GAVILAN ☕ COLLEGE

5055 Santa Teresa Blvd
Gilroy, CA 95020

Course Outline

COURSE: CSIS 175B   **DIVISION:** 50   **ALSO LISTED AS:**

TERM EFFECTIVE: Fall 2011   **Inactive Course**

SHORT TITLE: ROUTER THEORY/TECH

LONG TITLE: Router Theory and Router Technologies

Units	Number of Weeks	Type	Contact Hours/Week	Total Contact Hours
4	18	Lecture:	4	72
		Lab:	0	0
		Other:	0	0
		Total:	4	72

COURSE DESCRIPTION:

This course is the second of four courses in the Cisco Networking Academy curriculum. This course is an introduction to router concepts and terminology including Ethernet and Token Ring frames, RIP and IGRP routing protocols, distance vector and link state routing, routing loop issues, TCP/IP basics, IP addressing, and IP access lists. Students will get hands-on experience configuring Cisco routers. This course has the option of a letter grade or pass/no pass. PREREQUISITE: CSIS 175A ADVISORY: CSIS 48

PREREQUISITES:
        Completion of CSIS 175A, as UG, with a grade of C or better.

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES
        L - Standard Letter Grade
        P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:
        02 - Lecture and/or discussion
        72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:
1. Identify and use the main Cisco IOS software setup, configuration

and interface commands.

ILO: 7,3,2,1

Measure: Homework, projects, lab exercises.

2. Load the Cisco IOS from flash memory, a TFTP server, of ROM.

ILO: 3,7,2

Measure: Homework, projects.

3. Backup and upgrade the Cisco IOS.

ILO: 3,7,2

Measure: Homework, lab exercises, projects.

4. Configure the router with IP addresses and the RIP and IGRP
routing protocols.

ILO: 3,7,2

Measure: Homework, projects, tests, quizzes.

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CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Inactive Course: 09/26/2011

Week   Hours   Content

1   4   Review 175A. OSI Model. LANS.
Basics of TCP/IP Addressing. The Host Layers.
EXERCISES/READING/HOMEWORK: Read these chapters
and do the homework exercises. Describe the OSI
Model. Describe LANs. Describe the basics of
TCP/IP Addressing. Describe the Host Layers.

2   4   Basic Information about Routers and their use
in Networks. Function of a router. WAN technology
relation to routers. WANs and devices. Overview
of WAN technology. Five WAN physical layer
standards. Eight WAN data link protocols.
Common WAN technologies. General parts of a router
configuration file.
EXERCISES/READING/HOMEWORK: Read these chapters
and do the homework exercises. Understand basic
information about routers and their use in networks.
Understand WANs. Perform the network setup lab.

3   4   Using the Router. Basics of Router's Command Line
Interface. How to log into the router. How to
enter router modes. Different router modes and
commands.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand the basics
of router's command line interface. Demonstrate
how to log into the router. Demonstrate how to
enter router modes. Demonstrate ability to discern
different router modes and commands.

4-5   8   Router Components. Router show commands and network
neighbors. Basic network testing commands.
competence with the basic show command. Competence

with the CDP-related commands. Remote router access
using Telnet. Network connectivity using Ping.
Network troubleshooting using trace IP. Interface
status using show interface. Facility with a range
of show and testing commands.
EXERCISE/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand router
components. Understand router show commands.
Understand router's network neighbors. Understand
basic network testing commands. Demonstrate
competence with the CDP-related commands.
Demonstrate remote router access using Telnet.
Demonstrate network connectively using Ping.
Demonstrate network troubleshooting using Trace IP.
Demonstrate Interface Status using show interface.
Demonstrate facility with a range of show and
testing commands.
6   4   The Router Boot Sequence and Setup Mode.
Configuring a Router from Setup Mode.
Configuring a Router from Setup Mode in the Lab.
EXERCISES/READING/HOMEWORK: Read these chapters
and do the homework exercises. Understand the
router boot sequence and setup mode. Demonstrate
ability to configure a router from setup mode.
Demonstrate ability to configure a router from
setup mode - challenge lab.
7   4   Router Configuration.
Where router configuration files are located.
Router configuration. Basic router configuration
skills. Router interface configuration. Network
configuration. Router configuration.
EXERCISES/READING/HOMEWORK: Read these chapters
and do the homework exercises. Understand where
router configuration files are located. Understand
router configuration. Demonstrate basic router
configuration skills. Demonstrate router interface
configuration. Demonstrate a network configuration.
8   4   Basics of IOS Versions. Use and interpret the
show version command. Load IOS images. Loading IOS
image from a TFTP server. Loading a new IOS image.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Describe the basics of
IOS versions. Load IOS images. Loading IOS image
from a TFTP server. Loading a new IOS image.
9-10   8   Configure a Router from the CLI, for a router which
has had a start-up configuration erased. The
importance of individual router configuration.
A flowchart showing the router configuration

process. The router password recovery procedure.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Configure a router from
the CLI. Flowchart the router configuration
process. Use the router password recovery procedure.
Perform individual router configuration lab.

