Course Description

Architecture is made of materials. But where do those materials come from, and what types of labor and energy do they embody? As in the cases of more easily fetishized commodities, building materials' fabrication is often concealed beneath finished architecture. Prying open buildings and the parts they are made of, this seminar will look at the composition, production, and assembly of construction materials in order to consider materials' impacts from the perspectives of environment, aesthetics, and otherwise. Modern architecture is often characterized by the inauguration of newly available, large-scale manufacture of glass, metals (iron, steel, aluminum, as well as fasteners), reinforced concrete (and its nineteenth-century predecessors, branded “Roman cement” and “Portland cement”), plywood and other standardized components (two-by-fours, drywall, precast and post-tensioned concrete), plastics, and composites. Architects have often derived inspiration from those materials, and even used certain substances to imitate the appearance of others. By tracking how parts of buildings move from their raw states to specifiable names and numbers on construction documents and sites, this course will study the aesthetics of architecture through its components, finishes, and joinery, while retaining a focus on the labor necessary for putting those pieces together.

Today, such processes have become almost unfathomably globalized, to the extent that architectural material production and demand can stand as a proxy for the world economy. The environmental impact of cement production in the China, India, and the U.S., the world's largest producers, can be felt across the planet, and it has given rise to an entire field of research into waste reduction. The float glass industry, once localized in the U.S., Britain, and France, has expanded such that Asian firms send immense quantities of sheets to Africa and the Middle East. Bauxite, the mineral in which aluminum ore is found, has sustained the Jamaican economy since its discovery there in the 1940s, and the enormously energy-consuming process of reduction is powered by hydroelectric dams in Africa and Asia, where electricity is cheap enough to make aluminum production economical. Steel, cement, plywood, and even quotidian timber are routine fulcrums in geopolitical economic negotiations among the U.S. and other countries, notably China and Canada, recently. These are just a few of the entanglements that prompt us to interpret architecture on several scales at once, from the smallest construction details of joinery between individual elements, all the way to the vastness of global imports and exports. The goal of this course will be to interrogate architecture across scales by analyzing its production.

Course Requirements

The main requirement for this course will be a single, synthetic research paper. Students will propose a research topic that follows particular materials from their production to their implementation in architecture. The topic may relate to one of the subjects covered in class, or students may choose a different material to investigate in depth and discuss in relation to one or more buildings in which it is used. In any case, students should take a critical stance toward the material, its production, the labor and energy that it requires to be made, produced, and assembled, and the ways that it appears in architects', engineers', and builders' drawings, other documents, and buildings. Because the process of architectural construction plays such an essential role in this course, students are encouraged to include objects that are records or artifacts of production (architectural, constructional, etc.) in their research.

A one-page (250-word) abstract will be due on 20 February outlining a proposal for the research paper. On 20 March, students are required to submit a three-page beginning of the paper, along with a bibliography of sources.

Papers should include a mix of primary and secondary sources, the majority of which should be from
printed books, journals, or other formats that would stand up to scholarly scrutiny. Use any materials published exclusively online judiciously and skeptically. All written work should be the students' own, and any plagiarism will be grounds for automatic failure of the course. The paper should follow conventions of academic writing, including proper citation of all sources with footnotes or endnotes according to the Chicago Manual of Style: http://www.chicagomanualofstyle.org/tools_citationguide/citation-guide-1.html.

Each student is also responsible for a critical presentation of one or more readings for one week, using selected architectural projects or other visual materials. The presentation may or may not relate to students' final paper topics.

All students are expected to have done the readings for each week, and to come to class prepared to discuss them. Attendance and participation in class conversations is required.

Course Schedule and Readings
Note: All readings are available on Courseworks, with the exception of the following two books, which students are encouraged to purchase because of their pertinency to the course in general:


16 January
Introduction

23 January
Wood 1: Industrialization of Timber Processing

30 January
Wood 2: Plywood, Laminated Lumber
  ° [recommended: Wilk, Plywood: A Material Story (rest of book).]

6 February
Glass 1: Crown Glass, Cylinder Glass, Sheet
Glass, Plate Glass


13 February

Glass 2: Float Glass, Shatterproof Glass

- Alfred D. Chandler, Jr., Scale and Scope: The Dynamics of Industrial Capitalism (Cambridge, MA: ), 113-119.

20 February

Metals 1: Iron

**DUE: Paper Abstract**


27 February

Metals 2: Steel


6 March

Metals 3: Aluminum

  - [recommended: Sheller, Aluminum Dreams (rest of book).]

[Spring Break]
20 March
**Metals 4: Tin, Copper, Brass, Zinc, Titanium, Etc.**

**DUE: 3-Page Beginning of Paper with Bibliography**


27 March
**Masonry, Ceramics, and Stone**


3 April
**Concrete 1: Cement, Pre-Reinforcement**

  - [recommended: Lawrance Hurst, “Concrete and the Structural Use of..."


10 April

**Concrete 2: Reinforced & Post-Tensioned**

  - [recommended: Courland, *Concrete Planet*, 143-342.]

17 April

**Plastics, Composites, and Textiles**