APPENDIX – Classrooms

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Date	Section	Description of Change
4/12/24	Clocks	Removed low-voltage for Primex clocks
5/8/24	Addendum	Removed membership list for Committee on Academic Infrastructure
4/15/25	Furniture Writable Surfaces	Clarifications
4/15/25	Addendum	Updated contact list
4/15/25	Accessibility	Aligned with current ADA standards
7/03/25	Instructional Technology and AV Systems	Updated standards to reflect industry trends and best practices
10/10/25	Seating	Updated language to include wall saver legs, and update preferred chair examples.
11/20/25	Signage	Update to reference Interior Signage Appendix
10/23/26	Instructor Station	Update to align with AVS standard product and procedure

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PURPOSE

The purpose of this document is to provide guidelines for classroom design to ensure that learning spaces meet the needs of students and faculty. The standards have been created to ensure instructional spaces at the University of Oregon include the following characteristics:

- Supports student-centered learning
- Appropriately located, sized, and configured to meet academic needs
- Facilitates current pedagogy with appropriate technology integration
- Adaptable over time to facilitate evolving pedagogy, changing student demographics, and changing technology
- Supports a variety of teaching and learning styles
- Accessible (ADA compliant at a minimum, and inclusive of Universal Design principles.)
- Promotes safety
- Facilitates connection between students
- Facilitates interaction between students and faculty
- Attractive, comfortable, and welcoming
- Durable and cost effective to maintain
- Minimizes environmental impacts

SCOPE

The standards apply to the construction of new classrooms and the renovation of existing classrooms at the University of Oregon and are applicable to the Eugene and branch campuses, including but not limited to Portland, Bend, and Charleston. The standards apply to general pool, joint-controlled, and departmentally controlled classrooms. In the case of individual classroom renovations in existing buildings, all desired characteristics may not be practicable but should be implemented as closely as possible to the intent stated herein.

This document is to be used in conjunction with the Campus Design Standards. It is assumed that the required application of federal, state, and local codes and regulations governs all design work, therefore references to these regulations may not appear as directives in each section.

In keeping with UO principles of governance and participative planning, the classroom design process will involve faculty, students, and staff end users.

These standards are not intended to apply to specialized learning spaces such as teaching labs, studio space, or research space.

DESIGN REVIEW AND APPROVAL

All classroom designs must be approved in writing by University of Oregon's Committee on Academic Infrastructure (CAI). Reviews by CAI will be required at each project phase (programming, schematic design, design development, construction documents, and any value engineering or changes). Plans and documentation for Information Services Audio Visual Services team (AVS), CPFM, and CAI review should be submitted for review at the following phases and should include the following information:

Documentation Required by Project Design Team	Program	SD	DD	50% CD	95-100% CD
Classroom Design Intent *SAG or Registrar's Office scheduling determination: General, joint, departmental control, funding sources determined, and refresh funding committed.*	X	X			
Classroom Basis of Design & Space Requirements *Seating capacities; classroom types, special requirements requested by Users.*	X	X	X		
Projection/Control Booth *Coordination of requirements early; submissions of AV cut sheets necessary for infrastructure or any architectural requirements, etc.*	X	X	X	X	X
Classroom Plans/Drawings *Floor plans, ceiling plans, electrical and data plans, furniture plans, room elevations; include notes, symbols and finishes for the following: furnishings, white boards, lighting, floor and wall boxes, teaching station location, AV equipment locations (equipment racks/closets if applicable, screens, speakers, microphones, cameras, projectors, panel monitors, etc.).*	X	X	X	X	X
AV Estimate of Costs *Revised for each phase, as necessary.*	X	X	X	X	X
AV Design and Equipment List *Revised for each phase, as necessary.*	X	X	X	X	X
Details & Specifications *Teaching Station determination, shop drawings, finishes for procurement, submissions of AV cut sheets necessary for infrastructure or any architectural requirements, etc.*	X	X	X	X	X
Construction & Installation Schedule *Revised for each phase, as necessary.*		X	X	X	X

CLASSROOM PLACEMENT

Classroom Locations

1. Locate classrooms as close as possible to main entrances of buildings to limit student travel through the building and facilitate easy and safe egress. This is most important for large-capacity and lecture classrooms, which should also be located on the main level of buildings.
2. Locate classrooms away from indoor noise-generating equipment and activities, including restrooms, mechanical rooms, vending areas, break rooms, eating venues, etc. If a classroom must adjoin a noise-generating area, provide adequate sound barriers to minimize sound transfer.
3. Locate restrooms near lecture halls.
4. Group classrooms together within the building. A building with mixed functions (classrooms, laboratories, and offices) should have separation of the classrooms from other functions.

Corridors and Space Outside of Classrooms

1. Corridors shall be sized to accommodate the number of students leaving classrooms competing with those entering classrooms and must comply with universal access guidelines, and OSSC (building code) egress and occupancy requirements.
2. Corridors, common areas, and areas outside classrooms should be considered valuable teaching and learning spaces and the design should utilize every opportunity to create multiple types of adjacent learning spaces. Corridors and hallways should be an extension of the learning environment. Consider equipping these spaces with seating and whiteboards to facilitate student discussions and interactions, along with power outlets to support use of laptops.
3. Informal interaction spaces for small or one-on-one collaborative and instructional interaction is encouraged and can be incorporated within lobbies and hallways.
4. Non-recessed doors that open into the hallways are to be avoided.

CLASSROOM TYPES

It is important that there be a variety of sizes and classroom types available for instruction. Different pedagogical teaching styles require different types of learning environments.

The Registrar's Office, CAI, and AVS shall be engaged to determine University needs in terms of classroom size, seating capacities, and pedagogical needs. The following classroom types shall be supported.

Note the following when referencing the Classroom Types & Characteristics chart:

1. SF/station is a range and could be greater than highest, if pedagogy requires.
2. Square feet per student includes circulation areas and instructor space. If the function of the room requires a large stage area or additional circulation, the overall SF/station may need to be increased.
3. See Furniture Section (08) for additional furniture information.

