APPENDIX O

2000 Edition, May 1, 2000; Revision Date: October 16, 2017

CLASSROOM DESIGN GUIDELINES

The Ohio State University

PART I: ROOM GEOMETRICS	SEMINAR ROOMS (20 or less)	GENERAL PURPOSE CLASSROOMS (21-80)	LECTURE HALLS (81 or more)
A. ASPECT RATIO (Length to Width)	ideally length (dimension perpendicular to teaching center) shall be equal to width and shall not exceed 1.5 width	ideal aspect ratio length to width is 1.5:1	not applicable due to varying room shape -- effective sight lines for viewing entire teaching area and projected images are critical adherence to guidelines is mandatory (see PART III-D)
B. CEILING HEIGHT	8' minimum	- minimum 9.5', desired [(room length/666+4) feet]	10' minimum at rear wall; front wall viewing area height to be minimum of [(room length / 6 + 4)feet] while maintaining clear sight lines from each seat
C. TEACHING AREA DEPTH (Least Distance) (perpendicular measure from center of teaching wall to nearest student seat)	minimum 6' if an identifiable teaching station is provided by furniture arrangement	Minimum 8' -	depth of teaching area dependent on stage dimensions and location of any fixed equipment such as demonstration bench or electronic lectern; general minimum 15 feet
D. SIGHT LINES FROM EACH STUDENT SEAT TO CENTER OF TEACHING SURFACES	Vertical: not > 20° from horizontal sight line of seated person Horizontal: not > 45° from perpendicular line to each teaching surface from student seat	Vertical: ±15° from horizontal sight line of seated person Horizontal: not > 45° from perpendicular line to each teaching surface from student seat	Vertical: ±15° from horizontal sight line of seated person Horizontal: not > 30° from perpendicular line to each teaching surface from student seat
E. FLOOR ELEVATION CHANGES	not permitted	rooms with >70 capacity may provide tiered seating to improve sight lines from rear access as needed	- should provide tiered seating to improve sight lines from rear access as needed
F. CEILING ELEVATION CHANGES CEILING ANGLES WITH TEACHING WALL	not permitted	normally flat--in rooms >70 capacity ceiling above teaching center may be angled to better reflect sound to rear of room	ceilings must be angled properly to provide for sound reflection from teaching center to rear portions of room

G. SIDEWALL ANGLES WITH TEACHING WALL	normally perpendicular but may be angled for architectural reasons	normally perpendicular but may be angled for architectural reasons in smaller rooms (<50 capacity)	sidewalls must not be parallel -- angle(s) with teaching all shall be determined from study of acoustics in each room depending on size and shape
H. TEACHING AREA ELEVATION	required to be same as seating area if a separate teaching area is demarked by furniture arrangement	ADA accessible platform required to be same as seating area except in rooms of > 70 capacity where an ADA accessible platform not to exceed 7 inches in height may be provided for the teaching center.	must be at same elevation as entry corridors to "front" of lecture hall and adjacent classroom service rooms provide ADA accessible to & from "stage" front and rear area

PART II: SONIC CONDITIONS & CONTROLS	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. ROOM SOUND QUALITY	all rooms must feature a sonic environment which provides for good aural conditions at every student seat with particular attention to: 1)preventing unwanted sounds outside the room from entering through walls, floor, mechanical ducts or other openings into the room 2) preventing **interfering** sound reverberations within the room 3) providing for clear transmission of sounds from the teaching area to all student seats		
B. SOUND CONTROLS	room enclosures shall have a sound transmission coefficient of at least 45 - -- sound levels in empty room shall have ambient noise not greater than 35 db measured at average head height (44”) for a seated person -- all walls must extend to structure -- doors shall not have louvers	same as Seminar Rooms	same as Seminar Rooms
C. SOUND CONTROLS: INTERIORS	teaching wall must be hard surface -- side and rear walls may have sound dampening material applied as needed -- - use sound reduction material with a noise reduction coefficient of 0.6	same as Seminar Rooms except that rooms of >70 capacity may provide a sound amplification system for both live and recorded presentation and shall have acoustical shaping to insure good sound projection to rear seats	side walls shall be neither parallel nor of continuous hard surface expanse and have a sound transmission coefficient not less than 45 - -- teaching wall must be of hard surface materials -- rear wall and side walls shall have sound dampening material applied to "tune" the room so that sound is adequately reflected without interfering reverberations -- - designers are strongly encouraged to use services of an acoustician in Lecture Hall design

