Architecture 504
Fall 2024

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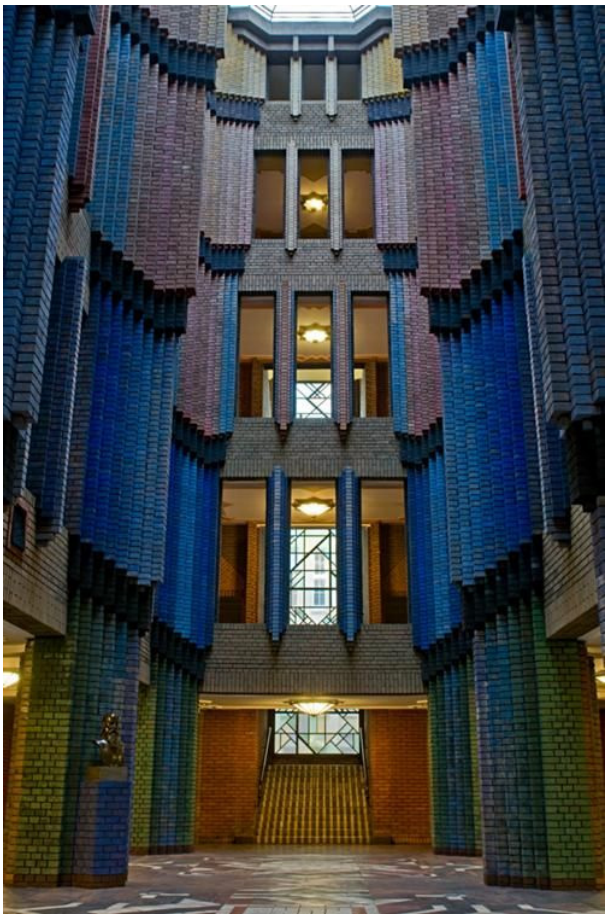
MASONRY STRUCTURES (3)

Tues.-Thurs 11:00 – 12:30 room 2210 Art & Architecture Bldg.



DESCRIPTION

This course provides an understanding of the behavior and strength of masonry structures. This includes both reinforced and unreinforced walls, columns and beams. Material properties of different masonry units (brick, block and tile) and construction details are examined. Lateral loads and shear walls are included.
Pre-requisite: ARCH 324 or equivalent.

OBJECTIVES

Students are introduced to the basic masonry materials of clay brick, concrete block, mortar, and grout as well as reinforcing. Basic analysis and design procedures based on applicable codes of practice are explored. This includes both reinforced and unreinforced walls, columns and beams as well as masonry vaulting. Use is made of the appropriate codes including the TMS 402, the NCMA TEK Notes and Manuals and the BIA Technical Notes.

ORGANIZATION

The course is lecture based, and the concepts and procedures are taught in this context with classroom and homework problems solved by the students. The course has a website, which is used for the posting of lecture material and for students to enter homework solutions.

Textbook

No textbook is required for the course, but recommended:
C. Beall, “Masonry Design and Detailing”
R. Drysdale, “Masonry Structures, Behavior and Design”

TOPICS COVERED

An overview of the topics covered is as follows:

1. Historic Masonry Structures
2. Structural Restoration
3. Contemporary Masonry Design
4. Materials – bricks, blocks, mortar and grout
5. Masonry Construction Assemblages
6. Empirical Methods (unreinforced)
7. Analytical Methods (reinforced and unreinforced)
8. Lintels and beams
9. Columns and Pilasters
10. Shear wall diaphragms
11. Masonry Veneer and Cavity Walls
12. Connectors and Ties
13. Alternative units (AAC, glass)
14. Vaulting and Shells

PROBLEMS

Homework problems covering the primary aspects of the course are spaced about one per week throughout the semester. Solutions are entered interactively online. Late solutions to problems will be penalized -5% per day up to a maximum of -35%.