

Voice/Data/Video
Year 1 – Semester 1

Lesson Topic Description from Introduction to Electric book used for Yr. 1 Semester 1

Included is the Table of Contents as applied to the Lesson Plan.

Safety Training – OSHA 10 & CPR Certification

<u>Lesson</u>	Total Hours – Year 1 – Semester 1 (76 Hours)
101	Fundamentals of Electricity – Current – voltage – Resistance (8 Hours)
	Math Review (2 Hours)
Chapter 1	Fundamentals of Electricity
Chapter 2	Current
Chapter 3	Voltage
	Grounding as a Voltage Reference
Chapter 4	Resistance
102	Ohm's Law, Kirchhoff's Law; Electrical Measurements and Power (8 Hours)
Chapter 5	Ohm's Law
Chapter 6	Electrical Measurements
Chapter 7	Power
103	DC Circuits – Series, Parallel, and Series-Parallel Circuits (8 Hours)
Chapter 8	DC Circuits
104	Magnetism, Inductance, and Capacitance (8 Hours)
Chapter 9	Magnetism
Chapter 10	Inductance
Chapter 11	Capacitance
105	Alternating Current, AC Measurements, Transformers (8 Hours)
Chapter 12	Alternating Current
Chapter 13	AC Measurements
Chapter 18	Transformers

106 Semiconductors, PN Junctions, Zener Diodes, and Bipolar Transistors (8 Hours)

Chapter 19 Semiconductor Fundamentals

Chapter 20 PN Junction Diodes

Chapter 21 Zener Diodes

Chapter 22 Bipolar Transistors

107 Power Supplies and Amplifiers (8 Hours)

Chapter 27 Power Supplies

Chapter 28 Amplifier Basics

Chapter 29 Amplifier Applications

108 Digital Electronic Circuits (8 Hours)

Chapter 32 Binary Number System

Chapter 33 Basic Logic Gates

Chapter 34 Simplifying Logic Circuits

Chapter 35 Sequential Logic Circuits

Chapter 36 Combination Logic Circuits

Chapter 37 Microcomputer Basics

109 Review (8 Hours)

110 Test (4 Hours)

VOICE/DATA/VIDEO

Year 1 – Semester 2

Lesson Topic Description from NCCER Low-Voltage Cabling Book

Included is the Table of Contents as applied to the Lesson Plan.

<u>Lesson</u>	<u>Total Hours-Year 1-Semester 2 (80 Hours)</u>
111	Introduction, Conductors & Insulation, Low Voltage and Fiber Optic Cables (4 Hours)
Section 1.0	Introduction
Section 2.0	Low-Voltage Cable Conductors and Insulation
Section 3.0	Low-Voltage and Optical Fiber Cables
112	Low Voltage and Fiber Optic Cables, Commercial Installation (4 Hours)
Section 3.0	Low-Voltage and Optical Fiber Cables (cont'd)
Section 4.0	Commercial Cable Installation
113	Commercial Installation, Installation in Plenums, Optical Fiber Cable and Communication Cables (NEC), Coaxial CATV within Buildings (4 Hours)
Section 4.0	Commercial Cable Installation (cont'd)
Section 6.2.5	Installation in Plenums, Risers, Cable Trays, and Hazardous Locations
Section 6.6	Optical Fiber Cable
Section 6.9	Coaxial CATV Cable Installation within Buildings
114	Lift Safety (2 Hours) Blueprint Reading (2 Hours)

Lesson Topic Description from NCCER Pathway and Spaces Book

Included is the Table of Contents as applied to the Lesson Plan.