D. SOUND AMPLIFICATION	-rooms must have audio amplification system and volume control accessible to the instructor.	-Same as Seminar rooms. Classrooms - with >70 to provide speech reinforcement as well, wireless microphone is desired. Audio system required to accommodate current ADA requirements. - -	Same as General Purpose Classrooms— a wireless microphone is required – Audio system required to accommodate current ADA requirements. -

PART III: VISUAL CONDITIONS AND CONTROLS	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. LIGHT QUALITY AND INTENSITY	light levels must be uniform throughout the task area -- audience light levels shall be 40-50 foot candles for non-mediated instruction, audience light levels shall be 2-10 foot-candles for mediated and note taking instruction, chalkboard illumination shall be 60-70 foot-candles -- audience level measurements to be taken at desktop height	same as Seminar Rooms	same as Seminar Rooms with the inclusion of appropriate aisle/entrance lighting be uniform throughout task area -- all fixtures flush with the ceiling. -
B. ARTIFICIAL LIGHT CONTROL	lighting controls shall be standardized in layout and location as much as possible -- all controls must be labeled clearly and adhere to all applicable ADA requirements and building regulations -- an entry lighting control shall be located at each room entrance, full room lighting controls shall be located - with easy access from the teaching station – Classrooms required to have multiple lighting levels available for different tasks as specified by Office of distance Education and eLearning – Learning Environment team. - -	same as Seminar Rooms -	same as Seminar Room with these additions: - -- optional lectern spots with separate controls may be used, placement and design of these fixtures must eliminate any chance of shadowing or bleeding onto the projection screen - -- consideration for the ease of lamp replacement must be taken when choosing fixtures -- *-
C. NATURAL LIGHT CONTROL	all fenestration openings must be equipped with light control devices which will eliminate natural light on the projection screen and permit room darkening to 5 foot candles at student stations even if direct sunlight is a factor (NOTE: this includes interior door glass) -- since frequent room darkening is required in classrooms, window area shall be minimized	same as Seminar Rooms	windows not recommended in Lecture Halls, otherwise, same as Seminar Rooms provide room darkening if needed in entry door vision panels
D. PROJECTED IMAGES -- ANGLES AND DISTANCES	sight lines from average person's seated eye level (44”) to center of projection screen(s) shall not exceed 45° from perpendicular in the horizontal plane -- student seats shall be no closer than 1.5 times a single image width nor farther than 6 times a single image height -- lowest part of projected image to be 36”- 48” AFF -- top of projection screen shall subtend an angle not > 35° from the horizontal sight line of average seated person	same as Seminar Rooms	same as General Purpose Classrooms except that student sight line angle shall be reduced to a maximum of 30 degrees from perpendicular in the horizontal plane lowest part of projected image based on stage characteristics
E. SURFACE	reflectance values of surface finishes shall be	same as Seminar Rooms	same as Seminar Rooms except for ceilings

REFLECTANCES	within the following ranges: • Ceilings 60-90% • Walls 40-60% • Floors 20-50% • Table or tablet-arm tops 30-50% • Chalkboards 20-30%		(see Part IX-B)

PART IV: THERMAL CONDITIONS AND CONTROLS	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. IN-ROOM HVAC CONTROLS	room HVAC controls shall be part of a building zone or whole building control system with tamper proof thermostats -- in-room systems or window units not permitted due to noise generation	same as Seminar Rooms	due to room volume and occupation of multiple building levels, in-room HVAC controls may be used -- install tamper-proof thermostats
B. HVAC SYSTEMS	air conditioning required -- shall be part of a building central system or at minimum a building area system -- in-room HVAC systems or window units not permitted due to noise generation -- air flow (supply/return) in room shall not move the projection screen	same as Seminar Rooms	same as Seminar Rooms consider separate air handlers for one or groups of similar rooms
C. TEMPERATURE AND HUMIDITY TOLERANCES	Temperature and humidity should be maintained to meet the health and comfort requirements of the occupants	same as Seminar Rooms	same as Seminar Rooms

