1.0 - FOREWORD

Building and adapting learning spaces to support the continuing change of pedagogy and technology at the University of Georgia (UGA) provides many challenges; however, there are a number of evidence-based reasons to pursue excellence in learning space design. Research has shown that active learning techniques provide clear improvements in learning\(^1\), but a majority of the current teaching spaces at UGA don’t easily lend themselves to support these pedagogies. The Georgia Board of Regents has long supported the creation of classrooms with a standard level of quality that includes a “flexibility to respond to future requirements.”\(^2\) One of the operative goals is “to develop and implement a well-conceived and consistent concept for how technology requirements can best be accommodated in designing new and renovated facilities.”\(^2\) A lack of compliance to these minimum standards creates a clear challenge to effective learning according to research.\(^3\) It is vital that all classrooms have appropriate furniture, correctly maintained classroom technology, and proper physical design and maintenance. All of these have been shown to have a direct effect on learning outcomes \(^3\) and student success.

This document has been a joint effort between the UGA Office of University Architects and the Center for Teaching and Learning to provide relevant standards and guidelines for the design and construction of new classroom space and the renovation and maintenance of existing spaces. Outside consultants have been included in this process to ensure that current best practices in the fields of architecture, design, construction, and technology have been brought together with the current research regarding teaching and learning. The result provides clear direction for the effective design and development of learning environments at UGA.

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\(^1\) Summary of Key Papers on Efficacy of Active Learning (2012).  
[http://cst.yale.edu/sites/default/files/active%20learning%20bibliography.pdf](http://cst.yale.edu/sites/default/files/active%20learning%20bibliography.pdf)


\(^3\) Making the Case for Space: Three Years of Empirical Research on Learning Environments (2010)  

Space Matters: The Impact of Formal Learning Environments on Student Learning (2010)  
[https://www.bgsu.edu/content/dam/BGSU/master-plan/documents/space-matters.pdf](https://www.bgsu.edu/content/dam/BGSU/master-plan/documents/space-matters.pdf)

Minimum Classroom Size and Number of Students Per Classroom (2000/2009)  
[http://sdpl.coe.uga.edu/research/territoriality.html](http://sdpl.coe.uga.edu/research/territoriality.html)
2.0 – BACKGROUND & SCOPE

With the University of Georgia’s continuing development of educational pedagogy, it is clear that new design requirements and best practices are needed. This section is to be referenced during the design of learning environments at the UGA to ensure that all classrooms are consistent with current teaching practices. The considerations highlighted should be part of the design conversation at the earliest stages of both new construction and renovation projects.

The UGA understands the design of each individual project is a unique and dynamic process, in which the project has specific goals and needs. These specifics may not be covered in the guidelines; however, the intent of the learning environment should be honored. The Design Professional is to communicate with UGA regularly about the quality of project specific learning environments, and any questions should be directed to the OUA or FMD Project Manager. If there is a valid reason to deviate from the Standards, the Design Professional shall submit a Variance form per section 00 00 05 Variance Requirement & Form. To fully capitalize on the benefits of the University’s educational pedagogy and availability new technologies, learning environments should strive to not be static physical spaces which support only one-way transmission of information. This idea should not be limited to new learning environments, but should also be upheld during renovation of existing spaces.

This section outlines requirements and best practices for the following classroom types:

1. 10 to 20 seat flat lecture, seminar, conference, and active learning classrooms.
2. 20 to 49 seat flat lecture and active learning classrooms.

3. 50 to 60 seat flat lecture and active learning classrooms.
4. 60 to 100 seat flat lecture and active learning classrooms.

5. 100 to 120 seat tiered collaborative lecture classrooms.
6. 200 to 280 seat tiered collaborative lecture, and traditional lecture halls.

7. 45, 72, and 99 seat SCALE-UP classrooms.
3.0 – GENERAL CONSIDERATIONS

3.1 – New Construction vs. Renovation

There are a variety of ways that instructors teach and students learn, and there is a wide range of ways that those interactions manifest in the physical environment. Spaces that were once considered appropriate for a certain classroom sizes and teaching styles may no longer be appropriate. In these situations, special considerations must be taken during the renovation of existing classrooms. The Design Professional must be in communication with UGA to determine the best use for existing spaces to support the current instruction methodology. Renovations to existing learning environments should hold true to the intent of the classroom design guidelines.

3.2 – Goals

The goal of the Design Professional is to provide learning environments in which the values inherent in traditional instruction are upheld, but easily adapt to allow collaborative learning scenarios. The classroom should be easily adaptable to enable new opportunities and universal access.

The following goals should be addressed during the design of learning environments:

1) Flexibility
2) Accessibility
3) Life Cycle
4) Cost Benefit

The flexibility of classrooms is encouraged so that a variety of learning scenarios may take place in each classroom, as required by the end user. When necessary, multiple furniture layout scenarios may be considered in the overall design of the classroom. Additionally, the flexibility of the systems provided in the classroom may be necessary for students to access instructional courses via alternative modes of delivery. The required flexibility of the classroom will inform the adaptability and scalability of the furniture and systems provided in the instructional space.

