

a place of mind



LEARNING SPACE DESIGN GUIDELINES

Prepared with the UBC Learning Space Design Guidelines Working Committee

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IMPORTANT: Changes since last version (March 8, 2012)

- 1 ROOM SIZE CONSIDERATIONS (pg 5.1)**
- 5.02.1 Overall room size, room dimensions, seat count and type, and general learning technology criteria are defined in the pre-design stage of functional programming and by Facilities Planning. **Rooms should be column free.** Ceiling height will determine optimal room dimensions.
- 2 STEPS, RAMPS AND AISLES (pg 5.3)**
- 5.03.3.a.2 Minimize opportunities for instructors **and students** to stumble by ensuring that steps have consistent rise and run dimensions across the full width of the aisle, and **that stair nosings are highlighted with a minimum of 38 mm to maximum 50mm high-contrast photo-luminescent strip for the full width of the step tread and extending down the face of the nosing for 38 mm to 50 mm.**
- 5.03.3.a.3 **Provide stair lights integrated into seating or risers. Lights should have daylight sensors and should not be tied into the Emergency Lighting system. Consider LED lights for longevity. See UBC Technical Guidelines Section 16505 (Interior Building Lighting).**
- 3 INSTRUCTIONAL AREA (pg 5.4)**
- 5.03.5.5 **In Type 1, 2 and 3 rooms, provide sufficient space at the front of the room for an instructor table (24"x60") and chair. Additional chairs may be required for Type 1 and 2 rooms.**
- 4 Signage Considerations (pg 5.6)**
- 5.04.02g Refer to the "UBC Sign Standards and Guidelines" (separate cover) for design guidelines containing descriptions, policy statements and design specifications for each type of sign used on campus. **Tactile signs using high contract colours are required for all classroom signs.**
- 5 MARKER BOARDS (pg 5.14)**
- 5.09.1.4 **Marker board material will be porcelain on enamel. Chalk rails will be ordered and installed for each board.**
- 6 LEARNING TECHNOLOGY AND AV SYSTEM CATEGORIES (pg 5.15)**
- 5.09.4g **Additional wireless access points must be installed to handle the potential capacity of the learning space:**
1. **See UBC Communication Guideline Specifications section 4.3 (Special Rooms and Areas)**
- 7 Seat Numbering (pg 5.17)**
- 5.10.1.f.1 Though fixed seating is not generally acceptable, should it be required with the approval of Facilities Planning, then seat numbers will be included for all fixed seats. **All rows require unique identifiers at each end.**
- 8 Clocks (pg 5.18)**
- 5.10.3b.1 Provide a **Primex Wireless Synchronous Network System (SNS) Wi-Fi clock in** each enclosed learning space and in larger informal learning spaces **as per UBC Technical Guidelines Section 16730 (Clock and Program Bell).**
- 5.10.3b.4 **Dual-sided clocks are not permitted.**



Section 1: Introduction

1.01 INTRODUCTION

In this section:

- 1.01 Introduction
- 1.02 Background
- 1.03 Purpose
- 1.04 Document Organization

1.02 BACKGROUND

Formal and informal learning spaces are critical to The University of British Columbia's missions of teaching, learning, research, and engagement. For the purposes of this document, formal and informal learning spaces are generally defined as follows:

- Formal learning space
 - Classrooms: general-purpose spaces that are centrally scheduled and accessible to all campus users.
 - Teaching labs (not included in these guidelines): Specialized spaces (by virtue of their furnishings and technical infrastructure requirements) typically assigned to a specific department, discipline, or program.
- Informal learning space
 - Space where students spend time learning outside of formal learning spaces.
 - Unlike formal learning spaces, informal learning spaces cannot be as easily categorized, as there are many possible configurations and capacities, ranging in size from a few square metres (e.g., a bench outside a classroom) to hundreds of square metres (e.g., a centralized student commons).

Design of formal and informal learning environments involve many elements, including acoustics, lighting, heating/ventilation/air-conditioning (HVAC), furnishings, audiovisual (AV) systems, and the application of building codes and universal design and sustainability principles. Well-designed learning spaces can improve learning in several ways: intelligibility of information presented; student engagement with the material, the instructor, and other students; student and instructor morale; and the physical well-being of students and instructors.

This document is intended to provide design guidelines for these considerations and others.



1.03 PURPOSE

1.03.1 GENERAL

UBC Technical Guidelines serve as the standard for quality and performance for the design, construction, and renovation of University-owned institutional buildings. This includes housing, athletics, and institutional buildings, along with landscape and infrastructure, but excludes market housing whose maintenance is managed on a separate and different system. The UBC Technical Guidelines include: performance objectives, technical requirements, mandatory UBC-specific requirements for all campus buildings, recommended practices based on the experience of UBC professionals, project documentation requirements, UBC code-related issues, sample front-end documentation, plus steps to follow to expedite completion of UBC projects.

This version of the Learning Space Design Guidelines (“Guidelines”) replaces the original version developed as part of the 1996 UBC Classroom Master Plan. The Guidelines are intended to provide guidelines rather than specifications, and exclude technical considerations found in the UBC Technical Guidelines. The Guidelines are intended for the use of design professionals and other UBC agencies in the planning and design of learning spaces. In addition, the Guidelines is intended:

1. To minimize design and construction problems that negatively affect learning spaces.
2. To standardize formal learning spaces.
3. To document learning-space aspects critical to supporting users and those that can negatively affect space.
4. To minimize “re-do” change orders and help save on project costs.
5. To assist design professionals and other UBC stakeholders by being a means to communicate with Facilities Planning and the AV Group – Information Technology.

1.03.2 QUALIFIERS

When using the Guidelines, consider the following:

1. The Guidelines are for formal and informal learning spaces only and are not for specialized teaching laboratories (e.g., computer labs, chemistry labs, fine arts studios, etc.).
2. Special departmental needs beyond the Guidelines should be identified in the functional programming stage of work.
3. The Guidelines are expected to be periodically updated as pedagogy, learning modalities, and learning technologies change. As a result, the planner may be introduced to new developments not identified in this document. These changes need to be carefully considered and incorporated into the specific project’s program and/or design brief with the approval of the UBC leadership involved with the project.
4. The Guidelines are not intended to restrict creativity relative to classroom design. However, the information is presented to indicate the minimum requirements necessary. New ideas that appear to support the learning process and/or pedagogy are to be encouraged and subjected to review, evaluation, and feedback by the project Working Committee and Facilities Planning.



1.04 DOCUMENT ORGANIZATION

This document is organized into seven sections, as follows:

- Section 1: Introduction
- Section 2: Protocols
- Section 3: Key Principles
- Section 4: Room Types Templates and Space Data
- Section 5: General Design Considerations
- Appendices

SECTION 1: INTRODUCTION

This introduction briefly outlines general background information, overall document purpose, document organization, and the purpose of each major section.

SECTION 2: PROTOCOLS

This section outlines the development and design approval processes, expectations around future updates to this document, and the roles of Facilities Planning, Enrolment Services and the AV Group - Information Technology in the planning and design process.

SECTION 3: KEY PRINCIPLES

This section outlines principles to be considered in learning space design.

SECTION 4: ROOM TYPES TEMPLATES AND SPACE DATA

This section defines space types and includes basic attributes, and examples of generic room layouts for basic room types. This information is intended to provide a "template of types" to be considered in the functional program and design stages of a project. Once the room type is confirmed, then the more detailed information included in other sections would need to be considered.

SECTION 5: GENERAL DESIGN CONSIDERATIONS

This section provides general design guidelines related to:

- Room-size considerations
- Sight lines and room dimensions
- Accessibility
- Sustainability
- Informal learning spaces
- Doors, windows, and corridors
- Finishes
- Specialities and equipment
- Furnishings
- Lights and lighting controls
- Emergencies and security
- Mechanical systems access

APPENDICES

Supporting appendices including:

- A. Definition of Terms
- B. Pedagogy approaches
- C. Methodology and references



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Section 2: Protocols

2.01 INTRODUCTION

In this section:

- 2.01 Introduction
- 2.02 Classroom Development
- 2.03 Approval Process
- 2.04 Updating this Document

Learning space projects may include:

1. New Construction: design and construction of new space, requiring full compliance with the Guidelines.
2. Renew: large-scale, comprehensive renovations of whole buildings. In Renew projects, which typically have pre-defined structural grids, building widths, and other fixed elements, full compliance with the Guidelines may not be possible but will nevertheless be pursued to the extent practical (see section 2.03.4d, Variances).
3. Renovation: projects that can range from minor interior changes to significant upgrades to larger areas or specific building systems. See section 2.03.4d (Variances) when full compliance with the Guidelines is not considered practical.

2.02 CLASSROOM DEVELOPMENT

2.02.1 GENERAL

Facilities Planning, a unit within Infrastructure Development at UBC, manages the ongoing development of UBC's classrooms, teaching labs, and informal learning spaces in consultation with the scheduling function at Enrolment Services and the Manager, AV Group from Information Technology. Facilities Planning provides innovative services and solutions in the scheduling, use, development, and design of UBC's learning spaces.

2.02.2 PLANNING AND DESIGN

Key roles and responsibilities in the planning and design of classrooms include:

1. In addition to a Facility Planner, the Manager, AV Group from Information Technology, will be included as a project User Group on the Working Committee or its equivalent for each new construction, Renew, and major renovation project which includes learning space. Both roles will participate in decision-making, reviews, approvals, and will provide input at each stage of the design and development process.

In its role as member of the Working Committee, Facilities Planning will act to balance the interests of the University with the interests of the Client (i.e., Faculty, Department, or Program) and provide direction to the design team.



Smaller learning space renovation projects may not have Working Committees or their equivalents. In these cases, Facilities Planning and Manager, AV Group, Information Technology will be included as members of any other project decision-making committee; some of the protocols in this section may be omitted by agreement.

2. Facilities Planning and Manager, AV Group – Information Technology will be consulted by the design team for all aspects of formal and informal learning space design. This consultation will occur early in all stages of design and follow through to project construction and final commissioning. Sufficient time (10 business days minimum) will be provided for review and comment.

As part of these consultations, Manager, AV Group, Information Technology will recommend learning-technology hardware components that have the lowest incidence of service calls.

3. As seating types and room-seating capacities are particularly critical to the success of learning space projects, a vendor will be pre-selected for loose furnishings by Facilities Planning and Supply Management.

Supply Management at UBC provides a supply leadership role and customer service framework for goods and services procurement, travel, freight, customs, and surplus equipment management.

2.03 APPROVAL PROCESS

2.03.1 FUNCTIONAL PROGRAMMING

Definition: a functional program, typically developed by a functional programmer consultant, is a pre-design document describing the functional requirements of a building or renovation in sufficient detail to initiate schematic design.

During functional programming, Facilities Planning will be included as a User Group and as a member of any decision-making committee when the project includes learning spaces. Interactions between the functional programmer, Facilities Planning, and others during functional programming will be as follows:

1. Learning Technologies Meeting

Programmer, Client (Faculty, Department, Program representatives), Manager, AV Group - Information Technology, Centre for Teaching, Learning and Technology (CTLT) and UBC Facilities Planner meet at the outset of functional programming to review technology options, trade-offs and the related implications on pedagogy, room design, and capital budgets.

2. Programmer/Client

Programmer collects section information and learning technologies performance requirements from Client representatives and works with Client to document learning space functional requirements.

Programmer completes section analysis and preliminary learning space requirements analysis and submits results to the scheduling function at Enrolment Services for review.

3. Enrolment Services/Programmer/UBC Facilities Planner

Scheduling staff from Enrolment Services reviews analyses and generates options considering Client needs, what is available in the area of campus, and overall campus needs.

Programmer meets with scheduling staff and UBC Facilities Planner to review options.



Programmer prepares draft functional program, integrating options information.

4. Programmer/Enrolment Services/Client

Programmer, Facilities Planner and Scheduling staff from Enrolment Services to meet with Client to review options and identify final option for functional program.

2.03.2 DESIGN

At the outset of schematic design, the design consultant will conduct a Learning Technologies Meeting with the Client (Faculty, Department, Program representatives), Centre for Teaching, Learning and Technology (CTLC), Manager, AV Group, Information Technology, and UBC Facilities Planner to generally review learning technology options, trade-offs and the related implications on pedagogy, room design and capital budgets. The purpose of this meeting is to minimize potential conflicts between user pedagogical aspirations and the technical requirements of learning technology systems. Though more specific and technical, this meeting is similar to what occurs during functional programming (see section 2.03.1, Functional Programming).

Additional meetings, reviews and approvals by the Working Committee and Manager, AV Group, Information Technology will occur throughout the design and development process as required.

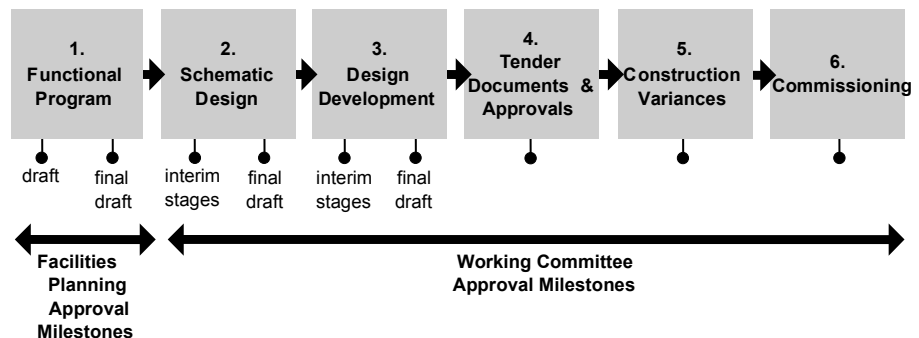
2.03.3 SPECIALTY CONSULTANTS

In addition to design-team consultants, projects including learning spaces require specialty acoustic, IT, AV, lighting and accessibility consultants to provide design input, review, and direction. These consultants will be provided with draft dimensioned floor plans and sections, electrical layouts and lighting plans, ceiling choices, and furniture and fixture choices early in the schematic design process to ensure there is ample opportunity for review and comment to the Working Committee.

2.03.4 REVIEW AND APPROVAL PROCESS

a. Review and Approval Milestones

The project schedule will provide sufficient time to allow Facilities Planning and Manager, AV Group, Information Technology review and approval of first, interim, and final draft documents at each of the stages illustrated below.





At each stage of the design process, design consultants will provide scaled drawings for review. Drawings will include sufficient detail to ensure compliance with the functional program, the Guidelines, Working Committee, or equivalents' directions.

Design consultants will provide comprehensive documentation of AV, electrical, lighting, interior finish, acoustical, mechanical, and structural design. Design consultants will provide furniture data sheets for review in a format and level of detail specified by Facilities Planning.

b. Other Compliances and Conflicts Between Documents

The Guidelines are intended to augment information included in the UBC Technical Guidelines and Building Code and not to re-state the criteria therein. These documents will be consulted and any conflicts with the Guidelines will be resolved through discussion with Facilities Planning.

In addition, key strategic influences to all design and development stages include Place and Promise: The UBC Plan and related campus, community, faculty, and departmental learning and strategic plans.

c. Development Process Delays

If, in Facilities Planning's opinion, there has been a significant delay between stages of the design and development process or if key concepts related to pedagogy have changed, Facilities Planning may request a review by the Working Committee to ensure common understanding and opportunity for revision before the design team proceeds to the next stage.

d. Variances

The design and development process is dynamic, and continuing innovations and new ideas can and should be weighed against required compliances in this document. The protocol for these potential compliance variations is as follows:

1. New Construction: when design consultants' work results in variances from previously approved stages of work or the Guidelines, then the consultant will prepare and submit to Facilities Planning a variance report that clearly communicates the details of and rationale for these variances. Facilities Planning, in consultation with AV-IT and the scheduling function, then recommends to the Working Committee acceptance or rejection of the variances.

Approval by the Working Committee is required in order for these variances to be accepted.

2. Renew and renovation: there are typically fixed structural grids, exterior walls, building widths and other elements in Renew and renovation projects and as a result, compliance with all aspects of the Guidelines may not be practical. However, the reporting process noted above for new construction is still required. For small upgrade projects, some of the protocols in this section may be omitted by agreement.



