Portland State University
Classroom Standards – 9/03/14

Purpose

Provide guidelines for classroom design to ensure that learning spaces meet the needs of students and faculty.

The standards and recommendations for classroom design are intended to create classrooms that are characterized by the following qualities:

- Appropriately located, sized, and configured, to meet scheduling and academic programming needs
- Facilitate current pedagogy, integrating technology as appropriate
- Flexible, to cater to multiple learning styles through multiple activities
- Adaptable over time, to facilitate evolving pedagogy, changing student demographics, changing technology, and need to use classrooms for a variety of activities
- Accessible (further discussed in Appendix A)
- Promote personal safety
- Facilitate connections between students
- Facilitate interaction between students and faculty
- Attractive and comfortable
- Durable and cost effective to maintain
- Minimize environmental impacts

Scope

The standards and recommendations apply to the construction of new classrooms and renovation of existing classrooms. The standards apply to both general pool and departmental controlled classrooms. These standards are not intended to apply to specialized learning spaces, such as teaching labs, studio space, or research space.

These standards are meant to complement internal standards developed by departments:

- Capital Projects & Construction maintains Technical Design Standards that specify construction parameters and preferred products (such as light fixtures).
- The Office of Information Technology maintains standards for technology, including computers and projectors (an appendix of this document).

When possible, classrooms should be designed with faculty input, to ensure that spaces are compatible with current and evolving teaching practices. In some cases, the end users of classrooms are not known during the design stage, and standards provide an important guide for creating quality learning spaces.

All newly constructed classrooms shall be general pool classrooms unless they are designed to meet a specialized instructional need, such as a studio or lab.

Context: Current Trends in Pedagogy

Changes in teaching practices directly affect how classrooms are used. Two current trends impact classroom design: active learning and changing use of technology.

Active Learning

An increased focus on "active learning" in the classroom requires specific classroom functionality. Classrooms must accommodate increased collaboration, allowing students to work together. In some cases, classes are "flipped," with lectures distributed online and class time being used entirely for exercises, group work, and interaction with the instructor. In other cases, class time is a combination of traditional instruction and activities. When not lecturing, the instructor must be able to access the entire room to provide guidance to students working in groups. Depending on the subject, activities may benefit from multiple whiteboards, screens, smartboards, or computers for student use.

Use of Technology

The increased use of technology may be changing the role of physical space on campus. Activities that may occur in classrooms include:
- Viewing of multimedia content
- Video-conferencing and/or streaming of content from outside the classroom
- Recording and/or streaming of lectures and content for viewing outside the classroom
- Use of provided computers and other electronic devices, whether stationary computers or laptops
- Use of personal computers and other electronic devices, sometimes in combination with provided electronic devices

The classroom standards were informed by these two trends. Although not every classroom must facilitate every activity, design choices, such as the inclusion of ample electrical outlets and sufficient Wi-Fi capacity, can impact the long-term flexibility of classrooms. As pedagogy continues to evolve, classroom standards must be revisited.

Classroom Standards & Considerations

Number, Types, and Scheduling of Classrooms

Decisions regarding the size and type of new classrooms must reflect current demand for existing classrooms, while considering potential programmatic changes.

Design decisions can improve the utilization of classrooms.
- Desirable classrooms are used more frequently
- Classrooms with sizes that correspond to typical enrollment caps are more fully occupied (for example, classrooms that accommodate 47 students, cannot accommodate courses with enrollment caps of 50)

There are several types of classrooms, reflecting size and pedagogy.
- Seminar Rooms
    - Small classes, significant student interaction
    - Flat floor
    - Large table, tablet arm chairs, or moveable tables and chairs, ensuring that movement is not restricted in small rooms
    - Students typically face each other
- General: Flexible
    - Flat floor (preferred) or wide tiers
    - Moveable tables and chairs or tablet armchairs
- General: Fixed
    - Flat floor (preferred) or wide tiers
    - Fixed tables
    - Fixed OR moveable seating
- Lecture Hall
    - Tiered or sloped floor
    - Fixed tables or tablets
    - Fixed or moveable chairs
- Auditorium
    - Tiered floor
    - Fixed tablet seating

When constructing new classrooms, consult with the Campus Planning Office and Academic Scheduling to determine the appropriate size and type of classroom(s) to construct, given current campus utilization and the location of the classroom(s) to be constructed.

The relationship between room size and capacity is addressed in Appendix B.