Learning environments should not only be physically accessible (so that they conform to ADA requirements), but should also be technologically accessible to all students and instructors. Equipment, furniture, and other technology must be easily accessed and manipulated by end users.

The typical life cycle of finishes, furniture, and equipment should be considered during the design of learning environments, as they relate to the overall operational life cycle of the building in which it resides. The selection and location of classroom elements should meet requirements outlined in the UGA Design and Construction Standards, as well as allow for easy maintenance and replacement within each classroom.

Cost benefit analysis must always be taken into consideration during the design of learning environments. The guideline outlines considerations to be taken during the design of classrooms;

4 The goals outlined are adapted from the Board of Regents of the University System of Georgia's Facilities Guidelines for Instructional Technology, 2001.
however, the extent to which best practices are followed should be determined on a case-by-case basis. The Design Professional should determine if certain recommendations are the most cost efficient solution for each instructional space, or if other options are available that meet the intent of the guideline.

4.0 – CLASSROOM GENERAL DESIGN CRITERIA

This portion outlines necessary design characteristics that must be considered during the design of learning environments. The scale of considerations varies from the location of specific classroom within an overall building to providing finish protection in high traffic areas. All considerations intend to help each classroom perform at a high level for UGA.

4.1 – LOCATION

Classroom spaces shall be located as close as possible to building entrances and level accesses to improve circulation and reduce noise levels in other parts of the building. Large classrooms shall be located close to primary building entrances. Circulation spaces which support large classrooms should be sized so that they accommodate students waiting in the hallway for the next class session.

It may be desirable for smaller classrooms to be located closer to offices and/or related lab spaces. The location of small classrooms should be discussed with end users to determine special requirements for circulation spaces and programmatic adjacencies.

When possible, classrooms should be separated from noise generating areas such as mechanical rooms, elevators, vending areas, and restrooms. When separation from these functional areas is not possible, ensure that adequate noise separation is provided. Please refer to the Acoustics section 4.8 of this guideline.

The location of certain classrooms in relation to their solar orientation impacts their access to natural daylight considerably. The Design Professional should discuss with the end user whether natural daylighting is beneficial or should be avoided (i.e. easily controlled). Classrooms with northern exposure may be more easily designed to provide comfortable natural daylighting capabilities while not adversely impacting AV systems, as well as be more energy-efficiency than rooms with windows facing other cardinal directions. Passive solar design features should be considered for rooms where windows face south, east, and west.

4.2 – SIZE & PROPORTION

Classrooms must be designed so that they comfortably accommodate the number of students planned for each classroom type, as well as the types and sizes of furnishings anticipated to be used in the space. The UGA Center for Teaching and Learning shall be involved in any discussions that concern classroom functions and/or seating capacities. The Design Professional shall coordinate with the Project Manager to assist with including the UGA Center for Teaching and Learning in design meetings.

The following space standards and furnishing types shall be used to estimate the total usable floor area of classrooms during the programming phase of a project:
The Design Professional shall develop applicable classroom furnishing layouts during the schematic design phase to verify that the proposed classroom sizes and shapes successfully accommodate the number of students programmed for each space.

Classroom proportions have a considerable impact on seating capacity, sight lines, and instructor/student interaction. There are no set required proportioned for classrooms; however, the Design Professional should keep these common issues in mind during the design process:

**Classrooms that are too wide** make it difficult for instructors to maintain eye contact and typically have poor sightlines. This issue is especially significant for students located in the front corners of the space. Instructor areas are often deeper than necessary in order to avoid this issue. This is not typically an issue for non-traditional style classrooms, i.e. SCALE-UP classrooms.

**Classrooms that are too deep** make it difficult for students in rear rows to hear what is said, see projected images, and see notes on marker boards. Special consideration must be taken into account for the acoustics of large classrooms to ensure that students are able to hear all necessary instruction. Additionally, projected images must be adequately sized so that all students are able to see classroom instructional information.

Highly adaptable small classroom, which accommodate seminar classes, should avoid long rectangular proportions. Elongated proportions for this instruction type inhibit eye contact between students and instructors, and diminish the view angles of classroom participants to projected information. To encourage interactive discussion while providing good sight lines, rooms that are nearly square or have a shape based on viewing angles from projection screens/flat-panel monitors are the most successful and adaptable for all small classrooms instruction type.