Each of the development process stages will require different information to be included in the variance report, including:

1. Functional Program
 - a. Summary of variances from the Guidelines.
2. Schematic Design
 - a. Scaled and dimensioned plans including room names, furnishing layouts, and accessible seating locations.
 - b. Learning technologies and power requirements variations from those requested by Facilities Planning and/or the Client.
 - c. Room-by-room net space, seating capacity, and functional space relationships variations from those specified in the functional program and the Guidelines.
3. Design Development (same as for Schematic Design).
4. Tendering
 - a. Summary of any variations in seating or furniture types, seating capacities, and power, lighting and physical infrastructure requirements/specifications.
5. Construction (same as for Tendering).
6. Commissioning (same as for Tendering).

e. Required Seat Counts

When required seat counts are provided via the functional program or other approved document, those counts will be designed into the room, even if the area needs to be larger than programmed. However, if the design consultant is not able to achieve the required seat count or can only achieve this count by changes to other required room attributes, then this variance will be documented in both writing and graphic form by the design consultant, who will then submit this information to Facilities Planning at least five days prior to the next Working Committee meeting.

f. Room Data Sheets

Consult Facilities Planning on preparation of all relevant room data sheets.

g. Learning Technologies Budget

At all early budget development stages, a Learning Technologies budget line item will be identified by or in consultation with Manager, AV Group, Information Technology.

2.04 UPDATING THIS DOCUMENT

In order to remain current and consistent with the UBC Technical Guidelines, the Guidelines will require periodic revision. It is recommended that this occur at least once every three years, with interim changes compiled annually, and that Facilities Planning act as a repository for new concepts, new information, updates, and any required changes that may arise in the interim.



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Section 3: Key Principles

3.01 INTRODUCTION

This section is organized as follows:

- 3.01 Introduction
- 3.02 Overall Principles

3.02 OVERALL PRINCIPLES

Source: McGill University (adaptation of "Benchmarks of effective educational practice: National Survey of Student Engagement," 2004 Annual NSSE Survey Report)

Five general design principles for learning spaces include:

1. **Interaction**: encourage interactions between participants to enable active and collaborative learning (e.g., student to student, student to instructor, instructor to instructor, including easy interaction with wheelchair users and other people with disabilities).
2. **Technology**: provide appropriate technology to support diverse, enriched, and flexible learning experiences.
3. **Environment**: design a sustainable and healthy learning environment.
4. **Flexibility**: design a flexible environment that will support a range of current and future pedagogies and learning styles.
5. **Location**: locate learning spaces to provide opportunities for effective zoning and access.

1. **Interaction**: encourage interactions between participants to enable active and collaborative learning (e.g., student to student, student to instructor, instructor to instructor, including easy interaction with wheelchair users and other people with disabilities).

An important predictor of student success is the opportunity for engagement, including meaningful interactions amongst and between students and instructors. As a result, learning spaces will serve to facilitate these interactions and minimize any related barriers. Key examples include:

1. Furniture that is moveable and supports collaboration and student group work.
2. Participants can move around the room easily, interacting with smaller groups, the whole group, or individuals. Instructional processes can occur anywhere in the room.
3. Appropriate acoustics for a wide range of activities including "single voice to whole group" and "multiple groups" and so that all participants can effectively hear each other.
4. Table and wall surfaces support student work (e.g., multiple marker boards, projection surfaces).
5. Informal interaction areas provided adjacent to/outside of the room.

2. **Technology**: provide appropriate technology to support diverse, enriched, and flexible learning experiences.

The use of technology can support more diverse learning experiences and approaches by allowing information to be shared or presented in multiple ways. Key examples include:

1. Balanced design response to the requirements of learning technologies (e.g., viewing angles), room furniture flexibility, and interaction between students and instructors.



2. Multiple working and viewing surfaces maximizing the number and amount of image projection and marker board capacities, within appropriate viewing distances and angles.
3. Capacity for shared and networked Internet access.
4. Common pedagogical experience in all learning spaces in terms of technology systems, capacities, and controls.
5. AV and room lighting systems that facilitate all of the intended functions of the room (e.g., interaction, working on and viewing marker boards, note-taking by participants, image projection, and simple, intuitive and straightforward AV room lighting controls).
6. Technology-mediated interaction as appropriate (e.g., in-room communication/presentation and/or distributed learning interactions).
7. Infrastructure that will allow the incorporation of new/additional technologies at a future date without significant work.

3. Environment: design a sustainable and healthy learning environment.

Learning spaces will support reflective individual processes, interactive engagement, current known pedagogies and learning activities, as well as ready adaptation to future unknowns. To accomplish these ends, design of these spaces will support a healthy and effective environment for learning, which is sustainable for the life cycle of the space and building. Key examples include:

1. Appropriate HVAC, acoustical controls, and lighting.
2. Furniture that is comfortable, ergonomic, and robust.
3. Inviting, welcoming ambience that supports accessibility.
4. Environmentally sensitive and sustainable approaches in constructing, operating, and fitting out learning spaces.
5. Materials and technical infrastructure that are robust and result in longevity, serviceability, and ease of maintenance.
6. Room controls that are intuitive, simple to operate.
7. Low operating costs.
8. Finishes that are durable, easy to maintain, and with appropriate acoustic properties.

4. Flexibility: design for a range of current and future pedagogies and learning styles.

A wide range of instructor, student, and curriculum requirements, pedagogies, and learning styles will need to be supported by each learning space. These requirements may change in unknown ways in the future. As a result and to the extent practical, learning spaces will be designed with flexible technical infrastructure, furnishings, and spatial dimensions.

5. Location: locate learning spaces to provide opportunities for effective zoning and access.

Appropriate location of learning spaces can be critical to their effectiveness. Key examples include:

1. Locate large learning spaces as close to the building entrance level, major stairs, and elevators as possible in order to improve access, isolate class-change noise and high-traffic functions from office and lab functions, and provide opportunities for building security zoning.



Large formal and informal learning spaces in particular should be located close together and close to primary building entrances and circulation spaces that are large enough to accommodate students waiting for the next class.

4. Cluster learning spaces, preferably on the ground floor, to enable opportunities for optimal thermal zoning, lighting zoning, and application of energy efficiency strategies. This zoning will also assist in other considerations for security zoning and related safety of building occupants and equipment.
5. Classrooms should generally be separated from labs, hazardous material rooms, and noise-generating areas such as mechanical rooms, elevators, cafeterias, vending machine areas, and restrooms.
6. Learning space locations will be accessible as per relevant codes and standards.



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Section 4: Room Types Templates and Space Data

4.01 INTRODUCTION

In this section:

- 4.01 Introduction
- 4.02 How to Use This Section
- 4.03 Space Type Definitions
- 4.04 Generic Room Type Diagrams

4.02 HOW TO USE THIS SECTION

This section defines the basic learning-space types and their general attributes that are expected to be the focus of design at UBC. These types exclude more specialized teaching laboratories and studios.

This information is intended to be used as follows:

1. To assist in determining the "best fit" of space type and related attributes with expected pedagogy and learning goals. This determination will be a product of discussions between the Client (Faculty, department, program), Facilities Planning, and the functional programmer (see section 2.03.1 Functional Programming).
2. To assist the design team, Working Committee, and User Group at the design stages of development to understand the basic attributes of the room types identified in the functional program. This information will be used along with the more detailed design guidelines included in other sections.

4.03 SPACE TYPE DEFINITIONS

4.03.1 TEMPLATE OF TYPES

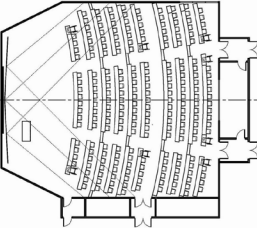


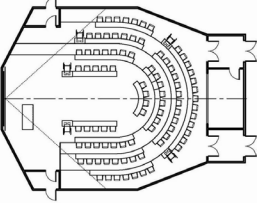


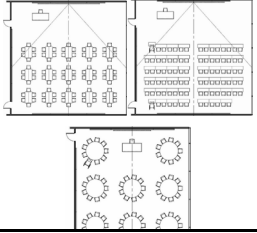


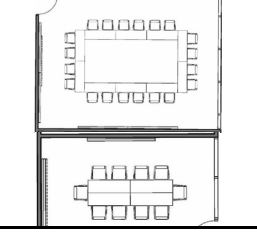


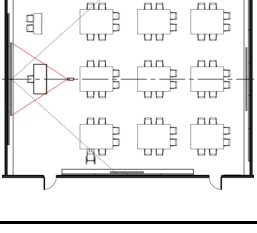






The definitions that follow are intended to provide a "template of types" that include design guidelines and space for each, but do not necessarily identify what the space is being used for at a given point in time.

Listed below are the seven basic learning-space types that have been defined to accommodate the most prevalent pedagogy approaches (see Appendix B: Pedagogy Approaches) and learning modalities expected at UBC. Although these definitions are documented as discrete types, in practice there is natural overlap as each is part of a continuum of room types and attributes.

- Type 1: Tiered Large Group
- Type 2: Case-Style
- Type 3: Open Design General Purpose
- Type 4: Small Group
- Type 5: Studio Lab
- Type 6: Videoconferencing/AV-Capture-Enabled
- Type 7: Informal

Note: the following two pages are intended to be viewed as a single table, summarizing key attributes of these types. The area per seat ranges included are based on information in section 5.10.1.b (Area Requirements by Room and Seating Types), with the low end of the range typically applicable to the smallest seat capacity of the particular type, and the high end of the range typically applicable to the largest seat capacity of the particular type. Additional information for each room type is included in the pages that follow the table.



TYPE	METRICS	EXAMPLES (photo credits in next section)
TYPE 1: Tiered Large Group	1a: 75-200 seats 2.60-2.20 nsm/seat 1b: 201-500 seats 2.20-1.85 nsm/seat	  
TYPE 2: Case-Style	40-100 seats 2.80-2.40 nsm/seat	  
TYPE 3: Open Design General Purpose	40-120 seats 2.60-2.20 nsm/seat	  
TYPE 4: Small Group	4a: 16-40 seats 2.90-2.50 nsm/seat 4b: 8-16 seats 2.50-2.20 nsm/seat	  
TYPE 5: Studio Lab	40-80 seats 5.30 nsm/seat	  
TYPE 6: Video- conferencing/ AV Capture Enabled	6a: Small Group, High Fidelity VC 8-16 seats nsm/seat varies 6b: Immersive 8-24 seats nsm/seat varies	Floor Plans are variations of Types 1 - 5  
TYPE 7: Informal	7a: Centralized 7b: Decentralized 7c: Cafes # seats varies nsm/seat varies	Floor Plans Vary  



PHYSICAL	SUCCESS	KEY VARIATIONS
<ol style="list-style-type: none"> 1. Tiered floor 2. High ceiling height, multi-floor for large rooms 3. Fixed, continuous tables in rows oriented to front-of-room teaching wall 4. Multiple marker boards and projection screens 	<ol style="list-style-type: none"> 1. Moveable chairs and 2 rows per tier to facilitate student interaction 2. Tables and circulation support group work and interaction w/ instructor 3. Sufficient table space to support range of student activities 4. Lighting: Minimum four zones 	<ol style="list-style-type: none"> 1. One or two rows per tier 2. AV Systems: <ul style="list-style-type: none"> • Enhanced Plus AV (75-100 seats) • High-Tech AV >100 seats • Video Conferencing/AV Capture Enabled
<ol style="list-style-type: none"> 1. Tiered floor 2. High ceiling height, sometimes multi-floor for large rooms 3. Fixed, continuous tables in curved "case style" rows oriented for balance of interaction and sight lines to front-of-room teaching wall 	<ol style="list-style-type: none"> 1. Same as Type 1 2. In addition: <ul style="list-style-type: none"> • All students can face ~2/3 of all other students • Instructor can be physically close to most students without leaving instructor area 	<ol style="list-style-type: none"> 1. One or two rows per tier 2. Layout/ orientation of table "curve" (e.g., curved vs. angled) 3. AV Systems <ul style="list-style-type: none"> • same as for Type 1 • Enhanced AV (40 to 75 seats)
<ol style="list-style-type: none"> 1. Flat floor 2. Movable tables and chairs 3. Multiple walls with marker boards 4. Fixed location for projection screens and AV connections 	<ol style="list-style-type: none"> 1. Group work interaction and capture technology 2. Power outlets in floor and walls to support flexible table locations 3. Easily moveable chairs and tables to support wide range of layouts 4. Lighting: two to four zones depending on room size 	<ol style="list-style-type: none"> 1. AV Systems: same as Type 4 2. May or may not be a teaching wall 3. Example optional technology capacities include multiple projection surfaces and ceiling projectors, linkable to student and/or instructor laptops.
<ol style="list-style-type: none"> 1. Movable tables and chairs optimized for small group interaction (e.g., open-square, horseshoe for larger rooms; and central table for smaller rooms) 2. Multiple walls with marker boards 	<ol style="list-style-type: none"> 1. Ceiling mounted projector or flat panel monitor (all larger rooms, smaller rooms where practical) 2. Power outlets in floor and walls for larger rooms, and walls only for smaller rooms 3. Lighting: two to four zones 	<ol style="list-style-type: none"> 1. Seat layouts: <ul style="list-style-type: none"> • hollow-square/ horseshoe • central table/ meeting room 2. AV/Distance Learning Systems: <ul style="list-style-type: none"> • Enhanced AV (<100 seats) • VC-Enabled AV (Distance Education)
<ol style="list-style-type: none"> 1. Flat floor 2. User defined technical requirements 3. Fixed group table with moveable chairs that supports small group interaction requiring additional or special purpose equipment 4. Demonstration bench 	<ol style="list-style-type: none"> 1. Group work interaction and capture technology 2. Power /bench services reflect user defined technical requirements 3. Marker boards adjacent to each group bench 	<ol style="list-style-type: none"> 1. Example optional technology capacities: <ul style="list-style-type: none"> • Ceiling mounted camera over each table • Projection capability or large flat panel monitor at or adjacent to each bench, linkable to student laptops and/or instructor laptop
<ol style="list-style-type: none"> 1. Videoconferencing-based distance education or lecture capture-enabled AV system determines room shape and very specific environmental attributes (e.g., sound, lighting, seat and table layout, etc.) 2. Fixed tables 	<ol style="list-style-type: none"> 1. Ability to hear each individual and see them as they speak 2. Robust infrastructure including AV as well as technical support staff and help line 	<ol style="list-style-type: none"> 1. Seat layouts vary with capacity 2. Support rooms that may include AV Rack Operator Room, AV Storage Room, Vestibule, Closet Projection screen or flat panel display
<ol style="list-style-type: none"> 1. Wide variety of possible locations and configurations, indoors and outdoors 2. Wide variety of seat types 3. Wide variety of seat cluster sizes 4. Number of seats is a function of local requirements and capacities 	<ol style="list-style-type: none"> 1. Locate small clusters throughout buildings plus larger cluster(s) at circulation hub(s) or entries 2. Meaningful spaces that appear purposeful and well considered 3. Moveable and varied chair and table types (wheels/casters) 4. Power accessible from each area 	<ol style="list-style-type: none"> 1. Location 2. Seat capacity 3. Open area or enclosed 4. Possible AV considerations

4.03.2 DEFINITIONS

Type 1: Tiered Large Group

A large tiered room used primarily for lectures, classes, meetings, presentations, and performances for scheduled classes requiring a seating capacity of 75 to 500. These rooms may also serve as assembly halls, auditoriums, and theatres in support of non-instructional purposes. These rooms typically have seats oriented towards the front "teaching wall" of the room, and fixed or sliding marker boards.

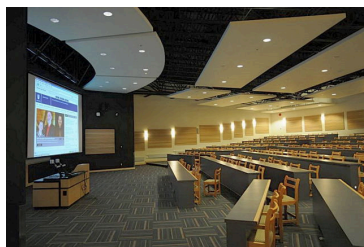
Tiered large group rooms need to include wheelchair-accessible seating in at least two separate areas of the room to create choice for wheelchair users and people with mobility impairments. Space needs to be provided for a minimum two wheelchair users parked beside one another.

This type can be loosely categorized by seat capacity as either Type 1a: 75 to 200 seats, or Type 1b: 200 to 500 seats.

Attributes



UBC Buchanan B, Rm208. Type 1a.
photo: RPG



UBCO Arts and Sci. 2, Rm140. Type 1b.
photo: UBC

1. Tiered, one or two rows per tier (two rows preferred) with variations including:
 - a. Smaller Type 1a rooms should have a shallower floor-rake with stairs or, if practical, ramps to facilitate the movement of instructors.
 - b. Larger Type 1b rooms require somewhat steeper floor rakes with stairs to facilitate face-to-face sightlines between students and instructors.
2. Long, fixed, bench-style tables, oriented towards the front of the room.
3. Minimum of 50% of all seats provided with one power point and, as practical, a preference for one power point per seat.
4. Moveable seats.
5. Five percent of seating space should be accessible to wheelchair users and people unable to use stairs; this is most effectively achieved by utilizing removable seats in accessible sections that allow the accessible seating areas to be flexible in their use.
6. Type 1b rooms and sometimes the largest Type 1a rooms typically have additional attributes including:
 - a. Wide spans and multi-storey height in order to accommodate sightlines and acoustical requirements.
 - b. Increased distance between the instructor and students offset by inclusion of multiple vertical and horizontal cross aisles to support the movement of instructors.
 - c. Special lighting and lighting zoning considerations. Depending on room size, lighting control will be either by switch or both switch and AV control system.
 - d. Special acoustic design requirements including wall and ceiling treatments and sound reinforcement for instructors.
 - e. Additional room controls for lighting, window coverings, AV equipment, and communications between students and instructors.
 - f. Support spaces for projection, storage, and sound-lock entry.

