ARCH 573 Course Description **Spring 2014**
Studio Instructor: Scott Murray

ELEMENTAL ARCHITECTURE

structure + skin ⇒ space + light

Note: This is the first in a potential series of studios to be offered in the School's new Performance Program Area which will link a design studio with an advanced technical course.

In this case, the current studio will be taught jointly with ARCH 556: Advanced Structural Planning.

A joint venture of
ARCH 573: Technology & Performance Studio
ARCH 556: Advanced Structural Planning

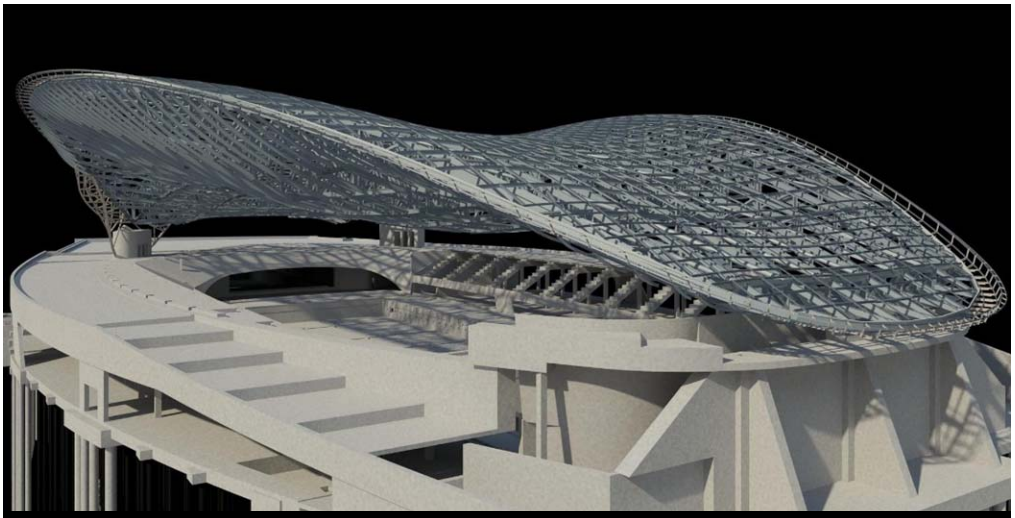
ARCH 573 Course Catalog Description

Design studio investigations of buildings and systems focusing on structure, enclosure, technology and performance. Integration of building materials, components and systems and their impact on the design, construction, and sustainability of buildings. May be repeated to a maximum of 12 hours. Prerequisite: Graduate standing in Architecture.

Introduction

This studio will be focused on how two primary architectural elements—structure and skin—can work together to create phenomenal experiences of space and light in a high-performance public building. Specifically, we will be designing long-span structural systems to shape space, integrated with custom enclosure systems that modulate natural light, in the creation of a new aquatic center on an urban site in New York City. The goal of this work is to develop design proposals that are both technologically and conceptually rigorous, and to define what this conception of "elemental architecture" might produce.

*Image above: London Olympic Aquatic Center under construction (source: http://www.detail-online.com)