When walls are the first items laid out in classrooms, and subsequently furniture layouts are tested; it is difficult to verify that students have quality sight lines and instructor areas are adequately sized. The
following are recommendations for developing classrooms with good sight lines and efficient seating layouts:

1) Determine number of screens based on seating capacity and classroom type.
2) Determine the general location, size, and orientation of each screen and the seating area.
3) Determine the location and size of the instructor area based upon the required markerboards, projection screens, and other equipment necessary for the classroom type.
4) Make certain the instructor area is large enough to accommodate the instructor workstation, required equipment, and ample circulation around workstation, markerboard, and seating. Ensure that the instructor station is not directly in the light path of a front-screen projector.
5) Determine optimum width and depth of the seating area based on seat spacing guidelines, provided in each of the typical classroom layout sections.
6) Determine the location and size of access aisles.
7) Draw viewing angles from each screen and make certain all seats provided fall within them.
8) Finally, determine where the walls of the classroom should be located.

4.3 – Sight Lines & Viewing Angles

The Design Professional should provide recommendations for existing ceiling height. If the existing ceiling height does not work, the Design Professional should notify the Project Manager to resolve concerns.

The Design Professional is responsible for coordinating with the Audio-Visual Consultant to ensure all seats have good sight lines. If any seats have marginal sight lines, the Design Professional must bring this to the attention of the Project Manager.

The closest viewer should be no closer than one and a half times the width of the screen
Ex: if the screen is six feet wide, the first viewer should be no closer than nine feet from the screen.

In flat floor classrooms, the bottom of the projector is recommended to be a minimum of 48” above the finished floor (AFF); however, 54” AFF is preferred. The Design Professional should keep in mind that combining the 5H screen sizing factor with the 48” AFF image requirement will have a significant impact on the ceiling height of larger learning spaces. Strategies such as favoring wider rooms over deeper rooms (thus reducing the distance to the farthest viewer) and/or routing ductwork around the front-center area of the room such that the ceiling elevation can be raised in the projection screen area should be considered.

SCALE-UP classrooms shall have smaller sized projection screens which are located on multiple walls of the classrooms between groups of tables to allow students to see content without having to rotate their seats away from their work surface.

4.4 – Seat Spacing
### Student Seating Scenario

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Minimum Chair Spacing (Inches) On Center (O.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moveable Chairs at Movable Desk</td>
<td>30” O.C.</td>
</tr>
<tr>
<td>Movable Chairs at Fixed Desk</td>
<td>28” O.C.</td>
</tr>
<tr>
<td>Fixed Chairs w/ Tablet Arms*</td>
<td>24” O.C.</td>
</tr>
</tbody>
</table>

*Center for Teaching and Learning shall be notified of intent to have fixed seats and approve application as early as possible in the design phase and prior to completion of schematic design.

Fixed tables with movable chairs are provided in larger collaborative tiered classrooms. Seating should be spaced a minimum of 28” on center. Continuous work surfaces should be a minimum of 18” deep, and should be equipped with modesty panels. Provide 36” clear between work surfaces in rows up to 20 seats. Consider providing 38” clear in rows with more than 21 seats. To ensure that students have adequate knee clearance in the collaborative fixed table scenario, the work surface in the rear of the grouping should have a 4” to 6” overhang.

Fixed chairs with tablet arms are only acceptable in large tiered lecture halls with 200-280 seats. The minimum seat spacing in this scenario is 24” on center. A minimum of 12” clear is to be provided between edge of the tablet arm (when in use) and back of seat in front.

When classrooms have tiered seating, and their occupancy is large enough that they are considered assembly areas, additional consideration must be given to aisle clear dimensions. Aisles and handrails provided in assembly areas should be sized and located to conform to building and fire codes.

### 4.5 – Doors & Windows

Classroom entry doors with visual connection to corridors should be used whenever possible. Visual connection may be achieved by providing glass sidelights or vision panel within the door itself.

In small classrooms, where only one entry is provided, doors should be located away from the instructor to avoid bottlenecking at door.

In large classrooms, locate doors so that students entering class late minimally distract from instruction. In classrooms where lights are dimmed, light may seep in from corridors, which could diminish the contrast ratio of projected information. Doors should be located to reduce the impact of light entering from corridors. In larger tiered classrooms, it may be helpful to locate entry doors at the rear of the classroom or within entry vestibules to help minimize light spillover from the hallway.

Transoms are encouraged above doors to increase natural daylight into corridors. Care should be taken to ensure that direct sunlight is kept off of projection screens and/or that transoms are provided with proper shading controls.

Special consideration must be taken in locating windows in classrooms spaces. Instructor areas should not be located along window walls. Certain instructional classroom types necessitate locating markerboards and projection surfaces on a majority, if not all, of the classroom walls. When this is a
possibility, windows are most conveniently located above and/or below markerboard space. When it is not possible to locate windows in this fashion, the Design Professional should strategize how to provide adequate collaborative equipment without conflicting with window locations.

Certain classroom types require blackout capabilities, especially distance learning classrooms. Locate these classrooms accordingly within the building. If windows are provided in these spaces, ensure that adequate window shading is provided.

4.6 – FINISHES

Refer to section 09 00 00 General Finishes Requirements.