- g. Up to two tiers of sliding marker boards (top tier is covered when dual projection screens are lowered).
7. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

Type 2: Case-Style¹



Wharton U. of Pennsylvania, John M. Huntsman Hall. photo: UBC via Flickr

A medium- to large-tiered room provides a balance between traditional tiered rooms and the promotion of dynamic interaction between students and instructors for scheduled classes requiring a seating capacity of 40 to 100. To achieve this balance, these rooms have a steeply curved horseshoe-style tiered fixed-bench layout. The open ends of the fixed benches are oriented towards the front of the room to also provide reasonable sight lines to written and projected materials on the front wall. These rooms are used primarily for lectures, classes, meetings, presentations, discussions, and debates.

Tiered large group rooms need to include wheelchair-accessible seating in at least two separate areas of the room to create choice for wheelchair users and people with mobility impairments.

Attributes



Harvard Business School, Hawes Hall
photo: www.eypaedesign.com/project.php?subj=1andpage=1andproject=21#

1. 40 to 100 seats.
2. Tiered, one row per tier, typically two to six tiers total.
3. Long, fixed, bench-style tables, oriented towards the front of the room.
4. Minimum of 50% of all seats provided with one power point and, as practical, a preference for one power point per seat.
5. Moveable seats.
6. Five percent of seating space should be accessible to wheelchair users and people unable to use stairs; this is most effectively achieved by utilizing removable seats in accessible sections that allow the accessible seating areas to be flexible in their use.
7. Depending on room size, lighting control will be either by switch or both switch and AV control system.
8. Enhanced opportunities for students to face and interact with all other students in the room.
9. Enhanced opportunities for instructor to move around the space and interact with students without climbing stairs.
10. Three projection display surfaces/walls are preferred to maximize the number of comfortable viewing angles. However, the nature of this room type may result in a more limited single projection-display surface.
11. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

¹ For reference, the term "case-style" sometimes also referred to as "case-method" has its roots in the Harvard University Business School where this layout originated.



Type 3: Open Design General

Purpose

A medium to large flexible room used for the widest range of scheduled class activities requiring a seating capacity of 30 to 120. These are the most common learning spaces at UBC. As they have moveable furniture, these spaces are flexible. Furniture can be configured to suit a range of pedagogies and learning modalities. These spaces require instructors to return furniture to its original location at the end of class.

Attributes



UBC, University Centre Lower Level
photo: UBC



American University. Example of "SCALE-UP" type room.

photo: http://scaleup.ncsu.edu/groups/adopters/wiki/1f6b2/American_University.html

1. Flat floor.
2. Flexible seating arrangements so that students and instructors can easily interact with each other in small or large groups.
3. Standard moveable chairs and standard moveable tables.
4. Five percent of seating space should be accessible to wheelchair users.
5. Minimum of 30% of all seats provided with one power point.
6. Multiple walls with marker boards and capacity to view and interact with digital material as a group.
7. Depending on room size, lighting control will be either by switch or both switch and AV control system
8. See section 5.09.4 (Learning Technology and AV Systems Categories) for AV system category references.
9. A variation of Type 3 is the "SCALE-UP" (Student-Centered Active Learning Environment for Undergraduate Programs) room.
 - a. These rooms are typically oriented towards the sciences, math, and engineering, but can be used in the arts.
 - b. Students typically sit in round tables of nine (three groups of three). Each team of three students usually has a laptop (provided or student-owned) with Internet access.
 - c. The instructor's workstation can be located anywhere in the room. (In design, it can be located anywhere, but if it has AV equipment or computers, it will have a fixed location).
 - d. Surrounding marker boards act as public thinking spaces. Optional multiple ceiling-mounted projectors support group presentations.
 - e. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references. Optional additional technologies may include:
 - Multiple ceiling-mounted projectors and/or flat panel displays to support small group presentations
 - Additional instructor workstation capabilities such as the ability to view the laptop material at any table and project that material to the whole class.

Type 4: Small Group

A room that is particularly suitable for small group discussion, meetings, presentations, and collaboration for scheduled classes requiring a seating capacity of 8 to 40. In these rooms, students are typically seated around central tables. This type can loosely be categorized by seat capacity and table configuration as Type 4a: 16 to 40 seats and Type 4b: 8 to 16 seats.

Attributes



UBC, Library Processing Centre
photo: UBC



Emory College, Cox Hall.
photo: <http://cet.emory.edu/cox/classrooms.cfm>

Type 5: Studio Lab

Key Attributes



UNBC Northern Medical Program Bldg.
photo: RPG

General

1. Flat floor.
2. Face-to-face seating arrangement so that students and instructors can easily interact with each other.
3. Moveable chairs, sometimes on casters, and movable tables.
4. Minimum of 30% of all seats provided with one power point.
5. Marker boards on multiple walls and capacity to view and interact with digital material as a group.

Type 4a: 16 to 40 Seats

6. A combination of easily reconfigurable tables typically organized in a rectangular "hollow-square" format, surrounded by chairs.
7. Type 4a seating requires more space per person than Type 4b.
8. Capacity for digital material viewing via ceiling mounted projector and consideration for interactive whiteboard-projector technology.
9. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

Type 4b: 8 to 16 Seats

10. A single table or combination of tables in the centre of the room, surrounded by chairs. Tables are rarely moved.
11. Capacity for digital material viewing either via wall mounted flat-panel display or ceiling-mounted projector and consideration for interactive whiteboard-projector technology.
12. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

A medium sized somewhat specialized room with fixed benches organized into clusters of four to eight students (six is typical), for scheduled activities requiring a seating capacity of 40 to 80. Benches support students working in pairs or small groups around focused tasks, and are typically equipped with additional technology and services including computer monitors and keyboards, power and data. These rooms are infrequent at UBC and typically developed as multipurpose or first-year classroom labs for science and health science programs (see Type 4b Active Learning Classroom or "SCALE-UP" for a somewhat similar but more flexible space variation).

1. 40-80 seats.
2. Flat floor.
3. Fixed benches each with four to eight seats supporting students working in pairs or small groups around focused tasks. Benches may be higher or standard height. Bench technology typically includes one computer monitor and keyboard per two to three seats, power, and data. Bench layouts support movement of instructors to each bench and student.
4. Movable chairs on casters. Chairs may be standard height or higher if higher



UBC Hebb Building, First-Year Physics.
photo: RPG

benches are used.

5. Two walls minimum, three preferred, are provided with marker boards to support collaborative work by student groups or interaction with instructors.
6. Instructor workstation is typically located in the front of the room adjacent to primary "teaching wall" with marker boards and projection surfaces. This workstation includes UBC standard items plus sometimes additional control options such as:
 - a. Overhead camera to send image of demonstration to student bench monitors.
 - b. Projecting computer-based products, information, or presentations of any particular student group to the whole class.
7. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

Type 6: Videoconferencing/ AV-Capture-Enabled

A small to large room used for camera-enhanced learning activities, in particular for videoconference (VC)-based distributed learning where participants at multiple sites can interact and learn together and have the same or a very similar learning experience.

Seating capacities can range significantly from 8 to 500 seats. These rooms typically have very specific technology and requirements in order to effectively support the distributed learning experience, and reduced flexibility in design and furnishings to accommodate technical camera requirements, a fixed instructor workstation, more specialized lighting, specific colour requirements, limited room dimension ratios (width, depth, height), additional secure access requirements, fixed microphone points, and additional control requirements

Attributes



UBC School of Medicine, Royal Columbian Hospital. photo: RPG

1. For smaller rooms (typically 8 to 40 seats):
 - a. Moveable seats around a central or "horseshoe" table configuration, oriented towards video-conference projection screen or flat-panel display and VC cameras.
 - b. Typically requires a fixed table arrangement to support very specific view angles for VC.
 - c. Careful control of acoustics, lighting, and wall colours to support effective VC.
 - d. May require additional support space for AV Equipment Rack, System Operator and AV Equipment Storage.
2. For larger rooms (40 seats and larger), same as for small rooms except as follows:
 - a. Fixed tables in rows, facing towards projection screens or other displays.
 - b. May require additional support space for AV Equipment Rack, System Operator and AV Equipment Storage, Vestibule.



UNBC Northern Medical Program.
photo: www.wood-works.org/BC/Wood%20First%20Act/Showcase/UofNBC?Language=EN

- c. Type 1 rooms require an appropriately sized (minimum 24 square meters) lockable AV booth at the back of the room to provide housing for the AV equipment racks and an AV operator position, as well as mounting locations for the projection equipment.
 - d. Type 1 rooms may require an AV technician operator in the AV booth with a clear view of the front of the auditorium to assist with large or complex events, such as multipoint videoconferencing.
 - e. Larger rooms may require additional specialized communication technologies such as student microphones (one per two seats) and voice-tracking cameras.
3. See section 5.09.4 (Learning Technology and AV System Categories) for AV system category references.

Type 7: Informal

Informal learning space (ILS) comes in many varieties, sizes, and seat capacities, and can be configured as enclosed rooms or open areas off of or within corridors, atria, or outdoors. These spaces are not scheduled and are available for a variety of student uses including study, waiting between classes, socializing, interacting with each other or with instructors, etc. For the purpose of this document, ILS has been loosely categorized into three types:

- 7a. Centralized (i.e., student lounges, breakout rooms, large open areas with combinations of individual and group tables and chairs).
- 7b. Distributed (i.e., small clusters of seats located throughout a building, such as corridor seating).
- 7c. Cafés (i.e., seating designed to be part of cafés)².

Attributes

General



UBC Ike Barber Learning Centre:
Type 7a, Centralized. photo: RPG

- 1. Key AV attributes for ILS will vary widely depending on the space type and user requirements. However, typically ILS will require lighting suitable for study, power for laptops, and wireless access to the Internet.
- 2. In some cases, particularly Type 7a and Type 7b, loose furnishings are often moved into classrooms and so fixed seating may be preferred.
- 3. In most cases, ILS is open whenever the building in which it is located is open.

Type 7a, Centralized

- 1. Larger, higher-capacity spaces that may be open or partially enclosed.
- 2. Typically easy to locate, often near a main building entrance.
- 3. Typically include multiple types of study arrangements (e.g., group study, individual, breakout rooms, etc.).

Type 7b, Distributed

- 1. Decentralized, located throughout a building.
- 2. Often located outside of classrooms and in corridors, areas of refuge,

² Though cafés are considered ILS, design requirements for cafés are determined by UBC Food Services.



UBC Buchanan A Corridor:
Type 7b, Distributed. photo: RPG



UBC Buchanan A Café:
Type 7c, Cafés. photo: RPG

stairwells, and transition spaces between adjoining buildings.

Type 7c, Cafés

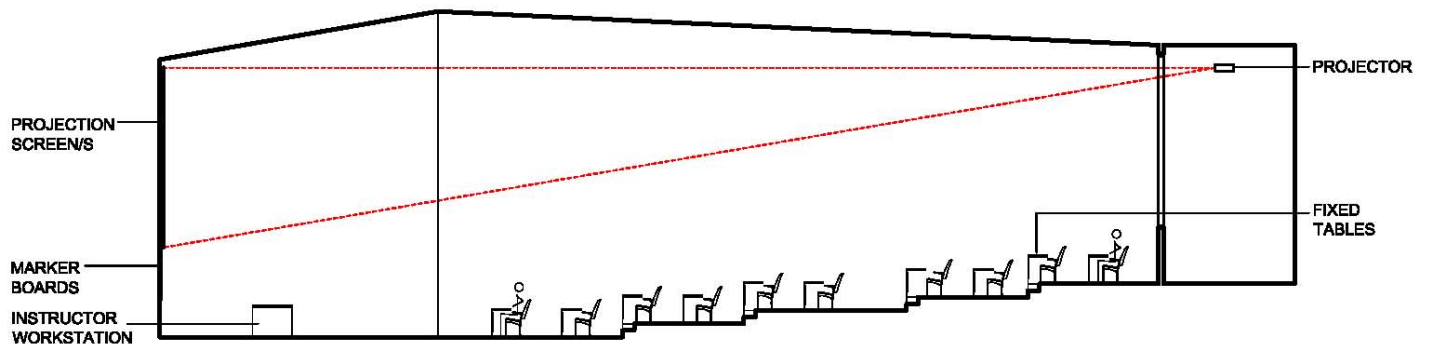
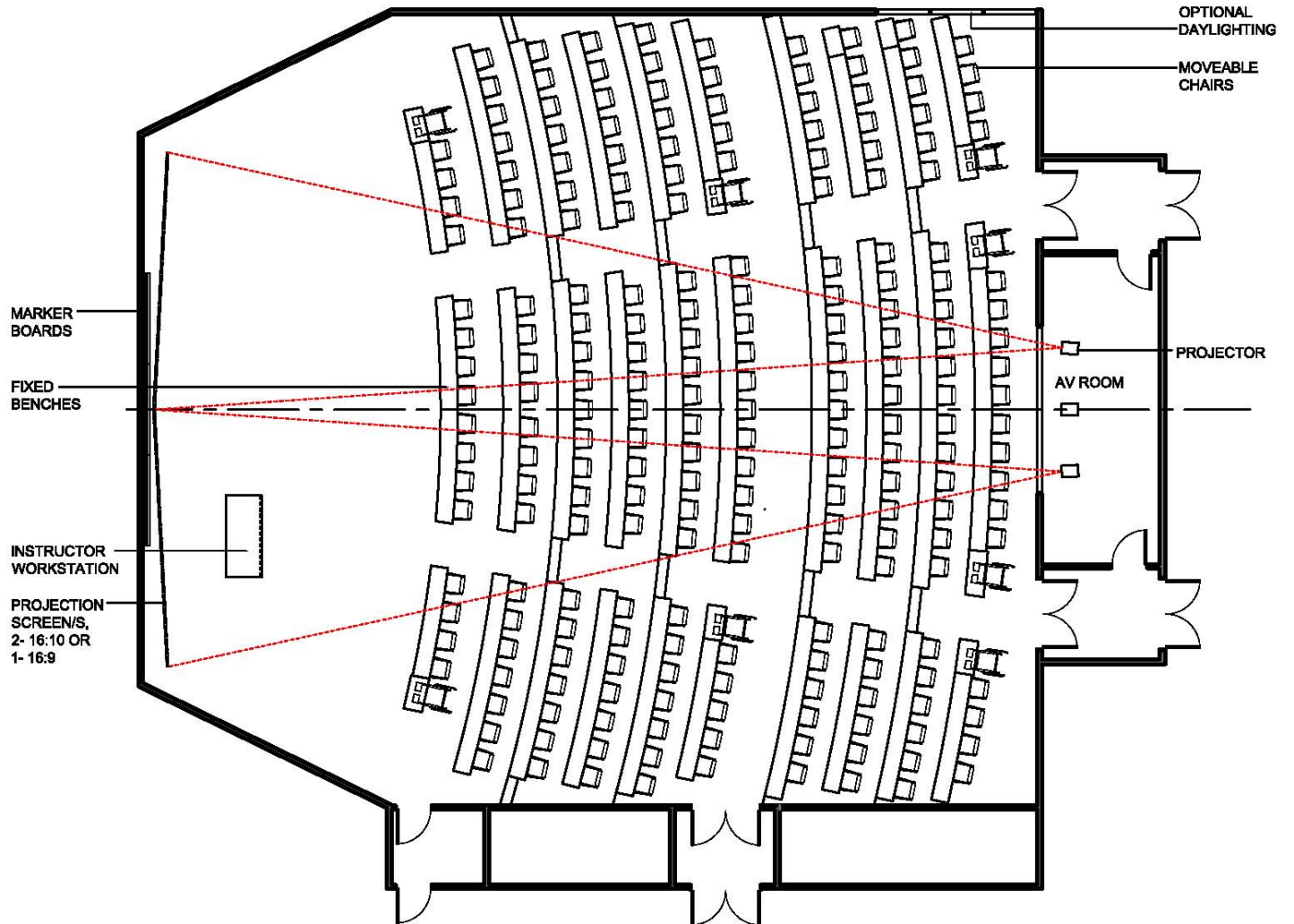
1. Accommodates individual students and large groups, typically accommodating 30 to 45 people.
2. Support a range of activities including eating, socializing, group activities, meetings, individual reading and studying, and waiting.
3. Typically located close to a main building entrance.
4. Varied furnishings (e.g., flexible seating in Buchanan A café; fixed seating in Woodward IRC).



