



Overview

This lecture hall is a large room capable of seating approximately 80 students with stadium-style seating, providing clear and unobstructed views of a large screen at the front of the room, along with two large projection screens. A large lectern is located in front of the room, serving as the central point for content delivery and control. This system is designed to support the visual communication needs of a modern educational classroom. It supports digital and analog sources using a digital switching infrastructure that manages HDCP digital content protection, from the point of origin to any given destination.

Room Needs Assessment

Staffing

Instructors require the flexibility to present multiple sources from the lectern during classes. There is a need to provide annotation and mark-up of materials being presented, regardless of their incoming video signal type.

Source Locations

Lectern: The lectern will feature several source input options, the ability to annotate over source materials, and provide many “hands-on” controls for monitoring and interacting with source materials.

Floor Box: A floor box at the front of the lecture hall will allow additional equipment to be connected to the display system. HDMI, DVI, and VGA connections will be provided through the use of twisted pair extenders.

Control Room: The control room will allow for operational support of the system and feature the majority of the switching, scaling, signal distribution, and monitoring for the system.

Display Requirements

An instructor's 65 inch (165 cm) confidence monitor will be accompanied by two projectors for viewing materials in the classroom. The confidence display will be capable of showing four different sources at one time, providing a comprehensive view of various materials. The two DLP projectors will project onto screens located at the front of the room and above the white board.

Functional Requirements

Classroom presentations and instruction are intended to be recorded for archiving and distribution to a central monitoring location. Cameras located within the classroom will be focused on capturing both the instructor and classroom participants.

System Design Solution

Display System

Two 1920x1080 DLP projectors projecting onto motorized screens, arranged side-by-side and ceiling-mounted above the stage at the front of the room. Individual screen sizes are approximately 133 inches (338 cm) diagonal with a 16x9 aspect ratio.

Cameras

Two HD cameras will be installed on wall mounts, one mounted in the rear of the room and facing the instructor. The second camera will be mounted in the front of the room, facing the classroom.

Digital Matrix Switching and Signal Management

The **Extron DXP 88 DVI Pro** 8x8 matrix switcher will function as the heart of the system. All HDMI, DVI, VGA and composite sources will be converted to the DVI for seamless integration with the displays and other peripheral equipment. HDMI and DVI source material with HDCP content protection will be switched alongside non-HDCP sources within the matrix switcher.

Lectern Sources

An **Extron Annotator** will be located at the lectern and will provide local switching, scaling, and annotation capabilities for the instructor. VGA, DVI and composite video connections from an **Extron Cable Cubby® 600** will feed the Annotator inputs. The Annotator will be used to scale and convert all lectern sources to DVI at a 1920x1080 resolution.

Digital Signal Distribution and Extension

Extron DTP HDMI 301, HDMI 201 and DVI 201 Twisted Pair Transmitters and Receivers will be paired to extend DVI and HDMI video signals over shielded CAT 5e cables. The HD cameras, and the digital inputs at the floor box will use this common cabling infrastructure. DDC and HDCP transmission is supported, which will provide reliable long distance DVI and HDMI signal distribution. The analog video and PC sources will be scaled and converted to DVI using an **Extron RGB-DVI 300** scaler.

Multi Graphics Processor

An **Extron MGP 464** Multi-Graphic Processor is used to provide quad screen views to the confidence monitor. All sources can route digitally through the DVI matrix switcher and into the quad processor.

Fiber Distribution

Fiber optics with **Extron FOXBOX DVI Plus** Extenders will be used to cover the substantial distances from the control room to a central monitoring location. The FOXBOX DVI Plus transmits signals up to 1920x1200 and HDTV 1080p, and supports bidirectional RS-232 control over the fiber infrastructure. All content from the lectern location will be transmitted with pixel-for-pixel image quality via FOXBOX 4G DVI Plus extenders.