4.7 – FURNITURE & EQUIPMENT

Refer to section 12 00 00 General Furnishings Requirements.

Instructor Area

A minimum of 8’ clear space parallel to the instructor wall (10’ preferred) shall be provided in small and large lecture style classroom layouts. Instructor areas are to accommodate computer-based audio-visual systems. Provide floor and/or wall junction boxes for power/data/audiovisual systems wiring to serve the workstation. The floor junction box should be a minimum of 5 feet from the front wall in small classrooms and a minimum of 6 feet from the front wall in large classrooms. Instructor areas are to accommodate instructors who are standing, seated, or using wheelchairs.

Workstation features and location considerations:

1) Workstations should be oriented to maximize eye contact between instructor and students, while allowing students to see projected media.

2) In rooms with one screen, an instructor workstation on the left side of the instructor area, markerboards in the center, and a screen in the right corner is preferred.

3) In large rooms with multiple screens, a workstation located on the left side of the instructor area, near the markerboard, usually works well, but a more central location may be preferable.

4) Provide adequate circulation space around lectern and surrounding equipment/furniture. The minimum clear dimension is 36”; however, 48” is preferred.

5) The type/size of the lectern is to be determined by the classroom type. Refer to section 12 56 52 Audio-Visual Furniture for listing of recommended lectern types and sizes.

Additional Considerations:
Consider providing an additional small table within instructor area in large lecture classrooms for disbursement and collection of classroom handouts. Should additional tables and/or equipment (i.e. demonstration table) be required and located within instructor area, include these items in preliminary classroom layout. Carefully locate the required equipment and j-boxes in the instructor area so that tripping hazards are avoided.
Student Seating

Refer to 12 00 00 General Furnishings Requirements. This section also includes minimum chair spacing information which is critical when initialing laying out classrooms.

Interior Waste Receptacles

The designer should plan for efficiently sized waste receptacles near exit doors in locations that do not obstruct other room functions. Refer to section 12 46 33 Interior Waste Receptacles.

Provide a large clock that is easy to read and can be seen by instructors and students.

Audio-Visual Furniture

Using similar lecterns from classroom to classroom simplifies instructor equipment training, and makes classrooms more technologically accessible. Refer to section 12 56 52.

4.8 – ACOUSTICS

Numerous studies over the past several decades have concluded that transmission of the spoken word from talker to listener is of primary importance in any learning environment to enhance learning, minimize listener fatigue, promote the retention of information, and reduce distractions from unwanted noises. As learning pedagogies evolve from traditional models (i.e. a one-to-many delivery paradigm) to more active model (e.g. group discussion/interaction), the transmission of intelligible speech within the room and the overall behavior of a space acoustically becomes even more critical. Additionally, the current trend in architecture towards less “soft goods” in a space (i.e. concrete floors, exposed concrete or metal deck ceilings, etc), whether to meet sustainability goals or to meet a design aesthetic, can often run counter to a classroom’s acoustical needs and primary functional intent.

To address the successful transmission of intelligible speech – whether from instructor to student, student to instructor, or student to student – three separate but related acoustical areas of concern must be addressed:

1) Room acoustics pertaining to surface finishes and room geometry
2) Background noise levels, primarily HVAC systems and
3) Sound isolation from exterior noise intrusion (i.e. from adjacent rooms and lobbies/ corridors, as well as outside noise from traffic, cooling towers, transformers, etc.)

If all three of these areas are properly addressed, the dependence on speech reinforcement systems (i.e. lavaliere microphones, digital mixers, etc.) can be eliminated for all but the largest lecture halls. Eliminating speech reinforcement would result in lower initial project costs, as well as simpler operations and maintenance for the entire lifecycle of the classroom. Thus, the Design Professional should consider acoustics a primary design consideration for all learning spaces.

Below is an overview of each of the three areas of concern and design criteria and strategies for each:
Room Acoustics

Room finishes have the most dramatic impact on the intelligible transmission of speech within most classrooms, as well as the management of the overall noise level in a classroom for active learning spaces where multiple group discussions may be occurring simultaneously.

In general, classrooms and lecture halls should be designed to distribute sound absorbing materials among the major surfaces in the space (floor, ceiling and walls) while balancing other major design considerations such as durability, aesthetics, daylighting and cost. Reverberation times for classrooms should be targeted to meet an RT-60 criteria (i.e. the time it takes for sound to dissipate by 60 decibels) of less than 1 second for most classrooms and closer to 0.6 seconds for distance learning classroom.

A general strategy to achieve this reverberation time for these major surfaces is as follows:

Floors

For durability, hard-finish floors may be preferred. Where possible, low-pile carpeting is recommended classroom floor surface area to mainly reduce foot-fall traffic noise and introduce sound absorption to this major surface area, especially for distance learning spaces.

