APSC 131: VDV/FIRE LIFE SAFETY PREP, NETWORKING, CCTV, CATV & DAS

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	4
Hours:	40 lecture, 40 laboratory per quarter (80 total per quarter)
Prerequisite:	Per California Code of Regulations, this course is limited to students admitted to the Northern CA Sound & Communication JATC Apprenticeship Program.
Advisory:	Not open to students with credit in APRT 160.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	None
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- A successful student will be able to define nurse call terms and devices.
- A successful student will be able to solder an XLR, RCA, and a DB9 connector.

Description

Preparation for the Voice Data Video and Fire Life Safety state certifications. Review of navigating the NEC, Fire Alarm and Signaling Code, overview of the certification application process and lessons on most aspects of the Voice Data Video industry. Concludes with sample exam tests. Also includes basic networking, studies on the OSI reference model, TCP/IP reference module, managing IP addresses and data transport. Networking lessons tie directly into the Closed Circuit Television (CCTV) Intelligent Network Video advanced study of CCTV systems, including video camera types, lenses, optics, lighting characteristics and the study of signal transmission methods. Hands-on lab assignment installing and configuring networked video surveillance camera system. Further lessons include the fundamentals of Closed Antenna Television (CATV) and Distributed Antenna System (DAS). Fundamentals of distributing a radio frequency over the proper medium, connections, signal levels and testing. Hands-on lab includes installing cable, connector terminations, equipment installation and testing.

Course Objectives

The student will be able to:
A. Navigate the NEC and NFPA 72 reference books.
B. Complete the state certification application form.
C. Identify the individual layers of the OSI model.
D. Define and set static and dynamic IP addresses.
E. Identify the required components to make a CCTV circuit work.
F. Construct a CCTV system in a hands-on lab.
G. Identify the required components to make a CATV and DAS system work.
H. Install coaxial and heliaxial cable and their connectors.

Course Content

A. NEC & NFPA 72
1. Presentation on the layout of the national electrical and fire protection codes as they pertain to the Voice Data Video industry (Lec)
B. State certification
1. Preparing sample application and instructions (Lec & Lab)
C. Networking
1. OSI reference model (Lec)
2. TCP/IP reference model (Lec)
3. Managing IP addresses (Lec)
4. Data transport (Lec)
5. Network security (Lec)
D. CCTV
1. Analog and digital cameras (Lec & Lab)
2. Lenses (Lec & Lab)
3. Sensors (Lec)
4. Transmission (Lec & Lab)
5. Resolution (Lec & Lab)
6. Video compression (Lec & Lab)
E. CATV
1. Amplifier (Lec & Lab)
2. Splitters/taps (Lec & Lab)
3. Signal levels (Lec & Lab)
4. Testing (Lec & Lab)
F. DAS
1. Purpose (Lec)
2. Passive systems (Lec)
3. Active systems (Lec)
4. Hybrid systems (Lec)
5. Cable installation (Lab)
6. Testing (Lec & Lab)

Lab Content

Work individually and in teams on navigating the NEC. Students will also build a small scale networked video surveillance system, CATV system and DAS system. Equipment safety and safe handling practices are reviewed and applied.

Special Facilities and/or Equipment

A. Audio-visual equipment (laptop, video projector with screen)
B. Laboratory with test instruments and hands-on projects
C. Computers with internet access
D. When taught via Foothill Global Access, on-going access to computer with email software and hardware; email address

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Results of quizzes and tests
Classroom and laboratory project participation
Online discussion participation

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture
Online lessons
Lab assignment
Group discussion
Demonstration

Representative Text(s) and Other Materials

National Fire Protection Association, Inc. (NFPA). NEC 2017 (NFPA 70). 2017.

National Fire Protection Association, Inc. (NFPA). Fire Alarm and Signaling Code (NFPA 72). 2016.

Electrical Training Alliance. Introduction to Network Technologies. 2016.

Nilsson, Fredrik (Axis Communications). Intelligent Network Video: Understanding Modern Surveillance Systems. 2017.

These are the standard Sound & Communications textbooks/workbooks used for this course. Although one or more may not be within 5 years of the required published date, they are the most current books used when teaching this course. We will adopt the next edition of each text, as it is published.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

A. Reading assignments, for example:
1. Intelligent Network Video textbook, Chapter 11, OSI Reference Model
2. Intelligent Network Video textbook, Chapter 11, Managing IP Addresses
3. Intelligent Network Video textbook, Chapter 4, Lenses
B. Writing assignments, for example:
1. Write a paragraph comparing a fixed lens, vari-focal lens, and a zoom lens; describe the benefits and pitfalls of each type of sense and include where each would be used
2. Write a paragraph describing the size of image sensors and how that corresponds to image resolution
C. Other:
1. Videos (created by the JATC) accessed on Canvas CMS, including navigating the NEC, how to apply for the state VDV exam, how to select the proper camera lens
2. Axis Communications videos on thermal imaging, frame rate vs. shutter speed (on the Axis Communications website, www.axis.com)

Discipline(s)

Telecommunication Technology