache Object Server, Project, Connecting to Cache, Working with Combo-box, Searching the database, Using embedded objects, References, Updating the database, Multimedia-Photos, Formatting data for Output, Making Relationship.

Module VII: Cache Server Pages
Introduction to CSP, Configuring CSP, Writing code in CSP

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

- From website: www.cache.com
- Documentation of cache

SOFTWARE ENGINEERING LAB

Course Code: MCA 420 **Credit Units: 01**

Course Contents:

Week I: Introduce the lab environment and tools used in the software engineering lab: WebCT, Rational Rose for UML, MS Project, MS Source Safe (configuration management), Rational Requisite Pro (Software requirements and prerequisite pro), JUnit (Software Testing).

The key objectives are

- Discuss the Project & learn how to write project definition.
- Learn the cycle phases (project management, requirement engineering, software design, prototyping and testing software life).
- Practice the software phases using a project.
- Learn a number of CASE tools and use them in a project within a team work environment.
- Get familiar with UML (modeling language for analysis and design).

Week II: For a given dummy project given to a team, Software process overview must be done using MS source safe

Week III: For the above mentioned Project, Project planning must be done .Also the students should be taught how to write planning documentation using MS Project

1. For the above mentioned Project, Software requirements are found and also teach the students, how to write Planning document using Rational RequisitePro

2. Introduction to UML, Unified Modelling Language and use case diagrams using Rational Rose

3. Develop System modeling (DFD and ER) using Rational Rose

4. Design Flow of events and activity diagram using Rational Rose and how to write SRS document.

5. OO analysis: discovering Classes Interaction diagrams: sequence and collaboration diagrams using Rational Rose

6. Developing Version 1 of Software Design: software architecture and object-oriented design using Rational Rose

7. Developing State Transition Diagram using Rational Rose

8. Developing Component and deployment diagrams for Final Documented Project Report using Rational Rose.

9. Software testing using JUnit and other testing tools.

Note: The above steps should be followed for a given project to a team to teach the students how to write a project.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTERNET AND JAVA PROGRAMMING LAB

Course Code: MCA 421 **Credit Units: 01**

1. Write a Java Program to compute & print factorial of any given number.
2. Write a Java Program to compute the sum of digits of a given integer.
3. Write a Java Program to calculate & print first n Fibonacci numbers.
4. Write a Java Program to reverse the digits of a numbers.
5. Assume that a bank maintains two kinds of account for its customers, one called saving and other current. The saving account provides compound interest and withdrawal facilities but not cheque book. The current account provides cheque book but no interest. Current account holders should also maintain a min balance & if the balance falls below, a service charge is imposed. Create a class Account that stores customer name, account number & type of account. From this derive the classes Curr-acc & Sav-acc to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:
   a) Accept deposit from a customer and update the balance
   b) Display the balance.
   c) Compute and deposit interest
   d) Permit withdrawal and update the balance.
   e) Check for the minimum balance, impose penalty. If necessary, and update the balance
6. Write a Java Program to sort element of the array.
7. Write a Java Program to read marks out of 100 declare result as follows:
   a. 60 or more 1st class
   b. 50-59 2nd class
   c. 40-49 pass
   d. Less than 40 fail
8. Write a java program to check whether a year is a leap year or not.
9. Write a Java Program to read string from console and display the number of occurrence of each word
10. Write a Java Program to demonstrate use of Inheritance through vehicle, two wheeler, four wheeler and three-wheeler class.
11. Write a Java Program to demonstrate runtime polymorphism with the help of abstract classes.
12. Write a Java Program to demonstrate runtime polymorphism with the help of interfaces.
13. Write a java program to display the use of all access modifiers with the help of two packages
14. Write a Java Program to take a filename as command line argument and display its contents.
15. Write a Java Program that reads a file and then displays it, with a line number before each line.
16. Write a Java Program that displays number of characters, lines and words in a text file.
17. Write a Java Program that appends the contents of one file to another.
18. Write a Java Program to demonstrate how we can make sure that the main thread gets executed after the child threads finishes.
19. Write a Java Program to show exception handling. Also demonstrate the use of finally.
20. Write a Java program which takes as input a number and throws a user defined exception when number is greater than 10.
21. Write a Java Program to demonstrate the use of throws. Also show what happens if a parent exception class precedes a child exception class in the throws class.
22. Write a Java Program to demonstrate the Applet Life Cycle.
23. Develop an applet that displays the received integer in one text box and then on pressing the compute button, displays the factorial in another text box.
24. Write a Java Program to demonstrate a working chat applet (Create both server and client).
25. Write a Java Program to roll a given string diagonally in an Applet. Make use of <param> tag for setting the width and height of the applet.
26. Write a Java Program a program to show how interface can be used to support multiple inheritances in java.
27. Create an applet that will have a text area and a Frame. When any mouse event occurs on the frame, make an entry of that event into the text area. For example, add "Mouse Dragged" when the mouse id dragged.
28. Write a Java program in which Server and client communicate using UDP sockets.
29. Write a Java program in which Server and client communicate using TCP/IP sockets.
30. Create an applet with Border Layout, with a button in each of the border layout component.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ROUTING PROTOCOLS AND CONCEPTS LAB

Course Code: MCA 422 **Credit Units: 01**

Course Contents:

1.0 Cabling a Network and Basic Router Configuration

- Cable devices and establish console connections.
- Erase and reload the routers.
- Perform basic IOS command line interface operations.
- Perform basic router configuration.
- Verify and test configurations using show commands, ping and traceroute.
- Create a startup configuration file.
- Reload a startup configuration file.
- Install a terminal emulation program.

