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Course Outline for CNT 7301

VOIP: CISCO AND ASTERISK IP PHONES

Effective: Fall 2008

I. CATALOG DESCRIPTION:
CNT 7301 — VOIP: CISCO AND ASTERISK IP PHONES — 4.00 units

VoIP (Voice over Internet Protocol) offers a cost-effective alternative to plain old telephone service. What is it, how does it work and what does it mean? This class is for all business, SOHO and computer users interested in using this technology, and will provide a guide for selecting, setting up and using IP phone services. It will serve as a practical hands-on guide to the purchase and setup of hardware and software for Internet phones and the broadband Internet services required to support them, providing basic need-to-know information about getting the most out of VoIP services.

3.00 Units Lecture 1.00 Units Lab

Strongly Recommended
CIS 50 - Intro to Computing Info Tech

Grading Methods:
Letter or P/NP

Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	54.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 2

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CIS50

IV. MEASURABLE OBJECTIVES:

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

A. outline the key features, advantages and uses of VoIP B;
B. install and configure a VoIP service
C. describe and evaluate VoIP software and hardware solutions;
D. identify and discuss the advantages and limitations of closed source and open source VoIP technologies;
E. demonstrate an understanding of tradition Telephone;
F. demonstrate an understanding of IP Telephony;
G. outline the steps necessary to plan and design a VoIP installation for a home or SOHO business;
H. demonstrate an understanding of Windows, Linux and Apple OS X desktop environments as they relate to VoIP;
I. demonstrate the ability to configure system and network settings for VoIP;
J. discuss and evaluate security and authentication methods;
K. demonstrate an understanding of TCP-IP basics related to VoIP on LANs and WANs;
L. demonstrate the use of Wireshark and other network monitoring tools in evaluating VoIP;
M. describe and demonstrate troubleshooting methods for VoIP.

V. CONTENT:
A. Telephony Fundamentals:
1. History
2. Development
3. Analog
4. Digital
5. PSTN
B. Voice Over IP
1. IP
2. VoIP Signaling
3. VoIP Conversation
4. Features

C. Broadband phone services
    1. Infrastructure
    2. Costs
    3. Virtual / real phone numbers
    4. Features
D. Reliability / Availability
    1. QOS
    2. 911
    3. E911
    4. Backup power
    5. Features
    6. TCO
E. VoIP equipment
    1. Hardware
    2. Software
    3. ATAs
    4. SIP providers
F. VoIP PBX
    1. Cisco
    2. Astarisk
    3. Open Source
    4. Other vendors
G. Planning home VoIP
    1. Requirements
    2. Plan
    3. RFP
    4. RFQ
    5. Installation / Configuration
    6. Security / Troubleshooting
H. SOHO PBX
    1. Requirements
    2. Plan
    3. RFP
    4. RFQ
    5. Installation / Configuration
    6. Security / Troubleshooting
    7. Cisco call manager / options
    8. Astarisk
I. VoIP on Wireless
    1. Cordless sets
    2. LAN wireless
    3. Security
    4. Bandwidth
    5. Configuration / Troubleshooting
    6. Bridging
J. Additional services
    1. Chat
    2. client-server
    3. Skype
    4. Google Talk
    5. Gizmo Project
K. Future of Telephone
    1. Network convergence
    2. Video/VoIP/Data convergence
    3. Costs/TCO
    4. Features

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Demonstration** -
C. **Research** -
D. **Lab** -
E. Assigned reading
F. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Reading / listening to presentations and readings 1. Presentations and lectures a. Example: Lecture on Cisco 2. Call Manager installation 3. Selected current online readings a. Example: Read Astarisk configuration tutorial, at www.astarisk.org B. Search for relevant material and read 1. Students use search engines to find readings relevant for each module a. Example: Find resources describing effects of delay and jitter on VoIP, select 3 to read C. Provide comments regarding curriculum 1. Discussion and response questions accompany each module a. Example: “Discuss how SIP manages call setup and teardown.” D. Answer comments and questions from fellow students and instructor 1. Students must participate in group discussion a. Example: On the www.testyourvoip.com site, run several tests, observe the detailed report, and discuss the quality of your internet connection for VoIP operation.

VIII. EVALUATION:
A. **Methods**

B. **Frequency**

1. Frequency:
    a. 6-10 module assignments
    b. Weekly discussion of group work
    c. 6-10 module quizzes
    d. 6-10 labs
    e. 1 final project
2. Typical quiz question:
    a. What is the difference between Gizmo Project and Skype?

b. Describe the operation of SIP
3. Final exam

IX. TYPICAL TEXTS:

1. Jerri Ledford *Cut the Cord! The Consumer's Guide to VoIP.*, Course Technology Publishing, 2006.
2. John Q. Walker *Internet Communications using SIP: Delivering VoIP and Multimedia Services with Session Initiation Protocol.*, Wiley, John & Sons, 2006.
3. Henry Sinnreich *Taking Charge of Your VoIP Project: Strategies and Solutions for Successful VoIP Deployments.*, Pearson Education, 2004.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Students require access to a computer connected to the Internet, with word processing and browser software, and an email address.