Classroom Types & Space Requirements

Classroom Type	Definition	Acceptable Furniture Types	Seat Count	Sq. Feet per Station
Traditional/Flexible Classroom	Traditional/Flexible Classrooms should have single level flooring/no tiers. Furniture should be freestanding to accommodate various teaching styles and layout requirements.	-Chairs & tables on casters (stackable chairs & nesting flip-top tables as needed to accommodate pedagogy) -Tablet arm chairs on casters	25-100	25-30 SF for tables/chairs 20-25 SF for tablet arm chairs
Active Learning Classroom	Active Learning Classrooms should have single level flooring/no tiers. Furniture should be freestanding to accommodate various teaching styles and layout requirements. Design should allow for all walls to serve as instructional space. There should be no 'front' of classroom.	-Chairs & tables on casters (stackable chairs & nesting flip-top tables as needed to accommodate pedagogy) -Tablet arm chairs on casters	25-100	30-35 SF for tables/chairs 25-30 for tablet arm chairs
Seminar Classroom	Seminar classrooms should be designed for up to 20 students doing group work. Furniture should allow the instructor flexibility to arrange the class in small discussion teams or meet with the class as a whole.	-Tables on casters (nesting flip-top tables if needed) -Chairs should be comfortable with casters or swivel seats	Up to 20	25-30 SF
Lecture Hall	Lecture Halls are large, tiered floor classrooms. Aisles can be sloped, but seating areas must be tiered. Seats and rows must be numbered. Rooms of this type typically require an adjacent Projection Booth and Control Room.	-Fixed auditorium seating with tablet arms -Fixed tables and chairs with swivel seats -Fixed tables and chairs on casters	100+	15-20 SF/student overall; at least 10 SF per student for their seating area.

General Design Features

The following should be considered when designing a new classroom:

1. Classrooms must be ADA compliant. Refer to Section 05.4.
2. The preferred configuration of classrooms shall be determined by the needs of the faculty and instructors, department programs and curriculum, and pedagogical methods.
3. Future pedagogy, instructional technology, and forecasted student and instructor needs should be reviewed and related infrastructure should be planned.
4. Designing for flexibility of the room is strongly encouraged. The more square footage given per student, the greater the flexibility.
5. The total square footage of each room should be based on the classroom type, capacity, and furniture type as noted in Section 05.1.
6. Rooms should be rectangular with a length-to-width ratio of 2:3 or 3:4 with the headwall on the long side. Use of all walls for instructional purposes should be considered. Instructional pedagogy and user function are paramount for room configuration. Long, narrow rooms are not acceptable.
7. Classrooms with a capacity of 49 or less are to be as square as possible to allow for greater flexibility in furniture arrangement and better sightlines.
8. The ideal configuration of a lecture hall is dependent upon the seating capacity, seating type (e.g. fixed, mobile, etc.), acoustic design, and viewing angles for each room and most importantly, the pedagogy and instructor needs. A curved configuration improves visibility and student/instructor connectivity. These rooms will tend to be more fan-shaped with seating, screen, and instructional needs dictating the shape.
9. In classrooms with fixed tables and/or fixed seating, the front edge of the teaching station must be at least 6'-0" feet from the front row.
10. Every seat must have an unobstructed view of instructional content from at least one angle. Columns or other visual obstructions are not permitted in the instructional space..
11. Ensure 36" clear between rows of tables.
12. Projection path from projectors to projection screens is essential. Avoid lighting and ceiling fan placement that interferes or compromises projection paths, as well as other obstructions such as HVAC ducts or structural beams located at the ceiling.
13. Student seating areas are to be designed with optimal viewing angles and positioning to instructional material. See Diagrams 1.2, 1.3, 1.4 and 1.5 for exact angles, dimensions, and additional information.
14. Seats are to be no closer than the dimension of the screen width. 1.5 times the screen width is the preferred minimum distance. AVS should review and approve viewing distance and angle calculations.

    Example:

    8'-0" screens should have seats no closer than 8'-0" to 12'-0". The 90-degree side-to-side viewing angle and the 30-degree vertical requirement can increase this distance to greater than the 1 to 1.5 times requirement.

The following applies specifically to classrooms providing remote, hybrid, or distance education (or production capabilities):

1. For distance education classrooms, particular attention should be paid to daylighting and noise control. If the classroom is to be used exclusively for distance education, consider no exterior windows and away from indoor noise-generating equipment and activities, including restrooms, mechanical rooms, vending areas, break rooms, eating venues, etc. If a distance education classroom must adjoin a noise-generating area, provide adequate sound barriers and acoustic treatments to minimize sound transfer. Room lighting and acoustics are of utmost importance for these rooms.
2. Specify lighting, window treatments, and interior room finishes and surfaces suitable for video projection and production.
3. Accommodate display of near and far participants at the front and back of room.
4. Provide network connection for conferencing technology at teaching station and at rear of room with necessary conduit pathways to teaching station.
5. Provide an AV station or control room, with pathways for display and audio with control to all displays. – See Division 27 for specific requirements.
6. Provide adequate power for laptops.
7. Provide adjustable lighting and window shade control to accommodate video projection and production, i.e. zone/scene control with the option to adjust with a dimmer switch. See Classroom section in Divisions 23, 25, 26 in Campus Design Standards.
8. Whiteboards are preferred in distance education spaces for better contrast.

The following applies specifically to classrooms with capabilities for wireless laptop use:

1. Closets and/or carts are required for computer storage, charging, and disk maintenance. Provide power for battery charging, at least 110 watts per laptop.
2. Provide multiple projectors and projection surfaces.
3. Provide moveable furniture.
4. Provide maximum wireless access point coverage (WAP) to address high, and simultaneous, demand. CPFM to coordinate with AVS; design is provided by AVS.
5. Consider providing power for laptops while in use (floor box locations, and/or integrated power in furniture).
6. Provide (1) 20A circuit for every 15 laptops.
   Calculation:
   Take the current rating of the notebook brick and multiply by number of laptops.
   For example, a MacBook uses a 65-watt brick, while a 15in Dell Latitude uses 90-watt bricks. Add/allow for AC/DC conversion losses (20% roughly). If the laptops will not be operating when charging, less may be required.

Projection Booths & Control Rooms

All projection and control booths shall be designed, reviewed and approved in direct consultation with AVS Engineers. See Division 27 for detailed requirements.