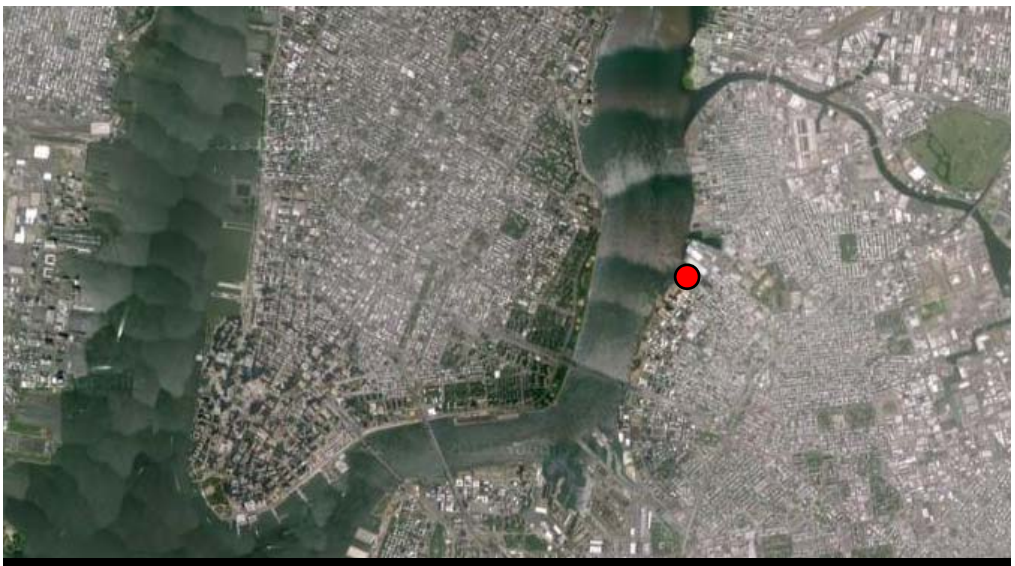


LONG-SPAN STRUCTURE. Structural model of London Olympic Aquatic Center
(source: www.nce.co.uk)

Studio Project

Following initial research and analysis of site, program, and precedents, students in this studio will work on one semester-long design project: the new East River Aquatic Center (ERAC), sited along the East River in Brooklyn, New York. Students will work on this project in teams of two in order to enable a high level of depth and detail in the projects and to develop collaboration skills.

The ERAC will be a 70,000 square-foot training and competition facility suitable for hosting the Swimming & Diving World Championships. The program includes one Olympic-sized swimming pool (25x50 m), one diving pool (20x25 m), and one short-course training pool (25x25 m), as well as spectator amenities, administrative space, support functions, and adjacent park space. The project will require structural spans in the range of 150 to 400 feet and will be designed using steel as the primary material. Another design objective will be to maximize the potential for natural lighting within the building while also addressing energy-saving priorities through innovative building-envelope design.



SITE. Studio Project Site Location: Brooklyn, New York

Link with Advanced Structural Planning

As noted above, this studio will be taught in conjunction with ARCH 556: Advanced Structural Planning, which is led by Prof. Marci S. Uihlein.

Students enrolled in ARCH 556 will also enroll in this studio, and the same project will be used in both classes. The structural system designed for the studio project will be further developed and analyzed in ARCH 556, allowing the work in each of the two classes to productively inform and advance the other.

STRUCTURE + SKIN. Beijing National Aquatic Center under construction
(source: www.moreaedesign.wordpress.com)

Learning Objectives and Process

The studio will emphasize mastery of technical principles in combination with more intangible qualities such as spatial experience and the creation of unique architectural character, while also integrating comprehensive design principles of accessibility, life safety, and site design. Appropriate and inventive responses to climatic and site conditions will be sought.

The design process will be based on experimentation with structure, form, and enclosure, developed through iterative design proposals using large-scale, detailed physical and digital modeling techniques. Design teams will be expected to generate, document, and analyze multiple schemes with clear conceptual foundations before arriving at a final proposal for the project. This process will include regular desk critiques and informal in-class pin-ups, in addition to the formal midterm and final reviews. Final projects will be presented in multiple media: detailed plans and sections, digital 3D modeling, physical models at a range of scales, and diagrams and details of structure and enclosure systems.

LONG-SPAN STRUCTURE. London 2012 Velodrome under construction
(source: http://esibuilding.wordpress.com)

Field Trips

We will be making two field trips this semester. First will be a visit to a structural steel fabricator's facility in Indiana. Second will be a visit to Arup's Chicago office for an interim review of student projects. More information on these trips will be distributed in class.

Faculty Bios

Scott Murray, Studio Instructor.
Scott is an Associate Professor in the School of Architecture and a licensed architect. His professional background includes working as a façade-design consultant with the firm of Heintges Associates in New York. He is the author of two books on building-envelope design.
http://www.arch.illinois.edu/faculty/scott-murray

Marci S. Uihlein, Structural Consultant
and Instructor of ARCH 556: Advanced Structural Planning.
Marci is an Assistant Professor in the School of Architecture and a licensed professional engineer with a graduate degree in architecture. Her professional background includes working at Arup in their San Francisco and Los Angeles offices. She was recently awarded the Building Technology Educators' Society (BTES) Emerging Faculty Award.
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