2.0 Basic Router Configuration

- Cable a network according to the Topology Diagram given by Lab Coordinator
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Ethernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation.

3.0 Challenge Router Configuration

- Subnet an address space given requirements.
- Assign appropriate addresses to interfaces and document.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Serial and Ethernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation.

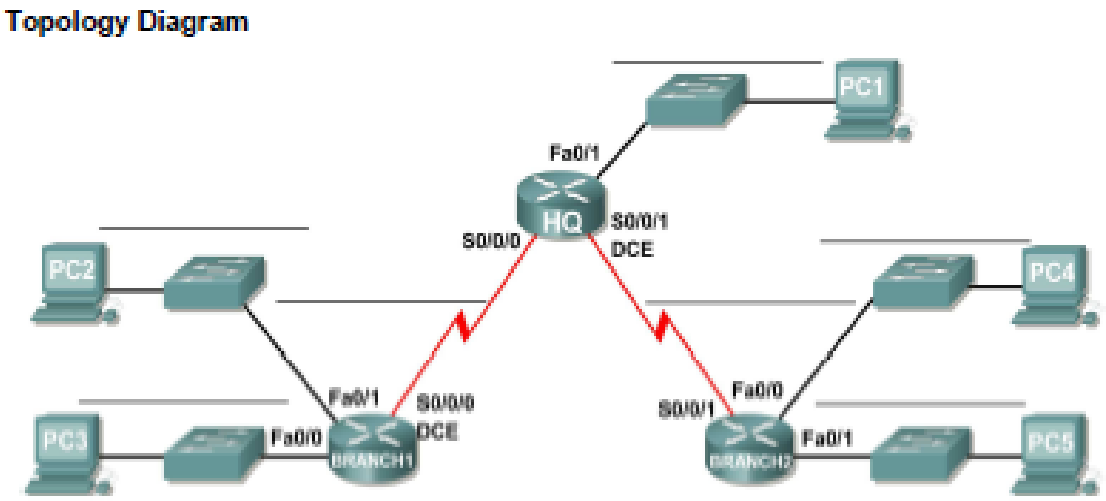
4.0 Basic Static Route Configuration

- Cable a network according to the Topology Diagram given by Lab Coordinator
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Interpret **debug ip routing** output.
- Configure and activate Serial and Ethernet interfaces.
- Test connectivity.
- Gather information to discover causes for lack of connectivity between devices.
- Configure a static route using an intermediate address.
- Configure a static route using an exit interface.
- Compare a static route with intermediate address to a static route with exit interface.
- Configure a default static route.
- Configure a summary static route.
- Document the network implementation.

5.0 Challenge Static Route Configuration

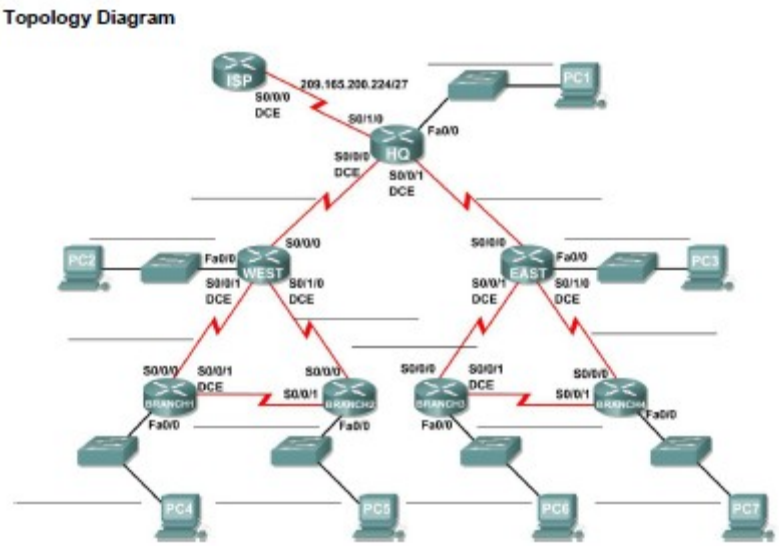
- Subnet an address space given requirements.
- Assign appropriate addresses to interfaces and document.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Serial and Ethernet interfaces.
- Determine appropriate static, summary, and default routes.
- Test and verify configurations.
- Reflect upon and document the network implementation.

6.0 Subnetting Scenario 1



- Determine the number of subnets needed.
- Determine the number of hosts needed.
- Design an appropriate addressing scheme.
- Assign addresses and subnet mask pairs to device interfaces and hosts.
- Examine the use of the available network address space.
- Determine how static routing could be applied to the network.