1. Booths and control rooms are typically required for large lecture halls and distance education or production classrooms. Pathways to shared control spaces and routing for communication cable paths outside the building shall be included in the design of booths and control rooms.

2. Booths/Rooms are to be 12'-0" wide by 7'-0" deep, at a minimum; possibly more depending on the classroom space the booth/room serves. AVS Engineers to review design.
3. Doors shall be oriented so that no direct exterior light is allowed into the space or classroom.
4. Full lighting and scene controls must be installed within these spaces.
5. Cable pass-through is required for temporary cabling from the booth to the classroom space.
6. No plumbing, HVAC equipment and/or pipe or ductwork shall be routed through or between these space types and adjoining rooms. Cooling to be provided to the room with set temperature not to exceed 78 degrees.
7. If an electrical panel is located in this space, the electrical panel and all associated clearances prescribed by building and electrical codes shall not in any way infringe upon space required by booth functions.
8. A minimum of one equipment rack location is to be provided within each space. Additional rack requirements will be determined by AVS during early design phases.
9. Doors to projection booths and control rooms shall have locks with entry by authorized AVS personnel only (AV3 key per UO Lock & Key Shop).
10. If the room is a projection booth only, a single projection window shall be provided with good visibility to the screen.
11. The projection booth window should meet the following design criteria:
    - Dimensions shall provide as much viewing area as possible.
    - Shall be set high enough so that projected images pass completely over the heads of students/audience.
    - Shall contain glass of optical quality or be water white seamless glass without visual imperfections.
    - Provide glass with gasket seals for sound control.
    - Shall be installed in a tilted orientation to prevent reverberations within the classroom.
    - Any projection window shall be placed so that the projector(s) (slide or data/video) may be placed at a perpendicular angle to that projector's portion of the projection screen, both horizontally and vertically. May vary with adaptable technology.
12. Projection Booth & Control Room Countertops
    - For each projector, or conferencing/camera control station, counter shall be a minimum of 30" in length and 30" in depth.
    - If a projection window is specified, counter length shall be full length of the window wall, with no cabinet, doors or kick plates under the counter to allow for operator knee room or portable cabinet placement.
    - Power shall be provided above and below counter and be switched.
      The floor, window, counter height, etc. shall be accessible for ADA users and equipment carts.

Accessibility

Universal design and ADA compliance is paramount to the University's mission for all instructional spaces. All classrooms must comply with current ADA Standards for Accessible Design, and in addition shall provide a minimum of the following:

1. Accessible wheelchair seating positions throughout assembly areas per Section 802 of the ADA Standards. (5% of total seat count).
2. If wheelchair seating is beside fixed seats, minimum clear floor space of 30" x 48" must be provided. If wheelchair seating is across the front of fixed seating, the minimum required clear floor space is 42" x 48". An accessible route to wheelchair seating is required.

- If wheelchair seating locations are at fixed tables, the table should provide a minimum unobstructed knee space depth of 19" and a minimum knee space height of 27".

3. One (1) Adjustable Height Table per 50 seats in new construction. For remodels, inquire with CPFM Design & Construction for best practice.
   - The table shall provide vertical height adjustment capability by individual users, unassisted.
   - The finish of these tables should match others within the space or the standard configuration provided by CAI.
   - If a crank mechanism is used to adjust the table height, the crank must not be removable.
4. One (1) Bariatric Chair per 50 seats
   - Seating should have at least a 500 lb rating.
   - Seating should have a similar aesthetic to other seats within the room.
5. Provide accessible route to front, rear, and middle seating of large lecture halls.
6. Writeable surfaces are to be installed at a level that is accessible. If utilizing a static board, it is recommended to be installed at 54" to the mid-height. If not, at least one vertically adjustable surface shall be provided. Ideally, adjustable height boards are encouraged over static boards. For writable surfaces, whiteboards are encouraged over chalkboards, where appropriate. Benefits of whiteboards include: reduced pressure and effort needed for writing, increased color options, and they do not generate irritating chalk dust. Whiteboards can also be used for LCD projection, and many can also be used as magnetic bulletin boards, making them multifunctional classroom tools.
7. Per the Universal Design for Learning framework, design of compliant learning spaces shall specify assisted listening devices and appropriately integrated AV systems for the deaf or hard of hearing. All classrooms should have connectivity for microphones and microphones available for use by the instructor and students.

ROOM CHARACTERISTICS

Doors and Security

1. Doors, hardware, opening force, thresholds, and maneuvering clearances must meet Campus Design Standards and comply with accessibility standards as specified in ADA Standards for Accessible Design. Reference Division 08 of the Campus Design Standards.
2. Each door leaf to be a minimum of 36" wide, including those used in pairs as double doors. No strike mullion on double doors.
3. Doors shall be solid construction for durability and sound control.
4. Occupancy within the classroom should be clearly visible from the hallway. Door shall be equipped with a narrow vision panel, half-lite, or separate sidelight.
5. Door sweeps and silencers are recommended for sound control and should be reviewed by UO Lock and Key Shop for approval.
6. The main entry to classrooms shall be located at the rear to minimize disruptions caused by arrivals or departures during class instruction. In rooms that require two or more points of egress, the doors should be located as far from the presentation area as possible while meeting current building code.
7. Doors to lecture halls should open into alcoves and be located at the rear or sides of the classroom.
8. All doors should be keyed per UO Lock and Key Shop standards. See Division 08 of Campus Design Standards.

9. Doors to projection booths and control rooms shall have locks with entry by authorized AVS personnel only (AV3 key).
10. Refer to Division 28 of the Campus Design Standards for additional security information.

Windows

1. Windows must comply with Division 08 of Campus Design Standards.
2. Daylight is an important part of most learning environments. Windows should be included in classrooms whenever possible, except for classrooms used solely for distance education.
3. Windows shall not be placed along instruction walls.
4. If easily accessible, window coverings can be manually operable; otherwise, coverings must be motorized with controls located at the instructor's station on the AV panel.
5. If motorized shades are used, electrical duplex outlets must be provided at each shade location.
6. Where applicable (rooms requiring blackout shades for projection, for example), the depth of the window should be designed to allow for the installation of motorized shade tracks.
7. Use of light diffusing roller shades in conjunction with a room darkening roller shade is required.
8. Vertical blinds and drapes are not to be used.
9. See Section 06.5 for classroom window treatment information.