PART V: TEACHING SURFACES	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. VERTICAL WRITING SURFACES	Teaching wall must have whiteboard (chalk board is acceptable) at 4' vertical height mounted 3' above finished floor . Chalk tray required below entire length of the board. Writing surface on corridor sidewall optional. To accommodate writing surface the teaching wall shall have no projections such as pilasters, columns, chases, etc. Writing surfaces must be properly illuminated (see Part III-A, B)	same as Seminar Rooms	Chalkboards optional . Size of auditorium and intended use would dictate that chalkboard specifications for each room shall be engineered individually. If multi-tiered boards are preferred, those requiring manual operation are recommended. Installed whiteboards or chalkboards must be properly illuminated (see Part III-A,B)
B. PROJECTION SCREENS	Optional. If desired, provide one projection screen per room. Screens may be either wall or ceiling mounted per manufacturer instructions. Screens shall be mounted the greater of 6” or the minimum distance required to clear any obstructions + 1”. Installation must support the weight of the screen and any dynamic loads applied during screen operation. For screens mounted to hollow walls, brackets shall be fastened to a surface-mounted continuous 1x wood board with blocking behind (paint or stain). The - center of the extended screen shall meet the viewing angles described in PART I-D and PART III-D	Required, installation same as Seminar Rooms	Screen size, type and placement to be determined by consultation with the ODEE. When an electric screen is utilized the controls shall be placed adjacent to the lighting controls in the teaching area Adhere to viewing angles described in Part III-D
C. TEACHER TABLE (movable)	Optional.	2’ x 4’ movable table minimum	Optional, same as General Purpose Classroom when desired
D. VERTICAL DISPLAY SURFACES	Optional. If provided, shall be in the hallway and not classroom.	same as Seminar Rooms	Same as in Seminar Rooms

PART VI: MOVABLE EQUIPMENT	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. AUDIO-VISUAL EQUIPMENT	Each room shall permit the use of all current educational technologies. All projects shall be coordinated with the Office of Distance Education and eLearning – Learning Environments team.	same as Seminar Rooms	Same as Seminar Rooms
B. TEACHING STATION MOVABLE EQUIPMENT	Rooms may have a free-standing podium; provisions must be made to meet ADA regulations. -	Same as Seminar Rooms	Same as Seminar Rooms
C. STORAGE UNITS	optional (see PART XIII-A)	same as Seminar Rooms (see PART XIII-A)	Same as Seminar Rooms (see PART XIII-A)

PART VII: FIXED EQUIPMENT	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. TV MONITORS	Optional	not recommended	not recommended
B. SOUND REPRODUCTION AND REINFORCEMENT	In-room system required – project designer shall consult with the Office of Distance Education and eLearning Learning Environments team (see PART II-D)	In-room system required – project designer shall consult with the Office of Distance Education and eLearning Learning Environments team (see PART II-D)	in-room system required -- project designers must consult with the Office of distance Education and eLearning Learning Environments team (see PART II-D)
C. AUDIO-VISUAL EQUIPMENT CONTROLS	All AV devices controllable from teaching area	Same as Seminar Rooms	Same as Seminar Rooms
D. VIDEO/DATA PROJECTION	Fixed video/data projection or displays and related equipment to be installed in all rooms. To be coordinated with the Office of Distance Education and eLearning – Learning Environments team -	Same as Seminar Rooms	Same as Seminar Rooms
E. CLOCK	rear of room	rear of room	rear of room
F. DEMONSTRATION BENCH (fixed)	optional	optional	optional in rooms where natural sciences are taught -- where specified, provide an instructor's fixed demonstration bench, - with acid resistant top and 120v power outlets

