

Section 04 | Programming

UNIVERSITY of
HOUSTON

FACILITIES PLANNING AND CONSTRUCTION

March 2023

Introduction

The University of Houston follows a Capital Improvement Program (CIP), a five year plan that details the long-range strategy to maintain and enhance the System's resources. The CIP allows for strategic planning for projects with a debt load over \$5 million.

Once a project has been identified in the CIP, the project may begin programming. The University of Houston System requires each capital project to be defined by a comprehensive program of requirements with a detailed cost estimate. Once programming is complete and funding has been identified, the project may be presented to the Board of Regents for approval to begin design.

A complete facility program helps to reduce the number of changes and potential cost increases that can occur during a project. Other benefits include:

- Campus stakeholders have an early opportunity to provide input and discuss issues.
- Project scope and needs can be developed into well-defined requirements before engaging architects and engineers to begin design.
- Concepts can be tested and various options evaluated inexpensively during programming.

Definition

Facility programming is the process of collecting, analyzing, synthesizing and documenting the requirements for a capital improvement project prior to beginning design. The final program document becomes a "building instruction manual" for the architects and engineers.

Programming involves gathering information from intended building occupants and user groups through group and individual interviews. The programmer researches current and projected needs in such areas as information and instructional technology, academic teaching methods, privacy and security. This process results in a comprehensive description of the necessary components of the project.

Programming has a significant impact on the design and construction of a capital improvement project. It is easier to influence a project's outcome during the early stages than it is to affect the outcome as the project moves forward.

Purpose

The goals of programming are to:

- Finalize the project objectives.
- Determine building and user requirements.
- Establish a total building area.
- Balance and align the scope of work with the project budget.

Using a defined program, it is possible to estimate a realistic project cost, to which yearly escalation factors may be added to account for the proposed schedule of construction and occupancy.

Final Program Document

The project program, the end result of programming, describes how the finished project will "work"-- how it will function for building occupants and how it will meet the project requirements.

The final program document presents final recommendations in a clear and succinct manner. It addresses the following key topics:

- Strategic and master planning requirements, consistent with the University's master plan
- Space and functional relationships
- Site location and utility considerations
- Total project cost and proposed project schedule
- Design expertise required by the project design team
- Concerns, if any, identified about the project scope, schedule, risks and plan of execution

Programming Guidelines

- Use these guidelines as a tool to prepare the project program. The guidelines are generic in nature and are suitable for use for all University capital projects.

Table of Contents

- Organize the final program document in the following order:

Chapter	Page
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2. Executive Summary.....	
• University Mission Statement	
• Brief Project Description/Narrative	
• Project Justification	
3. Project Vision and Goals.....	
• Aspirations of Project	
4. Site Development.....	
• Site Introduction	
• Site Location/Orientation	
• Site Circulation	
• Site Constraints	
• Site Utility Information	
• Landscaping Overview	
• Storm Water Detention	
5. Benchmarking/Lessons Learned.....	
6. Existing Facilities Studies (Renovations).....	
• Extent of Remodel	
• Code Compliance	
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• Master Specifications	
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• Owner’s Project Requirements	
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• THECB Efficiency and Space Inventory Code Requirements	
• University Required Non-Program Spaces	
• Auxiliary Services Space Approval	
• Building Summary Space List	
• Adjacency Diagram	
• Stacking Diagram	

- Detailed Space Requirements
 - Building Common Areas
 - Departmental Spaces (including offices)
 - Classrooms
 - Teaching Labs
 - Research Labs
 - Building Support
 - Active Exterior Spaces
 - Specialty Spaces/Requirements
- Functional Relationship Diagram
- Test Fits
- Room Data Sheets
- 9. Building Construction
 - Total Building Levels and Height
 - Building Massing
 - Mandatory or Recommended Infrastructure Improvements
- 10. Preliminary Project Budget.....
 - Construction Cost Limitation (CCL)
 - Soft Costs
 - Furniture Budget
 - Total Project Cost (TPC)
 - Annual Escalation
- 11. Preliminary Project Schedule.....
- Appendices (as necessary).....
 - Phasing Considerations
 - Alternate Studies
 - Renderings