Ceilings

Ceiling height and design is based on classroom capacity, acoustic and lighting needs, instructional technology requirements, and overall room proportions.

1. Ceilings must provide access for refresh and maintenance to AV technology (projector, speaker, and microphone locations), MEP, and other systems that may be located above.
2. Ceilings must have appropriate acoustic properties and a minimum Noise Reduction Coefficient (NRC) of .70 and a minimum Sound Transmission Class (STC) of 50.
3. Ceilings should have a minimum Light Reflectance Value (LRV) of 80%.
4. Ceiling height requirement may differ from seminar rooms, classrooms, and lecture halls but must be a minimum of 10'-0" AFF.
5. Ceiling height shall be considered when designing a classroom space since the size of projection screen is directly related to the height of the ceiling. See Section 07.2 for more information.

Acoustics

Classroom acoustics must meet the American National Standard on Classroom Acoustics. The following ANSI standard criteria should be adhered to:

1. Acoustic commissioning reports must be submitted to AVS so they can properly specify, commission, and calibrate AV equipment to those requirements.
2. In unoccupied classrooms of any size with sound amplification, ambient noise levels must not exceed 35 dBA.
3. If there is no sound amplification, ambient noise levels shall be less than or equal to 30 dBA.
4. In rooms with video-conferencing capability, ambient noise levels shall be less than or equal to 30 dBA.

5. The signal-to-noise ratio (the difference between the teacher's voice and the background noise) should be at least +15 dB at the student's ears.
6. Unoccupied classroom reverberation must not surpass 0.6 seconds in smaller classrooms or 0.7 seconds in larger rooms

Reference: ANSI/ASA S12.60-2010/Part 1

Additional design criteria to be followed:

1. For new construction, all walls must extend to the floor above or roof construction; walls cannot stop at the ceiling.
2. Classroom walls shall have a Sound Transmission Class (STC) of at least 50.
3. Walls separating classrooms from common spaces or restrooms should have an STC rating of at least 55.
4. Walls separating classrooms from mechanical or other high noise level spaces should have an STC rating of at least 59.
5. Acoustics shall be designed so that sounds and voices are heard easily, evenly and accurately from all seating locations while keeping unwanted background or outside noises from entering the space.
6. In large classrooms and lecture halls, a thorough acoustic evaluation by a professional acoustic consultant will be required. A design acoustician must work with AVS, and CAI for an understanding of room acoustics regarding amplified speaker systems and oral sound origination. Acoustic evaluation must include consideration of a reinforced, distributed speaker system.
   Classrooms for distance education have more specific requirements to prevent background noise that must be fully explored and implemented.

Finishes

1. All classroom finishes must be durable, easy to clean, and easily maintained.
2. Finishes should be selected to avoid visual distraction (no high-gloss finishes or busy patterns).
3. Refer to Division 09 of the Campus Design Standards for additional information.

See chart below for acceptable classroom finishes:

CLASSROOM INTERIOR FINISHES				
Flooring				
Type	Style	Size	Install Method	Comments
Hybrid Floor Tile	Kinetex	Varies	Glue down; Low-VOC	Preferred floor finish in all classrooms
Carpet Tile	Square, Plank	Varies,	Glue down; Low-VOC; Quick- Release	Type 6 Solution dyed nylon; Heavy-Severe TARR Rating
Hard Surface	Resilient Tile or Sheet	Varies, 3-5mm Thickness	Glue down; Low-VOC	Rubber or Linoleum are preferred. See Division 09 of Campus Design Standards.
Hard Surface	Polished Concrete	N/A	N/A	Minimal use only in Lecture Halls; Polished and sealed per Campus Design Standards
Base				
Type	Style	Size	Install Method	Comments
Rubber	Cove Base	4" or 6"H	Low-VOC Glue	

Wood	Varies	Varies	As needed	Wood base should only be used in historic buildings to match existing or maintain historic integrity
Walls				
Type	Style	Size	Install Method	Comments
Paint	Eggshell Finish	N/A	Low - No VOC	LRV between 50%-70%
Trim (door & window)	Semi-Gloss Finish	N/A	Low-No VOC	
Corner Guards	Stainless Steel	2" wide from top of base to 4'-0" AFF	Screw-on	Applied to all outside wall corners in and around classrooms
Ceiling				
Type	Style	Size	Install Method	Comments
Paint	Eggshell Finish	N/A	Low - No VOC	LRV should be 80% or higher
Acoustic Ceiling Tile	Varies	Varies	Varies	Designed to meet acoustic and LRV required within space. Must allow easy access to A/V, MEP, and other systems above
Window Treatments				
Type	Style	Size	Install Method	Comments
Solar Roller Shades	Manually Operated	Varies	Manual operation with continuous stainless-steel bead-cord control, each shade controlled separately.	3-10% Open weave is required on all exterior windows. For rooms with projection, a double roller shade is required, with one of the shades being blackout.
Solar Roller Shades	Motorized	Varies	Motorized shade with an outlet at each shade location. Controls shall be located on the wall near the teaching station and/or programmed and operable via the Crestron panel.	For use in rooms where access to manual shade controls is limited. Controls must be accessible for maintenance. Not approved for horizontal applications or skylights.