**4.04 EXAMPLE GENERIC ROOM
TYPE DIAGRAMS**

**4.04.1 TYPE 1B: TIERED LARGE
GROUP**

Example Diagram Metrics:
Area: 497 nsm; No. of Seats: 226; 2.16 nsm/seat.

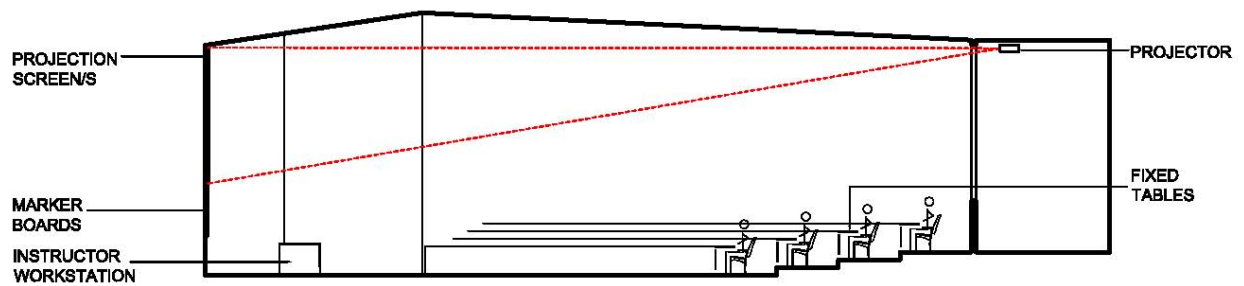
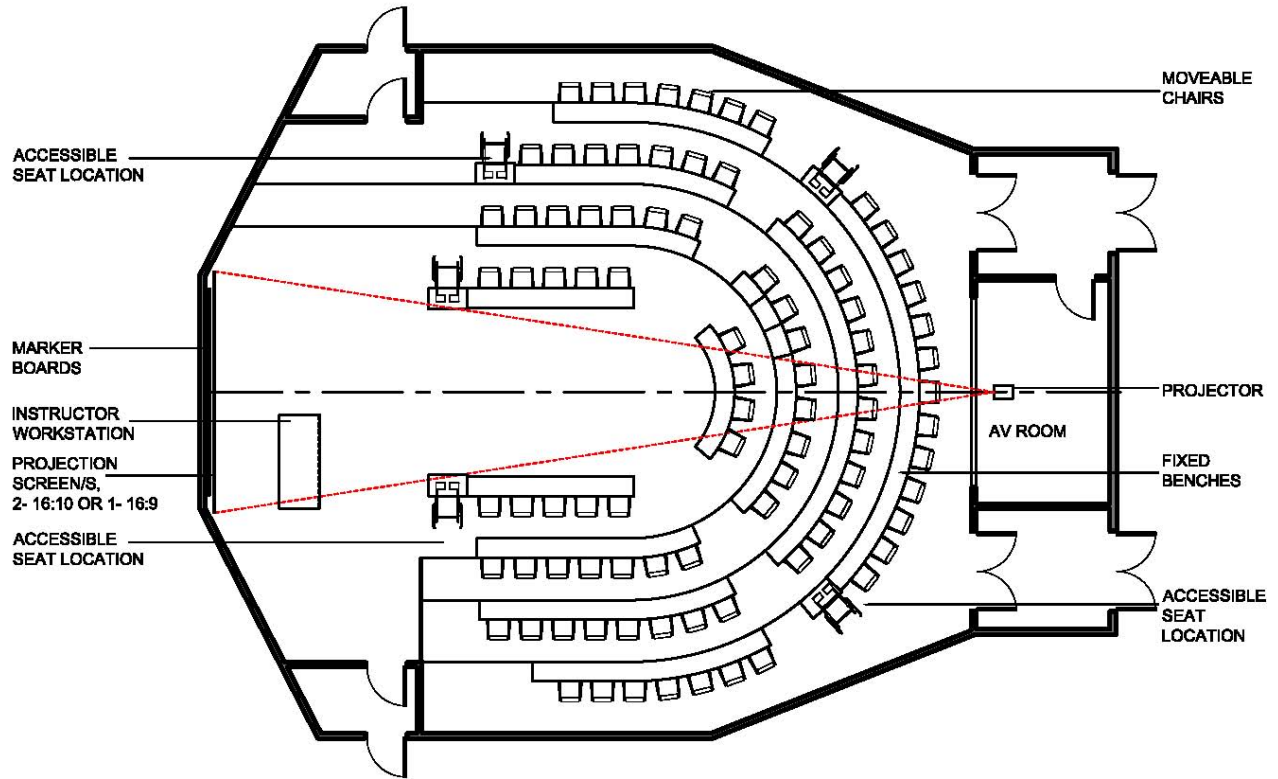




4.04.2 TYPE 2: CASE-STYLE

Example Diagram Metrics:

- Area: 253 nsm;
- No. of Seats: 95
- 2.66 nsm/seat





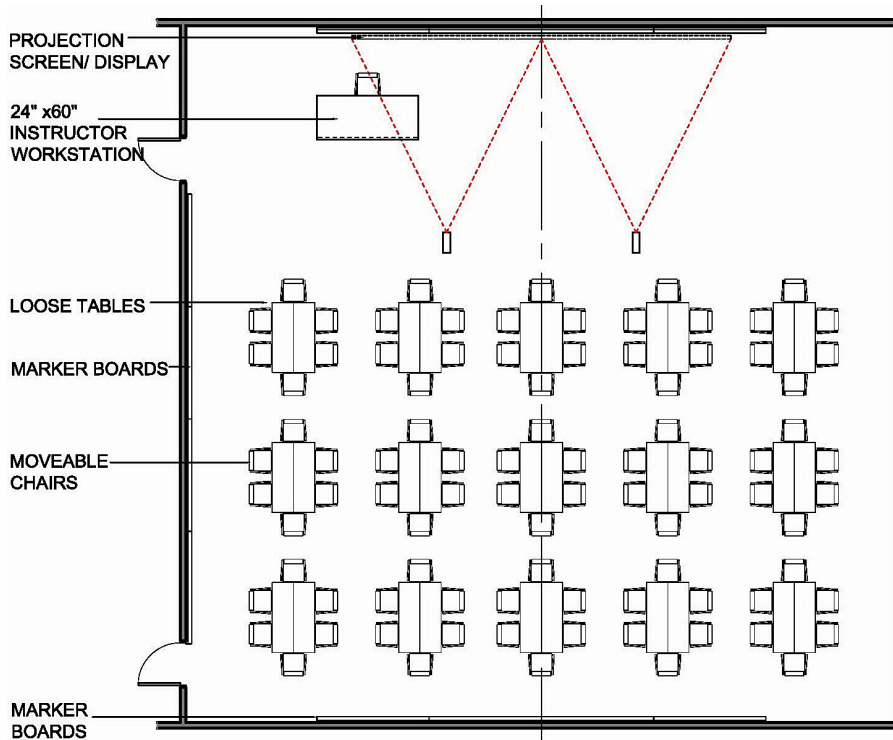
4.04.3 TYPE 3: OPEN DESIGN GENERAL PURPOSE

Version 1: Clusters

Example Diagram

Metrics:

- Area: 234 nsm
- No. of Seats: 90
- 2.60 nsm/seat

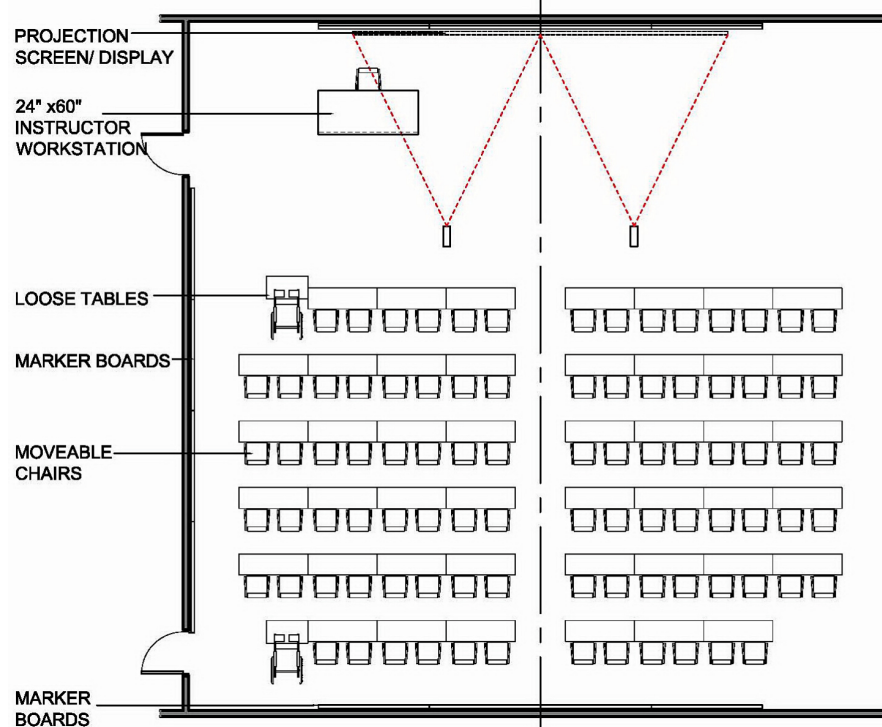


Version 2: Rows

Example Diagram

Metrics:

- Area: 234 nsm
- No. of Seats: 92
- 2.50 nsm/seat

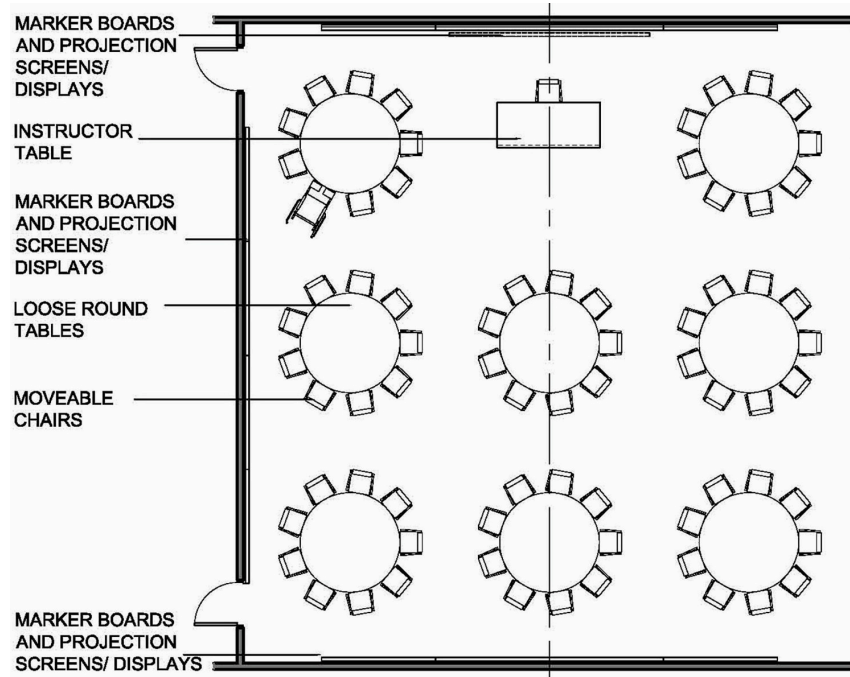


Version 3: "SCALE-UP"

Example Diagram

Metrics:

- Area: 178 nsm
- No. of Seats: 72
- 2.47 nsm/seat



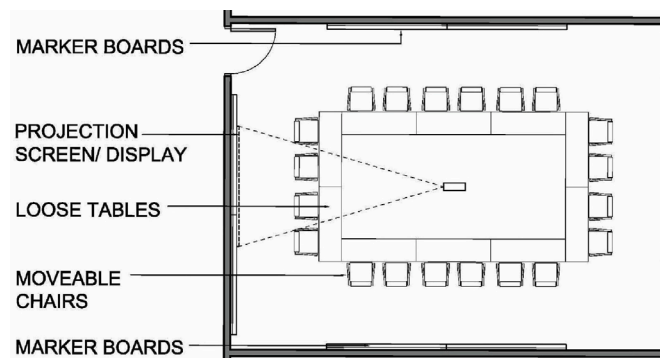
4.04.4 TYPE 4: SMALL GROUP

4a.

Example Diagram

Metrics:

- Area: 58.4 nsm
- No. of Seats: 20
- 2.90 nsm/seat

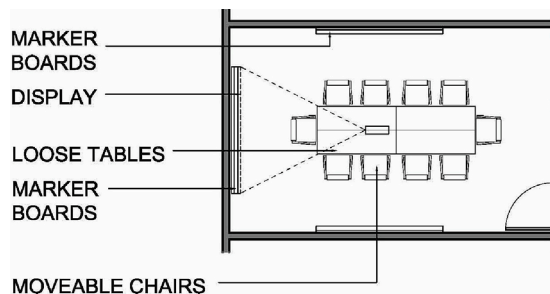


4b.

Example Diagram

Metrics:

- Area: 24.7 nsm
- No. Seats: 10
- 2.50 nsm/seat



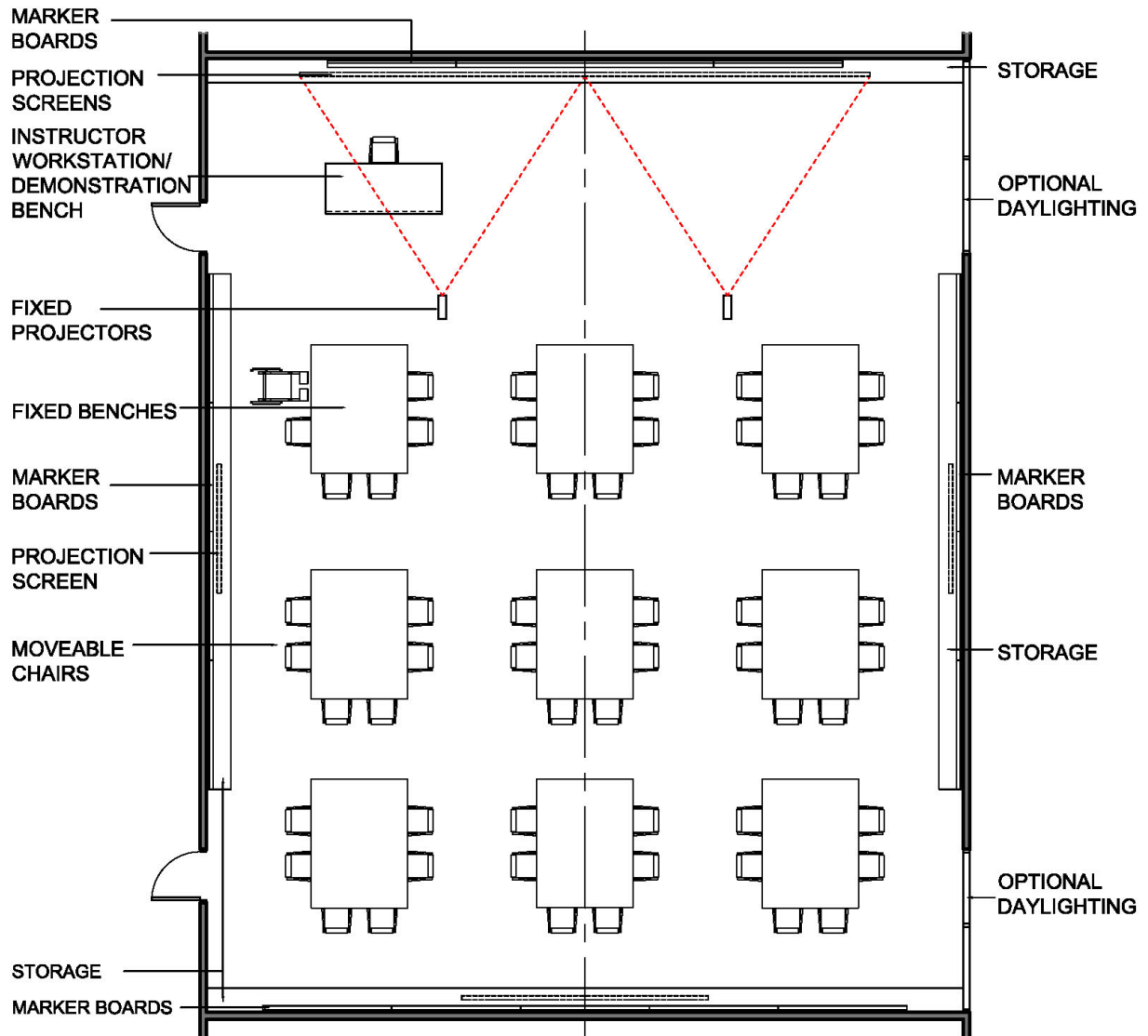


4.04.5 TYPE 5: STUDIO LAB

Example Diagram

Metrics:

- Area: 259 nsm
- No. Seats: 54
- 4.8 nsm/seat





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Section 5: General Design Considerations

5.01 INTRODUCTION

In this section:

- 5.01 Introduction
- 5.02 Room Size Considerations
- 5.03 Sightlines and Room Dimensions
- 5.04 Accessibility
- 5.05 Sustainability
- 5.06 Informal Learning Spaces
- 5.07 Doors and Windows
- 5.08 Finishes
- 5.09 Specialities and Equipment
- 5.10 Furnishings
- 5.11 Lights and Lighting Controls
- 5.12 Emergencies and Security
- 5.13 Mechanical Systems Access

5.02 ROOM SIZE CONSIDERATIONS

Learning spaces will be large enough and appropriately dimensioned to comply with the principles described in the previous section and to accommodate the anticipated seat count, pedagogies, learning technologies, furnishings, accessibility, and building code requirements. As a result, it is critical to consider the following before confirming wall locations:

1. Overall room size, room dimensions, seat count and type, and general learning technology criteria are defined in the pre-design stage of functional programming and by Facilities Planning. **Rooms should be column free.** Ceiling height will determine optimal room dimensions.
2. Projection screens/displays: determine number, size, and location of projection screens/displays based on pedagogical requirements, sightline considerations, and overall room size, height, and type.
3. Marker boards (white boards, chalk boards, black boards, interactive white boards, other wall writing surfaces): determine number, size, and location of marker boards based on pedagogical requirements, sightline considerations, and overall room size and type.
4. Aisle locations and sizes: determine based on anticipated pedagogies including opportunities for students and instructors to effectively move and circulate to interact with one another, and in compliance with code and accessibility requirements.
5. Room aspect ratio (width to depth) and height: determine once aisle locations and sizes and the number, size and location of projection screens/ displays are confirmed, based on sightline considerations. Consider the importance for instructors and students to be able to make eye contact, and to hear each other
6. Large Type 1 tiered group theatres should have an enclosed projection booth to house projectors and equipment racks. The room should be accessible from the entry vestibule or foyer outside the classroom wherever possible.