7.0 Subnetting Scenario 2



Determine the number of subnets needed.
Determine the number of hosts needed.
Design an appropriate addressing scheme.
Assign addresses and subnet mask pairs to device interfaces and hosts.
Examine the use of the available network address space.
Determine how static routing could be applied to the network.

8.0 Routing Table Interpretation Lab

Given: The output from the HQ router

HQ#**show ip route**
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/30 is subnetted, 1 subnets
C 10.10.10.252 is directly connected, Serial0/0/0
172.16.0.0/30 is subnetted, 1 subnets
C 172.16.100.0 is directly connected, Serial0/0/1
R 192.168.1.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
R 192.168.2.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
R 192.168.3.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
C 192.168.4.0/24 is directly connected, Loopback0
C 192.168.5.0/24 is directly connected, Loopback1
C 192.168.6.0/24 is directly connected, Loopback2
R 192.168.7.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1
R 192.168.8.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1
R 192.168.9.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1

Given: The output from the BRANCH1 router

BRANCH1#**show ip route**
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/30 is subnetted, 1 subnets
C 10.10.10.252 is directly connected, Serial0/0/0
R 172.16.0.0/16 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
C 192.168.1.0/24 is directly connected, Loopback0
C 192.168.2.0/24 is directly connected, Loopback1
C 192.168.3.0/24 is directly connected, Loopback2
R 192.168.4.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.5.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.6.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.7.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.8.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.9.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0

Given the output from the BRANCH2 router

BRANCH2#**show ip route**

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
R 10.0.0.0/8 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
172.16.0.0/30 is subnetted, 1 subnets
C 172.16.100.0 is directly connected, Serial0/0/1
R 192.168.1.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.2.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.3.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.4.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.5.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1

R 192.168.6.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
C 192.168.7.0/24 is directly connected, Loopback0
C 192.168.8.0/24 is directly connected, Loopback1
C 192.168.9.0/24 is directly connected, Loopback2

Draw a diagram of the network based on your interpretation of the router outputs and do the following:

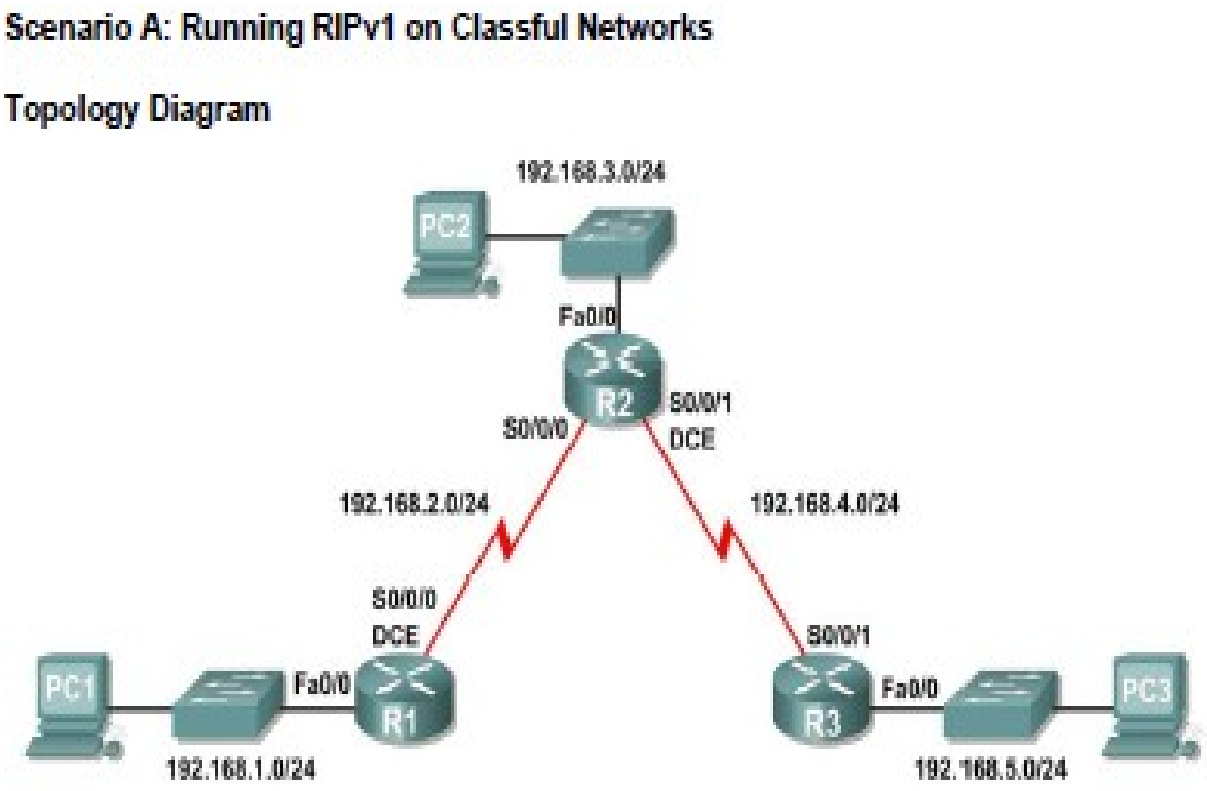
- Interpret router outputs.
- Identify the IP addresses for each router.
- Draw a diagram of the network topology.
- Cable and configure a network based on the topology diagram.
- Test and verify full connectivity.
- Reflect upon and document the network implementation.

