



COURSE SYLLABUS

Cisco Certified Network Professionals

CCNP ONT (Exam 642-845)



50 Cragwood Rd, Suite 350
South Plainfield, NJ 07080

Victoria Commons, 613 Hope Rd Building #5,
Eatontown, NJ 07724

130 Clinton Rd,
Fairfield, NJ 07004

Avtech Institute of Technology Course

Instructor:

Course Duration:

Date/Time:

Training Location:

Course Description

In this course students will learn the process and procedures needed to implement, troubleshoot repair and maintain a Cisco network. Students will have the opportunity to apply and enhance their skills through hands-on projects that simulate real-life scenarios. This course aids in the preparation for the **CCNP ONT Exam 642-845**.

Learning Objectives

1.0 Cisco VoIP (Voice over IP) Network Implementations

- 1.1. Describes the benefits of, and the basic components of, VoIP networks IP phones, gateways, gatekeepers and Cisco Unified CallManager; CCM). Conversion of analog voice signal to digital voice signal and vice versa, plus encapsulation of voice for transport across
- 1.2. Identifies the components necessary for VoIP support in an enterprise, describes the main IP telephony deployment models, and defines call admission control

2.0 IP Quality of Services

- 2.1. Provides the essential background, definitions, and concepts for learning IP Quality of Services.
- 2.2. Defines QoS, presents the main issues must be addressed in a converged network, and the key steps in implementing a Qos policy in a network are described. The three main Qos models and the key features, merits, and drawbacks of each model are discussed next. The last part explains the legacy Command Line Interface (CLI), Modular Quality of Service Command Line Interface (MQC), Cisco AutoQos, and Cisco Router and Security Device Manager (SDM) QoS Wizard
- 2.3. Discuss and compare the advantages and disadvantages of each of these QoS implementation methods

3.0 Classification, Marketing, and NBAR

- 3.1. Defines classification and marking, and presents the markings that are available at data link and network layers. Describes Qos service classes and how they can be used to create a service policy throughout a network, discuss Network trust boundaries,

- 3.2. Describes Network Based Application Recognition (NBAR) as well as Packet Description Language Modules (PDLM)
- 3.3. Presents the IOS commands required to configure NBAR

4.0 Congestion Management and Queuing

- 4.1. Defines what congestion is and why congestion happens, describes and explains the need for queuing or congestion management the router queuing components
- 4.2. Explains and provides configuration and monitoring commands for queuing methods, namely FIFO, PQ, PR, WRR, WFQ, Class-Based WFQ, and LLQ

5.0 Congestion Avoidance, Policing, Shaping, and Link Efficiency Mechanisms

- 5.1. Provides an overview of three main QoS concepts: congestion avoidance, traffic shaping and policing, and link efficiency mechanisms.
- 5.2. WRED and class-based WRED; the main mechanisms are covered
- 5.3. Explains Traffic shaping and policing concepts, learn the purpose of these mechanism and where it is appropriate to use them
- 5.4. Different compression techniques, discuss the concept of link fragmentation and interleaving

6.0 Implementing QoS Pre-Classify and Deploying End-to-End QoS

- 6.1. Describe the concept of QoS pre-classify, and how it is used to ensure that IOS QoS features work in conjunction with tunneling and encryption
- 6.2. Deals with the topics related to deploy end-to-end QoS
- 6.3. Discusses the concept of control plane policing

7.0 Implementing AutoQoS

- 7.1. Explains AutoQoS, including discussions on AutoQoS VoIP and AutoQoS Enterprise
- 7.2. Presents the key elements of QoS deployment, protocol discovery with NBAR, and AutoQoS deployment restrictions
- 7.3. Configuring and verifying AutoQoS on routers and switches
- 7.4. Discuss the concept of control plane policing

8.0 WLAN QoS Implementation

- 8.1. Explains the need for QoS in wireless LANs and describes WLAN QoS, which is work in progress
- 8.2. Describes WLAN QoS implementation between client and wireless access point, between access point and controller, and between controller and Ethernet switch
- 8.3. Configures WLAN QoS through defining QoS profiles and WLAN IDs on wireless controllers

9.0 Introducing 802.1x and Configuring Encryption and Authentication on Lightweight Access Points

- 9.1. Explains the need for wireless security and describing WLAN Security
- 9.2. Briefly introduce 802.11x, IEAP, EAP (FAST and TLS), and PEAP, and the concept of WiFi protected access (WPA)
- 9.3. Discuss how encryption and authentication on lightweight access points is configured

10.0 WLAN Management

- 10.1. Describes the Cisco unified wireless networks: the business drivers, the elements and the Cisco implantation model and its components
- 10.2. Describes Cisco Wireless LAN Solution Engine (WLSE) and WLSE Express and their features and benefits; presents a quick lesson on WLSE Express setup
- 10.3. Discuss Cisco Wireless Control Systems (WCS base and location software and system features), Cisco Wireless Location Appliance (architecture and applications), and rogue access point detection