11-12   8   The Basics of Layer 4. Some important layer 3
concepts. TCP/IP protocol suite. Use the show ARP
command. Gather and use ARP table information.
Remotely troubleshoot a router.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand the basics
of layer 4. Understand some important layer 3
concepts. Describe the TCP/IP protocol suite.
Demonstrate ability to use the show ARP command.
Demonstrate ability to gather and use ARP table
information. Demonstrate ability to remotely
troubleshoot a router.

13   4   IP addressing and subnetting. The role of DNS in
router configurations. Assigning new subnet numbers
to the semester 2 topology. Assigning subnet
numbers to a real network.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand IP addressing
and subnetting. Understand the role of DNS in
router configurations. Demonstrate the ability to
assign new subnet numbers to the semester 2
topology. Demonstrate the ability to assign subnet
numbers to a real network.

14   4   Basics of routing. Why routing protocols are
necessary. Basics of distance-vector routing. Basics
of link-state routing. Context of different routing
protocols.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand the basics of
routing. Understand why routing protocols are
necessary. Understand the basics of distance-vector
routing. Understand the basics of Link-state
routing. Understand the context of different routing
protocols.

15-16   8   Static routing and default routes. Interior and
exterior routing protocols. RIP and IGRP. Set up
static routes. Run RIP on a network. Compare and
contrast static and dynamic routes. Existence of a
routing loop. Techniques to prevent routing loops.
EXERCISES/READING/HOMEWORK: Read these chapters and
do the homework exercises. Understand static routing
and default routes. Understand interior and exterior

routing protocols. Understand RIP and IGRP.

Demonstrate the ability to set up static routes.

Demonstrate the ability to run RIP on a network.

17   4   Troubleshoot the 5-router network. The standard

configuration. Typical layer 1 errors. Typical

layer 2 errors. Typical layer 3 errors. Network

troubleshooting strategies.

EXERCISES/READING/HOMEWORK: Read these chapters and

do the homework exercises. Describe the standard

configurations. Describe layer 1-3 errors. Use

network troubleshooting strategies.

18   4   Final project and exam.

STUDENT PERFORMANCE OBJECTIVES:

Week 1

Students can understand the OSI Model.

Students can understand LANs.

Students can understand the basics of TCP/IP addressing.

Students can understand the Host Layers.

Week 2

Students understand basic information about routers and their

use in networks.

Students understand WANs.

Students perform the Network Setup lab.

Week 3

Students understand the basics of router's Command Line Interface.

Students demonstrate how to log into the router.

Students demonstrate how to enter router modes.

Students demonstrate ability to discern different router modes and

commands.

Weeks 4 & 5

Students understand router components.

Students can use router show commands, network testing commands.

Students can use Telnet, ping, and trace commands.

Week 6

Students understand the router boot sequence and setup mode.

Students demonstrate ability to configure a router from setup mode.

Students demonstrate ability to configure a router from setup mode

in the lab.

Week 7

Students can do basic router configuration.

Students can do network configuration.

Week 8

Students can load IOS images.

Students can load IOS image from a TFTP server.

Students can load a new IOS image.

Weeks 9-10

Weeks 11-12

Students can describe the basics of Layer 4 and Layer 3.

Students can use the show ARP commands.
Students can use ARP table information.
Students can remotely troubleshoot a router.
Week 13
Students can understand IP addressing and submetting.
Students can understand the role of DNS in router configurations.
Students can assign new submet numbers to the semester 2 topology.
Students can assign submet numbers to a real network.
Week 14
Students can understand the basics of routing.
Students can understand why routing protocols are necessary.
Students can understand the basics of distance-vector routing.
Students can understand the basics of link-state routing
Students can understand the context of different routing protocols.
Weeks 15-16
Students can use static routing and default routes.
Students can use interior and exterior routing protocols.
Students can use RIP and IGRP.
Students can set up static routes.
Students can run RIP on a network.
Week 17
Students can describe the standard configuration.
Students can describe layer 1-3 errors.

METHODS OF INSTRUCTION:
Lecture, demonstration, lab

METHODS OF EVALUATION:
The types of writing assignments required:
Written homework
Reading reports
Lab reports
The problem-solving assignments required:
Homework problems
Field work
Lab reports
Quizzes
Exams
The types of skill demonstrations required:
Class performance
Performance exams
The types of objective examinations used in the course:
Multiple choice
True/false
Matching items
Completion
Other category:
None

The basis for assigning students grades in the course:

Writing assignments: 10% - 40%
Problem-solving demonstrations: 30% - 50%
Skill demonstrations: 10% - 50%
Objective examinations: 5% - 20%
Other methods of evaluation: 0% -   0%

REPRESENTATIVE TEXTBOOKS:
^uCisco Systems Networking Academy: First-Year Companion Guide^s,
Vito Amato, Series Editor, Cisco Press, 2001, or other
appropriate college level textbook.
Reading level of text: 11 Grade level. Verified by: dvt

ARTICULATION and CERTIFICATE INFORMATION
> Associate Degree:
> CSU GE:
> IGETC:
> CSU TRANSFER:
>> Transferable CSU, effective 200630
> UC TRANSFER:
>> Not Transferable

SUPPLEMENTAL DATA:
Basic Skills: N
Classification: I
Noncredit Category: Y
Cooperative Education:
Program Status: 2 Stand-alone
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department: CSIS
CSU Crosswalk Course Number: 175B
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: C
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000015465
Sports/Physical Education Course: N
Taxonomy of Program: 070810