CENT 340 Advanced Routing
Syllabus Fall 2012

Instructor:	Sally Dunan
Office:	Bldg 13, Rm 107
Office hours:	MW: 11:30 AM-12:30 PM TR: 8:00-8:30 AM, 11:30 AM-12:30 PM, 3:30-4:00 PM F: by appointment
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Course Website:	https://laulima.hawaii.edu/access/content/group/HON.21568.201310/index.html
Class Time & Place:	TR 12:30-3:20 PM, Bldg 13, Rm 104

Course Description: A lecture/lab course covering topics on scalable networks. Emphasis is on scalable routing protocols like OSPF, EIGRP, and BGP. This course prepares the student for the CCNP ROUTE Exam.

Prerequisites: Completion of CENT 240 with a C or better.

Recommended Preparation: CCNA certification.

Student Learning Outcomes: Upon completion of this course the student will be able to:

- Describe network frameworks, architectures and models used in complex network designs.
- Describe and configure IP version 4 and IP version 6 addressing.
- Design network addressing using the following methods: variable length subnet masking, classless interdomain routing, subnetting, supernetting, route summarization, route aggregation.
- Configure routers to use the following features: private addresses, dynamic host configuration protocol (DHCP), helper addresses, IP unnumbered, network address translation, port address translation.
- Describe convergence issues related to different routing protocols.
- Describe the process of route calculation.
- Describe factors that affect route calculation.
- Describe the features and operation of the following protocols: RIP, EIGRP, OSPF, BGP.
- Configure and verify the operation of the following routing protocols: RIP, EIGRP, OSPF, BGP.
- Configure OSPF for the following operations: single area, multi-area, specialized OSPF areas, point-to-point, point-to-multipoint.
- Perform routing optimization to include routing policies and route redistribution.
- Describe path control and tools used for path control: offset lists, service level agreements, and policy-based routing.
- Perform branch office implementation and various services that can be implemented for branch office connectivity, including routing to branch offices and providing connectivity for mobile workers.
- Configure IPv6 addressing, routing protocols, and methods for transitioning to IPv6 networks including dual stack, tunneling, and translation techniques.

Course Content:

Implementing Cisco IP Routing (ROUTE)

- Routing Services. Network architectures and review of IP routing principles.
- Configuring Enhanced Interior Gateway Routing (EIGRP) Protocol. EIGRP terminology, operation, implmentation, verification and optimization.
- Configuring Open Shortest Path First (OSPF) Protocol. OSPF terminology, operation, configuration, network types, LSAs, routing table, and advanced features.
- Manipulating Routing Updates. Assessing network routing performance issues, route redistribution, and route filters.

- Implementing Path Control. Path control, offset lists, SLAs, and policy-based routing.
- Implementing Border Gateway Protocol (BGP). BGP terminology, concepts, operation, configuration, verification and troubleshooting, route maps, and route filters.
- Implementing Routing Facilities for Branch Offices and Mobile Workers. Branch office implementations, mobile worker implementations and routing.
- Implementing IPv6 in an Enterprise Network. IPv6 addressing, configuration and verification, routing with RIPng, OSPFv3, EIGRP, MBGP, policy-based routing, IPv4 to IPv6 transition, IPv6 tunneling, and IPv6 NAT-PT translation.

Textbooks: There is no on-line material provided by the Cisco Networking Academy for this course. The following textbook is required.

- *Implementing Cisco IP Routing (ROUTE), Foundation Learning Guide*, Diane Teare, Cisco Press, 2010, ISBN: 9781587058820. This is a hard copy textbook. HCC bookstore prices: used - $53.20, new - $70.00. Cisco Press: http://www.ciscopress.com/bookstore/product.asp?isbn=9781587058820

The following references are optional and may be of interest to students who would like to have a complete reference to Cisco commands relevant to this course, or a reference more specifically targeted toward preparing for the Cisco ROUTE certification exam.