5.03 SIGHTLINES AND ROOM DIMENSIONS

5.03.1 SIGHTLINES

a. General

1. Base design on the functional, pedagogical, and learning activities expected to take place in the classroom, and not on other external building considerations which may force the learning space into an inappropriate shape.
2. Balance the conflicting objectives of wider, shallower rooms (that make it easier to be closer to the audience in the most distant seats) with longer, deeper rooms (that may be more effective in terms of sightlines to projection screens/displays and marker boards).
3. Ensure there are no sightline obstructions between seats and projection screens/displays and marker boards in new construction. In Renew and smaller renovation projects, minimize the impact of existing obstructions.
4. The room will be designed to allow for an uninterrupted projection path from the mounted projector location to the screen locations. Suspended lighting fixtures will be taken into account.
5. Ensure that, from the front of the room, instructors are able to make eye contact with all students.

b. Horizontal Viewing Angle

1. The maximum off-axis horizontal viewing angle from the centre of a projection screen/display with a 16x10 aspect ratio is +/- 42 degrees (preferred) to 45 degrees (maximum), resulting in an 84 degrees (preferred) to 90 degrees (maximum) side-to-side cone. Up to 5% of seats may be outside of the 84 to 90 degree cone, if required.
2. In large rooms where there are two or more projection screens with different images, it may be necessary to angle the screens toward the centre of the room to ensure both screens can be viewed with equal legibility and the seats are within required viewing angles.

c. Vertical Viewing Angle

1. The nominal vertical viewing angle for the audience will be 30 degrees from eye level to the top of the screen. Up to 8% of all audience seats may be at a vertical viewing angle of up to 36 degrees
2. The minimum distance from the lower edge of the projection screen/display to the floor is 1220 mm (48") for Type 3 rooms.
3. For Tiered Large Group, the lower edge of the screens/displays should be above 2000 mm.

Source: University of Toronto, St. George Campus

5.03.2 SEATING LAYOUT

Source: UBC

1. Locate the front row of seating no closer than 1.3x the projection screen/display height.
2. The maximum ratio of the distance from the projection screen/display to the most distant viewer is 6x screen height. Up to 5% of seats may have a maximum ratio of 6.3x screen height, if required.
3. Ensure wheelchair-accessible viewing positions meet all clear space and viewing angle requirements. Where fixed seating is used, clear space and aisle widths accommodating people using walking aids and wheelchairs will be provided.



5.03.3 STEPS, RAMPS AND AISLES

a. Steps and Ramps

Source: UBC

1. For tiered rooms with fewer than 200 seats, consider a shallow tier and the use of ramps rather than steps to facilitate the movement of instructors. For tiered rooms of more than 200 seats, consider a steeper tier with steps to facilitate eye contact between students and instructors. Where ramps are used, the preferred slope is 5%, although 8% is permitted with appropriate landings.
2. Minimize opportunities for instructors **and students** to stumble by ensuring that steps have consistent rise and run dimensions across the full width of the aisle, and that **stair nosings are highlighted with a minimum of 38 mm to maximum 50 mm high-contrast photo-luminescent strip for the full width of the step tread and extending down the face of the nosing for 38 mm to 50 mm.**
3. **Provide stair lights integrated into seating or risers. Lights should have daylight sensors and should not be tied into the Emergency Lighting system. Consider LED lights for longevity. See UBC Technical Guidelines Section 16505 (Interior Building Lighting).**
4. Provide two rows of seats per tier, subject to required pedagogy.

b. Aisles

Source: University of Toronto, St. George Campus + Florida

Source: UBC

1. Balance conflicting aisle location and size objectives including the preference of some instructors for a centre aisle, overall sightlines, and "the best-seats-in-the-house" (seats that would be provided in the space otherwise consumed by a centre aisle).
2. Aisle location and size will support instructors walking through the seating area to support interaction with students, and invigilation during exams. More aisles (vertical and horizontal) that create opportunities to interact with students are preferred by instructors.
3. Row to row (fixed or moveable tables with moveable seats): provide a minimum of 1000 mm (39") from table-back to table-front, and preferably 1220 mm (48"). The preferred figure provides more space for instructors to circulate among students.
4. Seating locations for wheelchair users need to provide a clear and level area not less than 900 mm wide for each position and either 1525 mm long (to permit side entry of the wheelchair off an aisle) or 1220 mm long where the wheelchair enters from the front or rear of the space.
5. Minimum 1100 mm (43") wide aisle(s) leading to front of room.

5.03.4 CEILING HEIGHT

1. Ceiling height is primarily a function of requirements for projection screen/display plus marker boards heights. Projection screens/displays are typically available in fixed sizes and proportions that will be considered.
2. Ceiling plenums to be accessible for servicing and maintenance of lighting, learning technology, finishes, and other ceiling systems.
3. Ensure no obstructions between projection screens and projectors.



4. The height of the front wall for a Type 1 or 2 space will be high enough to accommodate the required screen height (based on the screen with calculated aspect ratio of 16:10 (16 wide to 10 high) with the bottom of the screen being at least 2000 mm from the finished floor.

5.03.5 INSTRUCTIONAL AREA

1. Locate the instructor workstation in the instructional area at the front of the learning space, either in the corner or just off centre stage right
2. Orient the instructor workstation to allow instructors to maintain eye contact with all students and to not block sightlines to marker boards or projection screens/displays.
3. Provide sufficient space at the front of the room for wheelchair circulation around the instructor workstation.
4. Provide a wheelchair-accessible route to the instructional area.
5. **In Type 1, 2 and 3 rooms, provide sufficient space at the front of the room for an instructor table (24"x60") and chair. Additional chairs may be required for Type 1 and 2 rooms.**



5.04 ACCESSIBILITY

5.04.01 ACCESSIBILITY CONSULTANT

Retain an Accessibility Consultant to ensure compliance with building codes and to assist in determining effective solutions to mobility, visual, acoustic, and environmental sensitivity considerations.

5.04.02 ACCESSIBILITY PRINCIPLES

a. Common Experience

Design to make it as easy as possible for people with special needs to effectively teach and learn in learning spaces, and to accommodate these individuals in an integrated fashion that provides them with an experience that is safe and, to the extent practical, the same as others. Considerations for this common experience should include all functional aspects of the space including entrances, circulation, access to and use of learning technologies, room environmental controls, and opportunities for interaction with other students and instructors.

b. Compliance with Codes, Standards and Regulations

Design to comply with the BC Building Code and UBC Technical Guidelines regarding accessibility and adherence to the seven principles of Universal Design. Consult these sources directly, as well as other relevant materials for more detailed information. New space will minimally meet these requirements. Renovated space will be brought up to as high a level of accessibility as practical.

In addition, accessibility design standards can be guided by the Americans with Disabilities Act Architectural Guidelines, the UBC Campus Plan Design Guidelines, as well as current, applicable amendments to these regulations. This additional reference is noted as it outlines requirements for some specific space types such as classrooms, auditoriums, theatres, etc.

c. Environmental Sensitivities

See also section 5.05.2 (Additional LEED® Considerations).

Minimize conditions that can cause environmental sensitivities whenever possible, including the use of materials with chemical aromas such as carpet glue, paint, and roof tar.

d. Acoustic Considerations

See UBC Technical Guidelines and section 5.09.4b (Assisted Listening System).

e. Mobility Considerations

Mobility considerations to meet or exceed building code requirements. Notwithstanding this requirement, key mobility considerations include:

Source: Pennsylvania State University

1. Clear and easily accessible routes and means to and from the exterior building doors to and from the classrooms.
2. Instructor space at the front of the room to be accessible to wheelchair users and people using walking aids.
3. Door hardware is to be lever-operated handsets with a handle return in place of all conventional round doorknobs. Door handles, pulls, latches, locks, and other operational devices should be operable with one hand and



with minimal force and should not require fine finger control, tight grasping, pinching, or twisting of the wrist.

4. All interior doors are to be equipped with low-resistance, delayed-action closers unless mandated by specific Fire Code requirements.

f. Wheelchair Lifts and Elevator Access Considerations

Wheelchair lift and elevator access considerations to meet or exceed building code requirements. Notwithstanding this requirement, key considerations include:

1. Provide a direct route for wheelchair users and people with mobility impairments to get to the accessible seating areas and to the front of the room.
2. Where a stairway wheelchair lift is required in order to access a classroom, the staircase width is to be a minimum of 1066 mm wide.
3. Provide card reader access for all wheelchair lifts.
4. Wheelchair lifts and Elevators will not be generally available for others except for the movement of equipment and/or building maintenance. If these elevators are located behind a locking door, then that door will also be accessed by card reader.

g. Signage Considerations

Refer to the "UBC Sign Standards and Guidelines" (separate cover) for design guidelines containing descriptions, policy statements and design specifications for each type of sign used on campus. **Tactile signs using high contrast colours are required for all classroom signs.**

h. Seating Considerations

See section 5.10.1.d (Accessible Seating).



5.05 SUSTAINABILITY

5.05.1 GENERAL PRINCIPLES

Design all learning spaces for the future by considering the life cycle of all aspects of the project including the building, the rooms, infrastructure, fittings, and furnishings. General principles include:

*Source: adapted from "Vancouver Campus Plan Design Guidelines."
http://www.planning.ubc.ca/vancouver_home/plans_and_policies/campus_planning.php*

1. Social, Economic, and Ecological Considerations. Integrate sustainable best practices in design including:
 - i. An emphasis on social sustainability to bring students, staff, faculty, as well as local neighbourhood residents, and visitors together for academic purposes as well as other recreational and cultural activities.
 - ii. Consideration of ecological sustainability through energy reduction strategies within the general context of functional requirements.
 - iii. Consideration of economic sustainability through use of design and material selection strategies that promote cost-effective, durable, and low-maintenance buildings and improvements.
2. Leadership in Environmental and Energy Design (LEED): design for new construction and major renovation to achieve the most recent version of LEED® Gold certified standards or approved equivalent, as amended from time to time, plus the additional requirements that:
 - i. Some optional LEED® credits will be mandatory for projects at UBC.
 - ii. Some optional LEED® credits, if selected, will trigger additional UBC-related design criteria.
 - iii. Some additional UBC sustainability measures are required for which there are no associated LEED® credits.
 - iv. Interior improvements should use the most recent version of LEED-CI® (Commercial Interiors) as a framework until its replacement LEED-IDandC® (Interior Design and Commercial) is established.
3. Living Lab Sustainability Opportunities: as part of UBC's Living Lab objectives, design is encouraged to embrace innovation and managed experimentation.
4. Monitoring: all new buildings provide performance monitoring (metering) infrastructure for electricity (lighting, plug loads and mechanical system), thermal energy, and water.
 - i. Consider monitoring large Type 1 spaces individually to provide building energy feedback to students.
 - ii. Design all new construction performance monitoring equipment to interface with UBC's online energy management information system (EMIS) and to include display features for building occupants and passers-by to show building performance and inform behaviour change initiatives



5.05.2 ADDITIONAL LEED® CONSIDERATIONS

a. LEED® Obligations

The requirement for LEED® Gold certification is triggered in all new building construction and major renovations (i.e., UBC Renew), and further detail is not required in this document. However, it is important to consider how this requirement impacts learning spaces, including the following considerations:

1. Energy Consumption
 - i. UBC requires that as part of LEED® Gold certification, all new construction and major renovations achieve five points in Energy and Atmosphere credit 1: Optimize Energy Efficiency.
 - ii. Significance for learning spaces: All energy-consuming features in a building must now be part of the overall energy performance strategy for the building (computers and AV equipment are now included). This is a new requirement that was introduced in the 2009 version of LEED®. This will require additional coordination between the learning space designer and the rest of the project team.
2. Other LEED® categories
 - i. The remaining LEED® credits that interface with learning spaces are not presently mandatory at UBC, though it is very likely some of them will become mandatory in the next year. Campus Sustainability is preparing a LEED® Implementation Guide for UBC and is assessing the viability of making a number of LEED® credits mandatory. Campus Sustainability will advise Facilities Planning of the outcomes to be incorporated in future revisions of the Learning Space Design Guidelines.

b. LEED® Opportunities

Though most of the LEED® credits that interface with learning space environments are not mandatory, a number of these credits are easily achievable and some provide tangible benefits directly to the occupants (e.g., improved air quality). Campus Sustainability recommends that environmental performance criteria for the following LEED® credits be mandatory in the design of learning spaces:

1. EQ 4.1 Low Emitting Materials
 - i. Adhesives and Sealants
 - ii. Paints
 - iii. Flooring Systems
 - iv. Composite Wood and Agrifibre
2. Subject to review by Facilities Planning, additional LEED® credits will be made mandatory for learning space design, including but not limited to:
 - i. Credits for materials with recycled content
 - ii. Rapidly renewable materials



- iii. Certified wood products
- iv. Daylight and views

To implement these recommendations, the above LEED[®] credit performance requirements will be considered integral parts of the Learning Space Design Guidelines and will be integrated within these respective sections (e.g., finishes and furnishings) in future versions of the Learning Space Design Guidelines.

5.05.3 REFERENCES

Standards with sustainability related requirements that should be referenced include:

1. Energy and Thermal Comfort

- a. ASHRAE Standard 55 – the most recent version of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Standard 55 Thermal Environmental Conditions for Human Occupancy.
- b. ASHRAE Standard 62.1 – the most recent version of ASHRAE Standard 62.1 Ventilation for Acceptable Indoor Air Quality.
- c. ASHRAE Standard 90.1 – the most recent version ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings.
- d. MNECB (Model National Energy Code for Buildings) – energy.
- e. Energy Star – equipment energy.

2. Indoor Environmental Quality

- a. EPA (US Environmental Protection Agency) – chemicals of concern list (surfaces, materials, etc.).
- b. MERV (Minimum Efficiency Reporting Value) – filter rating requirements (sizing filter racks in HVAC).
- c. SCAQMD (South Coast Air Quality Management District) – coatings and adhesives (floors, walls etc.).
- d. Green Seal – coatings and adhesives.
- e. Green Label+ – carpet and carpet adhesive.
- f. GreenGuard – furniture.
- g. FloorScore – Resilient Floor Covering Institute (RFCI).
- h. Ecologo or Environmental Choice – floor waxes, cleaning products.
- i. SMACNA (Sheet Metal and Air Conditioning Contractors National Association) – during construction for managing IEQ in ducting, etc.

3. Materials

- a. FSC (Forest Stewardship Council) – for wood.
- b. C2C (Cradle to Cradle) certification.