Mechanical, Electrical, Lighting

Refer to the following divisions of the Campus Design Standards for classroom and control room-specific information as it applies to Mechanical, Electrical, and Lighting:

Division 23 – Heating, Ventilation, Air Conditioning
Division 25 – Integrated Automation
Division 26 – Electrical

INSTRUCTIONAL TECHNOLOGY & AUDIO/VISUAL SYSTEMS

AV technology design is integral to classroom design. Pedagogical methods, faculty, and student needs must always be considered. IS AV Services Department must be engaged at every phase of design for all spaces AV technology is planned. Avixa provides additional references for AV industry and Higher Ed applications. AV related architectural drafting guidelines are also provided. See link below:

https://www.avixa.org/standards/current-standardsClassrooms, depending on category and pedagogy, and any other spaces used for instruction shall include the following:

1. Presentation systems, including data/video projectors and/or flat screen high definition displays, AV and multimedia switching systems, video and audio distribution systems.
2. Signal transcoding and routing over other types of cable, such as shielded Cat 6 or fiber optics, as required by the equipment installed for the highest performance outcome.
3. Audio systems including amplification, speakers, and microphones.
4. Video production systems, including control spaces and lighting, installed camera placement, and control.
5. User accessible controls, portable equipment connections, and alterable AV access technologies.
6. Design guidelines for AV provisions within public common spaces that could be used for instruction, gatherings, or events include the following:
    - Portable video production equipment needs power and signal connection to any installed audio and video systems: camera and microphone inputs; network connections; power.
    - Depending on the size of the space, common spaces may require recessed floor and/or wall boxes to supply multiple locations for recording systems and microphones. Wall boxes are preferred over floor boxes. If floor boxes are to be used, they should be recessed in to or flush with the floor.
    - Common spaces should be designed with signal/power paths to control rooms and/or associated distribution systems.

Classroom AV Feature Packages

The evolution of classroom technology at the UO has resulted in the development of three standard AV feature packages. Pedagogical needs, however, take precedent. AV Services will design spaces with the appropriate technology to meet those needs. Each feature package is designed to add an additional level of functionality and additional features to the overall system. For all UO Classrooms (general-pool, joint-controlled, and departmental), common area instructional and event spaces, and conference rooms, AV Services designs, specifies, services, and supports all AV equipment for projects they engage. For projects that are contractor installed, AV Services must approve all equipment and system designs. In addition, the final installation must be approved by AV Services.

AV Services provides estimates for project budgets at each stage of planning and design for projects IS engages, procures, and installs. For projects they do not, the AV contractor installing and procuring equipment will need to provide their estimates and final pricing.

For projects AVS does not engage, AVS will act as a UO consultant and a resource for AV classroom technologies. If an AV consultant and installation contractor is engaged for the system design and installation work, all AV equipment installed in general pool or joint control classrooms is turned over to IS inventory. AVS shall be engaged in project planning, approve design work, and be involved in close- out, commissioning, and turnover of the new equipment.

Classroom AV feature packages could include the following. Not all instances will be the same; each classroom or project varies and is custom-designed. Consultation with IS (or an AV Design Consultant) is required to identify the appropriate equipment for approved classroom features.

Standard Classroom Features:

- Blu-Ray player
- Crestron Touch Panel
- Document Camera
- Connections for HDMI input, and audio sources (PC and Mac)
- Single Display or one projector and screen, image and size adequate for furthest viewing distance
- Additional flat panel screen/screens for extra viewing angles
- Microphone, handheld (wireless/wired)
- Microphone, lapel
- Assisted Listening System (ALS)
- Speakers either in the ceiling or on the wall
- AVS approved network switch (for AVS)Dedicated wired Ethernet for instructor use (in addition to dedicated Ethernet for AV installation)
- In ceiling array microphones
- PTZ camera positioned in ceiling

Active Learning Classroom Features:
Includes standard features plus the following

- Two PTZ cameras positioned in ceiling
- Multiple Displays distributed around room
- IP Switching capabilities at each display
- Multiple locations for instructors/students to connect to displays

Lecture Hall Classroom Features:
Includes standard features plus the following

- Confidence monitor with or without annotation capabilities
- Additional projectors/screens or large displays
-
- XLR line input
- XLR mic input
- Video production equipment, if applicable
  - Cameras
  - Recording devices
  - Audio mixers, switchers
- PTZ demonstration camera located in ceiling near teaching station
- Control Room for video production AV equipment

Projection Screens

1. Multiple screens may be required based on the room type, type of seating, seating capacity, configuration of the room, architectural aspects of the space, and the primary instruction requirements.
2. Position screens to allow for simultaneous use with whiteboard(s) or chalkboard(s).
3. AVS to be provided product cut sheets and/or shop drawings and project architectural drawings with elevations, of all CFCI projection screens prior for approval to verify and confirm compliance with AVS standards.

4. Projection screens with a white matte finish and with blackout blocking at the top of the fabric are preferred.
5. Screen size is determined by individual project, user needs, or based on room dimensions, seating capacity, and the seating and audience configuration. The minimum acceptable height of the projected image is 4'-0" AFF. If the screen is lower than 6'-0" AFF, the instructor's body, media equipment and students in from rows may block the view of text or an image at the bottom of the screen. Projection screen specifications must be reviewed and approved by AVS and CAI. For appropriate screen specifications and ceiling heights based on industry calculations, room measurements, viewing distances, planned furnishings, and sightlines reference:

   https://www.avixa.org/standards/current-standards

   See related diagrams 1.2 to 1.5 and the reference publication in the Addendum.

6. All screens are to be mounted to allow sufficient clearance from the white/chalkboard trays.
7. All screens wider than 6'-0" shall be motorized with a wall-mounted low-voltage control switch located at a wall near the teaching station. Classrooms with control consoles (i.e. Crestron) will also provide screen control from the console. If screen control is incorporated in AV control system, also include wall mounted screen control switches.
8. All screens to be seamless.
9. Screen gain to be between .9 and 1.5; 1.0 is preferred; matte finish.
10. Wall mounted projection screens are preferred for maintenance and future refresh/replacement purposes. Recessed ceiling screens may be considered.
11. For recessed ceiling screens, the screen and screen housing shall be independent of one another and removable. Provide access hatches.
12. No short throw projectors allowed in classrooms
13. Lighting located near screen must be on independent dimmer
14. All lighting coordinated with AV devices

Flat Panel Monitor Displays

1. Adequate mounting reinforcement shall be part of the wall infrastructure wherever flat panel monitors are installed.
2. Standard 20-amp power shall be supplied on a single gang plate, recessed and hidden from view.
3. Recessed wall boxes must be reviewed and approved by AVS. Recessed wall boxes are CFCI.
4. AVS the data connection requirements for all AV systems.
5. If the flat panel monitor requires local user access, an accessible connection plate will be provided, typically below the mounted flat panel monitors.
6. For flat panel monitors that receive signals or supply signals to/from other equipment or remote switching/control equipment in a nearby room, signal routes shall be of sufficient number and volume to accommodate these wires. 1.5" diameter conduit is strongly recommended; 2" may be required in some installations. IS or contracted resource to review and provide requirement.
7. Panel mounting bracket specifications must be reviewed and approved by AVS. Mounting brackets are CFCI at AVS specified wall locations, depending on circumstances.
8. Flat panel monitor displays are OFOI by AVS for projects AVS engages

Electrical & Communications Systems

See Diagram 1.2 in Addendum for Wiring/Infrastructure Diagram for typical classroom.