Sign-Offs

- Provide a page for required signatures by those approving the facility program.
- Request the list of signatories when the program document is complete.
- Include acknowledgments of those who participated in creating the program:
 - Executive Steering Committee Members
 - User Groups
 - Facilities Operations and Maintenance
 - Any other participants

Executive Summary

- Provide a summary of the project scope, budget and schedule. Include a synopsis of the major points in the program document.
- Address the following topics in the executive summary:
 - University Mission Statement
 - Project Description and Scope Narrative
 - Project Justification
 - Efficiency Factors Used
 - Assignable Square Footage
 - Gross Square Footage
 - Opinion of Probable Construction Costs
 - Construction Cost Limitation
 - Soft Costs + Furniture Budget
 - Total Project Cost

Project Vision and Goals

- Describe why the project is necessary for the department(s) and College.
- Affirm that the project aligns with the stated direction and strategic plan of the University.
- Include the following topics:
 - Explain how the project complies with or will enhance the stated mission and vision of the University and the College/department.
 - Explain how the project will support the academic direction of the institution and the overall need of the project for the next five years.
 - Demonstrate how the project complies with or enhances the campus master plan.
 - Describe the main objectives for the project.

Example (Vision)

ASPIRATIONS

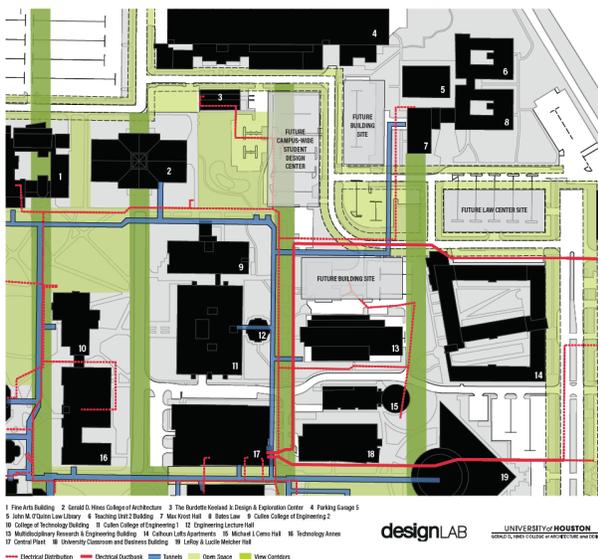
- Reflect the educational power and excellence of the Law Center
- Provide the capabilities, environment, and **image of a top-tier law school** in a major city
- Become a permanent top tier U.S. News & World Report law school
- Recruit **well-credentialed, diverse students and faculty**
- Be a leader in sustainable design

FEEL

- Create a smart building balancing the needs of the Law Center with available resources
- Create **a sense of community** through organic connections over multiple floors
- Celebrate and **support diversity of students**
- Create a timeless building

Site Development

- Provide an analysis of the proposed site or sites for the project.
- Identify the factors or site drivers that will affect the design of the facility.
- Prepare the site analysis in collaboration with the University Architect and Director of Engineering Services.
- Use illustrations to address the following topics:
 - Site Introduction
 - Site Location and Orientation (including climate, prevailing winds and solar angles)
 - Illustrate how the project and its site reinforce the University master plan
 - Identify potential synergies with neighboring buildings and open space
 - Site Circulation
 - Pedestrian access
 - Vehicular access and parking
 - Service access
 - Emergency vehicle access
 - Site Constraints and Opportunities
 - Visual connections
 - Primary entries
 - Site boundaries, setbacks, build-to lines
 - Location of any easements or setbacks
 - Storm water detention
 - Site Utilities
 - Availability, locations and expected connection points
 - Landscape Overview
 - Other
 - Alternative site studies, if required
 - Description of any known environmental issues that would limit use of the site or necessitate additional project costs such as hazardous waste cleanup
 - Diagram showing intended expansion during future phases, if planned
 - Any other significant site influences



Benchmarking/Lessons Learned

- If budgets allow, arrange visits to similar institutions or building types to obtain insights and end-user feedback and advice.
- Include user group representatives and FPC team members in the visits.
- Document comments and common themes from benchmark visits.
- Provide a summary in the final program document.