<u>Lesson</u>	<u>Total Hours-Year 1-Semester 2 (80 Hours)</u>
115	Raceways, Conduit, Fittings, Bushings, Locknuts, Sealings, Cable and Raceway Supports, Surface Metal and Nonmetallic Raceways (4 Hours)
Section 2.0	Raceways
Section 3.0	Conduit
Section 4.0	Metal Conduit Fittings
Section 5.0	Bushings and Locknuts
Section 6.0	Sealing Fittings
Section 7.0	Cable and Raceway Supports
Section 8.0	Surface Metal and Nonmetallic Raceways

116 Cable Trays, Storing and Handling Raceways, Underground Systems, Boxes, Construction Procedures, Overview of Cabling Distribution (4 Hours)

Section 9.0	Cable Trays
Section 10.0	Storing Raceways
Section 11.0	Handling Raceways
Section 12.0	Underground Systems
Section 13.0	Boxes
Section 15.0	Construction Procedures
Section 16.0	Overview of Cable Distribution

117 Conduit Bending (4 Hours)

Lesson Topic Description from NCCER Wire and Cable Terminations Book

Included is the Table of Contents as applied to the Lesson Plan.

Lesson

118 Coaxial Cable and Terminations, Optical Fiber Connections, Terminating UTP Cable (4 Hours)

Section 2.0	Coaxial Cable Terminations
Section 8.5	Optical Fiber Cable Connectors
Section 3.0	Terminating UTP Cable

119 Terminating UTP Cable, Legacy Connections, Lab installing various types of UTP Modules (4 Hours)

Section 3.0	Terminating UTP Cable (cont'd)
Lab	Installing various types of UTP Cable

120 Lab installing terminating Blocks including 66, 110 & BIX, Lab installing patch panels and coaxial cables (4 Hours)

121 Review and Mid-Term Exam (4 Hours)

Lesson Topic Description from NCCER Fiber Optics Book

Included is the Table of Contents as applied to the Lesson Plan.

Lesson

122 Introduction, Fiber Optics Theory, Fiber Optics Components (4 Hours)

Section 1.0	Introduction
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| | Section 2.0 | Fiber Optics Theory |
| | Section 3.0 | Fiber-Optic Components |
| 123 | | Understanding Light Transmission, Receivers, Connectors, Couplers & Splices (4 Hours) |
| | Section 4.0 | Understanding Light Transmission |
| | Section 5.0 | Receivers |
| | Section 6.0 | Connectors, Couplers, and Splices |
| 124 | | Working with Fiber Optics, Splicing, Fiber Optic Testing (4 Hours) |
| | Section 7.0 | Working with Fiber Optics |
| | Section 8.0 | Splicing |
| | Section 9.0 | Fiber-Optic Testing |
| 125 | | Lab to install fiber optic connectors (4 Hours) |
| 126 | | Fiber Optic Testing (4 Hours) |
| | Section 9.0 | Fiber-Optic Testing |

Lesson Topic Description from NCCER Site Survey, Project Planning & Documentation Book

Included is the Table of Contents as applied to the Lesson Plan.

Lesson

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| 127 | | Introduction, Job Estimating, Job Planning, Documentation, Scheduling (4 Hours) |
| | Section 1.0 | Introduction |
| | Section 2.0 | The Job Estimating and Bidding Process |
| | Section 4.0 | Job Planning After the Contract Award |
| | Section 5.0 | New Construction Site Survey, Planning, and Documentation |
| | Section 6.0 | Scheduling the Work |
| 128 | | Acquiring materials, Assigning Labor, Completing Installation, Quality Control, Punch list, and completing the job. Retrofitting installations, Additional documentation (4 Hours) |
| | Section 7.0 | Acquiring the needed Materials/Equipment |
| | Section 8.0 | Assigning the Installation Crew |
| | Section 9.0 | Completing the Installation |
| | Section 10.0 | Incorporating Quality Control/Acceptance Tests |
| | Section 11.0 | Completing Punch List |
| | Section 12.0 | Completing the Job |
| | Section 13.0 | Retrofitting Installations |
| | Section 14.0 | Additional documentation |