9.0 Basic RIP Configuration

- Cable a network according to the Topology Diagram given below
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate interfaces.
- Configure RIP routing on all routers.
- Verify RIP routing using **show** and **debug** commands.
- Reconfigure the network to make it contiguous.
- Observe automatic summarization at boundary router.
- Gather information about RIP processing using the **debug ip rip** command.
- Configure a static default route.
- Propagate default routes to RIP neighbors.
- Document the RIP configuration.

Scenarios

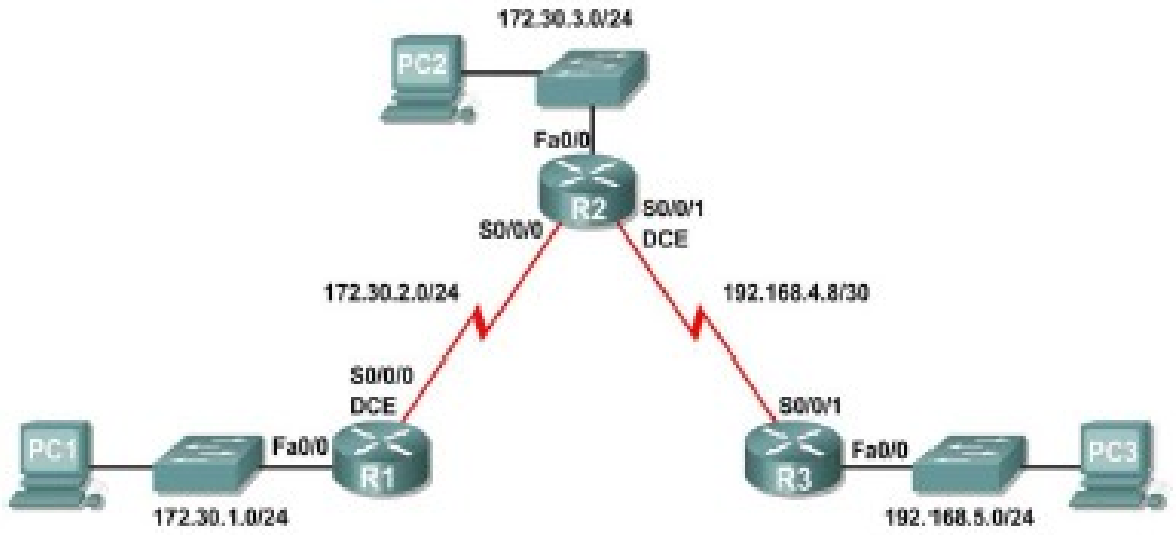
• Scenario A: Running RIPv1 on Classful Networks



• Scenario B: Running RIPv1 with Subnets and Between Classful Networks

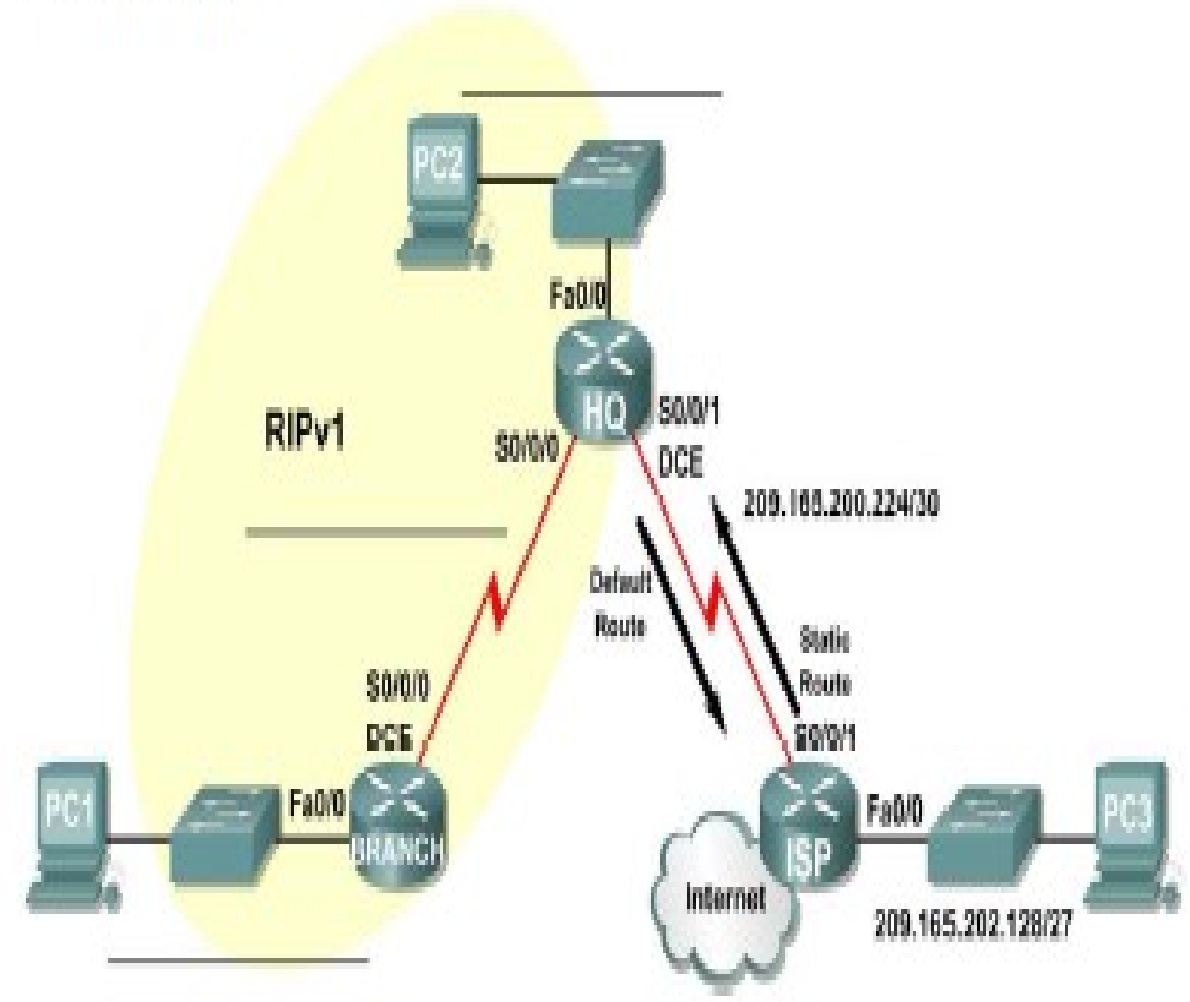
Scenario B: Running RIPv1 with Subnets and Between Classful Networks

