Building Element Design

MIM 244E

Dr. Nil Sahal

Objective

This course is designed to provide the student with the basic skills to design building elements in lieu with the appropriate performance requirements and to understand the strategies and techniques for integration of these systems with the structure and service systems.

The overall intention is to demonstrate that the successful completion of an architectural design relies upon a successful constructional design (structural system, building service systems, building elements, constructional methods, materials) and its imaginative use being consistent with the architectural design concept. It is hoped that at the earliest consideration of the appropriate constructional design may then become integral with the student's architectural design projects.

Content

Function of building elements

Factors affecting building elements (environmental factors, user requirements) Performance analysis of building element systems

• Floor systems (below grade and above grade: slab on grade, intermediate floor, projecting floors, suspended ceilings, raised floors)

- External wall systems
- Window and door systems
- Roof systems (low slope and pitched roofs)
- Stairs and ramps
- Internal partition systems (fixed and moveable partitions)

Performance requirements of building element systems with regard to their basic functions Principles of detailing building element systems

Integration of building elements with structure and service systems.

Methodology

Lecture with extensive use of illustrations.

(the course will be conducted in a discussion format with the students, as well).

Readings: use of referenced materials to develop design solutions is required.

Case studies: analysis of specific building element systems and components to develop the understanding of design requirements and construction methods.

Studio work: basic design requirements and construction methods of building element systems are exercised on simple buildings. A design problem will be given to the students and all the performance requirements and constructional detailing that the project demands will be studied and solved. All the design and constructional knowledge acquired by the students during the course will be applied to the design activity. Finally design solutions will be developed for each building element and will be integrated with the building's other systems.

I.T.U Faculty of Architecture Department of Architecture Building Technology Division

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Schedule

week	date	topics	
1		Introduction - overview of course and goals - Building sub-systems	
2		Floor systems	Case studies
3		External wall systems I	Case studies
4		External wall systems II	Case studies
5		Window and door systems	Case studies
6		Roof systems	Case studies
7		Stairs and ramps	Case studies
8		Partition systems	Case studies
9		Studio work	
10		Studio work	
11		Studio work	
12		Studio work	
13		Studio work	
14		Studio work	

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References

Books

- [1] Allen, E., Iano, J., "Fundamentals of Building Construction, Materials and Methods", John Wiley and Sons, 1990.
- [2] Allen, E., "Architectural Detailing; Function, Constructibility, Aesthetics", John Wiley and Sons, 1993.
- [3] Blanc, A., "Internal Components", Mitchell's Building Series, Longman, 1994.
- [4] Blanc, A., "Stairs, Steps and Ramps", Butterworth Architecture, 1996.
- [5] Busch, A., "Floorworks", Longmeadow Press, 1992
- [6] Ching, F. D. K., "Building Construction Illustrated", Van Nostrand Reinhold, 1991.
- [7] Chudley, R., "Construction Technology I, II, III, IV", Longman Ltd., 1999.

[8] Foster, J. S., Raymond Harrington, R., "Structure and Fabric, Part 2", Mitchell's Building Series, Longman, 1996.

- [9] Foster, J. S., "Structure and Fabric, Part 1", Mitchell's Building Series, Longman, 1996.
- [10] Hardy, S., Roof Design, Mc Graw Hill, 1998.
- [11] Mc Evoy, M., External Components, Mitchell's Building Series, B.T. Batsford Limited, London, 1991.
- [12] Millais, M., "Building Structures", E&FN Spon, 1997.
- [13] Nashed, F., "Exterior Wall Design", Mc Graw Hill, 1998.
- [14] Olin, H., Schmitt, J.L., Lewis, W. "Construction, Principles, Materials, and Methods, Van Nostrand Reinhold, 1995.
- [15] Osborn D., "Introduction to Building", Batsford Limited, 1985.
- [16] Reid, E., "Understanding Buildings A Multidisciplinary Approach", Construction Press, 1984.
- [17] Rich, P., Dean, Y., Principles of Element Design, Architectural Press, 1999.
- [18] Smith, J., "Materials of Construction", Mc Graw Hill, 1988.
- [19] Wakita, O., Linde, R.M., "The Professional Practice of Architectural Detailing", John Wiley and Sons, 1999.
- [20] Binan, M., "Ahşap Çatılar", Birsen Yayınevi, 1990.
- [21] Binan, M., "Ahşap Kapılar", Yapı Endüstri Merkezi Yayınları, 1995.
- [22] Binan, M., "Doğramalar, Ahşap Pencere", Kipaş, 1985.
- [23] Binan, M., "Yapı Elemanları, Çizimler ve Açıklamalar", İTÜ Vakfı, 1986.
- [24] Erol, A.İ., "Yapılarda Taşıyıcı Sistem", Zonguldak Karaelmas Üniversitesi, 1997
- [25] Salvadori, M., Heller, R., "Mimarlıkta Taşıyıcı Sistemler", İTÜ Mimarlık F., 1982.
- [26] Sarı, A., "Merdivenler, Düşey Sirkülasyon Araçları", Yapı Endüstri Merkezi, 1998. [27] Toydemir, N., "Yapı Elemanı Tasarımında Malzeme", Literatür, 2000.
- [28] Türkçü, Ç., "Yapım", Mimarlar Odası İzmir Şubesi Yayınları, 1997.
- [29] Yücesoy, L., "Temeller, Duvarlar, Dösemeler", Yapı Endüstri Merkezi Yayınları, 1998.

Journal

DETAIL

Institut für internationale Architektur Dokumentation GmbH, München.

- DEUTSCHE BAUZEITSCHRIFT, dbz
- Bertelsmann Fachzeitschriften, Gütersloh.

"bautechnik"

DEUTSCHE BAUZEITUNG, db

Deutsche Verlags Anstalt, Stuttgart.

"technik"

THE ARCHITECTS' JOURNAL, AJ

Emap Communications Ltd., London.

"working details", "building study"

Catalog

YAPI KATALOĞU Yapı Endüstri Merkezi Yayın Bölümü, İstanbul. YAPI MALZEMELERİ KATALOĞU TMMOB Mimarlar Odası İstanbul Büyükkent Şubesi, İstanbul. I.T.U Faculty of Architecture Department of Architecture Building Technology Division

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Web-sites

www.insaat-yapi.gen.tr www.yapitr.com www.yapimedya.com www.yapirehberi.net www.yem.net

Grading policy

Case studies: % 50 Studio work : % 50

Mid-term assessment: % 60 Final exam: % 40

Office Hours

Thursday 10.00-12.00