129 FireStoppng and Review (4 Hours)

130 Final Exam (4 Hours)

Note Blueprint Reading in Lesson 114 requires content identification

**VOICE/DATA/VIDEO
Year2 – Semester 1**

Lesson Topic Description from NCCER Access Control Systems Book

Included in this Table of Contents as applied to the Lesson Plan

Safety Training – First Aid

Lesson Total Hours-Year 2-Semester 1 (76 Hours)

201 Introduction to Entry and Access Control Systems (4 Hours)

Section 1.0 Introduction
Section 2.0 Entry and Access Control Systems

202 Controllers and Power Supplies (4 Hours)

Section 3.0 Controllers and Power Supplies

203 Entry/Exit Readers, Keypads and Other Control Devices (4 Hours)

Section 4.0 Entry/Exit Readers

204 Locking and Other Releasing Device Accessories (4 Hours)

Section 5.0 Locking Devices and Accessories

205 Entry Control Barriers/Installation Guidelines (4 Hours)

Section 6.0 Entry Control Barriers
Section 7.0 Installation Guidelines

206 Review (4 Hours)

207 Test (4Hours)

Lesson Topic Description from NCCER Intrusion Detection and CCTV Systems Books

Included in this Table of Contents as applied to the Lesson Plan

Lesson

208 Intrusion/CCTV Systems Overview (4 Hours)

Intrusion Section 2.0 Intrusion System Overview
CCTV Section 2.0 CCTV System Overview

209 Types of Intrusion Sensors and Basic CCTV Systems Components (4 Hours)

Intrusion Section 3.0 Types of Intrusion System Sensors
CCTV Section 3.0 CCTV System Components

210 Control Panels and Headend Equipment (4 Hours)

Intrusion Section 5.0 Control Panels

211 System Design and Proper Camera Application, Proper Lighting and Illumination (4 Hours)

Intrusion Section 7.0 System Design
CCTV Section 4.0 Lighting and Illumination

212 System and Equipment Installation Guidelines (4 Hours)

Intrusion Section 9.0 System and Equipment Installation Guidelines

213 Proper Inspection, Testing and Maintenance for Access Control and CCTV Systems (4 Hours)

Intrusion Section 11.0 Inspection, Testing, and Maintenance
CCTV Section 7.0 Testing CCTV Video

214 Review (4 Hours)

215 Test (4 Hours)

Lesson Topic Description from NCCER Broadband Systems Book

Included in this Table of Contents as applied to the Lesson Plan

Lesson

216 Introduction and Basics of CATV Systems, Architecture of Cable Systems and Cabling (4 Hours)

Section 1.0 Introduction
Section 2.0 Evolution of CATV Systems
Section 3.0 Architecture of Cable Systems

217 Satellite Technology, Head End Components and Signal Processing (4 Hours)

Section 5.0 Satellite Technology
Section 6.0 Head End Signal Processing

	Section 7.0	Head End Components
218		Distribution System Components, Topologies, and System Gains Losses, Test Equipment and Signal Alignment (4 Hours)
	Section 8.0	Distribution System Components
	Section 9.0	Distribution System Topologies
	Section 10.0	Distribution Systems Gains and Losses
	Section 11.0	Test Equipment
	Section 12.0	Head End Alignment
219		Review and Test (4 Hours)

VOICE/DATA/VIDEO

Year2-Semester 2

Lesson Topic Description from NCCER Fire Alarm Systems Book

Included is the Table of Contents as applied to the Lesson Plan.

