Design Online

Welcome
Introduction
Knowing the Essentials
How to Take this Course
Quizzes, Section Tests and Course Completion

The Principals of Applied AV Design
   Introduction to Design
      Design Team
      Other Design Team Members
      Roles and Responsibilities of Designers
      Skill Sets of Designers
      5 Steps of the Design and Construction Process

Project Documentation
   Project Documentation
   Sample Specifications
   Documentation Formats
   MasterFormat Divisions
   MasterFormat Numbering System
   Division 27 and Allied Industries
   Writing Specifications
   Drawings
   AV Project Drawings
   Drawing Title Block
   Drawing Abbreviations
   Scale
   US Customary and Metric Conversions
   Views
   Schedules and Notes
   Symbols
   Various System Drawings

Room Factors
   Room Factors
   Needs of a Room
   Types of Rooms
   The Technical Functions of a Room
   The Functions of Associated Spaces
   The Features of a Room

Facilities Design
   Viewing Considerations
      Facilities Design
      Visual Resolution
      Text Size
      Font Size
      Viewer Tasks
      Image Height
      Nearest Viewer
      Viewing Angle
Furniture, Interfaces and Lighting
Facilities Design Topics
Audiovisual Furniture
Ergonomics
Seating Layout
Designing for View-ability
Touch Panel Design
Dashboard for Controls
Introduction to Lighting
Lighting Terminology
Typical Lighting Used in Commercial AV Spaces
Control of Light

Acoustics
Facilities Design Review
Room Acoustics
Inverse Square Law
The Inverse Square Law Applied
Reflection
Critical Distance
Reverberation and RT60
Diffusion
Absorption, Absorption Coefficient & NRC
Speech Intelligibility
Background Noise - NC Ratings
Sound Transmission Class – STC

Infrastructure: Mechanical
Infrastructure
Heat Load
Calculating Heat Loads
Calculating Heat Loads from Power Amplifiers
HVAC Systems
Fire Protection

Infrastructure: Electrical
Electricity
Phase
Origins of Electricity
Power On Site
Single-Phase Power Distribution System
Three-Phase Power Distribution System
Clean, Reliable Power
Technical Power Systems
Line Conditioning
Branch Loads
Rack Powering Practices
Grounding
Importance of Grounding
Earth Ground
Grounding and AV System
Why Ground AV Systems
Technical Grounds
Ground Loop Prevention
Grounding Schemes
Chassis Ground
Signal Ground
Grounding Summary
Authorities for Codes and Regulations
Navigating the National Electric Code
Specific NEC Examples
Boxes and the NEC
Raceways
Conduit Construction
Conduit Capacity
Jam Ratio

Infrastructure: Structural
User Interfaces
Connectors
Interface Plates
Floor Boxes
Rules and Regulations for Building
Code Examples
Millwork and Casework for AV
Audio Visual Structural Mounting Principles
Rated Hardware
Mounting Stresses
Mounting Issues
Structural Mounting
Facilities Design Summary

Systems Design
Display System Design
Systems Design
Display Systems Design Process
Determine How the System Will Be Employed
Identify the Display Devices
Image Resolution
Identify Monitoring, and Recording Requirements
Monitoring
Feeds and Recording Requirements
Identify the Display Signal Sources
Display Signal Source Considerations
Identify Switching and Distributions Components
Switching
Distribution
RF Video Distribution
Create a Draft Display System Design
Future Provisions
Address Video Signal Issues
Video Signals 101
Video Signal Bandwidth
Determining Required Bandwidth
Insufficient Bandwidth
Calculating Bandwidth
Spectrum Analyzer
Gain and Peaking Controls
Cable Loss
Video Signal Distribution
Digital Video Signals
Processing and Conversion
Signal Processors and Converters
Design the Display System
Value Engineering
Display System Diagram
Consider Accompanying Audio and Control
Select Components and Equipment

Audio System Design
Systems Design Check-In
Audio Systems Design
Audio Systems Purpose
Identify the Audio Transducers
Identify the Audio Sources
Three Parameters for an Audio System
Frequency Response
Harmonic Distortion
Audio Mixers and Amplifiers
Processing and Conversion
Audio Equalizers
Echo Cancellers
Other Audio Processing Devices
Identify Monitoring, Feeds, and Recording, Requirements
Equipment Interconnection
Balanced or Unbalanced
Ground Lifting in a Balanced Audio Circuit
Interconnecting Unbalanced and Balanced Circuits
Patchbays in Audio Systems
Proper Impedance Matching
Measuring Sound
Loudness, Sound Pressure Level and Uniformity
Loudspeaker Specifications
Inverse Square Law and Loudspeakers
Adding Power to the Loudspeaker
Loudspeakers Wired in Series
Loudspeakers Wired in Parallel
Loudspeakers Wired in Series/Parallel Combination
Direct Coupled vs. Constant Voltage
Direct Coupled Transformers
Constant Voltage Systems
Transformer Connections for Constant Voltage
Calculating Amplifier Power Needs
Load Impedance
Impedance Meter
Audio System Terminology
Loudspeaker Deployment Options
Point Source Loudspeaker Placement
Determining Loudspeaker Coverage for Distributed System Layouts
Distributed Systems Layout Options
Intelligibility in the Audio system
Delay
Audio System Stability
Needed Acoustical Gain
NAG Compensations
Potential Acoustical Gain
Documenting the Audio Design
Select Specific Equipment
Design and Measurement Tools

Control System Design
Control System Design
Controlling Audiovisual Components
Designing Audiovisual Control Systems
Control System Characteristics
Controlled Devices
Control System Interfaces
User Interfaces
Graphical User Interfaces
Dashboard for Controls
Input Interfaces
Sensors
Logical Thinking
Central Processing Units
Master Control Unit Code
Control Data and Protocols
Electrical Formats and Protocols
Relays, Dry Closures. I/O Ports
Voltage Control, Digital Ramp, PWM
RS-232, 422, 485
ADTMF, Ethernet, TCP/IP
IR and RF
Control System Wiring
Control System Busses
Control System Variations
Control System Flow / Function Diagrams
Control System Bill of Materials

Equipment Racks
Equipment Racks
The Rack
Rack Accessories
Rack Elevation Diagrams
Ergonomics of Rack Design
Weight Distribution
RF and IR Rack Equipment
Cooling a Rack
Grouping Equipment
Block Diagrams
Rack Cable Signal Separation
Rack Power
Rack Grounding
Rack Building Summary
Systems Design Summary

Course Completion
Completion Certificate
Your Professional Development
Course Evaluation
Design Online Bibliography
Resources
Course Acknowledgements