

This set of Learning Technology Room Types is meant to facilitate the selection and implementation of classroom technology on the Cornell campus, based on teaching and learning activities.

Note: this document describes the learning technology only, and does not include other room elements such as flexible furniture, lighting, room finishes, adjacent spaces, etc. that also contribute to a current / modern learning environment. The rooms described are mainstream classrooms, not specialty rooms.

TYPE 1: STANDARD PRESENTATION – COLLABORATION AND LECTURE READY

TYPE 2: CUSTOM / ADVANCED PRESENTATION – COLLABORATION AND LECTURE READY

TYPE 3: ADVANCED COLLABORATION

TYPE 4: ACTIVE LEARNING SPACE

TYPE 5: INSTRUCTIONAL COMPUTER LAB

General Requirements for All Types

- » All learning technology types except for Type 4 will include Type 1 baseline functionality
- » Primary equipment will be selected from Cornell standard bundles and designs whenever possible
- » All classrooms will meet baseline quality and usability standards (to be defined)
- » Compliance with University standards and universal/regional building codes (ADA, etc.)
- » Screen controls from podium (if room environment warrants)
- » Network requirements include Ethernet connection available at instructor stations, plus the availability of wireless network for 2-3 devices per person

Sustainability Features

- » Automatic lighting and equipment shut-off

User Support

- » A/V support contact information is posted in clear view of instructor area (on podium).
- » A/V support staff escalation is readily available. (A consistent support model will be defined)
- » Contact information posted outside classroom in cases where room is locked
- » Support model in place for ongoing updates and reviews of hardware and software

Additional Notes

- » These requirements are targeted for mainstream classrooms, not specialty rooms (such as music, apparel design, etc.) although some such rooms are identified as Type 2

Type 1 Standard Presentation – Collaboration and Lecture Ready

Intended for learning spaces requiring support for lectures, basic digital/multimedia presentations, basic collaboration, and informal remote collaboration (synchronous, software-based). Includes medium sized seminar rooms as well as large lecture halls.

This type describes the minimum baseline requirements for technology-enabled learning spaces.

Cost of AV equipment and professional design / installation for this room type is \$8,500 - \$55,000



Enabled Teaching Activities

- » Presentation/lecture activities including display of rich media (images, video), and audio reinforcement
- » Lecture capture to record lectures (software based)
- » Use of web-based conferencing software for basic external collaboration (e.g. external speakers)
- » Student engagement activities, such as iClicker polling
- » Faculty able to annotate slides and notes on screen using “digital ink”
- » Can be used in multiple teaching modalities and disciplines, including STEM and humanities

Baseline Technology Requirements

Display and visualization

- » Mounted Data/Video display system - large flat panel display, or projector if room size warrants it

Sound

- » Audio amplification system and/or voice reinforcement suitable for room conditions with computer and portable audio device inputs
- » Assistive Listening System

Input

- » Option of instructor’s own BYOD device or dedicated computer
- » Annotation support, such as tablet or other digital ink option
- » Support for peripherals such as portable document camera, Blu-Ray player, document camera
- » Support for wireless projection from tablet and other mobile devices

Recording

- » Camera, audio, and display support for lecture recording consistent with room attributes (such as size)

Network & Wifi

- » Basic plugin network connection for instructor laptop
- » WIFI and cell phone coverage available in room for student collaboration

Type 2 Custom / Advanced Presentation – Collaboration and Lecture Ready

Intended for spaces supporting lectures and presentations that require advanced digital/multi-media capability or custom or specialized equipment to address field-specific needs.

Cost of AV equipment and professional design / installation for this room type is \$18,000 - \$98,000



Enabled Teaching Activities

- » Display and visualize complex, detailed information for large classes; 2 or more displays (for example, medical demonstrations, Artwork, manuscripts, etc.)
- » Presentation and critique of large format images and documents such as architectural/Engineering plots, planning documents, maps, etc.
- » Ability to collaborate with students and other class participants in remote locations.

Technology Requirements

The technology requirements for Type 2 rooms are dependent on the room use, but at a minimum they include the requirements listed for Type 1 rooms.

Examples of technology requirements include:

Display and visualization

- » Dual projection / high resolution monitor(s)
- » Interactive whiteboards

Sound

- » Audio amplification system and/or voice reinforcement suitable for room conditions with computer and portable audio device inputs
- » Assistive Listening System

Input

- » Support for wireless input from one or more devices, including instructor and student computers
- » Interactive whiteboard
- » Overhead camera suitable for large format / high resolution images

Other

- » Room environment controls (projection screen, shades, lights, etc.) available through A/V control panel

