Class Hours: 3.0  Credit Hours: 4.0
Laboratory Hours: 3.0  Date Revised: Spring 02

NOTE: This course is not intended for transfer credit.

Catalog Course Description:

This course offers lectures, hands-on labs, case studies and written exercises to the student all the advanced skills needed to configure Cisco routers. Students will learn the complex concepts and commands necessary to configure Cisco routers for scalable operation in large and/or growing internetworks. This course replaces the training included in the Advanced Cisco Router Configuration (ACRC) course. On Demand Prerequisite(s):

Entry Level Standards:

Students should be familiar with internetworking technologies and have the ability to perform basic configuration of Cisco routers. Prerequisite knowledge includes knowledge of IP, including the ability to perform IP subnetting and the ability to configure IP standard and extended access lists, distance vector routing protocol operation and configuration, serial interface configuration, and the ability to interpret a Cisco routing table.

Prerequisites:

NETW 1510 or consent of instructor

Textbook(s) and Other Reference Materials Basic to the Course:

Building Scalable Cisco Networks by Catherine Paquet and Diane Teare, Cisco Press. ISBN 1-57870-228-3

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Routing Principles</td>
</tr>
<tr>
<td>2-3</td>
<td>Extending IP Addresses</td>
</tr>
<tr>
<td>4</td>
<td>Configuring OSPF in a Single Area</td>
</tr>
<tr>
<td>5-6</td>
<td>Interconnecting Multiple OSPF Areas</td>
</tr>
<tr>
<td>7-8</td>
<td>Configuring EIGRP</td>
</tr>
<tr>
<td>9-10</td>
<td>Configuring Basic Border Gateway Protocol</td>
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</tbody>
</table>
II. Course Objectives*:

A. Select and configure a scalable IP address solution (including route summarization) for a diverse enterprise environment, given a list of specifications. III IV V VI XII

B. Select and implement the technologies necessary to redistribute between and to support multiple, advanced IP routing protocols, given a network specification. I IV VII VIII

C. Configure and test edge router connectivity (either single or multihomed connection) into a BGP network given a network specification. V VI VIII XI

D. Configure access lists, given a need to control access to devices and to selectively reduce overhead traffic in the network. II III IV X XI

E. Given a specification containing multiple routed and routing protocols, implement solutions in a large scale telecommunications project. I II IV V VI IX

*Roman numerals after course objectives reference goals of the NETW program.

III. Instructional Processes*:

Students will:

1. Design a complex networking plan which incorporates advanced IP address planning. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy

2. Examine and implement solutions to challenging internetworking processes. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy

3. Use professional diagnostic tools to produce successfully implemented autonomous systems. Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy

4. Participate in team projects involved in upgrading and improving routing performance. Communication Outcome, Problem Solving and Decision Making Outcome, Active Learning Strategy

5. Prepare documents explaining the mechanisms for troubleshooting autonomous systems. Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy

6. Practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. Personal Development Outcome

*Strategies and outcomes listed after instructional processes reference Pellissippi State’s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.
IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Setup Frame Relay configuration and TFTP a configuration file to a router. A, E
2. Migrate from a IP RIP to OSPF network. B, E
3. Configure and explore OSPF behavior in different Frame Relay environments. C, D
4. Summarize your networks on the area border router. A, C, D
5. Configure EIGRP for migration to OSPF. A, B, E
6. Summarize your pod’s IP address for EIGRP and verify pod connectivity. A, B, E
7. Configure basic BGP with one external neighbors. A, C, E
8. Configure basic BGP on all four routers in your pod. B, C
10. Redistribute between OSPF and EIGRP using distribute and route map filers. D, E
11. Troubleshoot policy-based routing using the traceroute and show commands. A, C

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures: 90% of grade

   Fourteen concept-based exams
   Exams 40% On-Line Exams
   Research 20% Professional Administrative Report
   Final Exam 30% Comprehensive Written, Oral, and Lab Practical Exams

   There will be no make-up tests unless prior arrangements are made with the instructor.

B. Laboratory Expectations:

   Skill Exams: pass/fail
   Mastery of Skills: Control routing; update traffic; setup default routing; use multiple routing protocols; configure RIP and OSPF; design autonomous systems; update BGP operation; issue redundancy, symmetry, and load balancing; design practical BGP configuration.
   Lab attendance is required. Assignments must be completed and submitted by the assigned deadline. This is a coordinated laboratory class, and assignments must be completed as scheduled.

C. Field Work:

   N/A

D. Other Evaluation Methods: 10% of grade

   Pop-Quizzes and "Outside-Class" take-home assignments may be given.
E. Grading Scale:

90 - 100%  A
80 - 89%   B
70 - 79%   C
60- 69%    D
0 - 59%    F

VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled required instructional activities. As a minimum, students in all courses MUST BE PRESENT for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.

B. Academic Dishonesty:

Plagiarism, cheating, software piracy, non-educational use of computer systems and other forms of academic dishonesty are strictly prohibited.