Standards for General Purpose

Multimedia Classrooms

General Guidelines for Design and Construction
of
Technology Enhanced Learning Environments
at
Louisiana State University

Standards for General Purpose Multimedia Classrooms

Classroom Information Technology, a division of Louisiana State University - Information Technology Services (LSU ITS), provides consultation, design, installation, and maintenance services for the University's general purpose multimedia classrooms. These are the general audio-visual technical guidelines for designing, constructing, and renovating instructional spaces at LSU. These are minimal standards and are not all inclusive. There will be unique situations that will require modifications.

the lectern or rack (screens, speakers, instructor area equipment/inputs, lighting control system, cameras, ceiling mics, wireless mic antenna, assistive listening transmitter, etc.).
No section of conduit shall be longer than 30m (100ft) or contain more than two 90 degree bends between pull points or pull boxes.
Fill capacity for conduit shall not be more than 50%.
AV cables cannot be in the same conduit as power.

3. Electrical

One isolated 115v/20-amp circuit shall be provided for the lectern and one isolated 115v/20-amp circuit shall be provided for the projector (see Appendix 5) each in its own conduit. No AV cables shall be mixed with electrical/power cables in the same conduit or

1. Design and Technology Employed

   The design and the technology remain relatively consistent; the actual equipment manufacturer model numbers may vary as new technology becomes available. Please reference Appendix 6 for current model numbers of equipment as of 2023.

2. Screen: Draper or DaLite Manufacturing (see Appendix 3)
   Screen shall be 16:10 or 16:9 (depending on application).
   Screen shall be sized vertically (furthest viewer divided by 5).
   Electric screen shall be recessed mounted when appropriate.
   The bottom of screen shall be dropped no lower than 60 inches (where conditions allow).
   Screen shall be matte white with gain of about 1.0 (30 Lamberts per square foot of screen area).
   An unobstructed view shall be provided of the entire image on all screens from all seats within the viewing angles.
   The viewing angle shall be a maximum 45-degree horizontal angle from the perpendicular to the center of screens and a maximum 35-degree vertical angle from the perpendicular to the top of each screen.
   Screens should be oriented towards the "center of gravity" of the seating area so students in all seats can easily see projected images and the whiteboards.
   Minimum distance between screen and closest seat is 9 feet.

3. Audio Systems: Please contact LSU ITS for specific model numbers as model numbers change.
   Speech reinforcement sound amplification shall be present and distributed through a minimum of four ceiling 2 X 2 ceiling drop-in speakers where applicable or pendant where applicable. Depending on room size, more speakers may be needed.
   Program sound amplification shall be present when a data/video projector is designed into the room.
   Special Performing Arts rooms: faculty should be consulted about their specific needs.
   Wireless microphones, if needed, should be frequency agile and the transmit frequencies shall be set upon collaboration with LSU ITS to eliminate interference.

4. Lectern
   There shall be laptop connectivity support via cable pass through or chassis bulkhead plates to include HDMI and USB – a minimum of 3 feet cable reach from cubby/plate.
   A power conditioner shall be provided with an 8-outlet minimum.
   The lectern shall be Mulnix, KSI, Marshall or equivalent Instructor's Lectern and be ADA compliant.
   Custom Designed Lectern
   NOTE: Most "off-the-shelf" lectern furniture does not meet our goals. The University has worked closely with A/V vendors and A/V Furniture Manufacturers to develop custom designs that do meet these goals and seek to standardize workstation and user interface

One bidirectional RS-232/RS-422/RS-485 serial port
Two IR/Serial ports for one-way control of external devices
Ethernet monitoring and control on each Ethernet port
Central Deployment - Use the primary control processor to deploy all system files, configurations, and programs

8. Computer: Please contact ITS for specific model numbers given that equipment changes over time.
    There shall be at least one computer installed in the classroom with the following specifications:
    - o Ultrasharp LCD display (monitor) with DisplayPort\HDMI input
    - o DVD ROM drive
    - o Minimum two HDMI/DP output ports
    - o Minimum USB 2.0, 6 port standard
    - o Minimum One active USB 2.0 powered extension
    - o One micro or standard sized keyboard
    - o One optical scroll wheel mouse
    - o A current version of Windows operating system
    - o Front USB connections

9. Document Camera
    There shall be at least one Document Camera installed with the following specifications:
    - o Progressive scan camera
    - o Digital SXGA, WXGA, 720P, 1080P, HDMI and USB simultaneous outputs
    - o 75Hz and 60Hz output modes
    - o RS232 (preferable) IR and USB inputs for control and connection to other devices
    - o Automatic and manual focus
    - o Brightness controls
    - o Lamps for overhead lighting
    - o USB connectivity for live document camera preview and control on local PC
    - o HDMI and USB simultaneous outputs