Existing Facilities Studies

- For projects that involve renovation of existing facilities, address the following topics. Many aspects may also apply if interim space will be used before a new building or renovation is complete.

Extent of the Remodel

- Provide a floor plan outlining areas to be remodeled. If an addition will be built, note where the addition is expected.
- List the furnishings, equipment and other items, if any, that need to be salvaged for re-use after the renovation.

Code Compliance

- Identify parts of the existing building that are known not to comply with current building codes or requirements. Describe the work required to bring the building into compliance.

Hazardous Materials

- Determine if any portions of the building to be remodeled contain any hazardous materials such as asbestos. Identify the extent of the hazardous materials.

Temporary Facilities

- Describe any temporary or interim facilities that will be required until the project is completed.
- If specific interim locations have been identified, include information about those facilities.

Existing Utilities Studies

- Determine if the existing facility is served by sufficient utility capacity for:
 - Water
 - Sanitary sewer
 - Storm sewer or detention
 - Electricity
 - Chilled water and steam
 - Data
 - Communications
 - Security
- Determine if the proposed project conflicts with any existing utilities.

Design Parameters

- Describe the design objectives for the project and any design constraints.
- Identify the building codes, regulations and University design standards that will directly influence the design and construction of the proposed facility.
- Note that the State Fire Marshal is the authority having jurisdiction (AHJ) for all issues pertaining to NFPA 101 Life Safety Codes. The University Fire Marshal is part of the State office.
- Include the following references for code compliance:
 - National Fire Protection Association - NFPA 101
 - International Building Code (IBC)—most recent editions adopted by the City of Houston
 - Texas Accessibility Standards (TAS)
 - FEMA Flood Mapping
- Note the requirement to follow the University’s published design guidelines. These include:
 - Project reviews
 - Architecture, site and landscape, exterior lighting and other topics
 - Sustainable design
 - Furnishings, both exterior and interior
 - Signage, including donor recognition requirements
- State the requirement to adhere to the University’s Master Specifications for design and construction of UH System projects.
- Note the requirement to design and certify the project to LEED Silver standards or better.

Component University Standards

- Each component university has its own technical standards that suit the unique requirements of its campus. Component university standards can have a significant impact on the design and construction of the facility. Describe these standards in the program. They may include the following:
 - Equipment or system specifications or standards
 - Existing special purchase arrangements with vendors for specific equipment or systems
 - Sole source requirements for equipment or systems (to be compatible with existing systems)

Space and Adjacency Requirements

- Use this section to explain the space requirements and desired functional relationships of the program.
- Include an overview or summary description of the proposed facility.
- Describe and quantify the facility in physical terms, including:
 - Number, type and square footage of each room
 - Expected number of occupants of each room
 - Adjacency diagrams that show relationships between specific rooms and spaces
 - Stacking diagrams that locate each area on desired floors
 - Room data sheets that call out specific requirements for each space
 - Illustrative plans or “test fits” that demonstrate typical layouts for a given program square footage

Texas Higher Education Coordinating Board (THECB) Requirements

- Adhere to the following definitions to comply with THECB space calculation and reporting requirements:
 - **Gross Square Feet (GSF)** – The sum of all enclosed areas on all floors; areas measured to the exterior surface of building walls, including basements and vertical penetrations. Usable area plus building circulation, mechanical rooms, general restrooms, janitor closets, unassigned storage, exterior walls and structure.
 - **Assignable Square Feet (ASF)** – The sum of all areas on all floors of a building that is assigned to or available for assignment to an occupant or other specific program use; for example, classrooms, offices, conference areas and reception. Does not include circulation areas. Measured from the inside face of enclosing partitions or walls.
 - **Space Efficiency Factor** – Total or gross building area is calculated using a factor with the assignable area as the base. This ratio is the expression of the assignable areas to the gross building area as a percentage. To calculate gross square feet (GSF), divide the sum of the assignable spaces by the appropriate grossing factor.
- Request the Space Efficiency Factor for the project from Facilities Planning & Construction (Space Management).
- Request the THECB space code for each program space type from Facilities Planning & Construction (Space Management).