1. Provide (2) duplex receptacles on a dedicated circuit at each AV / teaching station location; coordinate location with AVS.
2. Provide a minimum of one quad outlet in the ceiling at projector location for projector, must be within 6" to 8" from projector.
3. Provide one quad outlet at each TV/Display location
4. . Four (4) cable/data jacks must be installed at the AV teaching station / equipment rack location.
5. Separate conduit is required for AV and data cabling
6. All AV conduit sizing to be provided by AVS. A minimum of 1.25" conduit required for all AV equipment locations.
7. All communication (video, voice & data) design requires collaboration and consultation with AVS. AVS review and approval is required.
8. All classrooms shall have wireless access point network coverage (WAP) and should be coordinated with AVS. WAP devises shall not be located inside AV casework.

FURNITURE

The type of furniture for each classroom will be determined by the classroom type, pedagogical methods, and integration of AV systems. All furniture should meet the standards as outlined in Division 12 of the Design Standards. The information below is specific to classroom furniture.

All classroom furniture to be OFOI with the exception of fixed lecture hall seating. Manufacturer to install all fixed seating.

Tables

1. All tables should have High Pressure Laminate matte finish with matching 3mm PVC edge banding. Writable table surfaces are allowable.
2. Legs of tables shall not block student knee space within the 30" work space allotment. Table leg placement shall be considered and should not impede configurations that allow students to work collaboratively.
3. Table depths may vary between 18"-30" based on room layout and pedagogy.
4. Free standing tables should have casters with locking mechanism; ensure casters are specified to correspond with floor finish. Tables with flip-top mechanisms may be preferred.Modesty panels should be provided for tables in tiered classrooms.
5. Provide cable management systems for computer lab tables.

Preferred Products:

- Mobile Classroom Table: Herman Miller, Everywhere Table (Locking casters)

Similar tables may be specified and must be approved by D&C Design Services.

Seating

1. Chairs with molded poly seat and back and on casters should be specified for most classrooms.
2. Upholstered seats can be used in Seminar and Lecture Classrooms.
3. All upholstery must meet or exceed 100,000 Double Rubs and meet ASTM fire rating. Coated fabrics or fabrics with stain resistant or repellent finishes (such as Crypton or Alta) are preferred.
4. If tablet arm chairs provided are not handed universally, 10%-15% must be left handed.FUO
5. Fixed seating in lecture halls shall be constructed of iron or steel frames.
6. Fixed seating in lecture halls must provide a cushion seat and back.
7. Fixed seating in lecture halls are to be numbered with a permanently installed seat number. Seating rows should also be labeled. Project team to provide the Registrar's Office and AVS with a reproducible (digital format) seating chart.
8. Chairs shall incorporate wall-saver leg designs that prevent the chair back from contacting and damaging adjacent walls or finishes.

   Preferred Products:
   - Mobile Classroom Chair (Armless, On Casters): SitOnIt – Flyte, Rio, Lumin, or Sprout; Haworth – Very Side.
   - Mobile Tablet Arm Chair: KI Doni Learn2, (Casters; No-arm; Poly; Cup Holder/Access Rack; Standard Laminate Surface).
   - Spectrum Industries, Inc. for AV cabinet and Lectern. Pivot Premier Workstation and Companion Equipment Rack

   Similar chairs may be specified and must be approved by D&C Design Services.

Instructor Teaching Station

Contact UO AV Services for current classroom technology standards. Final design based on room size and layout.

1. Instructor teaching station to be CFCI and approved by CPFM and AVS. If AVS is installing the AV system, the teaching station will be OFOI.
2. Work surface of teaching station shall be non-reflective high-pressure laminate.
3. AVS must review final shop drawings of AV equipment-related furniture; provision of cut sheets is required. Internal cabinet dimensions and details must be provided.
4. Placement of instructor station shall not block views of screens and boards.
5. All AV equipment shall be controlled at the instructor station.
6. Cabinets, furniture or casework that houses IS supported AV and technology components shall be lockable and accessible by AVS only (AV3 key). If AV cabinets are for department classrooms, keying and accessibility are the responsibility of the department.
7. In instances where AV equipment is installed in equipment racks next to the teaching station, the cabinets should have front and rear lockable service access doors or panels. Minimum of (2) 20 amp circuits on standby power should be provided on or near teaching station or equipment rack for external devices.
8. Four (4) cable/data jacks must be installed at the AV teaching station / equipment rack location. AVS must review final shop drawings of AV equipment-related furniture; provision of cut sheets is required. Internal cabinet dimensions and details must be provided.

ACCESSORIES

Whiteboards & Writing Surfaces

1. All general pool classrooms shall be equipped with writeable vertical surfaces.
2. All boards shall have the following minimum characteristics:
    - Extend across the entire width of instructor (or projection) wall.
    - Writing surfaces on other wall/walls should be selected as appropriate for pedagogical need and as appropriate to the layout of the room.
    - All seams or joints (if necessary) should have no gap with concealed spine connections. Seams should be placed symmetrically.
    - Boards should be mechanically fastened in place without the use of glue.
    - The board should be mounted so the bottom of the tray is at 3'-0" AFF.
    - Include a full-length marker tray with rounded edges and open ends. There shall be no sharp edges or corners.
    - In all classrooms, board space must be usable even when the projection screen is down and in use. The projection screen should be positioned so that one contiguous writeable surface of at least 8'-0" in length is available when the screen is down.
    - In classrooms that require large sliding tiered boards, separate map hooks should be provided near the front of the classroom.
    - Delivery of boards to classroom should not require modifications to structural or egress components (i.e., height of elevator cab, widths of doors and hallways, etc.).
3. Marker board requirements:
    - Non-ghosting glass or resinous markerboards are preferred, with a low-gloss white finish and a minimum 10-year warranty.
    - Low-gloss white melamine boards are acceptable where approved by D&C Design Services.