Topology Diagram



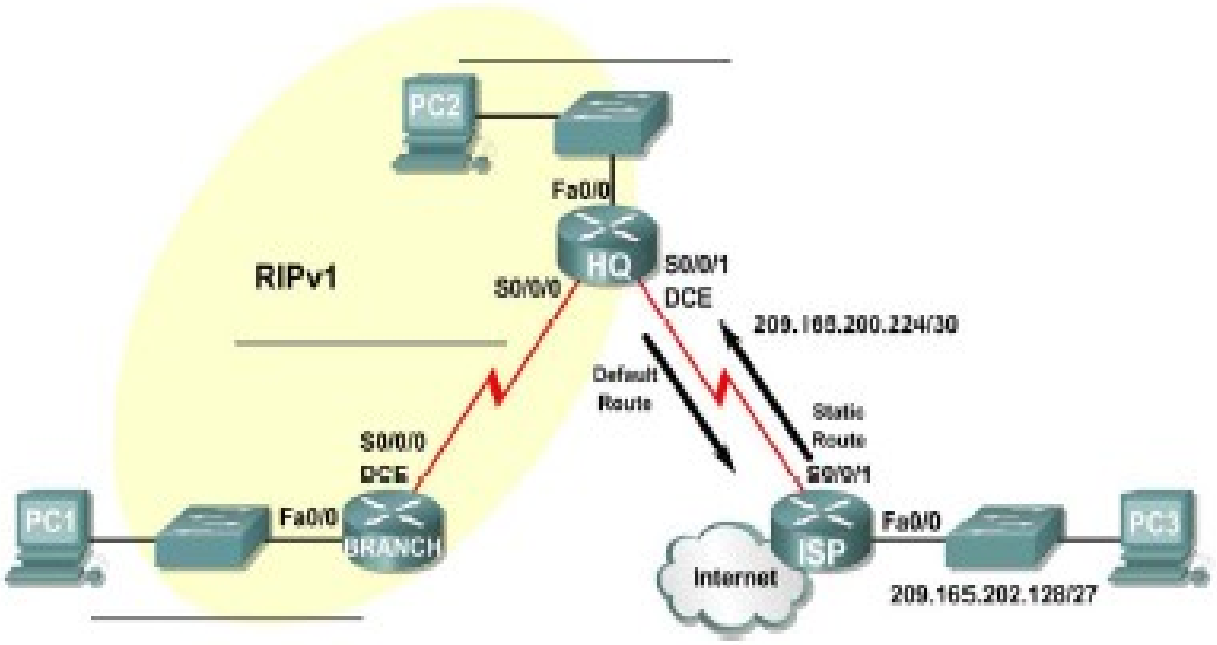
Scenario C: Running RIPv1 on a Stub Network