5.06 INFORMAL LEARNING SPACE

5.06.1 RATIONALE

As pedagogy and learning modalities have become more collaborative and team-oriented, the time spent learning outside of formal learning spaces – defined as "informal learning" – has become more important. The notion that the entire campus is a learning environment is central to the concept of informal learning. Example informal learning activities include rehearsals, practice, exploration, experiments, research, note-taking, discussion, social interaction, and instructor-student meetings and discussions. In response, the campus and its buildings will be designed to accommodate these activities, encouraging and inviting informal exchanges and activities.

5.06.2 GENERAL PRINCIPLES

1. User-controlled and flexible: reconfigurable technology and moveable furniture to accommodate a variety of learning styles, with marker boards installed wherever there is seating.
2. Variety: relating to context, support the simultaneous accommodation of multiple learning activities and the needs of a range of occupants:
 - a. Variety of furnishings, aesthetics, privacy levels, and choices
 - b. Moveable furnishings
 - c. Individuals and groups: opportunities for both secluded focused learning, and more social group learning
 - d. Secure and safe environment
 - e. Attractive space where occupants feel welcome and valued
 - f. Relaxing or stimulating: varying environments that are conducive to the intended activities, including consideration for access to natural lighting, comfortable artificial lighting, and acoustics controls
3. Accessible and inclusive.
4. Connectivity: Internet access and power outlets for laptops or other devices wherever there is seating.
5. Proximity to food services (vending areas, cafés, etc.).
6. Space allocation: more space typically required per ILS seat than for formal learning space, including wider aisles between tables and other furnishings.

5.06.3 LOCATION, VISIBILITY, ACCESS

1. Locate ILS in building circulation areas (e.g., foyers, atria, niches, corridors) to support casual and planned meetings and discussions.
2. Locate ILS where it will be most used (e.g., buildings with formal learning space) and near to food or vending locations and high-traffic zones, ensuring that it is easily found and identifiable as accessible to all.
3. Provide good visibility and sightlines throughout ILS, ensuring there are no "hidden areas" and that any areas with doors have visual connections with adjacent areas.
4. Design ILS to be attractive and easily maintained, ensuring that occupants feel welcome and valued.



5. Provide direct access between inside and outside ILS, where appropriate and practical (e.g., use of operable sliding glass panel/garage doors) ¹.
6. Locate centralized ILS on the ground floor adjacent to a major entry so that it can remain open to all after hours while the rest of the building is capable of being secured to provide controlled access.

5.06.4 HALLWAYS, CORRIDORS, ALCOVES

Design hallways, corridors, and connectors to provide essential, thoughtful, and valuable common spaces for informal learning, networking, and social interaction. Examples include the provision of small alcoves which are suitable for conversations between two to four people, and larger areas for interaction between groups of six or more. The high visibility and high traffic in these areas will make them popular with users, and an important element in new construction or renovation programming.

Key interior design guidelines for corridors as ILS include:

1. Inviting colours and patterns in durable, non-skid floor coverings to define the areas.
2. Purposeful character and visual interest, rather than as "afterthoughts".
3. Privacy in some areas, and opportunities for social interaction in others.
4. Design corridors, off of larger classrooms in particular, to be larger than minimum building code requirements, to support student traffic leaving from classrooms, arriving to classrooms, and those waiting or talking.
5. Acoustic controls.
6. Suitable area and locations for waste and recycling containers.
7. Enabling technologies, for example:
 - a. Marker boards
 - b. Wireless Internet access and power for laptops or other devices
 - c. Wall-mounted flat panel display
 - d. Appropriate lighting for reading and use of laptops

5.06.5 SPACE ALLOCATIONS

Based on an analysis of selected UBC informal learning spaces, the following space allocation metrics have been defined:

1. Minimum ILS equal to 12% of all teaching space in the building², and a goal of 14% to 16% where practical.
2. ILS to be developed as a mix of centralized and decentralized, with an approximate ratio of 65% to 70% centralized and 30% to 35% distributed.

¹ As the public realm program unfolds at UBC, under the guidance of the UBC University Architect, there may be additional guidelines for ILS outdoor areas.

² For this metric, "teaching space" equals the sum of categories 1.0 Classroom Facilities and 2.0 Laboratory - Undergraduate space, excluding support space sub-categories, as defined in the "B.C. Universities Space Manual".



5.07 DOORS and WINDOWS

5.07.1 DOORS

a. Door Location

1. Locate learning space doors to minimize congestion in hallways, to minimize disruption of learning space activities by latecomers and to provide easy circulation flow and egress. Rear entry doors are generally preferred to minimize disruption by latecomers.

b. Vision Panels in Doors or Side Lights

1. Provide either a glass vision panel in door between enclosed learning spaces and adjacent hallways, or a side light immediately adjacent to the door.
2. Ensure vision panel or side light glass is transparent and shatter-resistant.

5.07.2 WINDOWS

1. Operable exterior windows to be provided where practical.
2. Locate exterior windows as follows:
 - a. To prevent direct sunlight or reflected light onto projection screens/displays, video recording equipment and marker boards.
 - b. To prevent glare and relative visual discomfort of occupants.
3. Ambient light, especially daylight, will be controlled in all rooms with projection screens/displays that will be using video recording/streaming equipment.
4. Equip exterior windows with window coverings selected by Facilities Planning.



5.08 FINISHES

5.08.1 WALLS

a. General

1. Seal all exterior wall penetrations and wall elements to achieve required minimum STC acoustic ratings. Wall finishes are integral components of the acoustical considerations of the space.
2. Folding or moveable walls are not acceptable.
3. Apply chair rails on all non-masonry back and side walls with moveable student furniture.

b. Finishes and Colour

See also section 5.05.2 (Additional LEED® Considerations).

1. Wall finishes will not result in high-contrast repetitious patterns, such as narrow horizontal or vertical slats, as these patterns may “beat” in the visual field of room occupants and be problematic for video cameras.
2. Provide the instructor workstation and other items within the field of a video camera with matte finishes that are free of polished metal surfaces as the latter in particular may produce video “hot spots” and may cause video camera iris closure.
3. Consult Facilities Planning on selection of wall colours. Notwithstanding this requirement, considerations include:
 - a. Accent colours on walls. Minor wall graphics that are general and thematic may be considered.
 - b. Warmer wall colours are preferred.
 - c. Colours of wall finishes and furnishings to be coordinated.
 - d. Table colour will not be white and instructor workstations will not be black. Instructor workstations in rooms with chalkboards should be lighter in colour to hide chalk dust.
 - e. For videoconferencing/AV-capture-enabled rooms (Type 6), a light “dove grey” colour or equivalent is ideal for the surfaces near an instructor. Brightly lit pure-white surfaces will be avoided to ensure that the instructor or student is imaged appropriately by the camera and to reduce light reflections when data projectors are in use.

5.08.2 CEILINGS

1. See section 5.03.4 Ceiling Height for ceiling height guidelines.
2. Ceiling finishes to be matte, light in colour and highly reflective - balancing the requirements for projection screen/display viewing and natural light penetration into the space

5.08.3 FLOORS

See also section 5.05.2 (Additional LEED® Considerations).

1. Sealed concrete floors in seating areas are preferable in all formal learning spaces (Type 1, 2, 3, 4) except for videoconferencing/AV-capture-enabled rooms (Type 6) which require carpet.
2. Concrete floors are not acceptable in front of formal learning instructional areas, aisles, or stairs.
3. Carpet is not generally acceptable in learning spaces, except for videoconferencing/AV-capture-enabled rooms (Type 6), and never in front of chalkboards. Where carpet is used with the approval of Facilities Planning, it should be multi-coloured or patterned rather than solid colour.
4. Consult Facilities Planning on selection of colours for all floor surfaces.



5.09 SPECIALITIES and EQUIPMENT

5.09.1 MARKER BOARDS

In this document, the term "marker board" is used for whiteboards, chalkboards, blackboards, interactive whiteboards or other wall writing surfaces.

1. Locate marker boards at the front wall and depending on room type, anticipated pedagogy and Facilities Planning requirements, at sidewalls and rear wall.
2. Locate marker boards so they can be used simultaneously with the projection screens/display.
3. Do not locate marker boards behind instructor workstation if the instructor workstation blocks the view of the marker board from student seating positions.
4. **Marker board material will be porcelain on enamel. Chalk rails will be ordered and installed for each board.**

5.09.2 TACK BOARDS, NOTICE BOARDS

1. Do not locate tack boards or notice boards inside or immediately outside of enclosed learning spaces

5.09.3 SIGNAGE CONSIDERATIONS

1. Refer to the "UBC Sign Standards and Guidelines" (separate cover) for design guidelines contain descriptions, policy statements and design specifications for each type of sign used on campus.

5.09.4 LEARNING TECHNOLOGY AND AV SYSTEM CATEGORIES

a. General

See also section 5.05.2 (Additional LEED® Considerations).

1. For comprehensive design guidelines and technical guidelines relating to learning technology and AV systems, contact Manager, AV Group, Information Technology. Categories are Basic, Enhanced, Enhanced Plus, Hi-Tech, and AV Capture Enabled.

b. Assisted Listening System

1. There is a requirement for assisted listening systems in learning spaces of 100 seats or greater.

c. Microphones and Voice Amplification

1. In rooms with 75 seats or fewer, amplification of the instructor's voice is optional. In rooms with more than 75 seats, amplification of the instructor's voice is required.
2. Student seats will not be provided with microphones, except for videoconferencing/AV-capture-enabled rooms (Type 6) where one microphone per two seats is required.

d. Instructor Workstation

1. For rooms of 50 seats or more, provide one standard UBC instructor workstation of the appropriate size. For rooms of fewer than 40 seats, consult Manager, AV Group, Information Technology. All Type 1, 2, or 3 rooms will have an instructor table and chair.
2. Lighting, screen and room controls to be easily accessible from a wall panel and/or the instructor workstation.
3. The fixed lectern position in Type 1 rooms requires either deep floor



boxes or conduit stubbing into the lectern. Front stage area will require adequate slab thickness to accommodate floor boxes.

e. Video Cameras

Video cameras are required in rooms designated as videoconferencing/AV-capture-enabled rooms (Type 6) or distributed learning. The design team will need to make allowances for the successful incorporation of cameras in these rooms, including the following:

1. Ambient light control from exterior windows is a critical issue. A room without windows is optimal for use with a video camera. Any windows will need a full blackout blind with edge guides.
2. Optimization of artificial lighting is also a critical issue. Light levels will need to be higher than normal for camera use, and will need to be directed and controlled for optimum image-pickup.
3. Lighting fixture type and placement will also be critically important. Fixtures will be selected to eliminate hot spots in the camera's field of view.
4. The finishes in the camera field of view will be optimized to avoid glare, moiré patterns, and lighting or contrast issues. Metal finishes will be matte and not polished. Paint finishes should be matte and should be optimized to provide good contrast for the instructors. White finishes should be avoided as they create problems with the iris opening of the video camera.
5. Camera placement and field of view are critical elements in making these rooms successful. Camera placement will be a priority in the design process. The cameras may need to be wall- or ceiling-mounted, depending on the ceiling height. In classrooms with projection booths, if the camera is mounted in the booth, it will need to be behind anti-reflection coated glass, like the projector port glass.

f. Confidence Monitors

Video confidence monitors are required in videoconferencing/AV-capture-enabled rooms. The design team will need to make allowances for the successful incorporation of confidence monitors in these rooms, including the following:

1. The flat panel displays for these monitors will need to be large enough to provide good viewing for the instructor.
2. In smaller rooms, flat screen confidence monitors may be required along the rear wall in line of sight of the instructor standing at the lectern. They may be wall-mounted or ceiling-hung at that location.
3. In larger rooms, the flat screen confidence monitors may be required in the millwork of the front row of fixed tables or in millwork in the tables near eye-level where the seating tiers are steeper.

g. Wireless Internet

Additional wireless access points must be installed to handle the potential capacity of the learning space:

1. **See UBC Communication Guideline Specifications section 4.3 (Special Rooms and Areas).**



5.10 FURNISHINGS

5.10.1 SEATING

a. General

See also section 5.05.2 (Additional LEED[®] Considerations).

1. Chair selection to comply with classroom standards. Departments that require different seats or seat configurations will seek approval from Facilities Planning and may be responsible for replacement costs.
2. All learning spaces should offer a choice of seating with and without armrests.

b. Area Requirements by Room and Seating Types

1. The area per seat may not be less than the minimum noted in the following table. For reference, the lower figures in the seat capacity ranges refer to the largest seat capacities for that room type, and the higher figures in the range refer to the smallest seat capacities for that room type – reflecting relative efficiencies that are expected in larger rooms of any given type.

Type		Seat Capacity	Basic Furnishings	NSM/Seat
1. Tiered Large Group	1a.	75-200	Fixed tables, moveable chairs	2.60 to 2.20
	1b.	201-500	Fixed tables, moveable chairs	2.20 to 1.85
2. Case-Style	-	40-100	Fixed tables, moveable chairs	2.80 to 2.40
3. Open Design General Purpose	-	40-120	Moveable tables and chairs	2.60 to 2.20
4. Small Group	4a.	8-16	Moveable tables and chairs	2.50 to 2.20
	4b.	16-40	Moveable tables and chairs	2.90 to 2.50
5. Studio Lab	-	40-80	Fixed tables, moveable chairs	up to 5.30
6. Videoconferencing/AV-Capture-Enabled	-	8-500	varies	3.50 to 2.20
7. Informal	6a. Centralized	varies	varies	varies
	6b. Decentralized	varies	varies	varies
	6c. Café	varies	varies	varies

c. Power at Student Seats

See section 5.10.2b (Power at Student Tables).

d. Accessible Seating

Source: original UBC Classroom Design Guidelines.

1. Accessible seating is an integral part of any learning space with a fixed seating plan and will provide users with choice of sightlines and seat locations. Wheelchair access to the front and back of the room is a minimal requirement, and if practical, access should also be available to the middle of the room.
2. Seating locations for wheelchair users need to provide a clear and level area not less than 915 mm wide for each position and either 1252 mm long (to permit side entry of the wheelchair off an aisle), or 1220 mm long (where the wheelchair enters from the front or rear of the space).
3. A minimum of 5% of the total number of room seats and not fewer than two seats in rooms with fixed seating will be designated as accessible and reserved for persons in wheelchairs or with other accessible seating requirements. Locate these spaces close to a door. Readily removable seats may be installed in these spaces when they are not required to accommodate accessible seating users.
4. Accessible seating knee space to be a minimum of 730 mm to 760 mm (28" to 30") high, 760 mm (30") wide, and 450 mm to 480 mm (18" to 19") deep (as per International Best Practices of Universal Design).



5. Accessible table and counter-tops to be from 760 mm to 865 mm (30" to 34") above the finished floor (as per International Best Practices of Universal Design), and easily adjustable by the user.
6. Power-operated-wheelchair users require higher knee clearance and counter services, therefore maximum height dimensions are recommended.

e. Tablet-Arm and Drop-Arm Seats

Source: UBC

Tablet-arm chairs and drop-arm seating are not considered acceptable and may only be considered when preferred options are not feasible and with the approval of Facilities Planning, in which case consider the following:

1. Tablet surface area to be over-sized/over standard.
2. A minimum of 10% to 20% of writing tablets are to be left-handed.

f. Seat Numbering

1. Though fixed seating is not generally acceptable, should it be required with the approval of Facilities Planning, then seat numbers will be included for all fixed seats. **All rows require unique identifiers at each end.**

5.10.2 STUDENT TABLES

a. General

Source: UBC

See also section 5.05.2 (Additional LEED® Considerations).

All Student Tables

1. Tables to comply with classroom standards. Departments that require different tables or table configurations will seek approval from Facilities Planning and may be responsible for replacement costs.

Fixed Student Tables

2. Provide a small edge "lip" to help prevent items on the tables from falling off.
3. Ensure that tables have no sharp edges and are constructed so that they are not easily vandalized or damaged.
4. Ensure that surfaces are cantilevered to minimize the number of legs and optimize opportunities for flexible movement of seats.
5. Provide a front modesty panel, with the lower edge of the panel placed high enough above the floor so that feet will not kick it and result in damage. A foot rail should be considered to provide comfort as well as to keep feet away from the panel.
6. Fixed student tables, used in tiered rooms (Type 1 and 2) will comply with classroom standards (width per seat: 760 mm/30" minimum, depth: 457 mm/18" minimum to 508 mm/20" preferred).

Standard Moveable Student Table

Moveable Student Tables

1. Moveable student tables, used in most flat floor rooms (Type 3 and 4) will comply with classroom standards.

b. Power at Student Tables

Source: UBC

1. Provide access to power at student tables as follows:
 - a. Tiered rooms (Type 1 and 2): minimum of 50% of all seats provided with one power point and, as practical, a preference for one power



point per seat.