    Preferred Products/Manufacturers:
    - Deko Markerboard; Color: Diamond; Magnetic; with Z-clip; with marker tray
    - Ghent, Clarus, or Quartet are acceptable alternatives.

4. Chalkboards are acceptable only if:
    - Required by the needs of the faculty and instructors.
    - Required by the department program, curriculum, and the currently adopted pedagogy.
    - If chalkboards are approved, they will meet requirements for boards listed above in section 2; and will be black with a 25-year warranty against polishing.
5. Coordinate installation of boards to avoid conflict with fire alarm enunciators or other building systems components.
6. Whiteboards are preferred in distance education spaces for better contrast.
7. Classroom size and minimum whiteboard requirements:

Number of Students	Minimum Board Size
0 – 35	12 feet long x 4 feet high
36 – 60	20 feet long x 4 feet high
61 – 100	30 feet long x 4 feet high, may be sliding or tiered
Lecture Halls	At minimum, 3 sections; 12 feet long x 4ft high

Clocks

1. Clocks are required in each classroom and should be placed at the back of the room.
2. UO Standard Primex Clock should be used.

Waste and Recycling

Recycling and trash receptacles are required in classrooms and in hallways adjacent to classrooms. Refer to Zero Waste Appendix for details.

SIGNAGE

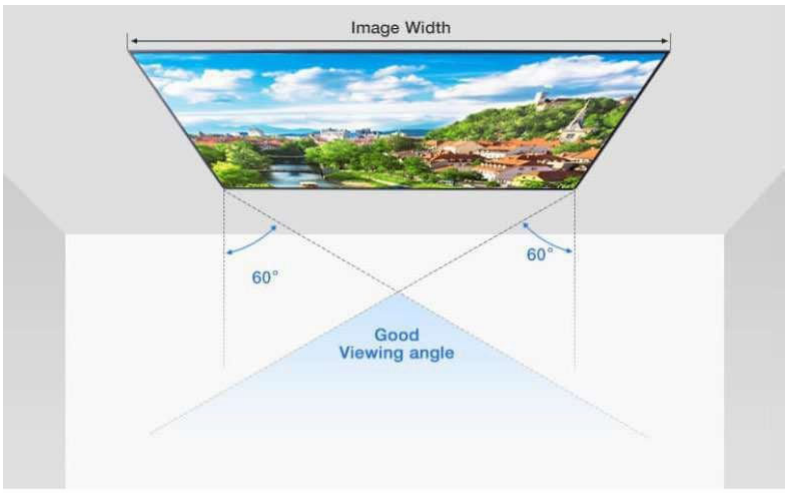
See Interior Signage Appendix

ADDENDUM

TABLE 1.1

Department or Committee	Role in Classroom Design	Contact
Committee on Academic Infrastructure (CAI)	Advise and review to ensure classrooms support the goals of learning environments at the UO	Office of the Provost OtP@uoregon.edu 541-346-3081
Facilities (CPFM)	Locks & doors, Zero Waste, electrical support, custodial, maintenance	Justin Grishkin jgrishki@uoregon.edu 541-346-5242
Design & Construction (CPFM)	Architecture & interior design plan review, furniture, finishes, wayfinding & signage, ADA compliance	David Cates dcates@uoregon.edu 541-346-8238
Energy & Engineering (CPFM)	Energy management, building utilities, MEP plan review	Jeff Madsen jmadsen@uoregon.edu 541-346-2256
Campus Planning (CPFM)	Historic preservation, exterior signs, space allocation, transportation impacts, bike parking	Jayde Hansen jaydeh@uoregon.edu 541-346-7188
UO Classroom Technology Design and Engineering (AVS)	Classroom educational technology design, engineering, and installation. Classroom technologies.	Andy Vaughn andyv@uoregon.edu 541-346-1016
Registrar's Office	Classroom scheduling, classroom seat count needs, and pedagogical needs.	Sarah Strickler sstrick2@uoregon.edu 541-346-1264
Environmental Health & Safety (EHS)	Life safety review and systems	Zach Earl zearl@uoregon.edu 541-346-9295
Network & Telecom Services (NTS	Wired/wireless network design, data storage, and installation	Andy Vaughn andyv@uoregon.edu 541-346-1016
UOPD	Project design security and access control, security cameras	Nick Hough nhough@uoregon.edu

DIAGRAM 1.2 – 60-Degree Horizontal Viewing Angle



A good viewing angle must be no more than 60 degrees from the perpendicular edge of the opposite side of the screen. (DISCAS specifies that no viewing position should exceed 60 degrees of any part of the displayed image.)

DIAGRAM 1.3 – 60-Degree Vertical Viewing Angle

Image offset is the difference between the height from the floor to the bottom of the image against the viewing height. The calculation is expressed as a positive number if the bottom of the image is above the viewing height and a negative number if the bottom of the image is below the viewing height.

Then the following equation gives us the closest viewer:

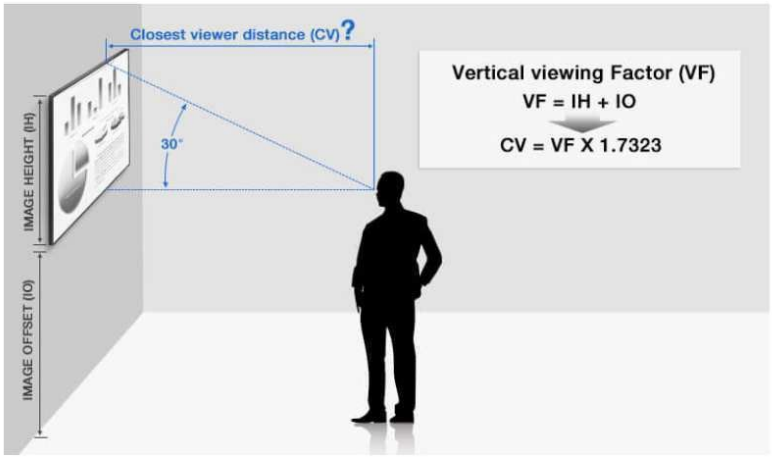
CV = VF x 1.732

Where CV is the closest viewer distance, and VF is the vertical viewing factor.