Prerequisite

Valid CCNA certification

Contact Hours

_____ Contact Hours (Lecture ____ Hours / Lab ____ Hours)

Semester Credit Hours

_____ Semester credit hours

Text / Lab Books

CCNP ONT Official Exam Certification Guide

- ü Master all **642-845 exam topics** with the official study guide
- ü Access your knowledge with **chapter-opening quizzes**
- ü Review key concepts with **foundation summaries**
- ü Practice with **hundreds of exam questions** on the CD-ROM

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Teaching Strategies

A variety of teaching strategies may be utilized in this course, including but not limited to, lecture, discussion, written classroom exercises, written lab exercises, performance based lab exercises, demonstrations, quizzes and examinations. Some quizzes may be entirely or contain lab based components. A mid-course and end course examination will be given.

CCNP Exams & Recommended Training

Required Exam(s)	Recommended Training
642-901 BSCI	Building Scalable Cisco Internetworks (BSCI)
642-812 BCMSN	Building Cisco Multilayer Switched Network (BCMSN)
642-825 ISCW	Implementing Secure Converged Wide Area Networks (ISCW)
642-845 ONT	Optimizing Converged Cisco Networks (ONT)
OR	
642-892 Composite	Building Scalable Cisco Internetworks (BSCI) Building Cisco Multilayer Switched Network (BCMSN)
642-825 ISCW	Implementing Secure Converged Wide Area Networks (ISCW)
642-845 ONT	Optimizing Converged Cisco Networks (ONT)

Method of Evaluating Students

Grade Distribution

Class Attendance	10
Mid Term	30
Finals	50
Special Projects Makeup projects	10
Total	100%

Grading Policy

At the end of each course, each student is assigned a final grade as follows:

Point Range	Interpretation	Grade	Quality Points
90 – 100	Excellent	A	4.0
80 – 89	Very Good	B	3.0 – 3.9
70 – 79	Average	C	2.0 – 2.9
60 – 69	Poor	D	1.0 – 1.9
Below 60	Failure	F	0
N/A	Withdrawal	W	0
N/A	Pass	P	0
N/A	Incomplete	I	0

A student earning a grade of D or above is considered to have passed the course and is eligible to pursue further studies. A student receiving a grade of F has failed the course. A failed course must be repeated and passed to meet Avtech Institute's graduation requirements, in addition to an overall program GPA of 2.0.

Requirements for Successful Completion of the Course

At a minimum, students must achieve the following:

- A passing grade of **D** or above
- Completion of all required examinations
- Submission of all required lab exercises and projects and;
- Adherence to the school attendance policy.

Equipment Needed

Industry standard desktop computer for lab exercises.

Equipment Breakdown Lab room

Videos and Projector

Library Assignments

To be determined by the instructor.

Portfolio Assignment

Student program outcome portfolios are required to demonstrate student competencies. In conjunction with your course structure, please select a project/paper that best demonstrates what you have learned in this course and add it to your program portfolio.

Course Policies

Disruptive Behavior

Disruptive behavior is an activity that interferes with learning and teaching. Inappropriate talking during class, surfing inappropriate website, tardiness, cheating, alcohol or drug use, use of cell phone, playing loud music during class, etc. all disrupt the learning process.

Copyright Infringement

Specific exemptions to copyright infringement are made for student use in the context of learning activities. Graphic design students often download images from the Internet, or scan images from publications. As long as this work is for educational purpose, and subject to faculty permission, this is not a problem.

Plagiarism

Faculty cannot tolerate the *misrepresentation of work as the student's own*. This often involves the use by one student or another student's design, whether voluntarily or involuntarily. In the event that plagiarism is evident and documented, all students involved in the conscious decision to misrepresent work must receive an F as the grade for the project. A second occurrence may result in suspension for the rest of the quarter, and return to the school only after a review by the Academic Standards Committee.

Attendance

Attendance and Lateness

In education and the workplace, regular attendance is necessary if individuals are to excel. There is a direct correlation between attendance and academic success. Attendance is mandatory. All students must arrive on time and prepared to learn at each class session. At the faculty member's discretion, students may be marked absent if they arrive more than 15 minutes late to any class. More than five absences in a class that meets twice per week or more than two absences in a class that meets once per week may result in a failure.

Make-Up Work

Late Projects and Homework

All projects and homework must be handed in on time. Homework should be emailed to your instructor if you are going to miss a class. Work that is submitted one week late will result in the loss of one full grade; and work that is submitted two weeks late will result in the loss of two full grades; more than two weeks late you will receive a failing grade on the project.