Ceiling

Acoustical ceiling tile with a noise reduction coefficient (NRC) of at least 0.70 should be at least 50% of the ceiling area for small rooms (10-20 occupants) and as much as 80% to 100% for large rooms (20 – 60 occupants). Rooms with a capacity of 100 or more occupants should use acoustical ceiling tile with a NRC rating of 0.90 over at least 80% of the ceiling area. As a strategy to promote the reflection of speech energy between instructors and students, the Design Professional can consider introducing some reflective ceiling elements (lay-in reflective panels or gypsum-board areas) in strategic locations in the ceiling area in balance with the absorptive areas around the perimeter.

Walls

Lastly, durable/tackable acoustical wall panels (with 1” thick fiberglass backing behind an acoustical transparent covering) should be considered for at least 25% of the room’s wall area. Larger volume spaces are naturally more inclined to result in higher reverberation times. Thus, as rooms get larger, it is increasingly important to control reverberation and echoes (from large area, hard, parallel surfaces) through the use of absorptive room finishes such as acoustical wall panels.

Since many rooms contain parallel walls, it is often advisable to apply acoustical wall finishes to adjacent surfaces to address the flutter echoes from these parallel surfaces. Alternately, walls can be designed to be non-parallel to reduce the need for absorptive wall materials.

Background Noise Levels

To achieve a proper signal-to-noise ratio in a classroom (where the signal is the spoken word and the noise is the background noise level) the Design Professional must consider the design of the HVAC system (which is the primary contributor to background noise) as part of the acoustical environment of
the classroom. Per ASHRAE guidelines classrooms should be designed to meet a background noise criterion of NC-30. Special purpose classrooms (e.g. distance learning, music classrooms, screening rooms, etc.) may require even lower background noise levels.

To achieve appropriate background noise levels, classrooms should be designed to be acoustically separated by physical distance and/or enhanced partition design (see the section to follow on sound isolation) from noisy mechanical rooms and primary duct runs. Noise-inducing HVAC equipment such as fan-coil units and VAV boxes should be positioned outside of the classroom envelope (usually outside the room over the hallways) and duct runs should be calculated to be long enough to reduce noise levels at any diffuser to be at least five points below the overall room criteria. Use of duct silencers is to be avoided and used as a last resort. The Design Professional shall discuss the specification of duct silencers with UGA prior to including them in the design. The need for duct silencers shall be supported by calculations to be submitted for review by UGA and CxA. Duct cross-sections shall be increased to minimize system pressure drop where duct silencers are the only alternative to achieve desired noise levels. Equipment with the lowest noise signature should be selected, and duct work shall be laid out in such a way that attenuation is maximized.

### Sound Isolation

Another contributor to acoustical distractions which can hamper a student’s ability to maintain focus/attention in a classroom setting is the intrusion of unwanted, outside noise into the classroom. This intrusion can come from adjacent spaces (both vertically and horizontally adjacent), as well as from outside the building (cars, trains, mechanical equipment, etc.).

The first, and often easiest and cheapest, sound isolation strategy is to architecturally isolate noisy spaces, such as main mechanical rooms, from noise-sensitive spaces, like classrooms, early in the design process. When physical separation is not possible, enhanced acoustical wall, floor and ceiling constructions must be considered as the next line of defense. Walls between adjacent classrooms should go to structure and have a sound transmission class (STC) rating of at least STC-45. Walls with STC ratings of 50 to 55 should be used between classrooms equipped with sound systems. Typical classroom doors should be STC-30 or more, while noisier classroom types (i.e. music rooms) should have doors with STC-40 or more. With studies showing that some amount of daylight helps to enhance student attention, special consideration should be taken to weigh the benefits of day lit classrooms with the potential distraction from the noise intrusion through the glass. There are many high-STC glazing solutions available, but these solutions can often increase material costs significantly.

**Recommendations** for classroom walls’ sound transmission class (STC):

<table>
<thead>
<tr>
<th>Adjacent Space</th>
<th>Sound Transmission Class Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor, classroom (non audio equipped), stair case, office, or conference room</td>
<td>STC-45</td>
</tr>
<tr>
<td>Classroom (audio equipped), learning clinic, break out space, or outdoors</td>
<td>STC-50-55</td>
</tr>
<tr>
<td>Restroom</td>
<td>STC-53</td>
</tr>
</tbody>
</table>

5 Recommendations based on the American National Standards Institute (ANSI) Section 12.6-2002
Acoustics Summary

The acoustics guidelines and strategies noted above are very general in nature and are intended as a basic starting point for design. Each project has its own unique acoustics conditions that require analysis. It is recommended that the Design Professional include acoustical expertise on their team to address the overall implementation of the design best practices noted herein, as well as and address the unique acoustical issues of the project.