Placement and Adjacencies

The placement of classrooms affects utilization and the learning experience.

Ideal classrooms are in locations characterized by:
- Accessibility, specifically including wheelchair access to all floors where classrooms may be located
- Safety, in the form of access control and emergency call boxes
- Intuitive wayfinding from entrances, through location on ground floor or near stairwells and elevators
- Compatible adjacent functions:
  - Sufficient circulation and "queuing" space for transitions between classes
  - Seating, for gathering before and after class, informal interactions with students and instructors
  - Common areas, for meeting & collaboration
  - Research space and faculty spaces to encourage additional interactions
  - Teaching labs, if likely to hold courses with associated lab component
  - Storage space with corridor access in addition to or instead of access from within the classroom to allow flexibility and access during class as needed
  - Restrooms, including accessible stalls
  - Classrooms should not be located near noisy uses or mechanical areas.

Proximity to other uses is a desirable feature in classrooms. General pool classrooms should be included in every new campus building, and be a primary component of any new or renovated building near the core of campus.

While proximity to faculty offices is desirable, and a primary factor in high utilization, classrooms should not be located behind departmental functions. Such locations limit long-term flexibility and can limit access to classes.

Buildings containing classrooms must include sufficient circulation space, with entrances, stairwells, and elevators that can accommodate large groups. Additional restrooms are needed. Where possible, large classrooms should not be located adjacent to each other. Entrances to large classrooms should not face each other, but should be staggered, to decrease crowding in corridors. Recessed entrances and alcoves prevent opening doors from obstructing corridors.

Classroom Size, Shape, and Infrastructure

While furniture can easily be rearranged or replaced, the "shell" of the classroom cannot easily be changed over time.

Ideal classrooms are characterized by:
- Accessibility
  - Accessibility seating must be easily accessible from classroom entrance.
- Functional configurations
  - Shapes that reduce distances between the instructor and students, while ensuring clear lines-of-sight despite the presence of lecterns and equipment
    - Wide rooms are preferable to deep rooms, though multiple screens may be necessary.
  - Tiered floors, only when required by large size of classrooms (tiered furniture should be considered as an alternative to maintain long-term flexibility)
    - Tiered floors and furniture allow instructors with disabilities to maintain visibility while sitting.
    - Wide tiers are preferred, to allow students from multiple rows to discuss content and collaborate for discussion.
  - Sufficient wall space for white boards and screens, which can be used simultaneously (multiple white boards, or white boards walls, should be considered)
  - Divisible partitions where necessary, with consideration for sound bleed, durability, and maintenance
    - Wear and tear can be reduced by ensuring that changes are not required during each academic term, and that partitions are operated by select users.
- Doors located at the rear of the classroom to minimize disruption, though multiple entrances are preferred to reduce congestion
- Windows where possible, as they are frequently requested by instructors and students
  - Windows in the front of the classroom should be avoided.
  - Tinted windows should be avoided.
  - Windows may be located in the interior of the structure, providing connections to daylight corridors while limiting glare.
  - Visual access from corridor is necessary to allow people in corridors to see if classrooms are occupied.
    - While being low enough to accommodate people using wheelchairs, visual disruption should be limited.
- Lighting that contributes to comfort
  - Lighting should not create glare on screens or white boards.
    - Emergency lighting should not be located immediately above projectors or screens.

- o Lighting controls should be installed at every entrance, and within the lectern panel where feasible.
  - ▪ Dimming controls preferred
- o Controls must be clearly labeled.
- o Zones should be established in large classrooms.
  - ▪ Zone options should be manual, rather than preset to modes, such as "presentation" or "lecture," to allow flexibility.
- o Occupancy sensors should be included to ensure that lights turn off when rooms are not occupied.
- Lack of sound interference
  - o Increased sound from group work within the classroom must be accounted for, especially when classrooms are located next to each other.
  - o Mechanical equipment should not be located adjacent to classrooms.
  - o Moving components, like doors, must be quiet.
- Thermal comfort and strategic location of mechanical components
  - o Air ducts should be placed away from projection screens to minimize movement.
  - o Access to mechanical equipment should be outside classroom if possible to minimize disruption.
- Adequate IT Services
  - o Ample outlets, preferably located within floor or furniture
    - ▪ Sufficient electrical capacity
  - o Appropriate wireless network connectivity

Flooring

Flooring material is selected with primary consideration for durability and sustainability. In small projects, environmentally friendly linoleum tiles (such as Marmoleum) are the preferred flooring material. In larger renovations and new buildings where flooring is purchased in large quantities, burnished concrete or rubber flooring should be considered. Vinyl Composition Tile (VCT) is discouraged, because of negative environmental impacts. Acoustic panels may be required.

In small classrooms under 30 students, carpet may be appropriate. Carpet is not appropriate in rooms with fixed seating, because of the high cost of maintenance and replacement. However, carpet may be installed in aisles.

Linoleum and carpet tiles are preferred to allow for spot replacement over time, required because of wear and tear. Solid colors or simple patterns should be selected as the original design may not be available in the future.

Window Treatments

Functional window treatments are needed to ensure visibility during multimedia presentations in classrooms. Window treatments are selected with primary consideration for ease of use, functionality, and durability.

In all cases, pull cords should be avoided, and curtains and blinds should be moved manually.

Curtains and screens are acceptable, because of ease of use and durability. Heavy curtains provide acoustic benefit and block light. Translucent or perforated screens may also be used, with consideration for the visibility of multimedia. Vertical blinds are acceptable, though mini blinds should be avoided.

In future large projects, the use of shades built into windows, which reduce wear and tear, should be explored.

Layout and Furnishings

Layout, furniture, and other components affect the functionality of classrooms for needed activities.

Ideal classrooms are characterized by:
- Signage on all entrances, clearly marked as classrooms
- Accessibility, allowing students and instructors of all abilities to access different portions of the classroom
- Wide aisles, to allow movement around classroom
- Chair rails, to prevent damage to walls
- White boards, not blocked by projector screens or other equipment
    - Potentially freestanding and moveable, with consideration for space, durability, and maintenance
    - Potentially incorporated into wall surface, to create additional space
- Limited distance between seats and instructor
- Lectern location that facilitates lines of sight and interaction
    - Equipment can block lines of sight to screen/whiteboards.
    - Stationary computers in the corner of rooms limit engagement with instructor during multi-media presentations.
- Clocks, located on side wall if possible

Other components might include:
- Multiple screens
- Moveable white boards and/or pin-up space

Furniture

Furniture strongly impacts the operation of the classroom and the activities that can be accommodated. A mix of classrooms with tables and chairs and tablet chairs is desirable. All seats should be located within 90 degree viewing angle of projection screen.

Portland State University has not selected any provider to be the exclusive provider of any classroom furniture and fixtures.

Moveable furniture should be selected with the following primary criteria:
- Affordable
- Durable
- Lightweight
- Comfortable
- Meets diverse needs of students
- Sustainable (materials and distance from manufacture)

In many cases, existing furniture can be maintained to meet the needs of students. Classrooms primarily designed for active learning may require unique furniture.

Chairs

Moveable chairs should be:

- Plastic & metal
    - Wood should be avoided, because of weight.
    - Fabric and mesh should be avoided to ensure durability.
- Solid colors (black & grey preferred)
    - Fluorescent and loud colors should be avoided to maintain ability to move furniture to other locations as needed.
    - A mix of colors should be selected to facilitate spot replacements over time.

Chairs that may scuff floors should be avoided.

The products noted below and their equivalents meet standards. Many chairs are available in several alternatives, with and without armrests, with and without tablets. Others are available in multiple heights, which should be considered.

When selecting tablet chairs, student belongings must be considered:

- Books
- Laptops and other electronic devices
- Food and Drink
- Winter layers, rain gear, and bike helmets

Herman Miller- Caper   SitOnIt- Anytime

Izzy+ - D Chair   Izzy+ - Fetch

New installations of fixed seating are expected to be limited. These products should be chosen with care, reflecting lessons learned from recent capital projects, such as the Collaborative Life Sciences Building. Fixed seats should swivel, allowing for interaction with nearby students. Ten percent of seating must accommodate left-handed students.

Tables

Moveable tables should be:
- Made of lightweight material.
- Wheels may be necessary on one or both sides if tables are difficult to move.
- A depth of 18-24 inches, to accommodate books, notes, and electronic devices.

The tables below, and their equivalents, meet standards. Tables may be modular, allowing individual use and combination for group work. Some small, high tables should be considered to allow students to stand during class.

St Johns Panel Systems Inc –made to order

Herman Miller- Everywhere

Accessible Furniture

When possible, a small amount of accessible furniture should be purchased when classrooms are furnished to limit the need for special requests. This furniture should be selected in collaboration with the Disability Resource Center.