Topology Diagram



10.0 Challenge RIP Configuration

Topology Diagram

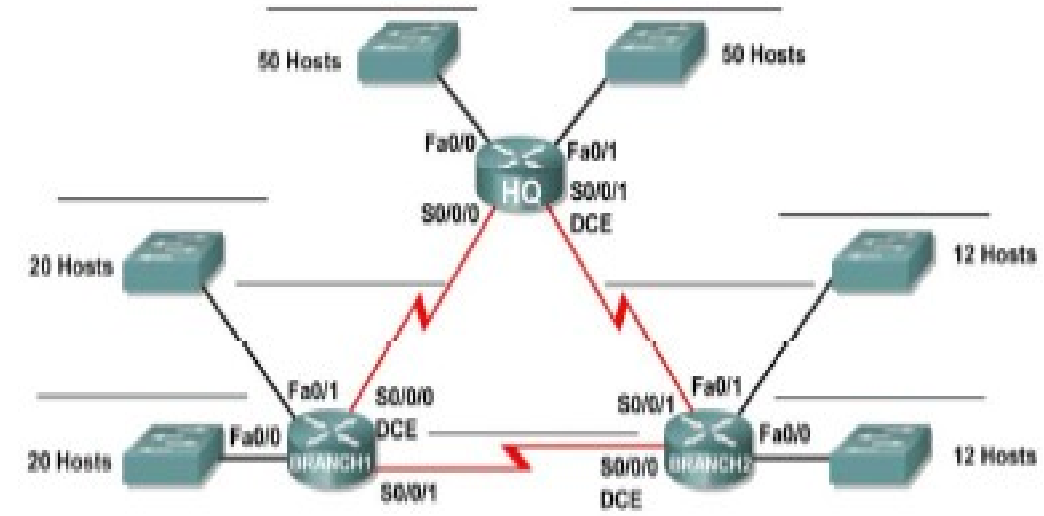


Subnet an address space given requirements.

- Assign appropriate addresses to interfaces and document them in the Addressing Table.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Configure RIPv1 routing on all routers.
- Configure and propagate a static default route.
- Verify RIPv1 operation.
- Test and verify full connectivity.
- Reflect upon and document the network implementation.

11.0 Basic VLSM Calculation and Addressing Design

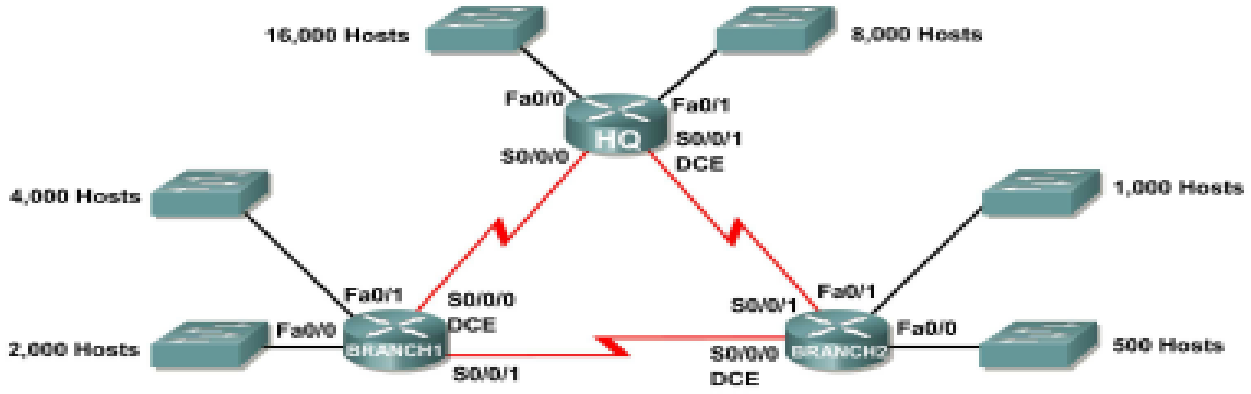
Topology Diagram



- Determine the number of subnets needed.
- Determine the number of hosts needed for each subnet
- Design an appropriate addressing scheme using VLSM.
- Assign addresses and subnet mask pairs to device interfaces.
- Examine the use of the available network address space.