PART VIII: FURNITURE	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. STUDENT SEATS	student seats shall be selected to provide comfort for all size students -- provide sturdy armless chairs for classroom capacity -- chairs shall be designed so that rear legs project further than top of seat back __ Chairs shall be on casters to promote flexible learning	Option 1: -sturdy tablet-arm chairs with usable writing surface >180 sq. in. with a minimum 12 in. in one dimension.- - - 10% of all chair stations shall have - left-hand tablet arms unless the writing surface is >200 sq. in. Option 2: Tables and chairs. Tables shall be minimum 18 inches deep and afford at least 30-inch width work space per student station. All: aisle width per code and ADA regulation. Seating shall be selected to provide comfort for all size students. Chairs shall be on casters to promote flexible learning.	Option 1: fixed theater type seat with fold-up tablet arm having usable writing surface >180 sq. in. with a minimum 12 in. in one dimension.-10% of all tablet-arm stations shall be left-hand unless the writing surface is >200 sq. in. Fixed seating shall be back-mounted to risers if possible. Option 2: loose armless chairs with fixed, continuous strip tables. All: provide stations for wheelchair at 5% of room capacity. Seating shall be selected to provide comfort for all size students. If not fixed, seating should be on casters to promote flexible learning.
B. STUDENT TABLES	provide tables with at least - 24 inch depth and 30-inch width work space per seat to afford minimum - 5 sq. ft. of table space per student station – tables shall be on casters to promote flexible learning.	Same as seminar room	Same as seminar room
C. SEATING FOR PEOPLE WITH DISABILITIES	leave clear space in front -- do not block aisles -- location and number of seats per ADA guidelines	leave clear space in front -- do not block aisles -- location and number of seats per ADA guidelines	leave clear space in front -- do not block aisles -- location and number of seats per ADA guidelines
D. TEACHING STATION	If teacher workspace is not included in room furnishings, provide instructors desk or table at least 24 inches deep by 48 inches long and one armless chair (In addition, see Part VI-B)	provide instructors desk or table at least 24 inches deep by 48 inches long and one armless chair (In addition, see Part VI-B)	Same as General Purpose Classroom (In addition, see Part VI-B)
E. WRITING SURFACE AT STUDENT SEATS	very durable, hard finish plastic laminate or equivalent required whether table top or tablet arm	same as Seminar Rooms	same as Seminar Rooms
F. WASTE AND RECYCLING RECEPTACLES	one located near room entrance(s)	same as Seminar Rooms	Same as Seminar rooms

PART IX: ROOM SURFACES	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. FLOOR FINISHES	vinyl tile or rubber tile--(sheet vinyl not permitted) -- carpet may be considered	Same as Seminar Room	resilient tile or finished concrete required in seating areas, carpet in main aisles for sound control
B. CEILING FINISHES	light color materials preferred --acoustical drop surface preferred -- painted plaster or gypsum board acceptable -- unfinished structure not usually acceptable	same as Seminar Rooms except in rooms > 50 capacity--acoustical properties must be carefully planned to insure sound reflectance to rear of room and control of reverberations	shall be light colored non-reflective materials -- acoustical properties shall be the over-riding factor in selection and application of ceiling finish materials
C. TEACHING WALL FINISHES	if a teaching area is established, sound and light reflectance are the most critical factors -- wall finishes or coverings below chalkboards must be of easily cleanable material -- teaching walls shall be free of projections such as pilasters, columns, chases, etc., front teaching wall shall not contain windows	same as Seminar Rooms	same as Seminar Rooms
D. OTHER WALL FINISHES	gypsum board or concrete block, painted or textured are preferred -- light colors preferred -- in rooms with movable table and chair furniture, chair rails required. -	same as Seminar Rooms--sound reflectance is more critical in rooms with > 50 capacity (see Part II-C)	same as Seminar except that acoustical properties become more critical, especially rear wall and rear portions of side walls, chair rail not requied with fixed seating. -

PART X: ELECTRICAL SERVICES	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. ELECTRICAL SERVICE	each classroom shall have multiple circuits on breakers not shared with other spaces number and location per Building Design Standards -	Same as Seminar Rooms -	Same as Seminar Rooms with special consideration given to AV Systems. Consult with the Office of distance Education and eLearning – Learning Environments team. -
B. COMMUNICATION AND DATA TRANSMISSION	refer to OSU wiring standards	refer to OSU wiring standards	refer to OSU wiring standards