- b. Flat floor rooms (Type 3, 4): minimum of 30% of all seats provided with one power point and, as practical, a preference for up to one power point per two seats. Power points will be accessible for students without power cords creating a tripping hazard.
- c. Videoconferencing/AV-capture-enabled rooms (Type 6): power requirements to be defined to suit individual room requirements.
- d. Informal learning areas (Type 7): power requirements to be defined to suit individual space requirements, with an initial rule of thumb to be one power point per three seats.

5.10.3 MISCELLANEOUS

a. Garbage and Recycling Containers

Source: UBC

1. Provide garbage and recycling containers (approved by Building Operations) in major circulation areas adjacent to all rooms (Types 1-6), and in larger informal Type 7 informal learning areas. Position containers so that they do not interfere with other room functions or circulation.

b. Clocks

Source: UBC

1. Provide a [Primex Wireless Synchronous Network System \(SNS\) Wi-Fi clock in](#) each enclosed learning space and in larger informal learning spaces [as per UBC Technical Guidelines Section 16730 \(Clock and Program Bell\)](#).
2. Locate clock on the side wall at the end of the first or second row, so it is easily seen by the instructor and students.
3. Very large Type 1 tiered rooms may require more than one clock.
4. **Dual-sided clocks are not permitted.**

c. Coat Hanging Racks

Source: UBC

1. Coat hanging racks and hooks do not need to be provided.



5.11 LIGHTS AND LIGHTING CONTROLS

5.11.1 CONSULTATION

1. Consult Manager, AV Group, Information Technology on lighting system selection.

5.11.2 ROOM LIGHTING ZONES

1. There are four general lighting zones which can be combined and or used individually to create a number of different lighting schemes in learning spaces, as follows:
 - a. Zone 1: Marker boards - uniform lighting of marker boards with sufficient illumination for legibility of writing from all seats. Switch these lamps separately from the rest of the room. These may require division into left and right zones.
 - b. Zone 2: Front of Room - uniform ambient lighting for the front of room instructor area with sufficient illumination to support visibility of instructor, other front of room participants, and anticipated demonstrations, without directing light onto the screen surface.
 - c. Zone 3: Front Seating - uniform ambient lighting for the front rows of seats with sufficient illumination to support reading, note-taking and visibility of seat occupants by the instructor and by other room occupants.
 - d. Zone 4: Back Seating - uniform ambient lighting for the back rows of seats with sufficient illumination to support reading, note-taking and visibility of seat occupants by the instructor and by other room occupants.
2. Determination of the required zones in any given room requires approval by Manager, AV Group, Information Technology and is generally a function of room seat capacity and size, as follows:
 - a. Fewer than 75 seats: two to three zones
 - b. Greater than 75 seats: four or more zones
3. In learning spaces that have been designed with daylighting, zone the lighting system so that the lights in the naturally lit area can be dimmed or turned off when sufficient daylight is detected.

5.11.3 VIDEOCONFERENCING AND LECTURE-CAPTURE ENABLED ROOMS

1. Videoconference (VC)-specific lighting is required for VC-enabled rooms. This will include specific zoning, delineated coverage of specific areas and specific illumination levels, much higher than the lighting requirements for regular classrooms
2. The performance of VC- or lecture capture-enabled classroom lighting is of key importance and may conflict with energy efficiency goals. Lighting in these rooms will also support regular light levels for conventional/non-VC uses.
3. Colour temperature (3500 degrees Kelvin) is required in Tiered Large Group (Type 1) rooms. Different lights/colour temperature will not be mixed.



4. The lighting dimmer system will have remote-control access capability via RS 232 for remote ON/OFF and preset recall control from the AV control system.
5. The instructor area as identified in the lighting requirements drawing will have specific illumination levels.
6. The room lighting that falls on the projection screen surface will be separately switched.
7. Increased light levels may require more light fixtures or higher power, producing an elevated HVAC load. Select light fixtures with the highest luminous efficacy to reduce the impact on heat load.

5.11.4 LAMP REPLACEMENT SERVICEABILITY AND MAINTENANCE

1. Incorporate fixtures that use lamps that are readily available, recyclable, energy-efficient, long-lasting, and that provide ease of maintenance (e.g., lamp replacement and fixture maintenance). Dimmable ballasts are not recommended for classrooms, except for videoconferencing and lecture-capture enabled rooms.
2. For tiered rooms (Type 1 and 2) with high ceilings, lamp replacement and fixture maintenance are of particular importance. For reference, high-ceilinged rooms can be defined as rooms requiring scaffolding for light fixture maintenance or lamp replacement.

5.11.5 LIGHT SWITCHES AND SENSORS

a. Light Switch Control Locations and Type

1. Provide labeled zone lighting diagram at each switch location. Zone label design will be approved by Manager, AV Group, Information Technology.
2. Locate light switches at each entrance to the room as well as on the instructor workstation.
3. Duplicate light switches in the projection booth.
4. Orient light switch positions and labeling to the room orientation.
5. Provide vestibule light switch at each vestibule door.
6. Provide light switches at the ends of ramps inside and into classrooms.
7. Where lighting controls are included in the AV system touch panel function, a basic wall-mount button panel to control lighting zones or preset selection should be included close to the instructor location.

b. Occupancy Sensors

1. Install programmable dual-technology sensors to automatically shut off the lights in the learning space and entry vestibule when vacant. Install a sufficient number of sensors in appropriate locations to detect occupancy throughout the room. Calibrate the sensor's sensitivity to the appropriate magnitude of motion and to avoid conditions that may result in false triggering. All occupancy sensors will have the capacity to:
 1. Automatically shut down all lights approximately 15 minutes after no room activity is sensed.



2. Provide a warning flash prior to turning off the lights so that if occupants are still present, they may trigger the sensor and avoid having the lights turn off.
3. Automatically turn on the main room lights within one second after activity is sensed.
2. Provide a light switch at each entrance to the room.

c. Daylighting Controls

1. In spaces that have been designed with daylighting systems, install photosensors to automatically adjust the electric lights.



5.12 EMERGENCIES AND SECURITY

5.12.1 EMERGENCIES

1. Exits from learning spaces to minimally comply with the BC Building Code regarding panic hardware for use in case of emergencies.
2. Lockdown capacity is required for all buildings and learning spaces in compliance with UBC lockdown procedures.
3. As per UBC requirements, Emergency "Blue Phones" that connect the user directly to Campus Security should be located in strategic and visible external locations.

5.12.2 KEY STRATEGIES, CARD ACCESS, SECURITY OF LEARNING TECHNOLOGY EQUIPMENT

a. Key Strategies and Card Reader Access

1. Provide card reader access to all buildings with learning spaces, at the perimeter building doors.
2. Provide all doors with a classroom-type lock so that they can only be locked or unlocked with a key kept by Facilities Planning. For buildings with card reader access, provide infrastructure for future card readers in all learning spaces.
3. Keys to be managed by UBC Parking and Access Control Services.
4. For projection rooms and media technology rooms/closets provide the following:
 - a. Proximity card reader or approved lock that is programmable by Manager, AV Group, Information Technology and located on the wall adjacent to the door lever.
 - b. Mechanical key override (refer to the UBC Grand Master Key System, separate cover), with any mechanical locks installed in the doors to be deadbolt locks that are card-activated.
 - c. Electrified hardware solution
 - d. Door closure.
 - e. Intrusion system protection as recommended by UBC Secure Access.

b. Security of Learning Technology Equipment

1. Security of learning technology equipment (e.g., computers, projectors, screens, DVD players, instructor workstations, etc.) will comply with AV Technical Guidelines.
2. Projection room windows utilizing anti-reflection coating on projection windows and security bars on anti-reflection coated projection port glazing.
3. Coordinate design with Manager, AV Group, Information Technology to ensure that audiovisual equipment is appropriately secured.



5.13 MECHANICAL SYSTEMS
ACCESS

Source: Emory College

1. Design HVAC systems so there is minimal need to access the systems for maintenance via the classroom.
2. Locate mechanical equipment needing routine service in a location outside the classroom to allow servicing without disrupting the class.
3. Provide above ceiling equipment with adequate access for servicing.
4. Mechanical systems will not be installed in, above, or around AV projection booths.



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Appendix A: Definitions of Terms

See also Appendix B: Pedagogy Approaches for definitions of pedagogy approaches (e.g., lecture, case-based learning, etc.)

See also Section 4 for definitions of room types.

AV (AUDIO-VISUAL SYSTEMS) – systems that communicate information to and from audiences by means of audio and/or video-supported technologies.

ANSI – American National Standards Institute.

ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers.

BIFMA – Business and Institutional Furniture Manufacturer's Association. ANSI/ BIFMA Safety and Performance Standards are developed by the BIFMA Engineering Committee.

BGSM – Building Gross Square Metres.

BMS – Building Monitoring System.

BUILDING GROSS SQUARE METRES – the sum of all building floor areas measured to the outside face of exterior walls for all stories or areas having floor surfaces. Gross area includes component gross areas, washrooms, telephones, general display, general circulation, mechanical and electrical space and exterior walls.

BUILDING SYSTEMS – all of the utilities and physical support systems and controls for the environmental support of all the elements of the facility, and the operational support of the delivery system, including: mechanical, electrical, structural, plumbing, circulation, cladding and interior finishing systems.

AV GROUP, INFORMATION TECHNOLOGY – is the unit that manages the Audio Visual equipment in UBC's classrooms.

CENTRE FOR TEACHING, LEARNING AND TECHNOLOGY (CTLT) – collaborates with academic and administrative units throughout UBC in order to advance the scholarly practice of all members of the UBC teaching community while supporting technology-enabled learning environments and distance learning opportunities.

CIRCULATION – the total system of connecting links that enable movement of people and materials throughout the facility, between rather than through departments (e.g., main corridors, elevators, stairs, etc.).

CLADDING, EXTERIOR – those components of a building which are exposed to the outdoor environment and are intended to provide protection against wind, water, or vapour.

CRI – Colour Rendering Index.

DISTRIBUTED LEARNING – carries the implication that the class section is physically distributed or multi-site and that synchronous learning activities are going on (e.g., the UBC School of Medicine utilizes this model).

EXIT – that part of a means of egress that leads from the floor area it services, including any doorway leading directly from a floor area, to a public thoroughfare or to an approved open space.



FACILITIES PLANNING – is the unit at UBC that manages the ongoing development of UBC's classrooms, teaching labs, and informal learning spaces.

FAR – FLOOR AREA RATIO – a ratio of the gross floor area of a building to the total area of the site

FORMAL LEARNING SPACE – includes general classrooms (general purpose spaces that are centrally scheduled and accessible to all campus users) and teaching labs (specialized spaces by virtue of their furnishings and technical infrastructure requirements and typically assigned to the use of a specific department, discipline, or program).

FUNCTIONAL PROGRAM – a pre-design document describing the functional requirements of a building or renovation in sufficient detail to initiate schematic design.

HVAC – Heating Ventilation Air Conditioning

INFORMAL LEARNING SPACE (ILS) – space where students spend time learning outside of formal learning spaces. Unlike formal learning spaces ILS cannot be as easily categorized, as there are many possible configurations and capacities, ranging in size from a few square metres (e.g. a bench outside a classroom) to hundreds of square metres (e.g. a centralized student commons).

LEED[®] – Leadership in Energy and Environmental Design is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LRV – Light Reflectance Value.

LUMENS PER SQUARE METRE OR LUX – a unit of measure of the intensity of light falling on a surface.

MARKER BOARD – in this document, a marker board may be a white board, chalk board, smart board or any other vertical writing surface. In this document, marker boards are generally assumed to be wall-mounted, but in practice may sometimes be portable.

MAXIMUM OCCUPANCY – the maximum number of people expected to be within an area at peak utilization. This figure includes visitors, employees and students.

NC – Noise Criterion.

NET SQUARE METRES (NSM) – the horizontal area of space assignable to a specific function. The net areas of rooms are measured to the inside face of wall surfaces.

NEW CONSTRUCTION – design and construction of new space.



NRC – noise reduction coefficient.

NSM – Net Square Metre.

PDT – Pacific Daylight Time.

PST – Pacific Standard Time.

RENEW – large scale, comprehensive renovations of whole buildings.

RENOVATION – projects that can range from minor interior changes to significant upgrades to larger areas or specific building systems.

STC – Sound Transmission Class.

SUPPLY MANAGEMENT – UBC Supply Management provides a supply leadership role and customer service framework for goods and services procurement, travel, freight, customs, and surplus equipment management. It is comprised of several broad supply chain functions that provide service to the UBC community: Strategic Sourcing, Customs and Freight Services, Travel Management Program, Surplus Equipment Recycling Facility (SERF).

TECHNICAL GUIDELINES – serve as the code of quality and performance for the design, construction and renovation of University-owned institutional buildings. This includes housing, athletics and institutional buildings, along with landscape and infrastructure; but excludes market housing whose maintenance is managed on a separate and different system. The UBC Technical Guidelines include: performance objectives, technical requirements, mandatory UBC-specific requirements for all campus buildings, recommended practices based on the experience of UBC professionals, project documentation requirements, UBC code-related issues, sample front-end documentation, plus steps to follow to expedite completion of UBC projects.

TIER 1 and 2 – when the scheduling function in Enrolment Services schedules buildings and rooms for academic sections, Tier 1 and Tier 2 refer to the access a department will have to a specific building. If a department has Tier 1 access to a building it means that they have priority to book into the unrestricted rooms in that building. In between certain dates the building is only available to the Tier 1 holders for that building. After a certain date the building is released for Tier 2 booking. Tier 2 access allows all departments to book in any remaining unscheduled non-restricted rooms.

UBC TREK 2010 – the five pillars of UBC's Trek 2010 vision define specific principles around which the University's goals and strategies will be determined.

VERTICAL CIRCULATION – the upward or downward movement of people and materials via elevators, stairs, etc., to connect with other floors within the building.

WORKING COMMITTEE – once a project is approved by the UBC Board of Governors for design and construction, a Working Committee is typically formed to act as decision maker for new construction, Renew, and major renovations which include learning space.



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Appendix B: Pedagogy Approaches

INTRODUCTION

Pedagogy: "The term generally refers to strategies of instruction, or a style of instruction." (Wikipedia)

For reference and though by no means to be considered exclusive or definitive, the following represent a cross-section of example pedagogical approaches that UBC students may experience and instructors may utilize over the course of their academic careers. This information is included herein to provide context for the users of the Learning Spaces Design Guidelines Update.

Definitions were derived from an Internet/literature search (references cited) and then posted to a project wiki site for review and revision by the LTAC user group for the project. The pedagogical approaches included herein are listed below and defined in the narrative that follows.

- | | |
|--|---|
| 1. Lecture | 15. Simulation (examples) |
| 2. Case-Based Learning | 15.1 Specialised Skills Hands-on Learning |
| 3. Demonstration | 15.2 Immersive Learning |
| 4. Problem-Based Learning | 15.3 Virtual Learning |
| 5. Studio-Based Learning | 16. Community of Practice (CoP) |
| 6. Project-Based Learning | 17. Reflective Learning |
| 7. Laboratory-Based Learning | 18. Discussion + Conversational Learning |
| 8. Seminar | 19. Informal Learning (examples) |
| 9. Tutorial | 19.1 Peer Tutoring/Peer-to-Peer Learning |
| 10. Group Work | 19.2 Independent |
| 11. Team-Based | 20. Experiential Learning (examples) |
| 12. Inquiry-Based | 20.1 Performance-Based Learning |
| 13. POGIL (Progressive Guided Inquiry Learning) | 20.2 Field Work |
| 14. Distributed Learning or Computer Mediated Communication (examples) | 20.3 Practica + Clinical |
| 14.1 Online | 20.4 Practice-Based Learning |
| 14.2 Video-conference | 20.5 Apprenticeship |
| 14.3 Technologically Enhanced, Simultaneous Learning | 20.6 Service (community based) |
| | 21. Classroom Assessment Techniques (CAT) |

PEDAGOGY APPROACHES

1. LECTURE

Source:
Wikipedia, *The Free Encyclopedia*. (2010, August 22), from <http://en.wikipedia.org/w/index.php?title=Lecture&oldid=380267140>

An oral presentation, often supplemented by media, intended to present information or teach people about a particular subject, for example by a university or college teacher. Lectures are used to convey critical information, history, background, theories, and equations. Usually, the lecturer will stand at the front of the room and recite information relevant to the lecture's content.

