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### ITS 152.01: CCNA 2: Exploration

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**ITS 152, ROUTING and SWITCHING ESSENTIALS**

**CREDITS: 3**

**Autumn, 2018**

August 27, 2018 - December 14, 2018

**COURSE DESCRIPTION:**

Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, virtual LANs, Standard Access Control Lists, DHCP, NAT for IPv4 and Device Discovery.

**REQUIRED TEXTBOOK:**

CCNA Routing and Switching, Portable Command Guide, Fourth Edition, Cisco Press, 2016, ISBN: 978-1-58720-588-0

**FACULTY:** Wally Higgins, Instructor  
7865

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**OFFICE HOURS:**

Office hours are 9-10 AM MTW or by appointment Office: Room MC320

**COURSE IMPLEMENTATION:**

Coursework (textbook) and all testing are 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 150

**PERFORMANCE OUTCOMES:**

At completion of course, students will be able to:

Understand and describe basic switching concepts and the operation of Cisco switches

1. Understand and describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q
2. Configure and troubleshoot basic operations of a small switched network
3. Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process
4. Configure and verify static routing and default routing
5. Understand and describe how VLANs create logically separate networks and how routing occurs between them

6. Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols
  7. Configure and troubleshoot basic operations of routers in a small routed network: RIP v1 and RIPv2
  8. Configure and troubleshoot VLANs and inter-VLAN routing
  9. Understand and describe the purpose and types of access control lists (ACLs)
  10. Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6
  11. Understand and describe the operations and benefits of Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) for IPv4 and IPv6
  12. Understand and describe the operations and benefits of Network Address Translation (NAT)
  13. Be prepared to sit for the CCNET certification exam.

**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% 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 **Monday, December 18**, 1:10 - 3:10 p.m.

**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.
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: August, 2018**

### **COURSE OUTLINE:**

- I. Routing Concepts
  - A. Initial Configuration
  - B. Routing Decisions
  - C. Router Operation
- II. Static Routing
  - A. Implement Static Routes
  - B. Configure Static and Default Routes
  - C. Troubleshoot Static and Default Routes

- III. Dynamic Routing
  - A. Dynamic Routing Protocols
  - B. RIPv2
  - C. Routing Tables
- IV. Switched Networks
  - A. LAN Design
  - B. Switched Environment
- V. Switch Configuration
  - A. Basic Switch Configuration
  - B. Switch Security
- VI. VLANs
  - A. VLAN Segmentation
  - B. VLAN Implementations
  - C. Inter-VLAN Routing Using Routers
- VII. Access Control Lists
  - A. ACL Operation
  - B. Standard IPv4 ACLs
  - C. Troubleshoot ACLs
- VIII. DHCP Dynamic Host Configuration Protocol
  - A. DHCPv4
  - B. DHCPv6
- IX. NAT for IPv4
  - A. NAT Operation
  - B. Configure NAT
  - C. Troubleshoot NAT
- X. Device Discovery, Management, and Maintenance
  - A. Device Discovery
  - B. Device Management
  - C. Device Maintenance