Required Non-Assignable Spaces

- The University requires certain “non-program” spaces to serve students, faculty and staff and to support the operation and maintenance of its buildings. Refer to the Design Guidelines for the latest list of these support spaces.

- Identify required, “non-program” support spaces in the Summary Space List as part of the proposed building’s gross square footage :

- | | |
|--|---|
| <ul style="list-style-type: none"> • Mothers Room • All Gender Restrooms • Attic Stock Storage • Custodial Storage • Custodial Closets • Recycling Rooms/Trash Rooms • Building Distribution Frame (BDF) • Intermediate Distribution Frame (IDF) • Security Closets | <ul style="list-style-type: none"> At least one, on any floor, min. 7’ x 7’ One per floor, near the male and female restrooms Ground floor, near the service entrance, min. 8’ x 8’ Ground floor, near the service entrance, min. 8’ x 12’ Each floor, near the common restrooms Each floor, min. 8’ x 8’ Ground floor Each floor, stacked Each floor, stacked |
|--|---|

Auxiliary Services – Food Service Review

- Notify the Department of Auxiliary Services if food or beverage service is desired in the new facility.
 - Auxiliary Services and the University’s food service provider will review the proposed space, develop sales projections based on location and determine viability.
 - Auxiliary Services will present its recommendation to the UH System Food Service Advisory Committee (FSAC) for review and approval.
 - Auxiliary Services will provide the FSAC recommendation to the Associate Vice Chancellor of Administration for review and to determine if revisions to the existing food service agreement will be required.

Summary Space List

- Include an overall summary list, by space type, of the space requirements for the project.
- Show the total assignable and total gross square footages and the target efficiency.
- Identify any specific requirements associated with non-assignable spaces (e.g., extra wide corridors or impromptu gathering spaces).

