

ITT Technical Institute
IT412
Voice and Data Integration
Onsite Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 50 (30 Theory Hours, 20 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: IT371 Advanced Routing and Switching II

Course Description:

Technology and trends in integrating voice on the data network will be discussed. Voice over IP (VoIP) will be studied incorporating Quality of Service (QoS) with general coverage on some other typical integrated voice technologies, such as Voice over Frame Relay and ATM multimedia capabilities.

Syllabus: Voice and Data Integration

Instructor:	_____
Office hours:	_____
Class hours:	_____

Major Instructional Areas

1. The traditional telephony world
2. Components of a Cisco VoIP network
3. Connecting IP phones to the LAN infrastructure
4. Installing and configuring Cisco Unified Communications Manager Express
5. Gateway and trunk concepts
6. Cisco Unity Express (CUE) concepts and configuration
7. The Smart Business Communications System

Course Objectives

1. Describe the traditional analog communications telephone system and analyze the impact of VoIP on business.
2. Describe the steps to convert analog to digital signals.
3. Define both Channel Associated Signaling (CAS) and Common Channel Signaling (CCS).
4. Explain the Cisco VoIP structure.
5. Describe the purpose of VLANs in a VoIP environment.
6. Describe the purpose and operation of PoE.
7. Configure the Cisco Unified Communications Manager Express.
8. Configure call transfer design specifics.
9. Configure voice productivity features, including hunt groups, call park, call pickup, paging, and paging intercom.
10. Describe the process of converting voice to packets.
11. Configure physical voice port characteristics.
12. Describe the steps necessary to configure quality of service.

SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, created by the National Secretary of Labor in the early 1990s, created a list of skills and competencies that the committee feels are necessary for employees to function in a high-tech job market.

1. Acquire information.
2. Understand how technological systems work and operate effectively.
3. Demonstrate competence in understanding systems.
4. Understand how a system's structures relate to goals.
5. Demonstrate competence in selecting technology including determining desired outcomes and applicable constraints.
6. Demonstrate competence in how to apply technology to task.

Course Outline

Note: All graded activities are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Labs: 2.1 refers to the 1st lab activity in Unit 2.

Unit	Activities
1—The Traditional Telephony World	<ul style="list-style-type: none"> • Content Covered: <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 1, “Perspectives on Voice Before Convergence” ○ Chapter 2, “Perspectives on Voice After Convergence” • Labs: 1.1, 1.2 • Course Project Work: 1.1 • Assignments: 1.1, 1.2
2—Connecting IP Phones to the LAN Infrastructure	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 3, “Connecting IP Phones to the LAN Infrastructure” • Labs: 2.1-2.4 • Course Project Work: 2.1 • Assignments: 2.1 • Quizzes: 2.1
3—Installing Cisco Unified Communication Manager Express	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 4, “Installing Cisco Unified Communications Manager Express” • Labs: 3.1, 3.2 • Course Project Work: 3.1 • Assignments: 3.1 • Quizzes: 3.1
4—Basic Cisco Unified CME IP Phone Configuration	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 5, “Basic CME IP Phone Configuration” • Assignments: 4.1 • Labs: 4.1, 4.2 • Course Project Work: 4.1 • Quizzes: 4.1
5—Configuring Cisco Unified CME Voice Productivity Features	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 6, “Configuring Cisco Unified CME Voice Productivity Features” • Labs: 5.1, 5.2 • Course Project Work: 5.1 • Assignments: 5.1 • Quizzes: 5.1
6—Connecting via Gateways and Trunks	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 7, “Gateway and Trunk Concepts” • Labs: 6.1 • Course Project Work: 6.1 • Assignments: 6.1 • Quizzes: 6.1
7—Configuring and Verifying Gateways and Trunks	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide:</i> <ul style="list-style-type: none"> ○ Chapter 8, “Configuring and Verifying Gateways and Trunks” • Labs: 7.1, 7.2 • Course Project Work: 7.1 • Assignments: 7.1

Unit	Activities
	<ul style="list-style-type: none"> • Quizzes: 7.1
8—Voice Mail with Cisco Unity Express	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide</i>: <ul style="list-style-type: none"> ◦ Chapter 9, “Cisco Unity Express Concepts” ◦ Chapter 10, “Cisco Unity Express Configuration” • Labs: 8.1, 8.2 • Course Project Work: 8.1 • Assignments: 8.1 • Quizzes: 8.1
9—Introducing the Smart Business Communications System	<ul style="list-style-type: none"> • Read from <i>CCNA Voice Official Exam Certification Guide</i>: <ul style="list-style-type: none"> ◦ Chapter 11, “Introducing the Smart Business Communications System” • Labs: 9.1 • Course Project Work: 9.1 • Assignments: 9.1 • Quizzes: 9.1
10—Team Projects	<ul style="list-style-type: none"> • Course Project Presentation
11—Course Review and Final Exam	<ul style="list-style-type: none"> • Final Exam

Instructional Methods

This course is intended to provide a foundation in VoIP technology using Cisco devices and software. Before you begin this course, you should have the prerequisite knowledge of data communications and Cisco router commands to successfully complete the lab activities. Through the readings, review questions, writing assignments, and labs, you will be prepared to manage a network using Cisco’s Unified CallManager Express.

Your instructor will give you weekly quizzes to test your understanding of the material. These quizzes will review the lecture and lab material covered in previous class meetings. You will also take a final exam and complete a course project.

Instructional Materials and References

Student Textbook Package

Cioara, Jeremy, Michael J. Cavanaugh, and Kris A. Krake. *CCNA Voice Official Exam Certification Guide*. Indianapolis: Cisco Press, 2009.

Equipment and Tools

- Two Cisco 2801 Series Voice over IP-equipped routers
- Two Cisco 3500 Series Power over Ethernet switches
- Four Cisco Voice over IP telephone handsets
- Console cables
- Serial cables
- Fast Ethernet cables

References

ITT Tech Virtual Library

Log on to the ITT Tech Virtual Library at <http://library.itt-tech.edu/> to access online books, journals, and other reference resources selected to support ITT Tech curricula.

Books

You may click “Books” or use the “Search” function on the home page to find the following books.

ITT Tech Virtual Library> Main Menu> Books> Books 24x7

- Shepard, Steven. *Voice Over IP Crash Course*. New York: McGraw-Hill, 2005.
- Miller, Mark. *Voice Over IP Strategies for the Converged Network*. Foster City, CA: M & T Books, 2000.

Periodicals

You may click “Periodicals” or use the “Search” function on the home page to find the following periodicals.

ITT Tech Virtual Library> Main Menu> Periodicals

- Ellis, Benjamin. “Managing Voice Matters.” *Communications News* May 2008: 25.
- “Advantages of Integrating Voice and Data Networks.” *Orange County Business Journal*. August 10, 2009: 18-19.

Course Evaluation and Grading

Evaluation Criteria Table

The final grades will be based on the following categories:

CATEGORY	WEIGHT
Labs	25%
Quizzes	10%
Assignments	20%
Project	20%
Final Exam	25%
Total	100%

Note: Students are responsible for abiding by the Plagiarism Policy.

Grade Conversion Table

The final grades will be calculated from the percentages earned in the course, as follows:

A	90–100%	4.0
B+	85–89%	3.5
B	80–84%	3.0
C+	75–79%	2.5
C	70–74%	2.0
D+	65–69%	1.5

D	60–64%	1.0
F	<60%	0.0