- *CCNP ROUTE, Portable Command Guide*, Scott Empson and Hans Roth, Cisco Press, 2010, ISBN: 9781587202490. This is a paperback book. Cisco Press: http://www.ciscopress.com/bookstore/product.asp?isbn=1587202492
- *CCNP ROUTE 642-902, Official Certification Guide*, Wendell Odom, Cisco Press, 2010, ISBN: 9781587202537. Cisco Press: http://www.ciscopress.com/bookstore/product.asp?isbn=9781587202537

Course Website: The course schedule, lecture notes, assignments and additional references will be posted on the Laulima course web site, which requires logging in using your MyUH login name and password.

Elements of Student Evaluation: Students will be evaluated on the items listed below. The approximate weighting for each area is shown. The relative weighting of each area may change, if deemed appropriate.

Assignment Type	**Percentage**
Lab Assignments	10 %
Case Studies	20 %
Online & Written Quizzes (may given as homework)	10 %
Cisco Online Final Exam (ROUTE)	10 %
Cisco Online Feedback **(REQUIRED for GRADE)**	0
Written Exams (in class)	30 %
Skills Exam	20 %
Total	100 %

Grading Scale: A standard 10% grading scale will be used. (A = 90%, B = 80%, C = 70%).

Quizzes: Quizzes include written quizzes and Cisco on-line chapter quizzes. Quizzes may be assigned as homework. Cisco quizzes may be retaken for practice prior to the Cisco on-line final exams. The last score recorded in the Cisco gradebook for any on-line quiz is the score that will be used for determining the final course grade.

Lab Assignments: Labs provide the hands-on experience necessary for this course. Labs may be performed in class or assigned as homework. Normally one week is allowed for completion of labs. Check your individual progress report to determine specific due dates for each assignment.

Case Studies: Case studies are comprehensive lab-type assignments involving network design and network configuration. A written report including documentation of network design and configuration is required for case studies. Check the individual progress report to determine specific due dates for case studies.

Exams: Course exams include Cisco on-line final exams, in-class written exams, and skills exams. Skills exams will require network design and network configuration. All exams are closed book, closed notes, and will be given in class. No calculators are permitted. An exam may be made up in the case of an excused absence.

Late Policy: The penalty for late work is 20% of the points possible for the assignment per week late. A one week grace period is allowed. Both the late penalty and grace period are built into the grading database.

Expected Student Workload: Students should expect to spend approximately 12 hours or more per week on this course including class time, assignments, and studying course materials.

Attendance: If you are late or miss class, as a professional courtesy, please leave a voice mail message or send email with a simple explanation (e.g., sick, had a car problem, overslept, etc.) of the reason for the absence or tardiness. If you have an ongoing time conflict, such as a work schedule that requires you to routinely leave early, please discuss the situation with me in advance so that I can be aware of it. Attendance is an important component for success.

Professional Work Habits and Ethics: Students are expected to demonstrate a professional attitude and work habits throughout the course. Factors that reflect professionalism include attendance and punctuality, attentiveness in class, ethical work, work quality, and behavior and language, as described in the separately provided document. Egregious or repeated failure to demonstrate professional and ethical work habits will result in failing the course.

Unofficial Drops and N Grade: Students who disappear without officially dropping the course will receive an F. If you encounter conflicts with completing course requirements, please see me to discuss possible grading options, such as an N grade. The N grade will be given at the discretion of the instructor and is not automatic.

School Computer Lab: HCC maintains a computer lab for student use in Bldg 2, Rm 405A. All students can use this lab to check email, study, work on assignments, etc.

Student Email Accounts: I normally use the MailTool in Laulima to send email to members of the class. You can set your UH email preferences to automatically forward email to any account you prefer to use for email.

Networking Lab Access: You can work in the networking lab in Bldg 13, Rm 104, to complete lab assignments when other classes are not in session. See Gerald Chen (Bldg 13, Rm 103, Tel. 844-2332) for access to the lab outside regular class hours. Access to CENT labs outside of class is intended for the purpose of completing assigned course work only.

Student Regulations: A summary of Student Regulations and the Student Conduct Code are posted on the HCC web site. Complete copies of the Student Conduct Code are available from the office of the Dean of Students.

Student Access: Students who have disabilities requiring special accommodation should contact the Student Health Office or the College Skills Center to document their disabilities and request necessary accommodations.