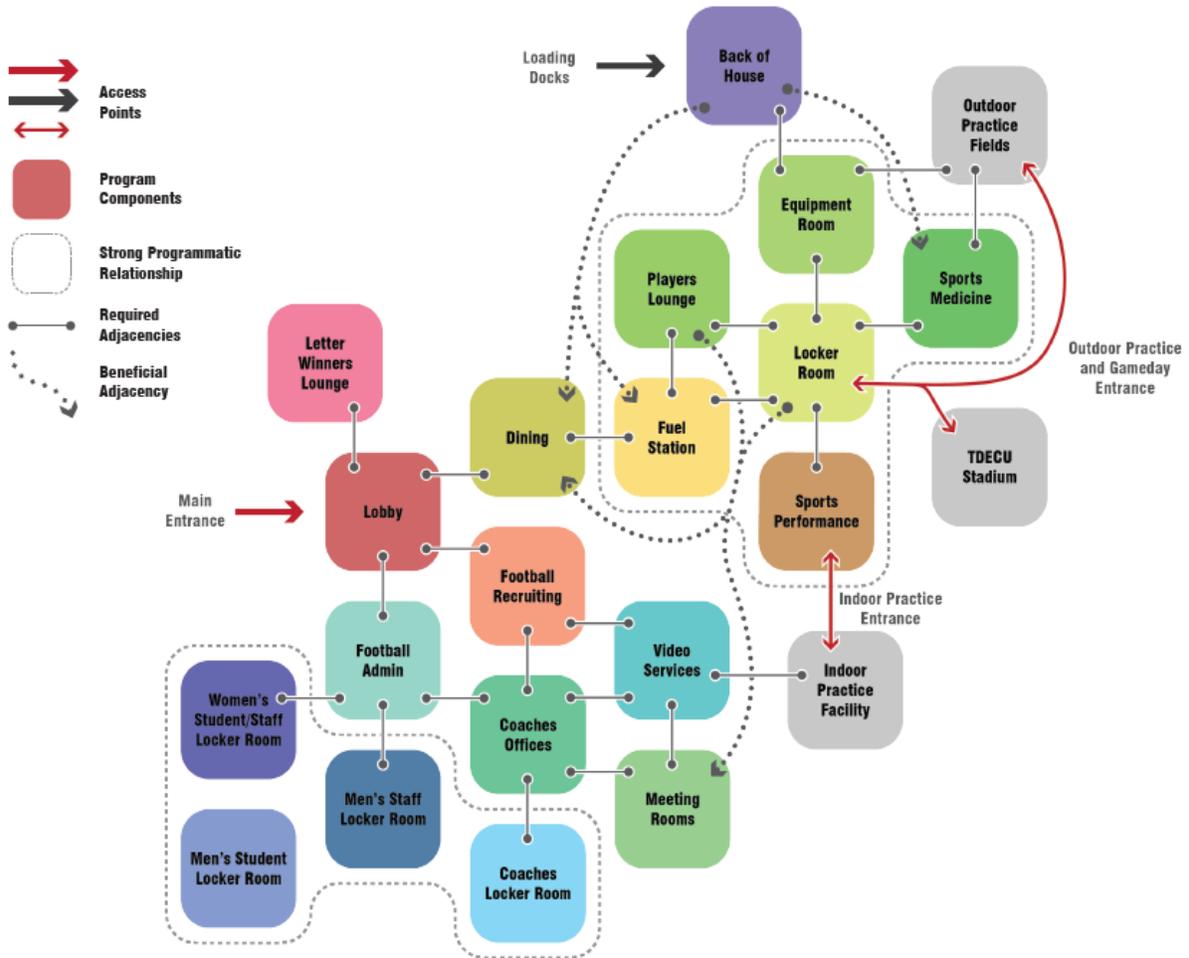
Example

<u>DEPARTMENT/AREA</u>	<u>SF</u>	<u>PAGE</u>
Building Entry	6,020	30
Instructional Areas	24,719	34
Student Spaces	4,160	44
Student Organizations	2,400	46
Library/IT	24,492	48
Clinics	8,054	58
Leadership + Admin. Suite	10,543	60
Academic Offices	11,438	62
Centers + Institutes	3,588	63
Student Services, Graduate + Global Programs, Admissions	4,563	64
Advocacy	1,456	65
Support	3,600	66
Exterior Lounge (<i>asf = total sf/2</i>)	1,000/500	67
TOTAL ASF	105,533	
TOTAL GSF (@ 62% EFFICIENCY)	170,214	

Adjacency Diagram

- Provide a diagram that illustrates the most important adjacencies for the program spaces. The adjacency diagram imagines all of the spaces as if on a single floor.

