Advanced Technician

OVERVIEW

This course teaches the broadband technician about the operation, set up, and application of headend components as the transition is made from analog to digital services. Transmission lines, radio wave propagation, antennas, microwave systems, and satellite communications are fundamental topics common to analog and digital communications and will be covered in this course. Since cable operators continue to distribute analog television, analog signal processing is covered as well, along with analog video analysis and FCC proof-of-performance execution. Digital communication and related topics are taught in lessons on digital satellite receivers, digital modulators, digital processors, and equipment connection protocols. The Advanced Technician course provides important technical instruction to the successful operation and maintenance of today's sophisticated broadband cable system headend.

Delivery Options:

Learning takes place using a textbook. Lesson and final exams are taken online.

Completion Time:

Varies based on the student's self-study pace, however, the maximum time allowed is six months from enrollment.

BENEFITS

Upon completion students will:

» understand how headend system components work together to process analog and digital television services.
» possess the requisite understanding of component operation in order to maintain and operate an analog and digital headend.
» correctly apply governmental regulations and industry recommended practices to headend operation and maintenance.
» use this course to prepare for SCTE's Broadband Transportation Specialist (BTS) and Broadband Telecom Center Specialist (BTCS) certifications and endorsements.
» earn four hours of college credit
» receive an industry-recognized Jones/NCTI™ certificate of graduation

Ideal for:

» system technicians
» hub technicians
» headend technicians
» access bandwidth technicians

COURSE OBJECTIVES

Upon completing this course students will be able to:

1. understand and apply RF communications transmission and reception fundamentals.

(Continued)

RECOMMENDED PREREQUISITE

» System Technician

RELATED COURSES

Students completing this course should then enroll in:

» Understanding Voice and Data Networks
» Effective Supervision
» Introduction to Business
» Introduction to Networking Series
» Principles of Management

TRAINING FEATURES

» Knowledge-based, broadband and job-specific content
» Highly illustrated and easy to read course materials
» Curriculum advising
» 24/7 lesson feedback and progress monitoring at www.jonesncti.com
» Online testing

Visit **www.jonesncti.com/coursepolicy.htm** for important information on computer hardware/software requirements and student-to-student transfer and extension limitations

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COURSE OBJECTIVES *(Continued)*

2. understand and apply theory of operation, how to connect analog and digital signal processing equipment.
3. understand and apply proper headend, combining and distribution techniques to downstream and upstream signals.
4. understand various types of telecommunications transmission systems and their associated applications.
5. understand the NTSC analog video format.
6. understand and apply FCC Technical Standards measurement requirements and NTCA Recommended Practices.
7. understand and apply how to set up a satellite receiver to receive programming.
8. understand and apply the different interconnection protocols used in the headend.

COURSE OUTLINE

1. **Transmission Lines and Techniques**
   Examining types of transmission lines, understanding characteristic impedance, exploring transmission line applications and examining transmission line losses
2. **Radio Wave Propagation**
   Examining radio wave characteristics, examining propagation characteristics, exploring atmospheric conditions and communications and extending the communication range
3. **Examining Antenna Principles**
   Examining antenna fundamentals, examining antenna energy transfer and examining special characteristics of antennas
4. **Investigating Antenna Types**
   Examining types of transmitting antennas, exploring antenna arrays, exploring wide-bandwidth and narrow-bandwidth antennas and examining receiving antennas
5. **Examining Microwave Communications**
   Introducing microwave fundamentals and explaining microwave transport systems
6. **Examining Microwave Components**
   Exploring passive microwave components and examining microwave oscillator and amplifier components
7. **Satellite Communications**
   Introducing basic concepts of satellite communications, describing satellite system applications, examining satellite technologies and examining the ground-based satellite antenna
8. **Analyzing Analog TV Signals**
   Introducing composite color video signal characteristics, examining synchronizing pulses, introducing signal separation and exploring television test signals
9. **Equipment Connection Protocols**
   Examining digital interconnection protocols, creating flexibility in the headend and inserting alternating sources
10. **Understanding Signal Processors**
    Examining the carrier frequency conversion process, examining the analog television channel processor and processing digitally modulated carriers
11. **Modulating and Demodulating Analog TV Signals**
    Examining modulation and demodulation, understanding analog television modulation, examining the modulator and examining the demodulator
12. **Digital Integrated Receiver/Decoders**
    Detailing satellite signal reception, examining the receiver in the integrated receiver/decoder, examining the decoder in the integrated receiver/decoder and configuring the integrated receiver/decoder
13. **Transcoding Digital Broadcast Channels**
    Examining digital broadcast television, distributing digital broadcast television services on the broadband cable system and discussing ancillary data
14. **Digital Modulators**
    Examining digital modulators, examining conditional access and examining applications of digital modulators
15. **Combining Broadband Signals**
    Describing downstream signal combining, describing upstream signal combining and describing signal combining devices
16. **Analog Video Measurements and Testing**
    Characterizing the baseband video signal, examining video test equipment and test signals, executing baseband video measurements and recognizing alternative baseband video test equipment
17. **Planning and Executing FCC Proof-of-Performance Tests**
    Recognizing the FCC proof-of-performance testing requirement, applying the FCC proof-of-performance testing requirements to a cable system, including the set-top box in the proof-of-performance test results, compiling the FCC proof-of-performance test results

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