<u>Lesson</u>	<u>Total Hours-Year 1-Semester 2 (80 Hours)</u>
220	Basic Fire Alarm Systems, Components, Circuits, and Codes and Standards (4 Hours)
Section 1.0	Introduction
Section 2.0	Codes and Standards
221	Power Supplies, Supplementary Circuits, Types on Control Circuits and Addressable Fire Alarm Systems (4 Hours)
Section 3.0	Fire Alarm Systems Overview
Section 4.0	Fire Alarm System Equipment
222	Fire Alarm Initiating Devices (4 Hours)
Section 5.0	Fire Alarm Initiating Devices
223	Fire Alarm Notification Appliances (4 Hours)
Section 8.0	Notification Appliances
224	General Installation Instructions for Fire Alarm Systems (4 Hours)
Section 10.0	General Installation Guidelines
Section 11.0	Total Premises Fire Alarm System Installation Guidelines
225	Fire Alarm System Startup and Acceptance (4 Hours)
Section 12.0	Fire Alarm-Related Systems and Installation Guidelines
226	Proper Inspection, Testing and Maintenance for Fire Alarm Systems (4 Hours)
Section 14.0	Inspection, Testing, and Maintenance
227	Review (4 Hours)
228	Test (4 hours)

Lesson Topic Description from NCCER Audio Svtems and Overview of Nurse Call and Signalling Systems Book

Included is the Table of Contents as applied to the Lesson Plan.

Lesson

229 Introduction, Systems Overview and Codes and Standards (4 Hours)

Audio	Section 1.0	Introduction
N. Call	Section 1.0	Introduction
N. Call	Section 3.0	Codes and Standards

230 Audio Systems Elements and Types of Nurse Call Systems (4 Hours)

Audio	Section 2.0	Elements of a Sound Reinforcement System
N. Call	Section 4.0	Types of Nurse Call Systems

231 Cabling, Systems Devices and Components Nurse Call Configurations, Power Supplies And Standards (4 Hours)

Audio	Section 4.0	Audio Cabling Options
N. Call	Section 7.0	Systems interfaces

232 Audio Sound/Nurse Call Systems Integration and Proper Installation Practices (4 Hours)

Audio	Section 6.0	Installing Audio Systems
N. Call	Section 8.0	Installation Practices

233 Proper Inspection, Testing and Maintenance for Audio Sound Nurse Call Systems (4 Hours)

Audio	Section 6.1.6	Testing
Audio	Section 6.1.8	Maintenance

234 Audio Sound/Nurse Call Systems Checkout and Commissioning (4 Hours)

Audio	Section 7.0	System Commissioning
N. Call	Section 9.0	System Checkout/Commissioning

235 Review (4 Hours)

236 Test (4 Hours)

Lesson Topic Description from NCCER Systems Commissioning and User Training Book

Included is the Table of Contents as applied to the Lesson Plan.

Lesson

237 **Commissioning Process Overview (4 Hours)**

Section 2.D Commissioning Process Overview

238 **User Training (4 Hours)**

Section 3.D User Training

239 **Review and Test (4 Hours)**

IEC VDV Curriculum

Year 3

Semester Five

Safety Training – CPR Certification

Module 1 – Electronics

Required Texts:

1. *Introduction to Electronics*, 4th Edition; Earl Gates; Thomson/Delmar Learning 2004.
2. *Lab Manual to Accompany Introduction to Electronics*; Earl Gates; Thomson/Delmar Learning 2004.

Session One – Circuits, Resistors, Inductors, and Capacitors

Lab: Resistor Measurement

Session Two – Semiconductor Fundamentals, Diodes, and Transistors

Lab: Testing Diodes and Transistors

Session Three – Thyristors, Integrated Circuits, and Optoelectric Devices

Lab: Testing Rectifiers and LEDs; Identifying Integrated Circuits

Session Four – Power Supplies, Amplifiers, and Oscillators

Lab: Capacitive Filters; Shunt Voltage Regulators; Amplifiers

Session Five – Electronics Module Review and Final Examination

Module 2 – Life Safety Systems

Required Texts

1. *NEMA Training Manual on Fire Alarm Systems 2003*; National Electrical Manufacturers Association; Global Engineering Documents 2003. (Not available until the end of 2003. The 1997 Manual is currently available.)
2. *NEMA Installation Guide for Nurse Call Systems*; National Electrical Manufacturers Association; Global Engineering Documents 2002.
3. *Fire Alarm Handbook: NICET Level 1 and 2 Element Review*; Grant Angell and Michael Baker; Limited Energy Resource Center 2000.