4.9 – ACCESSIBILITY

Accessible Workstations

Classrooms are to meet accessibility standards outlined by the Georgia Board of Regents, as well as the Department of Justice’s Americans with Disability Act. Horizontal and vertical dispersion of accessible workstations is required in assembly areas which provide 300 seats and over. Adequate accessible vertical circulation must be provided when accessible workstations are vertically distributed within the classroom. Handicap students are to be provided with a choice of viewing angles equivalent to (or better than) viewing angles available to all other spectators.

Required Number of Accessible Workstations Per Classroom:

<table>
<thead>
<tr>
<th>Number of Seats Provided in Classroom</th>
<th>Number of Accessible Seats Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-25</td>
<td>1</td>
</tr>
<tr>
<td>26-50</td>
<td>2</td>
</tr>
<tr>
<td>21-150</td>
<td>4</td>
</tr>
<tr>
<td>151-300</td>
<td>5</td>
</tr>
</tbody>
</table>

Assistive Listening Systems

Refer to section 27 41 00 General Audio-Visual System Requirements.

4.10 – AUDIOVISUAL SYSTEMS

Refer to section 27 41 00 General Audio-Visual System Requirements.

Flat-Panel Monitors

Refer to section 11 52 00 Audio Visual Equipment.

Projectors

6 Information provided from ADA Standards for Accessible Design, 2010. Section 221.2.1.1. See for further information.
Refer to section 11 52 00 Audio Visual Equipment.

Projector Screens

Refer to section 11 52 13 Projection Screens.

Audio Systems

Refer to section 27 41 00 General Audio-Visual System Requirements.

4.11 – LIGHTING / ELECTRICAL SYSTEMS

Lighting

Refer to section 26 51 00 Interior Lighting.

Electrical Outlets

Refer to section 26 00 00 General Electrical Requirements.

4.12 – BUILDING SYSTEMS

Building systems shall conform to the Standards. The purpose of this guideline is not to provide technical requirements for building systems, but rather to bring common issues and concerns specific to classrooms, as they relate to building systems, to the attention of the Design Professional.

Heating, Ventilation, and Air Conditioning (HVAC)

Refer to section 23 00 00 General Mechanical Requirements (HVAC).

Plumbing

Refer to section 22 00 00 General Plumbing Requirements.
5.0 – GENERAL PURPOSE FLAT CLASSROOM

General purpose flat classrooms are intended to be highly flexible classrooms. The classroom should easily transition from the classic lecture layout to collaborative layout scenarios. Whenever possible, electrical outlets are to be wall mounted. A multiple compartment (power, IT, AV) floor junction box which services the instructor lectern is to be located in the most flexible area, allowing the instructor to connect in all seating layouts to be used in the classroom while minimizing trip hazards. Conversely power, IT and AV connections for the instructor station can be provided from a series of adjacent wall boxes if the teaching station is located within a few feet from a wall in a non-traffic area.

It may be desirable to provide canted walls at the instructor wall in classrooms sized to accommodate over 20 students. Canted walls improve the overall acoustics of the room, while also improving sight lines.

The layouts included in the guideline are not to scale, and are to be used for diagrammatic purposes only.

<table>
<thead>
<tr>
<th>Typical Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPM</td>
</tr>
<tr>
<td>MB</td>
</tr>
<tr>
<td>J-BOX</td>
</tr>
<tr>
<td>PS</td>
</tr>
<tr>
<td>AFF</td>
</tr>
<tr>
<td>BO</td>
</tr>
</tbody>
</table>

5.1 – 10 TO 20 SEAT LECTURE, SEMINAR, CONFERENCE, & ACTIVE LEARNING CLASSROOMS

Individual tables may be preferred in small classrooms to allow for the most flexibility for seating arrangement. The minimum individual desk size is 30” wide x 24” deep. If double occupant desks are preferred, 60” wide x 24” deep desks are acceptable.

In smaller classrooms, consider providing large aisle space to increase the adaptability and accessibility of the room. 3 ft aisles are the minimum, while 5 ft aisle are preferred.

The following layouts are typical furniture scenarios for a small 10-20 seat flat classroom. The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.
Typical Section

Evenly Spaced Light Fixtures

Door Side Light

Consider Providing Windows Above and/or Below Equipment When FPM or MB Are Located on Window Wall

Typical Lecture Layout

42 sq ft per student

Note: Location of classroom windows will vary for each specific design. Refer to Section 5.1 and verify window locations with University

UGA DESIGN & CONSTRUCTION
SUPPLEMENTAL GENERAL REQUIREMENTS & STANDARDS
AUGUST 1, 2016

THE UNIVERSITY OF GEORGIA
Office of University Architects for Facilities Planning

DESIGNING LEARNING ENVIRONMENTS
00 00 13-20
U-Shaped Seminar Layout

Circular Seminar Layout
Active Learning Layout

Conference Layout
5.2 – 20 TO 49 SEAT LECTURE & ACTIVE LEARNING CLASSROOMS

As the classroom occupancy increases, the Design Professional should consider providing one larger table per every two students, rather than individual tables. The minimum double occupant desk size is 60” wide x 24” deep. The shared tables maximize the classroom efficiency, while also providing flexibility to transition between typical furniture layout scenarios.