10. Video/Data Projector (WUXGA preferred)
    NOTE: To keep pace with current technology, the Classroom Information Technology team should work directly with audio-visual consultants/vendors to specify projectors that meet current criteria established by LSU. Cost should not be the only consideration when selecting projection options.
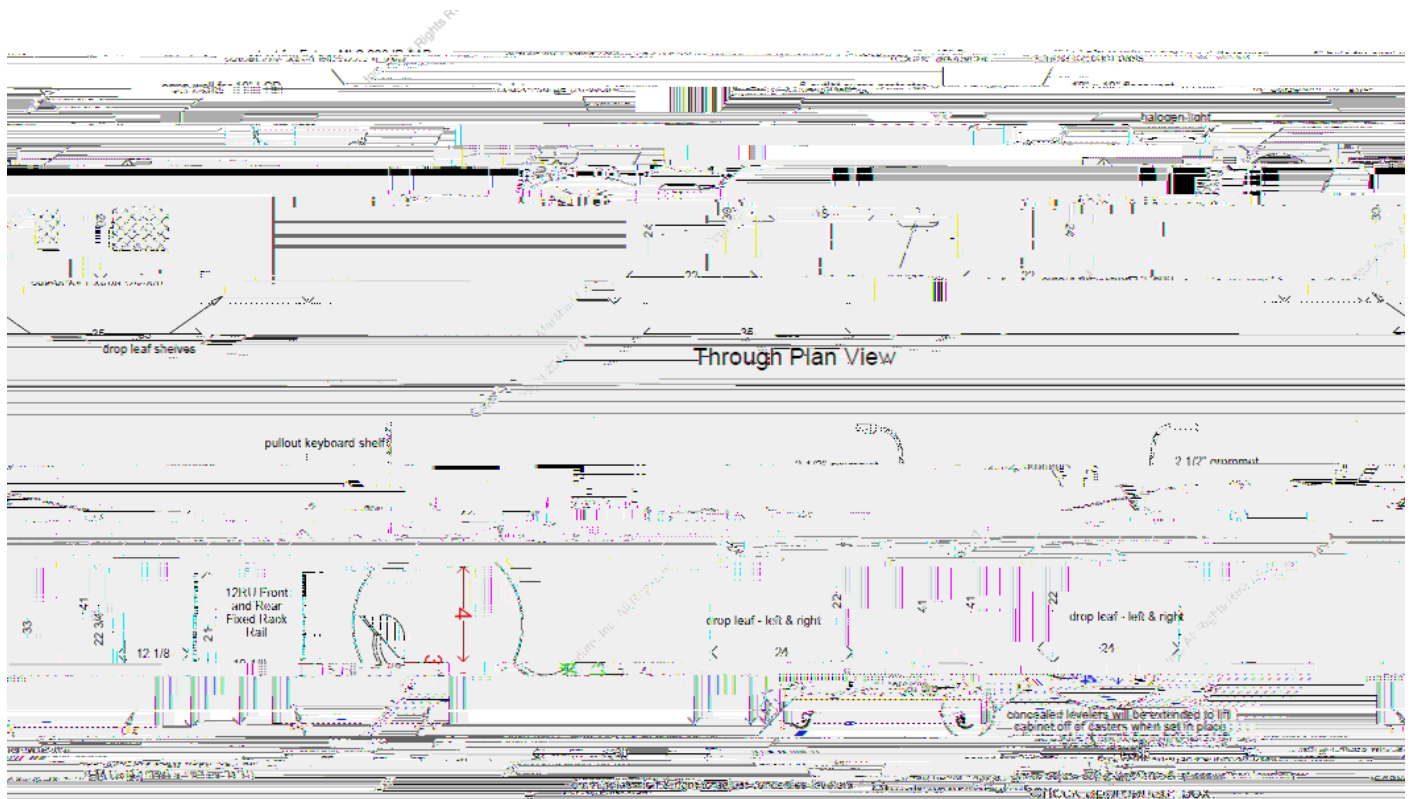   The criteria for projector selection shall include the minimum criteria:
    - o Seminar TEC – 1-19 seats - 6000 Lumen (laser preferred)
    - o Classroom TEC - 20 to 59 Seats – 6000 Lumen (laser preferred)
    - o Lecture Room TEC - 60 to 149 Seats - 6000 Lumens (laser preferred)
    - o Auditorium 150+ seats – 6000+ Lumens (laser preferred)
    - o Low noise output - 38 dB (High Brightness Mode) 30 dB (Low Brightness Mode)

- Compatibility with classroom computers, laptops, and other audio-visual components
- Uniformly bright, clear images with good resolution and excellent color rendition
- Reliability including proven track record for good customer service and next day advanced replacement warranty
- Low-profile size to avoid blocking views of screens and whiteboards
- Availability of specialized projectors and/or lenses for unique classroom spaces
- Accessibility of filter change without removing projector
- Lens shift preferred with standard Throw Ratio Range: 1.35–2.2:1
- Closed Captioning capability (preferred)
- Laser lit light source 20,000 hours full brightness 30,000 hours low
- RS232 or HDBT control (HDBT preferred)
- Input requirements - HDMI, HDBT, Composite Video
- Projectors shall be mounted with security mount (BMS Mfg.).
- NOTE: Projector mounts should not cover the lamp or filter change housing area so that lamp and filter changes can be made without removing the projector from the ceiling mount.
- Projector location: The center of the lens shall be exact height of the top of white projection area of the screen and perpendicular to the center of the screen. Zero keystoning preferred.

Middle Atlantic SSDR series security doors for equipment racks to cover switcher and power strip
Four lockable swivel carpet casters and concealed levelers to lift off casters when in place
Warranty- 3 years parts and labor

Shown below: Model ELSU35S

Through Plan View

drop leaf shelves

pullout keyboard shelf

2 1/2" grommet

12RU Front and Rear Fixed Rack Rail

drop leaf - left & right

drop leaf - left & right

halogen light

concealed levelers will be extended to lift cabinet off of casters when set in place

Lectern Rack Equipment Layout

LCD MONITOR

Wall Speakers

Ceiling SPKRS for
Speech Reinforc.

Projector

Screen

screen size

28'-0"

Wall Speakers
Program Playback

Projector

12'-0"

Screen

Projector location: The center of
the lens shall be exact height of

the top of white projection area o

the center of the screen

5'-0"

5'

26'-0"

White projection area above screen

120v screen

Network telecom