

Design Online

Welcome

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

11242 Waples Mill Road, Suite 200
Fairfax, VA 22030
www.infocomm.org

703.273.7200
800.659.7469
703.278.8082 FAX