Session One – Introduction to Basic Fire Alarm Systems

Session Two – Basic Fire Alarm: Components and Circuits

Lab: Basic Fire Alarm Systems

Session Three – Basic Fire Alarm: Power Supplies, Supplementary Circuits, and Types of Control Systems

Lab: Auxiliary Fire Alarm Systems

Session Four – Addressable Fire Alarm Systems and Technologies

Lab: Addressable Fire Alarm Systems

Session Five – Fire Alarm Initiating Devices

Lab: Wiring Initiating Devices

Session Six – Fire Alarm Notification Appliances

Lab: Wiring Notification Appliances

Session Seven – Installation Instructions for Fire Alarm Systems

Lab: Control Panel Wiring

Session Eight – Fire Alarm System Start-Up and Acceptance

Lab: Fire Alarm System Start-Up and Testing

Session Nine – Proper Maintenance of Fire Alarm Systems
Session Ten - Fire Alarm Review and Final Examination
Session Eleven – Nurse Call System Configurations, Power, and Standards
Session Twelve – Nurse Call System Installation and Systems Integration
Session Thirteen - Nurse Call System Review and Final Examination

Module 3 – Security Systems

Required Texts

1. *The Design and Evaluation of Physical Protection Systems*; Mary Lynn Garcia; Butterworth-Heinemann 2001.
2. *The Sales, Design, and Installation of a CCTV System*; Anixter 2001.
(Included in curriculum manual)

Session One – Security System Design and Sensors

Lab: Intrusion Detection Sensors

Session Two – Alarm Assessment and Communication, and Entry Control

Session Three – Video Security Systems Installation and Signal Quality

Lab: Video Security Systems Installation Layout and Integration

Session Four - Security System Review and Final Examination

Semester Six

Module 4 – Video (MATV and CATV) Systems

Four (4) lessons for a total of 16 hours of classroom instruction

Required Text:

1. *Broadband and Baseband Video Signal Transmission*; Anixter 2001
(Included in curriculum manuals).

Module 5 – Audio/Sound Systems

Five (5) lessons for a total of 20 hours of classroom instruction

Required Text:

1. *Audio Systems Technology Level 1: Handbook for Installers and Engineers*;
Larry W. Garter; National Systems Contractors Association 1998.

Module 6 – Wireless Communications/Wireless LANs

Three (3) lessons for a total of 12 hours of classroom

instruction Required Text:

1. Installation manual for *Internet in a Box* wireless network.

Module 7 – Intelligent Building Systems/Systems Integration

Five (5) lessons for a total of 20 hours of classroom instruction

Required Texts:

1. Text selection in process/materials under development.

Module 8 – System Commissioning, User Training, and Team Supervision

Three (3) lessons for a total of 12 hours of classroom instruction

Required Text:

1. Text selection in process/materials under development.

Module 9 – Review for BICSI and NICET Certification Testing

Two (2) lessons for a total of 8 hours of classroom instruction

Required Text:

1. *BICSI Telecommunications Cabling Installation Manual, 2nd edition*; BICSI; 1998 (Purchased in First Year).
2. *Network Cabling Handbook*; Chris Clark; McGraw-Hill Companies; 2002 (Purchased in First Year).
3. *Technician Level: Voice and Data Cable Installation Training Course; NetCBT (CD-ROM): Clark Technology Group; 2001*
4. *Fire Alarm Handbook: NICET Level 1 and 2 Element Review*; Grant Angell and Michael Baker; Limited Energy Resource Center 2000 (Purchased in 5th Semester).
5. *Audio Systems Technology Level 1: Handbook for Installers and Engineers*; Larry W. Carter; National Systems Contractors Association 1998 (Purchased in 5th Semester).