PART XI: ROOM ACCESS AND CIRCULATION	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. ROOM LOCATION IN BUILDING	location away from other high student access rooms is encouraged (e.g. libraries, computer labs, departmental offices) shall not be located adjacent to, above, or below toilet rooms, mechanical rooms or elevator shafts	Same as Seminar Rooms -- shall not be located more than three levels above grade -- rooms > 50 capacity shall be located on lower floors -- access from secondary building corridors is discouraged -- clustering classrooms for ease of support services is strongly encouraged	grade or ground floor access is required with preference for exterior ingress to a lobby area outside the Lecture Hall -
B. ROOM INTERNAL CIRCULATION	unobstructed access to all student seats with a minimum 36" passageway is required	same as Seminar Rooms. Also: capacities up to 50 require at least one distribution aisle perpendicular to the teaching wall with two cross aisles row or two distribution aisles with one cross aisle -- rooms > 50 capacity require at least two distribution aisles and two cross aisles directed at doorways -- for fixed seating, aisles between rows must allow minimum 12 inches between rear of seat and raised writing tablet or other furthest protrusion	unobstructed access to all student stations with adequate passage aisles to meet all ADA and Building codes -- multiple distribution aisles
C. DOORS	One access door with a clear glass view panel of 2-1/2" x 17-1/2" required. Door located at rear (opposite end of room from teaching wall). All other door characteristics per ADA and Building guidelines	Same as Seminar Rooms. Rooms > 49 capacity require two access doors, one at rear and another near center of corridor wall	exit openings as required to meet ADA and Building codes for room capacity -- student access shall be at rear of room for normal ingress/egress pattern -- view panel of 2-1/2" x 17-1/2" required in all exit doors
E. ASSOCIATED ROOMS AND SPACES	Classrooms in buildings create demands for nearby waiting space, - and toilet rooms -- however, vending areas shall not be located near classrooms -- waiting spaces shall be design to reduce need for students to sit on floor which interferes with emergency egress	same as Seminar Rooms	same as Seminar Rooms
F. ROOM IDENTIFICATION	provide room number per University signage system	same as Seminar Rooms	same as Seminar Rooms

PART XII: SPACE ALLOCATIONS	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. TEACHING AREA SPACE	Optional due to unusual furniture arrangement -- if a teaching area is defined the minimum depth shall be 6 feet	Size of teaching area will vary with room dimensions -- teaching area equals: (depth as specified in Part I-C) x (room width)	depth of teaching area dependent on stage dimensions and location of any fixed equipment such as demonstration bench or electronic lectern; general minimum = (15 feet) x (stage width)
B. AREA PER STUDENT STATION	Seating area per student station will vary with seating type and arrangement.	Seating area per student station will vary with seating type and arrangement, typical range from 13-17 sq. ft., adhere to all ADA and Building Design Standards.	Seating area per student station will vary with seating type and arrangement. Typical range from 9-13 sq .ft. per station for fixed tab-arm chairs, 14-17 sq. ft. per station for fixed tables and moveable chairs. Adhere to all ADA and Building design standards for number and width of aisles

PART XIII: CLASSROOM SERVICE ROOMS	SEMINAR ROOMS	GENERAL PURPOSE CLASSROOMS	LECTURE HALLS
A. AUDIO/VISUAL AND COMPUTER EQUIPMENT STORAGE ROOM	Provide one 10' x 10' lockable closet with hallway access for up to 10 classrooms in a building. in buildings with more than 10 classrooms provide one additional storage closet for each additional lot or fraction of 10 classrooms	same as Seminar Rooms	separate lockable room, accessible from front of classroom and located adjacent to teaching area as specified per the Office of Distance Education and eLearning – Learning Environments team.
B. PROJECTION BOOTH	optional	optional	optional
C. PREPARATION ROOM	optional	Optional -- Per special departmental requests and not as a general requirement	Optional -- Per special departmental requests and not as a general requirement