9-2013

ITS 255.01M: IP Telephony

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MISSOULA COLLEGE

ITS 255, IP TELEPHONY

CREDITS: 3

Fall, 2013

August 26, 2013 - December 13, 2013

COURSE DESCRIPTION:

Provides an introduction to converged voice and data networks as well as challenges faced by the various technologies. Presents solutions and implementation considerations for signaling, quality of service, call control, dial plans, gateway protocols, messaging, congestion, and connecting to a PSTN network.

REQUIRED E-TEXTBOOK:

CCNP Voice CVOICE 642-437
Quick Reference, 3rd Edition, Sauer and Wallace, CiscoPress, 2011.

ISBN: 978-0-13-249258-4
Order online.

SUPPLIES:

Headset with microphone

FACULTY: Penny Jakes, Associate Professor

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Phone: 406-243-7804

OFFICE HOURS:

Tuesday 9-10; Wednesday 12-1 8; Thursday 1-2 or by appointment in GH8.

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. Webcams and headsets are recommended for conferencing sessions and creating podcasts. Hands-on labs and e-labs using simulation techniques are utilized.

This course will be delivered in a hybrid format with the reading, lecture material, assignments, and tests done through Moodle. Lectures will go over concepts and include design activities. Hands-on labs will be required with students divided into teams with a posted lab schedule. There will be required discussion groups, collaborative/group projects, and presentations to entire class via web conferencing software.

PREREQUISITE: ITS 150

PERFORMANCE OUTCOMES:

At completion of course, students will be able to:

1. Analyze existing phone systems for IP capabilities
2. Design internetworks using VoIP switches to create VLANs and peer groups
3. Select VoIP equipment and IP phone features that ensures quality of service
4. Calculate bandwidth with number of trunks and grade of service as implementation criteria
5. Connect routers to phone lines and digital circuits
6. Configure H.323, MGCP, and SIP
7. Implement security policies and queuing for traffic priority
8. Setup, configure, and oversee a web conference/web meeting

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

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 **Wednesday, December 11, 3:20-5:20 p.m. in HB3**.

INCOMPLETE POLICY:

There is no option for receiving an "incomplete" for in this course because it is entirely online once per year and 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/ 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

EXPECTATIONS/POLICIES:

1. On-line 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. Official UM email is mandatory for all correspondence between instructor and students. If you would 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.
3. As each project is assigned, total points possible, due date, and specific requirements will be posted in Moodle. Remember, no points are given for late submissions.
4. Interactive exercises and e-labs will be assigned with each chapter.
5. All grades will be on the Moodle 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, 2013

COURSE OUTLINE:

I. Introduction to Telephony
   A. Traditional Phone Basics
   B. Standards
   C. Protocols
   D. Signaling
   E. Devices/Components
   F. Call Setup/control
   G. Digital vs. Analog Connections
   H. Multiplexing
   I. Packet Telephony vs. circuit-switched

II. Digital Encoding
   A. Segmenting
   B. Bandwidth
   C. Trunks
   D. Grade of service
   E. Evaluate IP Providers
   F. Packet Loss, Delay, Jitter
   G. Gateways
   H. Encapsulating voice in IP Packets
   I. VoIP Protocols and OSI Model
   J. Compression
   K. Tunneling

III. Planning for VoIP
   A. Existing phone systems
   B. Replacing PBX Trunks
   C. Connecting Router to Phone Line
   D. Connecting Router to Digital Circuit
   E. VoIP in the Home

- F. Installation
- G. Setting up Service

IV. Cisco CallManager
- A. Replace old switches
- B. Configuration of CME
- C. IP Phone setup/features
- D. In-line power
- E. Codecs
- F. VLANs
- G. Dial Plans
- H. ePhone configuration
- I. Softphone
- J. Web conferencing

V. Signaling and Call Control
- A. H.323
- B. MGCP
- C. SIP
- D. Quality of service
- E. Congestion Management
- F. Priority Queuing
- G. Classification/marking
- H. Policing and shaping
- I. Link efficiency

VI. Security
- A. Trust boundaries
- B. Convergence
- C. Compression
- D. Encryption
- E. Video/video conferencing
- F. Cellular
- G. Wireless