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Spring 1-2016

### ITS 250.01M: CNNA 3 - Exploration - Scaling Networks

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**ITS 250, CCNA3 SCALING NETWORKS**

**CREDITS: 3**

**Spring, 2016**

January 25, 2016 - March 11, 2016

**COURSE DESCRIPTION:**

Describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network.

**REQUIRED TEXTBOOK:**

*CCNA Command Quick Reference*, Cisco Press, 2013, ISBN: 978-1-58713-159-2 (from ITS 152)  
*Scaling Networks Lab Manual* Cisco Press, 2014, ISBN: 978-1-158713-325-1

**FACULTY:** Wally Higgins

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**OFFICE HOURS:**

Office hours are: M,W 11am-12pm; T 10:30-11am & 2:30-3pm or by appointment in GH8.

**COURSE IMPLEMENTATION:**

Coursework (textbook) and all testing is done on-line in a multimedia format. Students need modern computer equipment capable of viewing text, html, audio, video, and flash animation. Hands-on labs and e-labs using simulation techniques are utilized.

**PREREQUISITE:** ITS 152

**PERFORMANCE OUTCOMES:**

At completion of course, students will be able to:

1. Configure and troubleshoot DHCP and DNS operations for IPv4 and IPv6
2. Understand and describe the operations and benefits of the Spanning Tree Protocol (STP)
3. Configure and troubleshoot STP operations
4. Understand and describe the operations and benefits of link aggregation and Cisco VLAN Trunk Protocol (VTP)
5. Configure and troubleshoot VTP, STP, and RSTP
6. Configure and troubleshoot basic operations of routers in a complex routed network for IPv4 and IPv6 using single-area OSPF, multi-area OSPF, and EIGRP
7. Configure and troubleshoot advanced operations of routers and implement RIP, OSPF, and EIGRP routing protocols for IPv4 and IPv6

## 8. Manage Cisco IOS software licensing and configuration files

### EVALUATION:

Assignments will be graded on a point system; total points possible will be announced at the start of each project. Quizzes and tests will also be on a point system. Total points earned will be divided by total points possible to get a percentage with grade conversion as follows:

90 - 100 **A** | 80 - 89 **B** | 70 - 79 **C** | 60 - 69 **D**

FINAL: 30% on-line chapter quizzes  
35% pop-quizzes, labs, lab tests, homework  
20% on-line final  
15% skills final

*NOTE: Students must maintain a minimum grade of "C-" in all classes that count toward major for the AAS degree.*

There are no points given for work turned in late; therefore, it is essential to meet all deadlines.

### FINAL:

The final for this course is scheduled for **Weekend of March 12 online.**

### INCOMPLETE POLICY:

There is no option for receiving an "incomplete" for a final grade in this course because the course content, assignments, group projects, and labs change frequently. Please contact instructor for other options if you find yourself in a position that you cannot complete the work.

### ACCOMMODATION:

Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact instructor via email. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the Disability Services website at [www.umt.edu/dss/](http://www.umt.edu/dss/) or call 406-243-2243 (voice/text).

### ACADEMIC INTEGRITY:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at [http://life.umt.edu/vpsa/student\\_conduct.php](http://life.umt.edu/vpsa/student_conduct.php)

### EXPECTATIONS/POLICIES:

1. Class structure will include lectures on new material, assignments, lab assignments, group discussions, research of current periodicals and Internet, review, handouts, and scheduled tests. Internet and e-mail is used extensively. Course curriculum (textbooks) and all tests are on-line. Hard copies of the lab manual available in bookstore.
2. Cisco Academy site will be used for learning management system, as well as Moodle.

3. Official UM email is mandatory for all correspondence between instructor and students. If you would like to forward this email to a personal email, you can do that in Cyberbear. However, you must generate new messages from UMConnect account. This also applies to correspondence to admissions, the registrar, financial aid, and administration of Missoula College and UM.
4. As each project is assigned, total points possible, due date, and specific requirements will be announced in class and posted on Moodle.
5. No points are given for late submissions.
6. Interactive exercises and e-labs will be assigned with each chapter.
7. All grades will be on the Cisco course management system.

### **CHANGES TO SYLLABI:**

Note: Instructor reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

### **SYLLABUS UPDATED: January, 2016**

### **COURSE OUTLINE:**

- I. Growing the Network
  - A. Scaling the Network
  - B. Switched Network
- II. LAN Redundancy
  - A. Spanning Tree Concepts
  - B. Varieties of Spanning Tree Protocols
  - C. Spanning Tree Configuration
- III. Link Aggregation
  - A. Link Aggregation Concepts
  - B. Link Aggregation Configuration
- IV. Wireless LANs
  - A. Wireless LAN Concepts
  - B. Wireless LAN Operation
  - C. Wireless LAN Security
  - D. Wireless LAN Configuration
- V. Adjust and Troubleshoot Single-Area OSPF
  - A. Advanced Single-Area OSPF Configurations
  - B. Troubleshooting single-Area OSPF Implementations
- VI. Multi-area OSPF
  - A. Multi-area OSPF Operation
  - B. Configuring Multi-area OSPF
- VII. EIGRP
  - A. Characteristics of EIGRP
  - B. Configuring EIGRP for IPv4

- C. Operation of EIGRP
  - D. Configuring EIGRP for IPv6
- VIII. Adjust and Troubleshoot EIGRP
  - A. Advanced EIGRP Configurations
  - B. Troubleshoot EIGRP
- IX. IOS File Management
  - A. Managing IOS System Files
  - B. IOS Licensing