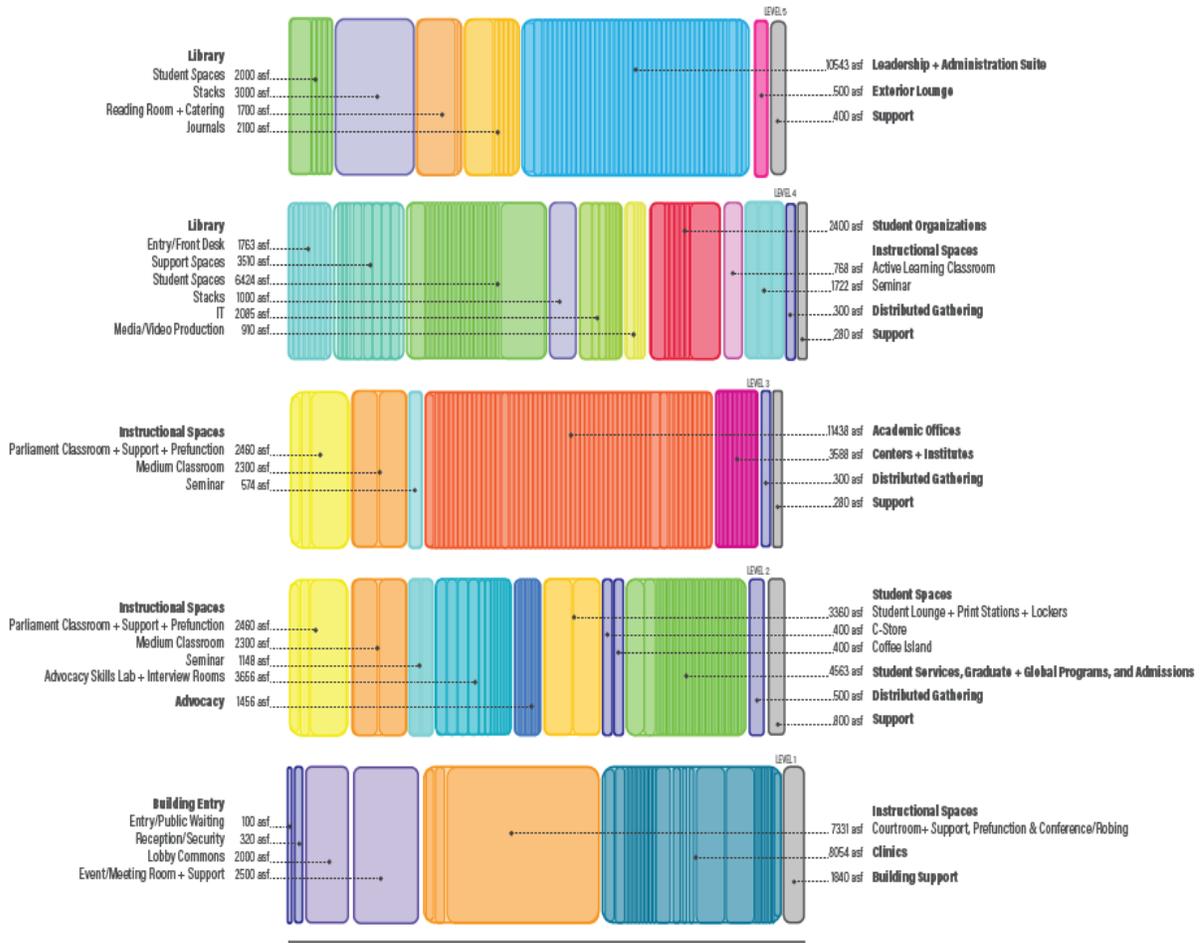
Example



Stacking Diagram

- Create a diagram that illustrates conceptually where each department or functional unit is placed, or “stacked,” vertically in a multi-story building. The stacking diagram balances many factors, including desired functional adjacencies, space requirements, site constraints and opportunities and campus master plan requirements.

Example



Detailed Space Lists

- Include detailed lists of program spaces organized by typology.
- Label each program space with the appropriate THECB space code.

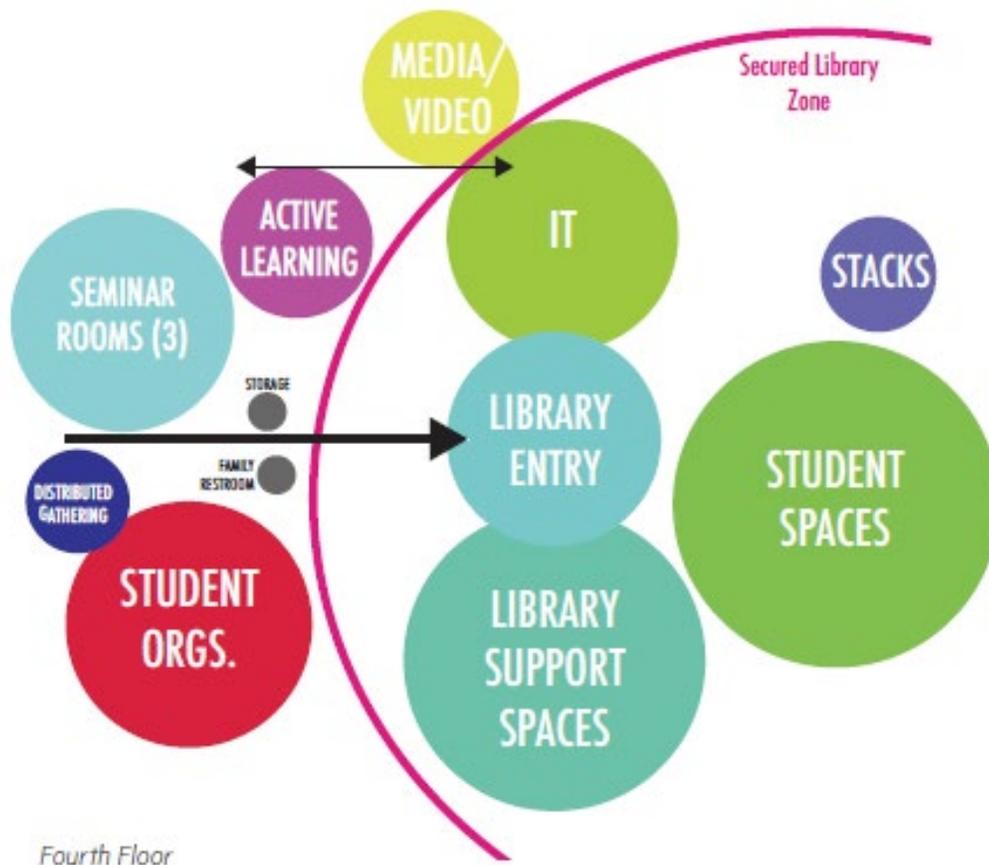
Example (Instructional Areas)