To calculate the horizontal closest viewer distance (this determines how wide the closest viewer area extends) you use the following:

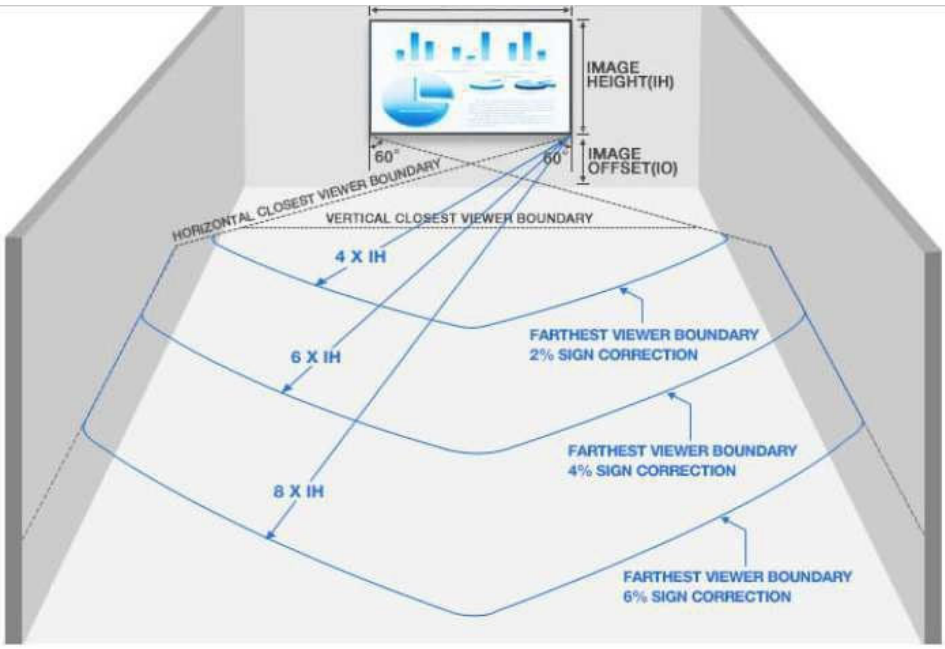
Horizontal CV = 6 x VF - IW

Where CV is the closest viewer distance, VF is the vertical viewing factor, and IW is the image width.



Closest viewer calculations for BDM, image height based on 16:9 (1.78:1) aspect ratio.

DIAGRAM 1.4 –Furthest Distance Viewing Angle



Viewing parameters for BDM, No Scale, Image height based on 16:9 (1.78:1) aspect ratio.

- **BDM Farthest Viewer**

FV = IH x %EH x 200 (BDM acuity factor)

Where FV is the farthest viewer distance, IH is the image height, and %EH is the percent element height. The 200 refers to the visual acuity factor for BDM.

- **ADM closest viewer**

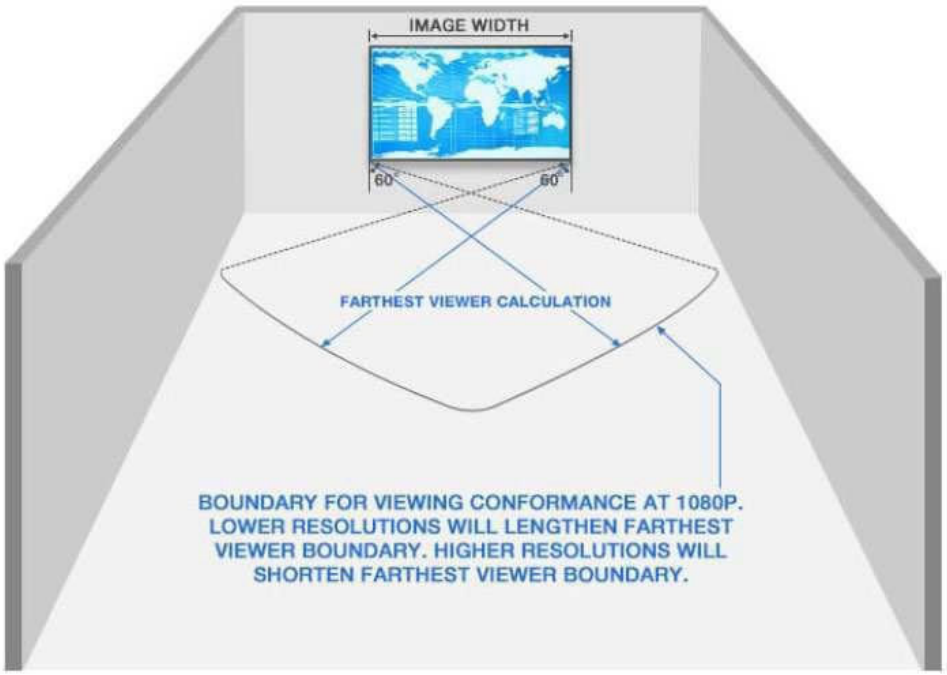
Due to the specialized nature of ADM and the fact viewers are meant to get very close to the screen, the standard does not call for the closest viewer distance to be calculated.

- **ADM farthest viewer**

FV = (IH / IR) x 3,438

Where FV is the farthest viewer distance, IR is the vertical image resolution, and IH is the image height. The 3,438 refers to the visual acuity factor for ADM.

DIAGRAM 1.5 –Furthest Distance Viewing Angle



Viewing parameters for ADM, no scale, image height based on 16:9 (1.78:1) aspect ratio.

- **Using the display for both ADM and BDM**

DISCAS recommends calculating the Farthest Viewer (FV), Image Size and Viewing distance to meet ADM recommendation and Element Height (%EH) and Closest Viewer (CV) to meet BDM recommendation.

AV Industry References for AV Design Consultants and Installation Contractors, Architects, and Drafters: https://www.avixa.org/standards/current-standards