AV equipment may be grouped together for multiple rooms into one closet. A closet is not necessary for each individual room; however, the Design Professional should verify that adequate circulation clearance is provided around the AV closet, should one be provided.

Collaborative layouts may orient groups toward the instructor wall, or toward group collaboration wall. The Design Professional should verify if both or only one collaborative orientation is preferred.

The following layouts are typical furniture scenarios for a medium 20-49 seat flat classroom. Classroom layouts which show canted walls at the instructor wall are noted as “best practice.” The University prefers canted walls rather than perpendicular walls at the instructor wall in classrooms with more than 20 seats. The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.

Typical Section
Typical Lecture Layout

Best Practice Lecture Layout
**Typical Active Learning Layout**  
Groups oriented toward instructor wall

![Typical Active Learning Layout Diagram]

**Best Practice Active Learning Layout**  
Groups oriented toward collaboration wall

![Best Practice Active Learning Layout Diagram]
5.3 – 50 TO 60 SEAT LECTURE & ACTIVE LEARNING CLASSROOMS
The following layouts are typical furniture scenarios for a large 50-60 seat flat classroom. Classroom layouts which show canted walls at the instructor wall are noted as “best practice.” The University prefers canted walls rather than perpendicular walls at the instructor wall in classrooms with more than 20 seats. Additionally, student desks are oriented toward the instructor wall at a slight radius in the following lecture layouts. The slight radius improves the viewing angle of students at the far sides of the classroom. Alternatively, student desks may be oriented parallel to the instructor wall; however the best practice is illustrated.

AV equipment may be grouped together for multiple rooms into one closet. A closet is not necessary for each individual room; however, the Design Professional should verify that adequate circulation clearance is provided around the AV closet, should one be provided.

Collaborative layouts may orient groups toward the instructor wall, or toward group collaboration wall. The Design Professional should verify if both or only one collaborative orientation is preferred.

The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.

Typical Section
Typical Lecture Layout – 54 Seats

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
Best Practice Lecture Layout – 54 Seats

Typical lecture layout with canted instructor walls

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
Typical Active Learning Layout – 54 Seats
Groups oriented toward collaboration wall
Active Learning Layout Alternate– 60 Seats
Groups oriented toward the instructor wall

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
5.4 – 60 TO 100 SEAT LECTURE & ACTIVE LEARNING CLASSROOMS

The following layouts are typical furniture scenarios for a large 60-100 seat flat classroom. Classroom layouts which show canted walls at the instructor wall are noted as “best practice.” The University prefers canted walls rather than perpendicular walls at the instructor wall in classrooms with more than 20 seats. Additionally, student desks are oriented toward the instructor wall at a slight radius in the following lecture layouts. The slight radius improves the viewing angle of students at the far sides of the classroom. Student desks may be oriented parallel to the instructor wall as well; however the best practice is illustrated.

Collaborative layouts may orient groups toward the instructor wall, or toward group collaboration wall. The Design Professional should verify if both or only one collaborative orientation is preferred. Additionally, in larger active learning scenarios, rolling collaborative equipment may be necessary is adequate wall space is not available.

The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.

Typical Section
Typical Lecture Layout – 100 Seats

22.0 NSF PER STUDENT

4' PREF
3' MIN

5'

4' PREF
3' MIN

4' PREF
3' MIN

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 4.1, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY
Best Practice Lecture Layout – 100 Seats
Typical lecture layout with canted instructor walls

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 4.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
Active Learning Layout – 78 Seats
Groups oriented toward collaboration wall

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 4.3 AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
6.0 – GENERAL PURPOSE TIERED CLASSROOMS

A multiple compartment (power, IT, AV) floor junction box which services the instructor lectern is to be located adjacent to the instructor lectern. If the room layout permits, power, IT and AV connections for the instructor station can be provided from a series of adjacent wall boxes if the teaching station is located within a few feet from a wall in a non-traffic area.

In the following tiered classroom layouts, the classroom seating is oriented toward the instructor wall at a slight radius. The slight radius improves the viewing angle of students at the far sides of the classroom. Alternately, student seating may be oriented parallel to the instructor wall; however the best practice is illustrated.

Rear entry to classroom (on wall opposite the instructor wall) may be desirable in larger classroom types. Rear entry minimizes instruction disruption when students enter the classroom late, and may be helpful in minimizing light spillover into projected images. Providing vestibules at the classroom entry may also assist in minimizing light spillover; this scenario is illustrated in the 200-280 seat lecture hall layout. The overall design of the classroom building may help determine if the entry doors should be located at the instructor wall, or on at the rear wall, and/or if vestibules should be provided. The location and design considerations of entry doors should be studied on a case-by-case basis.