12.0 Troubleshooting a VLSM Addressing Design

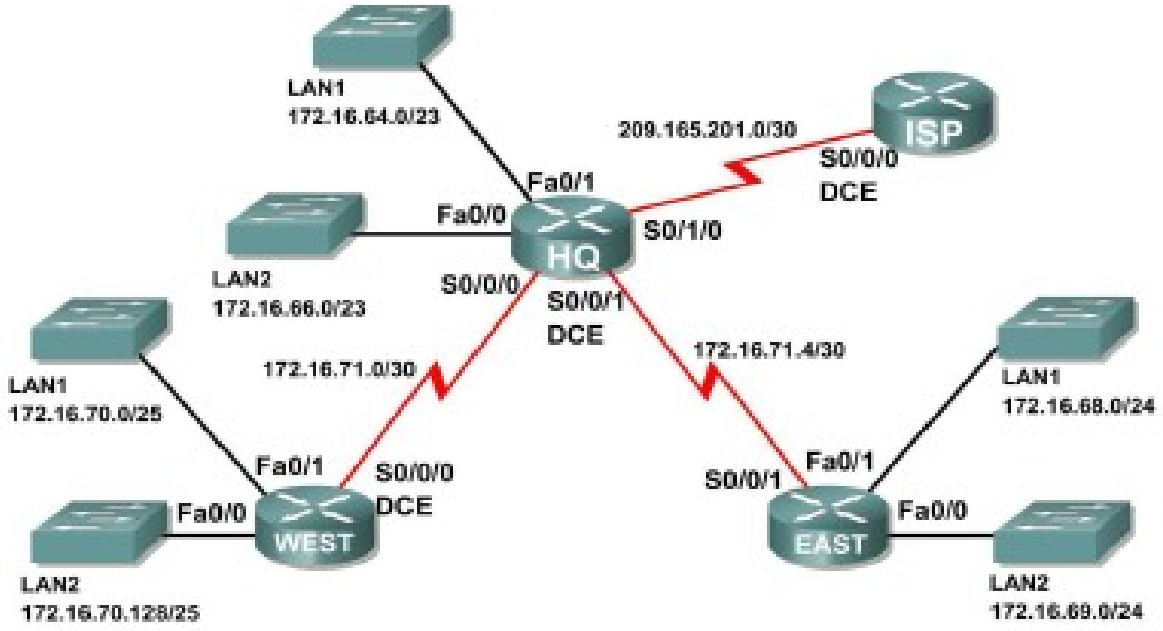
Topology Diagram



- Discover errors in a VLSM design.
- Propose solutions for VLSM design errors.
- Document the corrected VLSM assignments.

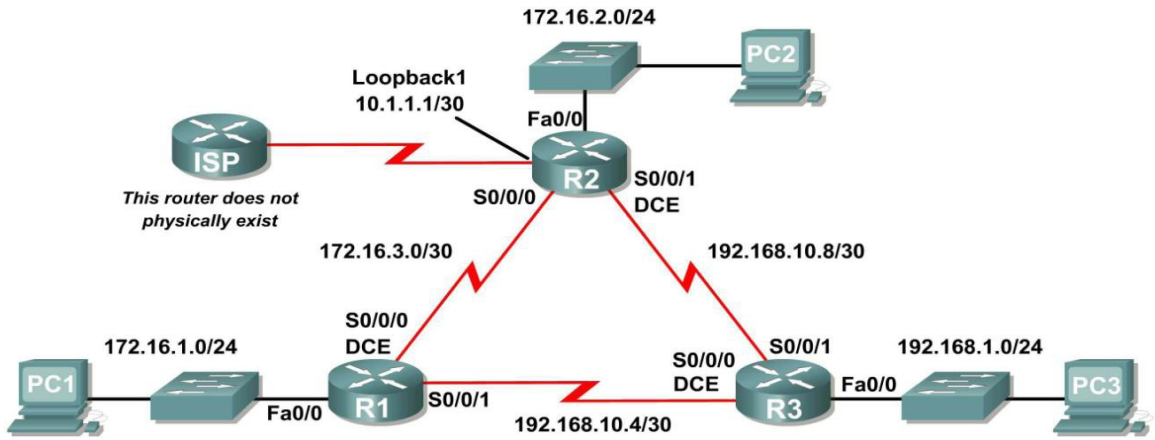
13.0 Basic Route Summarization

Topology Diagram



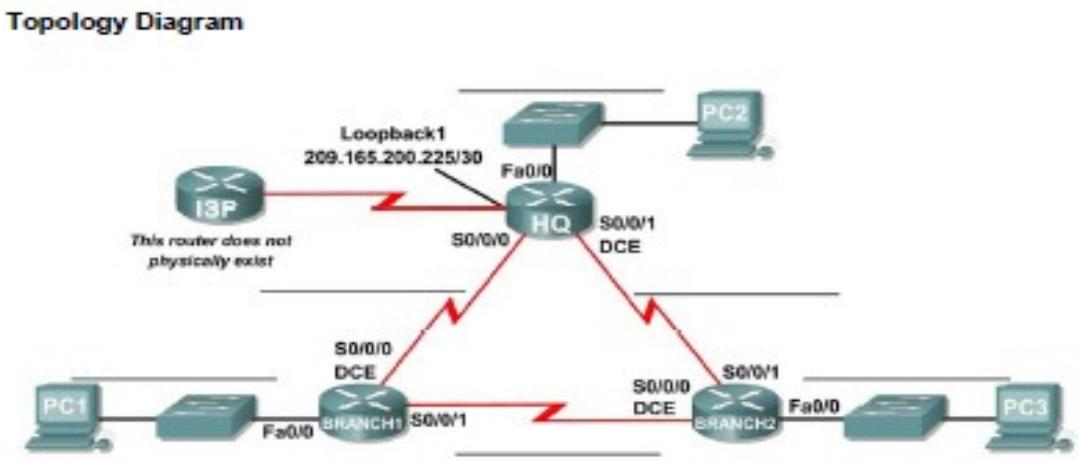
Determine summarized routes that can be used to reduce the size of routing tables

15.0 Basic EIGRP Configuration Lab



- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate interfaces.
- Configure EIGRP routing on all routers.
- Verify EIGRP routing using **show** commands.
- Disable automatic summarization.
- Configure manual summarization.
- Configure a static default route.
- Propagate default route to EIGRP neighbors.
- Document the EIGRP configuration.