Type 2 Use Cases

- » An instructor demonstrates a mathematical solution step-by-step in real-time. Annotations are hand written with “digital” ink from the instructor’s computer or tablet and projected. The instructor walks around the classroom with the annotation device. In some cases, the annotation device is handed to a student to demonstrate a solution. An electronic copy of the annotations is uploaded to the course management system after class for reference.
- » In a large lecture labor law course, the faculty uses a PowerPoint presentation on a windows laptop when teaching, annotates the presentation during class, and then uploads the completed presentation to Blackboard Course management system after class.
- » In a large lecture film studies course, the faculty uses Keynote presentation software to launch 6-8 video clips during each class session. The video clips have either been digitized or presented via links to video on you tube or other web sites.
- » In a small seminar room, a graduate seminar of 12 students uses WebEx on the instructor laptop to bring in a guest speaker for a class session. The WebEx session is displayed to the class.
- » In a large lecture physics course, the faculty uses a PowerPoint presentation on a windows desktop in the room when teaching. The presentation has links to web resources and video examples of demonstrations of physics experiments.

Type 3 Advanced Collaboration – Distance Learning Ready (synchronous; multiple sites)

Advanced Collaboration Classrooms feature specialized equipment to support multi-site and/or large-scale collaborations such as distance Learning, MOOC hosting, and virtual conferences. A key difference of this type is the potential to simultaneously capture all aspects of a presentation including the presenter, audience, and all supporting presentation assets.

Cost of AV equipment and professional design / installation for this room type is \$36,000 - \$135,000

**Enabled Teaching Activities**

- » Distance learning with option for synchronous / real-time
- » Multiple location or large format classes
- » Virtual conferences
- » Complex lecture capture and recording
- » Students are able to interact with students at local and remote locations

Baseline Technology Requirements

The technology requirements for Type 3 rooms are dependent on the room use, but at a minimum they include the requirements listed for Type 1 rooms.

Display

- » Dedicated video monitor(s) and audio feeds for standards-based videoconferencing
- » In a distance learning scenario, multiple screens / images to view the other classroom as well as the instructional content

Sound

- » Microphones set up to capture student questions and discussion from any location in the room (e.g. ceiling or push to talk microphones)
- » Conference telephone

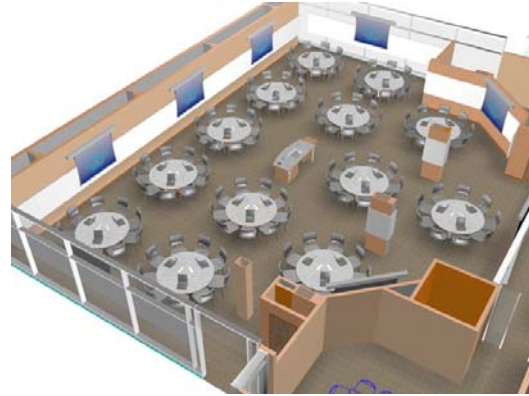
Other

- » AV support personnel in the room, immediately available, for operating advanced interactive technologies

Type 4 Active Learning Space

A flexible, dynamic learning space enables interactive collaboration between all occupants (many to many). Active Learning Spaces challenge the “sage on the stage” paradigm by enabling interaction among all room participants.

Cost of AV equipment and professional design / installation for this room type is \$8,750 - \$64,250



Images courtesy of John Belcher, MIT

Enabled Teaching Activities

- » Group collaborations and project work
- » Students able to share screens with small groups or entire class
- » Space for students to work with or without computers or other devices

Baseline Technology Requirements

The technology requirements for Type 4 rooms do not include the technology listed for Type 1 rooms.

Display

- » One or more mounted data / video display systems; preferably large flat panel monitors

Network

- » Wifi and/or cell phone coverage for student collaboration

Other

- » Adequate electrical outlets, raised floors or power towers if applicable

Optional

- » Document camera(s)
- » Collaborative displays with multiple inputs
- » Ability for any device to project wirelessly onto main display

Type 5 Instructional Computer Lab

Instructional Computer Labs are dedicated multi-user, technology-enabled spaces for instructional use of specialized software and equipment in support of course assignments and collaborative activities for student assignments/projects. Technology requirements will vary based on lab use.

Cost of AV equipment and professional design / installation for this room type is \$12,000 - \$68,000



Enabled Teaching Activities

- » Presentation / demonstration from instructor computer
- » Use of specialized software or equipment for course work and group projects
- » Each student has access to a computer with specialized software
- » Instructor is able to view and share an individual student's computer screen, and is able to lock student computers down to specified applications

Baseline Technology Requirements

The technology requirements for Type 5 rooms are dependent on the room use, but at a minimum they include the requirements listed for Type 1 rooms.

Display

- » One or more mounted data / video display systems; preferably large flat panel monitors

Network

- » Wifi and/or cell phone coverage for student collaboration
- » Individual student computers have hardwired network connection

Other

- » Adequate, flexible access to power stations
- » Monitors and keyboards for students' own devices

Optional

- » Document camera(s)
- » Scanner(s)
- » Large format color plotter
- » (For fabrication labs only:) Specialized equipment as needed such as laser cutters, CNC mills, water jet cutters, etc.