

COLUMBIA UNIVERSITY

Graduate School of Architecture, Planning and Preservation

A4865 - The Anatomy of Architecture:

Advanced systemic integration and architectural intention

A. Jay Hibbs, *Adjunct Associate Professor of Architecture*

Fall 2016

COURSE DESCRIPTION

Current architectural technology enables construction of virtually anything, in any form, anywhere. While certain site specific and programmatic factors may limit some design decisions; a building's formal, material, spatial and technical systems possibilities are endless. Developing technical system approach and integration methodologies has become one of the most essential and significant organizational attitudes of expression in architecture today.

Great architecture reflects a philosophical position and is an expression of architectural ideas, propositions, theories and intentions. When architecture is successful there is always a mastery of building technique in the service of an intention. Failure to understand the techniques of building leads to a loss of conceptual clarity in the built form. Form and technology are inseparable

In this seminar, the vehicle for learning will be an analysis of the primary technical systems – structural, mechanical and enclosure – of specific prominent pieces of post WWII built architecture. Students will study some of the best examples of architectural / technical synthesis created during the latter part of the 20th and early 21st centuries. Construction documents from a select group of buildings will serve as the core source of information with supplementation from other published resources. This detailed investigation will focus on the interrelationship between the structural, mechanical and enclosure systems, construction methods and materials and the architectural form. The examination of the building systems will emphasize the way in which each informs and impacts the others as well as their ultimate effect on the creation of the architecture.

While this course will have an emphasis on the “how” of architectural technology, it will also stress the “why” of technology choices and determinations. It is a fundamental premise of this course that the creation of architecture must be guided by an overarching architectural intention and that this vision of the architecture would form the approach to all design decisions – from planning to detail. As such, an objective of this course will be to understand the architect's attitude regarding building systems and how the architectural intention of the specific building is realized, reflected and/or amplified by the choice, manipulation, interaction and execution of the building systems. Students will investigate the principles behind the methods of construction as well as the reason certain construction methods and systems were created and employed.

This will be a semester long, single project based study. Students will work individually and will select a building to analyze from a list of construction sets of exceptional built pieces of architecture. Investigations will be organized by weekly technical exercises, class discussions and meetings with the instructor.

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COURSE SCHEDULE

DATE	ACTIVITY	ASSIGNMENT
13 September	Introductory Lecture / Discussion Select building for analysis	TE #1 - building research - <i>assigned</i>
20 September	Structural Systems Discussion TE #1 discussions	TE #2 – structural system - <i>assigned</i>
27 September	Mechanical & Enclosure Systems Discussion	
4 October	Building analysis meetings	TE #3 – mechanical system - <i>assigned</i>
11 October	Building analysis meetings	
18 October	Building analysis meetings	TE #4 – enclosure system - <i>assigned</i>
25 October	Building analysis meetings	
1 November	Building analysis meetings	
8 November	No class – election day	
15 November	Building analysis meetings	TE #5 – final presentation mockup - <i>assigned</i>
22 November	Building analysis meetings	
29 November	NO CLASS - Turn in final presentation for red marking	
6 December	NO CLASS - Review and revise drawings based on returned red marks	
15 December (Thursday)	FINAL REVIEW - technical report due	

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MINIMUM FINAL PRESENTATION REQUIREMENTS

DRAWINGS

Typical floor plans	1/8" = 1'- 0"
Building elevations	1/8" = 1'- 0"
Building sections	1/8" = 1'- 0"
Building envelope cut-away or exploded digital model	3/4" = 1'- 0"
Detail cut-away or exploded detail model (two)	3" = 1'- 0" or larger
Structural free body diagram	No scale
HVAC system diagram	No scale

TECHNICAL REPORT

Submit a report describing the building enclosure system, structural system and HVAC system of your building. For clarity, the description of each system should be keyed and cross referenced to your drawings. The report should be in 8 1/2 x 11 format and turned in at the final review. The report should cover the following:

General:

- statement of architectural idea/intention
- architect's attitude regarding utilitarian building systems (accommodation, integration, synthesis) and examples illustrating this attitude

Structural System:

- type
- material
- method of distributing gravity and wind loads
- system choice rationale
- relationship to architectural intention
- relationship to building enclosure and HVAC systems

HVAC System:

- type
- description of system operation and fluid distribution
- system choice rationale
- relationship to architectural intention

Building Enclosure System:

- wall type and materials
- method of wind load transfer
- method of gravity load transfer
- method of preventing water infiltration
- roofing system
- relationship to architectural intention

Construction:

- construction sequence