16.0 Challenge EIGRP Configuration Lab

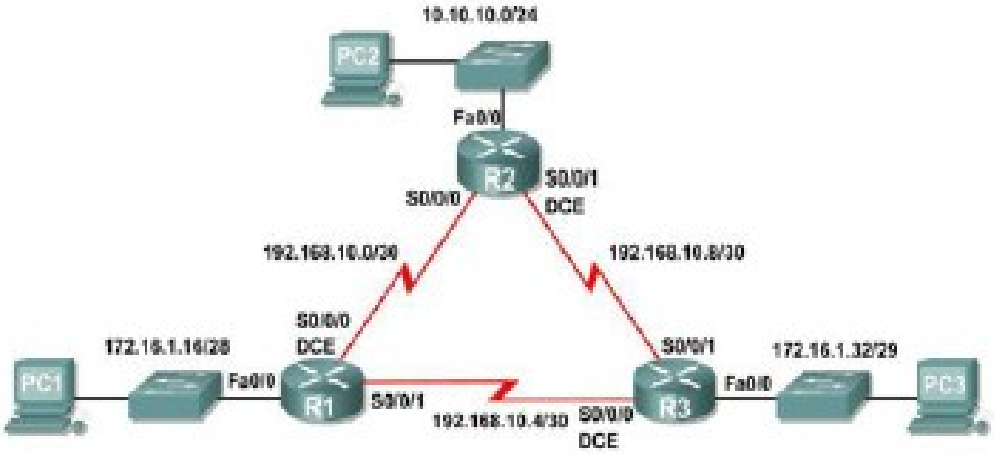


- Create an efficient VLSM design given requirements.
- Assign appropriate addresses to interfaces and document.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Configure routers including EIGRP.
- Configure and propagate a static default route.
- Verify EIGRP operation.
- Test and verify full connectivity.
- Reflect upon and document the network implementation.

17.0 Basic OSPF Configuration Lab

- Cable a network according to the Topology Diagram

Topology Diagram



- Erase the startup configuration and reload a router to the default state
- Perform basic configuration tasks on a router
- Configure and activate interfaces
- Configure OSPF routing on all routers
- Configure OSPF router IDs
- Verify OSPF routing using show commands
- Configure a static default route
- Propagate default route to OSPF neighbors
- Configure OSPF Hello and Dead Timers
- Configure OSPF on a multi-access network, priority and election process

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

COMMUNICATION SKILLS - IV

Course Code: MCA 441 **Credit Units: 01**

Course Objective:

To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

Course Contents:

Module I: Introduction to Speaking Skills
Business Conversation
Effective Public Speaking
Art of Persuasion

Module II: Speaking for Employment
Types of Interview
Styles of Interview
Facing Interviews-Fundamentals and Practice Session
Conducting Interviews- Fundamentals and Practice Session
Question Answer on Various Dimensions

Module III: Basic Telephony Skills
Guidelines for Making a Call
Guidelines for Answering a Call
Telephone Word Groups
Answering Systems and Voice-Mail

Module IV: Work Place Speaking
Team Briefing
Conflict Management
Negotiations
Participation in Meetings
Keynote Speeches

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.
- Taylor, Conversation in Practice.

BEHAVIOURAL SCIENCE – IV
(PERSONAL AND PROFESSIONAL EXCELLENCE)

Course Code: MCA 443 **Credit Units: 01**

Course Objective:

This course aims at imparting an understanding of:

- Build and leverage your professional reputation
- Maintain focus in pressure situations
- Make a balanced choice between professional and personal commitments

Course Contents:

Module I: Components of Excellence

- Personal Excellence:
  - Identifying long-term choices and goals
  - Uncovering the talent, strength & style
- Analyzing choke points in your personal processes by analysis in area of placements, events, seminars, conference, extracurricular activities, projects etc.
- Developing professional power: Goal-setting, time management, handling criticism, interruptions and time wasters

Module II: Professional Excellence

- Alan P. Rossiter's eight aspects of Professional Excellence
- Resilience during challenge and loss
- Continued Reflection (Placements, Events, Seminars, Conferences, Projects, Extracurricular Activities, etc.)

Module III: Career Planning

- Knowing one's Interest and Aptitude
- Identifying available Resources
- Setting goals to maintain focus:
- Developing Positive attributes in personality
  - Self-reliance and Employability skills

Module IV: Professional Success

- Building independence & interdependence
- Reducing resistance to change
- Continued reflection (Placements, events, seminars, conferences, projects extracurricular Activities etc.)

Module V: Stress Management for Healthy Living

- Meaning and Nature of Stress
- Stages of stress
- Causes and Con
- equences of stress: Personal, Organizational and Environmental
- Personal Styles and strategies of coping

Module VI: End-of-Semester Appraisal

- Viva based on personal journal
- Assessment of Behavioural change as a result of training
- Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term	VIVA	Journal (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers
- Raman, A.T. (2003) Knowledge Management: A Resource Book. Excel Books, Delhi.
- Kamalavijayan, D. (2005). Information and Knowledge Management. Macmillan India Ltd. Delhi

GERMAN - IV

Course Code: MCA 445 **Credit Units: 02**

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.
Introduction to Advanced Grammar Language and Professional Jargon

Course Contents:

Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing
To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale
Comprehension and narration
- Rotkäppchen
- Froschprinzessin
- Die Fremdsprache

Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs