

Planning Guide for the Refurbishment, Renovation, or Construction of Instructional Space Environments

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Introduction

This Planning Guide was developed to assist Cornell faculty and staff as they consider changing existing instructional spaces or creating new ones. The primary audience is the room user, especially a room user that is ready to make a change. This Guide might assist those who merely want to purchase some new furniture as well as those who wish to make more sweeping changes.

For larger projects that require licensed design work, Cornell involves internal staff experts and hires professional consultants. Such a design process will ensure that all work is developed in compliance with applicable codes as well as Cornell design standards that may exceed legal requirements, for example, in the area of sustainability. While this Guide might inform a professional design effort, its intended use is during preliminary scoping, before the formal work of design begins.

The Planning Guide will work best when those involved in its use have thoughtful discussions around the question of “how do we want to teach?” Instructional spaces should always be designed with a full understanding of existing and evolving pedagogical preferences.

Expectations

Instructional spaces take many forms, from flat floor seminar-style space, to large lecture hall, to chemistry lab, to dance studio. At Cornell, all instructional spaces should provide a comfortable and effective context for learning, for instructors and students. At a minimum, the following expectations should be met in every room.

Aspect	Expectation
Acoustics	<ul style="list-style-type: none">Instructors and learners can be heard at normal speaking volumes, whether amplified or un-amplified.
ADA Requirements <i>(additional requirements are embedded within specific aspects)</i>	<ul style="list-style-type: none">A minimum of one 36-inch aisle throughout the classroomIn the instructor area, teaching platforms must be accessible by means of a ramp; teaching equipment and room controls also should be accessible.In lecture halls, where sloped or tiered floors are required in order to provide acceptable sight lines, accessible viewing positions shall adjoin an accessible route that also serves emergency egress.Ramps must not exceed one-foot rise in twelve feet of run (1:12 ratio), with a maximum rise of 30" and maximum run of 30' for any slope before level landings are required. Level landings (60" in length) must be provided at the top and bottom of each slope, and wherever the ramp changes directions. Handrails should be provided if a ramp run exceeds 72" or the rise is greater than 6".
Capacities	<ul style="list-style-type: none">Capacities are based on reasonable station sizes that conform to Cornell space guidelines.

Aspect	Expectation
Doors & Doorways	<ul style="list-style-type: none"> • Should operate quietly • Should seal out sound when closed • Located at the rear or side of a room • Force required to open the door should not exceed 5 lbs. • Doorways: entrance must provide a minimum of 32 inches clear egress; Thresholds (not to exceed 2 inches), stairs, or other barriers should be minimized [ADA] • Lever style or U-shaped door handle (one that can be operated with a closed fist) [ADA] • An unobstructed route into the room that is maintained at a minimum of 36 inches [ADA]
External noise	<ul style="list-style-type: none"> • External noise from loading docks, parking lots, streets, mechanical rooms, mechanical systems, vending areas, dining facilities, etc. is mitigated so as not to impinge on the normal functioning of the space
Finishes	<ul style="list-style-type: none"> • Durable finishes are installed on walls and floors • Finishes are maintained in good condition • Finishes are updated/replaced when wear becomes noticeable
Furniture	<ul style="list-style-type: none"> • Furniture is well-made, ergonomic, and durable to maximize life cycle investment • Stations for students with mobility impairments, especially persons who use wheelchairs, should be provided at approximately four percent of the capacity of the room. In addition, one percent (at least one seat of all fixed seats in rooms of less than 100 capacity) should be adjacent to the aisle with no armrests on the aisle side. These stations should be available in a variety of locations within the seating area. To accommodate students using wheelchairs, a table that provides knee space of at least 27 inches high, 30 inches wide, and 19 inches deep should be provided. The optimal option is to provide adjustable height tables that adjust from 28 inches to 34 inches above the finished floor. In addition, provisions may be necessary to accommodate companions who assist students with hearing, sight, and mobility impairments. [ADA]
Horizontal surfaces	<ul style="list-style-type: none"> • Horizontal work surfaces are sufficient to accommodate the typical room use • All learning occupants have access to an equivalent amount of work surface • The instructor has sufficient horizontal space for effective presentation
Lighting	<ul style="list-style-type: none"> • At least two zones of lighting are provided, one for the instructor area and one for the student area
Location	<ul style="list-style-type: none"> • Instructional spaces are located near exterior doors on levels closest to the main building entrance (within 1 floor)
Network	<ul style="list-style-type: none"> • Strong wifi network available
Power	<ul style="list-style-type: none"> • Sufficient for the typically installed equipment • Easily accessible for ad hoc use
Sightlines	<ul style="list-style-type: none"> • When columns are structurally required in a space, seating is configured so as to minimize sightline obstructions • Where columns or other structural supports are not required, rooms should not contain sightline obstructions between instructors and students
Signage – Egress	<ul style="list-style-type: none"> • Emergency evacuation information of the facility must be prominently displayed in the immediate vicinity of lecture halls

Aspect	Expectation
Signage – Room Operation	<ul style="list-style-type: none"> Sufficient and clear signage is provided to identify important room contacts (e.g., for scheduling, technology support, etc.), room occupancy, and room set-ups (with graphics).
Signage - Wayfinding	<ul style="list-style-type: none"> Sufficient and clear signage, including both building directories and room signage, is provided to enable wayfinding to the room. The name/number identifying the rooms shall be marked in Braille as well as appropriate letters (not smaller than 5/8 inches), and shall be mounted at eye level (centerline 60 inches off the floor) adjacent to the door. [ADA] Areas of storage for hazardous materials, custodial area, engine or boiler rooms, doorways opening directly onto stairs, electrical service areas, or any area in which students could potentially be injured are required to have an identifying door knob (knurled surface on the back of the knob) to warn visually impaired students that this is a dangerous area. [ADA]
Storage	<ul style="list-style-type: none"> Sufficient storage is provided for both personal items (e.g., coats and backpacks) and portable objects (e.g., portable technology) The storage is configured to allow for unimpeded movement around the room
Technology & Equipment	<ul style="list-style-type: none"> All items for student use (pencil sharpeners, safety equipment, eyewash, soap/antibacterial dispensers) should be mounted or placed so that the highest operating part of the item does not exceed 48 inches from the floor. [ADA] For new construction, if classrooms or lecture halls accommodate at least 50 persons, or, if they have audio-amplification systems and they have fixed seating, they must have a permanently installed assistive listening system. In other existing locations, assisted listening systems may be portable or permanently installed. [ADA]
Thermal comfort	<ul style="list-style-type: none"> Room is maintained at a reasonably comfortable temperature in all seasons Occupants can set temperature with central system over-ride when unoccupied
Ventilation	<ul style="list-style-type: none"> Mechanical ventilation is provided Air changes comply with Cornell design standards Systems remove or prevent entry of distracting environmental odors
Window treatments	<ul style="list-style-type: none"> Window treatments function properly All cords and mechanisms are present and operational
Windows	<ul style="list-style-type: none"> Operable windows, when present, are maintained for usability
Vertical surfaces	<ul style="list-style-type: none"> Wall-mounted writing surfaces are provided Writing surfaces, including writable paint, are easy to clean and re-use

Best Practices for General Purpose Classrooms, including Lecture Halls

As units construct or renovate classrooms, especially general use spaces like flat floor and tiered rooms, it is important to consider how the room will be used, as well as the lifecycle cost of the investment. The more flexible features that can be incorporated into a space, the more that space will serve multiple pedagogical approaches. Flexible design also encourages spatial evolution through time with limited additional investment.