<u>SPACE</u>	<u>Nº + SIZE</u>	<u>SF</u>
Large Classroom Pre-function	2 @ 400 asf	800
Dividable Tiered Lecture	1 @ 6,231 asf	6,231
Control Room/AV Support	1 @ 100 asf	100
Furniture Storage	1 @ 400 asf	400
Conf./Robing	1 @ 200 asf	200
Parliament Classroom	2 @ 2,260 asf	4,520
Medium Classroom	4 @ 1,150 asf	4,600
Seminar Room	6 @ 574 asf	3,444
Active Learning Classroom	1 @ 768 asf	768
Advocacy Skills		
Advocacy Skills Lab	4 @ 574 asf	2,296
Support Storage	2 @ 200 asf	400
Interview/Video Review Rooms	8 @ 120 asf	960
TOTAL ASF		24,719

Functional Relationship Diagrams

- Use functional relationship diagrams to illustrate the hierarchy of adjacencies on a floor, within a department or within a grouping of rooms.
- Illustrate adjacency requirements clearly so the architect can later convert the diagram into a floor plan that maintains all required relationships.

Example



Room Data Sheets

- Provide room data sheets to identify specific requirements for each space type. These may include:
 - Desired occupancy
 - Finishes
 - Special security or access features
 - Special mechanical, electrical or plumbing requirements
 - Furniture or equipment to be relocated or provided by the Owner
 - Specialty furniture or equipment to be purchased and installed by the project

Example

COUNSELING ROOM

Expansion ▶ VS ▶ Shared Support

One-on-one counseling space

SPATIAL CHARACTERISTICS

ROOM SIZE	150 ASF
OCCUPANTS	2
WALL FINISH	Painted GWB
FLOOR FINISH	Carpet tiles
CEILING FINISH	Suspended acoustical tile
DOOR SIZE	36 in wide
EXTERIOR ACCESS	–
NATURAL LIGHT	Preferred

ELECTRICAL • IT • AUDIOVISUAL

POWER	Standard 120-volt ¹
DATA	Ethernet + wireless ¹
TELEPHONE	VOIP ¹
AUDIOVISUAL	–
SECURITY	Standard door lock; panic button ²
LIGHTING	LED ³

FURNISHINGS • FIXTURES • EQUIPMENT

Writable surface(s).....	OFOI
Table and chairs	OFOI
Computer station (for tele-health sessions)	OFOI
Telephone.....	OFOI

