Course Description

This studio is designed to provide students an opportunity to explore and develop innovative urban design and architectural solutions for a specialized research laboratory. The Oregon Museum of Science and Industry (OMSI) completed a master plan in early 2008. Research and development, laboratory and educational uses are envisioned within the plan to complement and expand the museum's science and educational programs. The campus is at the transportation nexus of Light Rail Transit, Streetcar, bus and regional highway systems, and occupies a prominent yet underdeveloped location on the east bank of the Willamette River. Oregon Health Sciences University’s hill top and emerging river front campus on the west shore will be minutes away upon completion of the Willamette River transit crossing.

Leading local laboratory design architects will make presentations and students will tour OHSU laboratories. Nancy Stueber, President - Oregon Museum of Science and Industry, will kick-off the studio at the OMSI campus, discussing OMSI’s vision for the future and the bridge between research science and education. John Thompson - ZGF who Mr. Lindley worked with on the Fred Hutchinson Cancer Research Center in Seattle will present the OMSI master plan and program and conduct a site tour.

Thomas Fortier - ZGF, currently designing the Lorry I. Lokey Stem Cell Research Building at Stanford University, will conduct a tour of Oregon Health Science University Biomedical Research Building. Additional tours and speakers will be announced.

Students will prepare case studies that answer questions about integration, interaction and collaboration, academic and research bridges between education and bioscience, “off the grid” green laboratory buildings, integration with transit facilities and, form, function and identity.

Course Objectives

Four objectives of the studio are to:

- Envision and create an integrated and interconnected contextual urban form through urban design and comparative building typology to provide insight into relationships between modes of transportation, shared facility usage and public spaces.

- Research and apply internal common area design that integrates and supports advances in research environment design, incorporates mechanical functions and informs building architecture to expand knowledge and creative thought around a highly specialized architecture.

- Identify research laboratory comparative architectural typologies to create a building that complements the OMSI master plan and program while advancing innovations in building design through green materials and systems,
environmentally responsive orientation, the exploration of expressive forms and integrated bioscience and education programs,

- Strive for an “off the grid” architecture that incorporates this transit oriented site, climate-sensitive design, daylighting, passive heating and cooling, photovoltaic cells, wind energy, waste water recycling and geothermal systems.

Urban Design

Working within a diverse urban context that includes OMSI, the Eastside Streetcar Loop, Milwaukie LRT, Willamette River Transit Crossing, MLK Viaduct, Willamette River, Springwater Trail, Willamette River Greenway systems, and the South Waterfront OHSU campus, students will study implementation strategies for the OMSI Master Plan. Urban design will focus on creating an interconnected urban form including public spaces, linkages, architectural continuity and cohesiveness, building height and massing and riverfront site design.

Research Laboratory

Through case studies, students will investigate and envision architectural typologies that provide models and patterns to shape future innovative interior and exterior laboratory design. Program and adjacency diagrams are provided to enable students to move directly into urban design and architectural plan and massing studies that incorporate environmental attributes of the site. Exploring distinct and identifiable building forms and materials should differentiate and provide balance between bioscience building identity and campus context of OMSI, the Portland Opera and the Streetcar/LRT station. Architectural typologies should also exhibit integrated and highly functional green building practices.

The integration of a Streetcar/LRT/Bus station within the laboratory program will provide an opportunity to create a non-automobile oriented solution. Integrating public transportation with an exclusive research environment presents opportunities to explore architectural transitions between uses, and the scale and affects of public activities and spaces on scientific research.

Questions for Investigation

- What are the fundamental elements necessary to understand the programmatic requirements for creating a medical research environment?

- What are the latest innovations in work and research environment design such as work group or team space, individual space, common areas, living space, etc?

- How can common areas inspire integration, interaction and collaboration?

- Can a private research laboratory share facilities with an institution such as OHSU?

- What are the programmatic elements that OHSU could theoretically provide such as clinical science and hospital functions for clinical trials?

- How would programmatic elements across the river at OHSU help define programs for the OMSI campus?
Would OMSI and the South Waterfront campus connected by streetcar, LRT, and bike and pedestrian facilities be any different than the tram connecting the South Waterfront and the Hill; what are the differences affecting the program such as travel time, ability to move patients etc?

What are the issues with integrating a streetcar/LRT station and research laboratory into a single architecture?

Considering that laboratory energy use is approximately 10 times that of a typical office system, how green can a laboratory building become and what ancillary plant or other related facilities are necessary or ideal for the greater greening of buildings (bioreactors, wind, solar, geothermal systems, systems heat recovery)? Where is the greatest need for green innovation, especially regarding building form and materials?

Where within a research laboratory building model (besides green building technology) are there areas for greatest architectural innovation?

How could architectural and programmatic identity be implemented in a building on the OMSI campus that would invite future development while complementing existing uses?

How can research laboratory, open interactive spaces, vertically and horizontally, foster academic interaction?

How can circulation for delivery vehicles and autos be designed to support a pedestrian only campus.