6.1 – 100 TO 120 SEAT LECTURE / COLLABORATIVE CLASSROOMS

It may be desirable to provide one center aisle or two center aisles in tiered classrooms. Two center aisles provides more student seating in the areas with maximized view angles, while one center aisle maximizes the number of students that can fit into an area.

In collaborative fixed table scenarios, the Design Professional should insure that there is an overhang provided on the collaborative workspace (rear table in collaborative grouping).

The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.

Typical Section
Typical Collaborative Section
Single Center Aisle Layout

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
Two Center Aisles Layout

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY
6.2 – 200 TO 280 SEAT LECTURE HALL

Fixed seats with tablet arms are considered to be a room layout type that is phasing out of use at the University of Georgia. Fixed seating with tablet arms should only be provided in rooms with over 200 seats. Whenever possible, locate the projector above a cross aisle when fixed seats are provided. This precaution will ensure that the projector may be easily accessed for routine maintenance. In the largest classrooms, where large projectors are needed, consider providing a conditioned sound enclosure and retractable projector life.

In collaborative fixed table scenarios, the Design Professional should insure that there is an overhang provided on the collaborative workspace (rear table in collaborative grouping).

Access aisle width and railing requirements will vary depending upon aisle design, and classroom occupancy. The Design Professional is to conform to local building and fire codes.

The Design Professional is to use the following classroom layouts during the design process as starting point to determine the layout scenarios intended for each similarly sized classroom.

Typical Section
Lecture Hall Layout

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
7.0 – SCALE-UP CLASSROOMS

Student-Centered Active Learning Environments with Upside-down Pedagogies (SCALE-UP) classrooms are designed to facilitate interactions between groups of students, and are a large part of UGA’s emerging educational pedagogy. Each circular table consists of a group of 9 students. The tables are typically 6 to 7 ft in diameter. The group focus is inward; therefore, the instructor works with each group individually, when necessary. There is not an instructor wall in the traditional sense. The furniture in these classrooms is to be fixed, and not to be rearranged. Junction boxes are provided in the floor for each group, and power is provided at the work surface of each work surface.

A multiple compartment (power, IT, AV) floor junction box which services the instructor lectern is to be located adjacent to the instructor lectern. Instructor areas are to be centrally located within each SCALE-UP classroom, which will not allow instructor power, IT, and AV connections being located on a side wall.

Collaborative equipment should flank a majority of the SCALE-UP classroom walls. Flat panel monitors should be provided for each group. Markerboards should infill the remaining wall space. Special consideration must be given to widows in SCALE-UP classrooms. Equipment is mounted on virtually every wall, which often conflict with window locations on exterior walls. Consider locating windows above and/or below markerboard and monitor locations. Portable collaborative equipment may be necessary in larger scale up classrooms. Adequate storage space should be provided to house additional equipment required for this classroom type.

Typical Section

![Diagram of typical SCALE-UP classroom layout with notes on equipment placement and window considerations.](image-url)
7.1 – 45 SEAT CLASSROOM

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
7.2 – 72 SEAT CLASSROOM

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3, AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY
7.3 – 99 SEAT CLASSROOM

NOTE: LOCATION OF CLASSROOM WINDOWS WILL VARY FOR EACH SPECIFIC DESIGN. REFER TO SECTION 5.3 AND VERIFY WINDOW LOCATIONS WITH UNIVERSITY.
### 8.0 – Classroom Design Quick Checklist

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Required</th>
<th>Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Seats</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Furniture Layouts to be Provided:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lecture, Seminar (circle/u-shape), Conference,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>collaborative (oriented toward lecture wall/monitors),</td>
<td></td>
<td></td>
</tr>
<tr>
<td>collaborative fixed tables w/ movable chairs (tiered),</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fixed chairs w/ tablet arms.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Lectern Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional equipment provided in instructor area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display table, hand out table, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lectern Area</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear area in front of instructor wall &amp; in front of student seating.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Seating Spacing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If fixed seats, was CTL approval received?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Student Desk Dimension &amp; Spacing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Side Aisles Dimension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of Markerboards</strong></td>
<td>42” AFF minimum.</td>
<td></td>
</tr>
<tr>
<td><strong>Number of Projectors</strong></td>
<td>48” AFF minimum, 54” AFF preferred</td>
<td></td>
</tr>
<tr>
<td><strong>Number of Flat Panel Monitors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are all students’ seats within 5 screen heights and within 100 degree viewing cone of projected image?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sound Transmutation Class (STC) of classroom walls.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verify adjacent space uses and confirm required STC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Voice Amplification / Assisted Listening Requirements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lighting Provided - Foot candles</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 1 - Main classroom lighting:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 2 - Instruction area:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 3 - Non-projection markerboard wall:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone 4 - Projection markerboard:</td>
<td></td>
<td></td>
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<tr>
<td>Zone 5 - Instructor workstation:</td>
<td></td>
<td></td>
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</tbody>
</table>