Aspect	Encouraging Engagement
Accessibility	<ul style="list-style-type: none"> • A mix of furniture types (i.e., fixed tables in the front plus a back row or two of tablet arm chairs and a variety of sizes of chairs including some chairs with cushioned seats) • In order to eliminate barriers for persons with low vision, use as much contrast as possible in image selection. Light levels should not be extremely high or extremely low, since both circumstances can impair vision. • Remote Real Time Captioning: Additional telephone lines with access to long distance and an electrical outlet in the front of the room for all auditoria seating 100+. It would be prudent to provide an extra Ethernet connection for future web access to replace the current method. • Lighting for Sign Language Interpreter: A separate light for a sign language interpreter in all auditoria seating 100+ will need to be placed adjacent to the front of the room. This light should not spill onto the projection screen. The light control may be located with other controls at the lectern. • Full Spectrum Lighting to reduce ultraviolet rays and glare (helpful for persons with vision disabilities and seizure conditions)
Availability	Open to students to use during non-scheduled hours in a manner that is mindful of personal safety and equipment security
Configuration	Highly reconfigurable within a day, including for non-instructional uses, and over time, i.e., only the walls are fixed, so furniture and equipment can be swapped out without high infrastructure costs
Display screens	Multiple, some movable or portable
Focal point	Multiple or not identifiable focal points, with no clear audience
Furniture	<ul style="list-style-type: none"> • Modular • Tables configurable in multiple patterns • On casters • Chairs without arms & with thin backs; some chairs with padded cushions and ergonomic • Seats that swivel to allow for neighbor interaction (even in lecture halls) • Curved-edged tables • Some variation in seating styles (e.g., café tables & chairs along the perimeter)
Furniture layout	<ul style="list-style-type: none"> • Grouped or clustered • Reconfigurable
Informal study spaces and congregation areas	<ul style="list-style-type: none"> • Nearby areas, adjacent to circulation, should encourage ad hoc conversations, and short individual and small group work sessions • Furniture varies from benches to informal chairs to tables and chairs depending on the size of the space
Horizontal work surfaces	Large enough for a variety of tools (e.g., cell phone, lap top, notebook, coffee) and certain stations with additional room for assistant such as captionist
Instructor station	Movable, especially to the center of the space

Aspect	Encouraging Engagement
Lighting	<ul style="list-style-type: none"> Controlled by the occupant Present in multiple zones Within each zone, multiple settings are possible Controls are present in at least two locations
Nature of interactions	Exchanges between instructor and students, students and students, and students and technology
Power	Available at student stations
Room entry and exit sequence	The area immediately outside a room should be configured to ease flow, especially during regular pass times when circulation peaks
Spatial layout	<ul style="list-style-type: none"> Rectangular, with the front a wide end Square or octagonal
Storage, personal possessions	Storage of backpacks, coats and other personal property is designed to minimize interference with movement within the space
Storage, room support	<ul style="list-style-type: none"> Cabinets are secure to prevent loss Security features are easy and convenient to use (e.g., card swipes and codes versus keys)
Technology	Consult with Academic Technologies for technology design guidelines and best practices: http://acadtech.cit.cornell.edu/in-the-classroom/ and Learning Technology Room Types
Tiers	Wide enough to allow two rows of seats to interact over one horizontal surface
Vertical work surfaces	<ul style="list-style-type: none"> Multiple surfaces, including walls Writing surface is not obstructed by screens or other physical features of the room Some surfaces are portable

Other useful references for active learning spaces include:

- Learning Space Rating System: <http://www.educause.edu/eli/initiatives/learning-space-rating-system>
The Learning Space Rating System (LSRS) project provides a set of measurable criteria to assess how well the design of classrooms support and enable active learning activities.
- Flexible Learning Environments eXchange: <https://sites.google.com/site/flexspacedev>
The Flexible Learning Environments eXchange – FLEXspace – is a robust, open access repository populated with examples of learning spaces. It contains high resolution images and related information that describes detailed attributes of these spaces from institutions across the globe.