RFM- Evergreen, locally produced in Hillsboro

Adjustable Height Desk or Table - Black Base with Small Top - Sit to Stand-Up Computer Workstation - Modern Standing Desk

Colors

Particularly in existing buildings, paint colors are chosen to be compatible with the identity standards of Portland State. New buildings often have a partnership component, requiring a unique color palate.

Technology

Minimal technology is installed in all general pool classrooms by Academic & Research Computing within OIT. Additional technology is installed in select rooms to accommodate different activities.

Classrooms are connected via the PSU campus network to a campus-wide audio-visual technology room management system. This system allows for staff to monitor room usage, lamp hours, and equipment security.

In addition to end-user technology, infrastructure must be incorporated to ensure sufficient electricity and access to wireless networking.

General Pool Classrooms

All PSU general pool classrooms feature basic resident technology to support instruction:

- Ceiling mounted data projectors
- Room size appropriate projection screens
- Teaching podium
- Resident computer with confidence monitor
- Document camera
- Integrated sound system for source devices
- Media player
- Wired connection for using portable media device (laptop, tablet, camcorder)

Technology within departmentally controlled classrooms is within the purview of the department.

Additional IT

In order to accommodate active learning activities, some classrooms may require multiple projectors and screens, monitors, and clusters of computers. When specific technology is likely to become obsolete, equipment should be installed in a fashion that facilitates replacement.

Appendix A: Accessibility Considerations

The special requirements of students and faculty with disabilities must be considered when designing and renovating classrooms. The goal of classroom design is to serve all potential users, including persons with mobility, hearing, vision, and mental disabilities. When designing and renovating classrooms, federal ADA Standards for Accessible Design must be applied. At PSU, the Disability Resource Center must be consulted about classroom design choices.

Classroom design components that require consideration include:
- Rise & run of any slopes in corridors and rooms, which must accommodate wheelchair users
- Handrails
- Colors and color contrasts, which can create problems for students with autism
- Building access and egress for typical and emergency movement
- Location of signage and inclusion of Braille
- Width of doorways, which must accommodate wheelchair users
- Width of aisles and space available to maneuver wheelchairs
- Air quality impacts, such as adjacency with potential irritants (exhaust vents and mechanical areas)
- Door opening mechanisms and opening pressure
- Ratio of stations that accommodate students in wheelchairs, and other seating that accommodates students with other limitations, including pregnancy
- Location of seating designed for students with disabilities, which is preferably dispersed throughout the classroom
- Location of lighting controls, which should be within reach of wheelchair users
- Lighting fixtures, which should be selected and maintained to reduce the risk of seizures
- Lighting levels
- Acoustics, which may impact students with hearing loss
- Audio amplification as needed

Additional Accessible Furniture

Despite efforts to select classroom furniture that serves the diverse needs of students, alternative furniture is often required. The Disability Resource Center maintains an inventory of furniture in order to respond to individual requests.

Appendix B: Square Feet per Student

The capacity of classrooms is determined by the size of the room and the space allocated to each occupant. "Square feet per student" is used to compare the efficiency of classrooms. Total square feet, including all circulation space, is divided by capacity to generate square feet per student.

The following standards should be used to ensure that classrooms can accommodate the appropriate number of students, and to ensure that sufficient furniture is installed.

Maximum Capacity	Room Type	Furnishings	Square Feet per student
0-29	Small	Large Table Flexible Furniture	20-25
30-76	Medium-Large	Flexible Furniture Some Fixed Tables	15-25
77+	Very Large	Moveable	18-22
77+	Very Large	Fixed Seating	13-18

Ranges are provided to reflect the diversity of furniture and pedagogy in classrooms. Rooms on the low end would be forward-facing, with little flexibility, while larger rooms would be tailored to active learning, with flexible furniture and additional equipment.

In some cases, exceptions may be necessary. Some classrooms may be repurposed spaces and some areas of the room may not be appropriate for seating, due to visibility issues. In these cases, additional circulation space may limit efficiency. In other cases, additional equipment, such as built-in cabinets, white boards, or IT equipment may increase the space needed per student.

In new projects, tradeoffs must be recognized. Efficient classrooms can accommodate large class sizes and, in some cases, allow a greater number of classrooms to be created. However, the need to facilitate many activities in the classroom will require more space per student in some classrooms. Careful furniture selection can accommodate flexibility while maintaining efficiency.

Appendix C: IT Standards

In progress