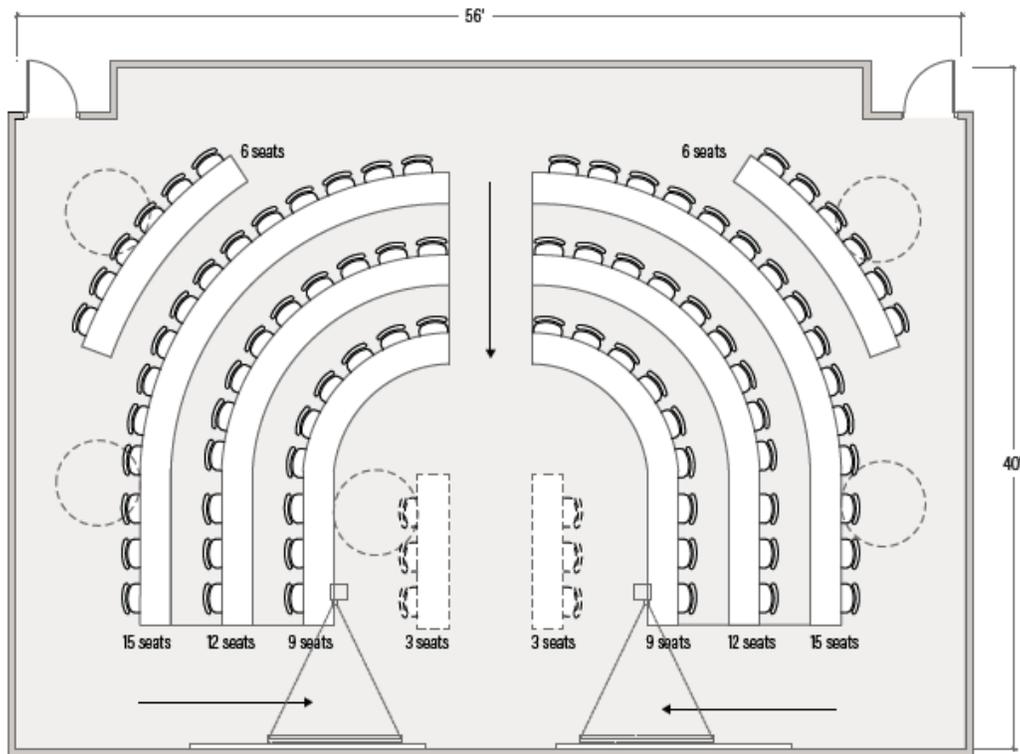
NOTES

- 1 Provide electrical receptacles and ethernet ports along the perimeter walls for convenience and to support a computer workstation
- 2 Room requires visual access from circulation via a window or side lite
- 3 Provide non-glare, direct/indirect lighting; utilize task lighting as required

Test Fit Plans

- Include illustrative plans or “test fits” for specialty spaces to demonstrate that stated needs and requirements can be accommodated within the proposed program square footage.

Example



Preliminary Project Budget

- Provide a preliminary project budget that estimates all expected costs involved in the project.
- Include an opinion of probable construction costs completed by an independent third-party cost estimator.
- Include the following in the project budget:
 - Opinion of probable construction costs
 - Annual construction escalation to (month/year)
 - Contractor contingency, overhead and profit
 - Sub-Total, Construction Cost—Construction Cost Limit (CCL)**
 - Soft Costs
 - Design and other fees
 - Owner’s project contingency (%)
 - Administrative costs
 - FP&C management fee (%)
 - Furniture budget (developed with FP&C, using UH furniture standards and historical cost information)
 - Other Costs
 - IT/Security
 - Audio visual equipment
 - Specialty equipment expenses
 - Public Art program (1%)
 - Moving expenses
 - Facilities shop support

Sub-Total, Soft and Other Costs

Total Project Cost

Preliminary Project Schedule

- Develop the preliminary project schedule in consultation with Facilities Planning & Construction and the end users.
- Include project milestones, any unusual schedule considerations, key submittals and approvals.
- Identify the need for phasing or interim moves in the preliminary project schedule.

Typical Milestone Schedule

- Board of Regents Approval
- Procurement (Selection of AE Firm and Construction Manager at Risk)
- Design
 - Program Verification
 - Schematic Design
 - 100% Schematic Design Review
 - Design Development
 - 50% Design Development Review
 - Campus Facilities Planning Committee (CFPC) Review
 - 100% Design Development Review
 - Construction Documentation
 - 50% Construction Documents Review
 - 90% Construction Documents Review
 - Issue for Construction Documents
- Demolition (if required)
- Construction
- Substantial Completion
- Furniture Installation
- Occupancy
- LEED Certification
- Project Close-out