2. CASE-BASED LEARNING

Source:
<http://www.queensu.ca/ctl/goodpractice/case/index.html>

CBL engages students in discussion of specific situations, typically real-world examples. This method is learner-centered, and involves intense interaction between the participants. It is popular in business and law schools. CBL focuses on the building of knowledge and the group works together to examine the case. The instructor's role is that of a facilitator and the students collaboratively address problems from a perspective that requires analysis. Much of case-based learning involves learners striving to resolve questions that have no single right answer.



3. DEMONSTRATION

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
[http://en.wikipedia.org/wiki/Demonstration_\(teaching\)](http://en.wikipedia.org/wiki/Demonstration_(teaching))

Demonstrations involve showing by reason or proof, explaining or making clear by use of examples or experiments. Students are typically set up to potentially conceptualize class material more effectively, to connect theories to actual practice, to understand the application of theories to practice.

4. PROBLEM-BASED LEARNING

Source:
Wikipedia, The Free Encyclopedia. (2010, September 23), from
http://en.wikipedia.org/w/index.php?title=Problem-based_learning&oldid=386487255

A student-centred instructional strategy in which students collaboratively solve problems and reflect on their experiences. Characteristics of PBL include:

- Learning is driven by challenging, open-ended, ill-defined, and ill-structured problems.
- Students generally work in collaborative groups.
- Teachers take on the role as "facilitators" of learning. In PBL, students are encouraged to take responsibility for their group and organize and direct the learning process with support from a tutor or instructor. PBL positions students in simulated real world working and professional contexts which involve policy, process, and ethical problems that will need to be understood and resolved to some outcome. PBL is typically done in small discussion groups of students accompanied by a faculty tutor. For example: a constructed, but quasi-realistic problem ("paper case") is presented in consecutive sections, mimicking the gradual acquisition of potentially incomplete information in real life situations; the students discuss the case, define problems, derive learning goals and organise further work (such as literature and database research); results are presented and discussed in the following session; when the participants agree that the relevant questions have been appropriately discussed, the case is resumed by the tutor presenting the next chunk of information; and this work cycle is reiterated several times over consecutive sessions.

5. STUDIO-BASED LEARNING

Source:
<http://www.nationalforum.com/Electronic%20Journal%20Volumes/Burroughs,%20Susie%20Problem%20Based%20and%20Studio%20Based%20Learning-NFTEJ-19-3-09.pdf>

SBL is similar to problem-based learning (PBL), with a primary exception being that the learning occurs within the shared learning environment of a studio. SBL guides learners into behaving as practicing professionals, typically using design cases, instead of problem cases, that are filled with multiple ambiguities and which lead each individual learner to multiple, scientifically accurate design proposals that vary in expression. PBL and SBL are similar in that they both are case-driven; both require a master-apprentice relationship between teacher and learner; both entice learners to lead their own inquiry; and both allow for a proposal, critique, iterate again procedure before adequate solutions can be offered.

6. PROJECT-BASED LEARNING

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
http://en.wikipedia.org/wiki/Project_Based_Learning

Project-based learning is the use of classroom projects, intended to bring about deep learning, where students use technology and inquiry to engage with relevant issues and questions. These classroom projects are used to assess students' subject-matter competence compared to traditional testing.



7. LABORATORY-BASED LEARNING

Source:
<http://www.queensu.ca/ctl/goodpractice/lab/index.html>

An approach that has traditionally been a central component of in the experimental sciences whereby the learner is directed to carry out experimental investigations, either in order to practice previously learned theories or techniques, or in advance of other learning. This approach typically takes place within a specialized laboratory setting or in nature where activities and/or experiments are done with required apparatus in order to illustrate theory and give students an opportunity to gain supervised experiences.

8. SEMINAR

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
<http://en.wikipedia.org/wiki/Seminar>

Generally, a form of academic instruction that brings together small groups for recurring meetings, focusing each time on some particular subject, in which everyone present is requested to actively participate. This is often accomplished through an ongoing Socratic dialogue with a seminar leader or instructor, or through a more formal presentation of research. Normally, participants must not be beginners in the field under discussion. The idea behind the seminar system is to familiarize students more extensively with the methodology of their chosen subject and also to allow them to interact with examples of the practical problems that always occur during research work. It is essentially a place where assigned readings are discussed, questions can be raised and debates can be conducted. It is relatively informal, at least compared to the lecture system of academic instruction.

9. TUTORIAL

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
<http://en.wikipedia.org/wiki/Tutorial>

A method of transferring knowledge that is more interactive and specific a lecture; a tutorial seeks to teach by example and supply the information to complete a certain task. Depending on the context, a tutorial can take one of many forms, ranging from a set of instructions to complete a task to an interactive problem solving session.

10. GROUP WORK

Source:
<http://www.cmu.edu/teaching/trynew/groupwork.html>

Though group work can take a variety of forms, the underlying commonality involves students working together, either cooperatively or collaboratively toward a common goal. In addition to the acquisition of key content knowledge, group work provides a context in which students practice important interpersonal, social negotiation, group management, and team process skills.

11. TEAM-BASED

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
http://en.wikipedia.org/wiki/Team-Based_Learning#2_Team-Based_Learning_in_the_Workplace

An instructional strategy that is designed to support the development of high-performance learning teams, and provide opportunities for these teams to engage in significant learning tasks. Teams are typically comprised of small groups of four to seven, which stay together for long-term interactions so that individual members feel committed to the team and the challenging tasks that they will be required to complete.

12. INQUIRY-BASED

Source:
Wikipedia, The Free Encyclopedia. (2010, September 20), from
http://en.wikipedia.org/wiki/Inquiry-based_learning

Inquiry learning emphasizes constructivist ideas of learning, with knowledge built in a step-wise fashion, best achieved in group situations. For example, the teacher does not begin with a statement, but with a question. This allows the students to search for information and learn on their own with the teachers guidance. The topic, problem to be studied, and methods used to answer this problem are determined by the student and not the teacher. An important aspect of inquiry-based science is the use of open learning. Open learning is when there is no prescribed target or result which students have to achieve. In open teaching, on the other hand, the student is either left to discover for his or her self what the result of the experiment is, or the teacher guides them to the desired learning goal but without making it explicit what this is.



12. POGIL (Progressive Guided Inquiry Learning)

Source:
Wikipedia, *The Free Encyclopedia*. (2010, September 20), from <http://en.wikipedia.org/wiki/POGIL>

POGIL is a method devised to teach process skills (such as collaboration and written expression) as well as content using an inquiry based approach. It was originally devised for use in teaching general chemistry, but the structure of POGIL is broadly applicable in all subjects. In a POGIL classroom, students work together in groups of 3 or 4. Each student is assigned a role, such as manager, recorder, spokesperson or reflector. The students work together on activities that are structured to help them build up a concept. The students are expected to reach a consensus answer to each question on the activity, and then be able to communicate that answer in written or oral form. This group structure creates positive interdependence among the students, reinforcing involvement and learning for each student.

14. DISTRIBUTED LEARNING OR COMPUTER MEDIATED COMMUNICATION (CMC)

CMC provides a collaborative and flexible learning environment in which students and instructors can communicate with each other any time, any place.

For reference, several example approaches are outlined below:

14.1 Online

Source:
Wikipedia, *The Free Encyclopedia*. (2010, September 20), from http://en.wikipedia.org/wiki/Online_learning

Learning that takes place entirely or partly online, making use of a variety of technological elements involving the internet. The internet enables individual interaction with Online course materials, one to one communication (for example, the instructor communicates via email to a student about their assignment), or one to many communication (for example a student posts a question to the course discussion group).

14.2 Video-conference

Source: not applicable

Mediated by a set of interactive telecommunication technologies that allow two or more locations to interact via two-way video and audio transmissions simultaneously.

14.3 Technologically Enhanced, Simultaneous Instruction

Source: not applicable

A technologically enhanced version of video-conferencing where multimedia instructional sessions, including questions by students and responses by instructors, can occur simultaneously and with the same experience at multiple sites. This approach typically requires a technologically sophisticated, structured and controlled environment to be successful for larger groups.

15. SIMULATION

Source:
Wikipedia, *The Free Encyclopedia*. (2010, September 20), from http://en.wikipedia.org/wiki/Instructional_Simulation#Instructional_simulation_or_virtual_learning_environment

An instructional simulation is a simulation of some type of reality (system or environment) but which also includes instructional elements that help a learner explore, navigate or obtain more information about that system or environment that cannot generally be acquired from experimentation. Instructional simulations are typically goal oriented and focus learners on specific facts, concepts, or applications of the system or environment.

For reference, several example approaches are outlined below:

15.1 Specialised Skills, Hands-on Learning (e.g. Nursing skills, interview/ observation)

Source: not applicable

Different than the widespread access to simulations and simulated environments available online or with specialised software, this approach involves learning-by-doing where learners are able to practice skills and apply theoretical understandings to simulated real world problems and situations that are relevant to their subjects, practices or professions. Examples include nursing or physiotherapy skills labs, interview practice rooms, business school laboratories, etc.



15.2 Immersive Learning

Source: not applicable

Small group learning in a highly simulated virtual environment, in which the student is immersed within a particular environment of a place or set of spatial information.

15.3 Virtual Learning

Source:

Wikipedia, *The Free Encyclopedia*. (2010, September 20), from http://en.wikipedia.org/wiki/Instructional_Simulation

Virtual learning provides learners with access to learning opportunities at different times in their lives, and without physically moving to a learning facility, or interacting face to face with an instructor in real time. For example, there are virtual classes, virtual labs, virtual programs, virtual library, virtual training, etc. For reference, virtual learning has been classified into 4 types:

- 1st generation: provided the first on line course opportunities, consisting of a collection of learning materials, discussion forums, testing and e-mail systems all accessible on line.
- 2nd generation: more powerful, both in data base integration and functions - planning and administrating, creating and supporting teaching materials, testing and analyzing results. For example: Learning Space, WebCT, Top Class, COSE, Blackboard, etc.
- 3rd generation: incorporates the newest technologies, accessible in real and non-real time (synchronous and asynchronous communications), such as audio and video conferences through the Internet - 'one to one' and 'one to many', collaboration features for work in groups, seminars, labs, forums, and the learning, development, planning, library and administrative functions. For example: Stanford Online, InterLabs, Classroom 2000 and the system "Virtual University" (VU).
- 4th generation: future environments, representing new learning paradigms, at the centre of which are the user and global resources, as opposed to the teacher and the local resources. Their main advantage will be that learning materials can be created, adapted, and personalized to the specific needs and function of each learner.

16. COMMUNITY OF PRACTICE (CoP)

Source:

Wikipedia, *The Free Encyclopedia*. (2010, September 20), from http://en.wikipedia.org/wiki/Community_of_practice

CoP involves a group of people who share an interest, a craft, and/or a profession. The group can evolve naturally because of the members' common interest in a particular domain or area, or it can be created specifically with the goal of gaining knowledge related to their field. It is through the process of sharing information and experiences with the group that the members learn from each other, and have an opportunity to develop themselves personally and professionally. CoPs can exist online, such as within discussion boards and newsgroups, or in real life, such as in a lunchroom at work, in a field setting, on a factory floor, or elsewhere in the environment.

17. REFLECTIVE LEARNING

Source:

Boyd and Fales (1983); http://radicalpedagogy.icaap.org/content/issue8_1/wang.html

The process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective. For example, developing the ability to critique one's own practices, academic or professional, is a skill which must be acquired in order to continue to learn and develop as practitioners after graduation. This process is central to understanding the experiential learning process.



**18. DISCUSSION +
CONVERSATIONAL LEARNING**

Source:
Wikipedia, *The Free Encyclopedia*. (2010, September 20), from <http://en.wikipedia.org/wiki/Discussion>

Learning through conversation or discussion allows people with different views on a topic to learn from each other. For a successful conversational learning experience, participation must achieve a workable balance of contributions. A successful conversation includes mutually interesting connections between the speakers or things that the speakers know. For this to happen, those engaging in conversation must find a topic on which they both can relate to in some sense.

19. INFORMAL LEARNING

Source: not applicable

Informal learning on an academic campus can be broadly defined as learning that takes place outside of structured or scheduled course sections. It can be in the form of individual, one-on-one or small groups and in almost any environment. Informal learning is greatly facilitated by access to the internet and simple, flexible furnishings.

For reference, several example approaches are outlined below:

19.1 Peer Tutoring/ Peer-to-Peer Learning

Source:
<http://wrt-intertext.syr.edu/VIII/dabkowski.html>

A system of instruction in which learners help each other and learn (themselves) by teaching, where "peer" refers to someone with the same or a nearly equal status as the person being tutored, who, as such, is not a professional instructor. This kind of interaction often occurs in informal settings.

19.2 Independent

Source: not applicable

Independent study is a process whereby a learner acquires knowledge by his or her own efforts and develops the ability for inquiry and critical evaluation.

20. EXPERIENTIAL LEARNING

Source:
Wikipedia, *The Free Encyclopedia*. (2010, September 20), from http://en.wikipedia.org/wiki/Experiential_learning

Experiential learning is learning through reflection on doing, which is often contrasted with rote or didactic learning. Experiential learning focuses on the learning process for the individual. An example of experiential learning is going to the zoo and learning through observation and interaction with the zoo environment, as opposed to reading about animals from a book.

For reference, several example approaches are outlined below:

20.1 Performance-Based Learning

Source:
<http://smart.com.ph/SmartSchools/SmartTools/performance.htm>

Performance-based learning and assessment represents a set of strategies for the acquisition and application of knowledge, skills, and work habits through the performance of tasks that are meaningful and engaging to students. The real environment is typically simulated to allow students to gain actual experience.

20.2 Field Work

Source: not applicable

Learning or investigation carried out in the field rather than in a classroom, laboratory or other place of work.

20.3 Practica + Clinical

Source:
http://psychsoma.co.za/learning_in_ivo/2010/04/definition-of-work-integrated-learning-and-related-terms.html

The in-occupational field and practice experiences described as a process of placing students in the workplace for hands-on experience. A workplace activity linked to the formal academic program for purposes of experiential performance and to allow the student first-hand experience. Most professional training programs include a practicum, which can vary from a few weeks to a few years of practical experience at a site of professional practice. Practica can be strongly or weakly integrated into the formal learning program, depending on how they are supported, supervised, and assessed.



20.4 Practice-Based Learning

Source:
www.open.ac.uk/pbpl/

Learning which arises out of, or is focused on, working practice in a chosen job, voluntary work, career, or profession.

20.5 Apprenticeship

Source :
Wikipedia, *The Free Encyclopedia*.
(2010, September 20), from
http://en.wikipedia.org/wiki/Educational_Theory_of_Apprenticeship

Example definitions of apprenticeship learning include: development of learning contexts that model proficiency, provide coaching and scaffolding as learners become immersed in authentic activities; working side by side with an expert in order to learn a specific task; independent practice so that learners gain an appreciation of the use of domain-related principles across multiple contexts.

20.6 Service (community based)

Source:
<http://www.queensu.ca/ctl/goodpractice/service/index.html>

A method of teaching, learning and reflecting that combines academic classroom curriculum with meaningful service, frequently youth service, throughout the community. More specifically, it integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, encourage lifelong civic engagement, and strengthen communities for the common good.

21. CLASSROOM ASSESSMENT TECHNIQUES (CAT)

Source:
<http://www.celt.iastate.edu/teaching/cat.html>

Classroom Assessment Techniques (CAT) are formative evaluation methods that serve two purposes: assistance in assessing the degree to which students understand the course content, and provision of information about the effectiveness of teaching methods.



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Appendix C: Methodology and References

METHODOLOGY

The document was prepared between late 2010 and early 2011 with five main steps:

Consultant Team included:

- Resource Planning Group Inc.
- Busby Perkins + Will
- AMBIT Consulting Inc.

1. Working Committee: at the outset of work and late in the process, meetings were held with the Working Committee on Learning Space Guidelines to provide the consultant team with direction and reviews of draft documentation.
2. Centre for Teaching, Learning and Technology (CTLT): meetings were held with the CTLT to discuss and define overarching design principles and pedagogy type definitions.
3. User Groups: meetings were conducted with a wide range of representative user groups of the UBC community. We consulted with the following departments, units, and working-groups:
 - Learning Technology Advisory Committee
 - Timetable Representatives
 - Campus Sustainability
 - Administrators
 - Access and Diversity
 - Graduate Student Society
 - AMS students
 - Infrastructure Development, Facilities Planning
 - Instructors (two sessions)
 - Media Group, Audio Visual Consultants
 - Building Operations, Technical Services
 - Building Operations, Custodial
 - Carl Wieman Science Education Initiative
4. Other Institution Design Guidelines: a review and compilation of the learning space design guidelines of other institutions was completed.
5. Classrooms Services: reviewed interim drafts of document sections for AV design guideline requirements and compliance/ integration with the UBC Technical Guidelines.



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