University of Oregon - School of Architecture and Allied Arts - Department of Architecture
Arch 4/584 Architectural Design – Winter 2015

image by Brandon McCoy, entobox.com

Image from Kellogg for Coho Initiative

Two Countries, One Planet

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The 2015 Shanghai Xian Dai - UO Exchange program's Studio class will focus on cross-cultural learning and sustainability. Oregon students will have the opportunity to partner with top architects from a top Shanghai architecture firm in applying sustainable design principles.

The studio will focus on DESIGN WITH NATURE: sun, water and wind. Emphasis will be placed on low-cost energy-efficiency through load reduction, passive solar, daylighting and natural ventilation, secondarily looking at integration of solar thermal and photo-voltaic panels. Stormwater management and artful rainwater design strategies will also be discussed. To incorporate performance-based design, the studio will teach solar simulation and parametric design methods using Rhino Grasshopper software.

It is envisioned that the Shanghai visiting architects will share architectural knowledge and skills along with Chinese cultural insights, while the Oregon students will help interpret local context and contribute ecological design methods. All will meet Monday and Wednesday afternoons, with initial Wednesdays devoted to digital design with Rhino-Grasshopper. Oregon students will have a separate session on Friday afternoons and the visiting architects will have separate seminar Wednesday mornings.

Students will first focus on understanding the natural and urban structure of downtown Milwaukie, Oregon, then work in teams to propose a site design. After receiving feedback on the site designs, the students will work on integrating usage, sun, wind and water considerations at the building scale. After the site design, the Chinese architects can choose to redesign their own buildings or work on the Milwaukie site.

The City of Milwaukie planners are interested in seeing ideas for how the small downtown could develop with the arrival of the TriMet MAX Light Rail station. The downtown sits amid many natural features, on the edge of the Willamette River bounded by Johnson Creek on the north and Kellogg Lake (a dammed creek) to the south, with a fast urban connector, McLoughlin Boulevard separating the downtown from the waterfront. Students can learn from the many planning ideas have been proposed for the immediate south downtown area, as well as the larger metropolitan area.

SYLLABUS *(subject to change)*

Week 1 SITE ANALYSIS – Nature in the City

Assignment: Ecological and Urban Analysis through reports & mapping. Individuals take on specific aspects of place to research and share.

Ref: Girling / Kellett, Skinny Streets & Green Neighborhoods: Ch. 1-3.

Ref: Chinese Conception of Space: Chinese Perception of Nature - Landscape

Ref: Lynch: Image of the City, Ch. 3:

Mon 1/5: Intro to Course, Students, & Milwaukie problem

Wed 1/7: Digital Skills – Rhino/ Grasshopper introduction

WEEK 2 DESIGN CONCEPTS: Systems thinking and design metaphors

Assignment: Site Selection & Concept Model showing Grey / Green relationships

Develop role of building in city and nature through design criteria and conceptual metaphors. Diagram how to connect your building to natural (Green) and built (Grey) networks. Examine how water can be saved, cleaned and infiltrated on-site. Create, test and document how solid / void options work with sun, wind, water and greenery.

Mon 1/12: EcoDistricts, Activity: Group discussion of sites and program,

Activity: Urban design charrette

*Mon 1/12 at 5:30pm in 206 LA: **Frank Escher and Ravi GuneWardena**, EscherGuneWardena, L.A,, CA*

Tues 1/13 at 2:30-4:00pm in 278 LA: Welcome Reception for Xian-dai Architects

Wed 1/14: Digital Skills: Sun-path simulation with Heliotrope, Climate Visualization with Ladybug

Ref: Girling / Kellett, Skinny Streets & Green Neighborhoods.

Ref: Allied Works concept models: http://alliedworks.com

Ref: Making Ecodistricts: Civic Ecology : http://ecodistricts.org/protocol/resources/

WEEK 3 SUN: Passive Solar orientation & massing for energy conservation

Assignment: Site Design massing studies with solar studies

Ref: Knowles' Solar Aesthetic in Sang Lee's Aesthetics of Sustainable Design, pp. 50-65.

Mon 1/19: MLK Holiday, No Class

Wed 1/21: Digital Skills: Solar SImulation w Ladybug

*Wed 1/21 at 5:30pm in the JS Museum of Art: **Kenneth O'Connell** on 100 years of Art at the AAA*

*Fri 1/23 at 5:30pm in 206 LA: **Gabriel Tan**, outofstock design, Singapore*

WEEK 4 ENERGY USAGE

Assignment: Model and diagram how loads could be reduced by adjusting program distribution & form

Mon 1/26: SITE DESIGN REVIEW

*Mon 1/26 at 5:30pm in 206 LA: **Isabelle Biro**, Atelier Isabelle Biro, Paris, France*

Wed 1/28: Digital Skills: Paneling Tools

Activity: Reduce Loads: examine Seasonal, diurnal usage patterns, program clusters

Activity: Use the Living Building Challenge to expand your project's ecological potential

Ref: Cascadia GBC Living Building Challenge: http://living-future.org/lbc

Ref: Brown and Mhuireach: Seven Strategies for Energy Balanced Buildings

Ref: Better Bricks Integrated Energy Engineering Guide

WEEK 5 WIND & WATER

Assignment: Sections showing how the building maximizes sun, wind & water. **Diagram water flow** Considering hydrolic cycle, watershed, riparian zones

Ref: ESBL Pacific Northwest strategies for passive ventilation

Ref: Language of Landscape. Ch. 4, Process: 84-101

Ref: City of Portland Stormwater Management guide

Ref: Echols, Artful Rainwater Design

Mon, 2/2 at 12noon in 206 LA: **Xian Dai Architects** public lecture

Wed 2/4: 3:30pm lecture by Brook Muller

*Fri, 2/6 at 5:00pm **James Tice,** UO Architecture, Presidential Lecture: Mapping Rome: Portraits of a City*

WEEK 6 STRUCTURE

Assignment: Material selection, framing diagram

Examine how resisting gravity and live loads give organizational clarity. Examine how elements (columns, piers, load-bearing walls, trusses and frames) can heighten spatial experiences.

*Mon 2/9 at 5:30pm in 206LA: **Carlo Ratti,** MIT Senseable Cities Lab, Cambridge, MA*

WEEK 7 FAÇADE EXPRESSION – Surfaces, Pattern, Depth

Assignment: Elevation variations: Consider compositional strategies. Looking at how to use punctures, transparency, overlay, contemporary collage, local symmetry, base-middle-top.

*Mon 2/16 at 5:30pm in room 206: **Nico Larco,** Department of Architecture, University of Oregon*

Wed 2/18 – BUILDING DESIGN REVIEW 2:45pm Milwaukie, 5pm-7pm Portland (to be confirmed)

*Wed 2/18 at 5:30pm in JS Museum of Art: **Anthony Belluschi and Judith Sheine:** The Architecture and Legacy of Pietro Belluschi*

Thurs 2/19: Chinese New Year

WEEK 8 INTERIOR SPACE AND LIGHT

Assignment: Daylighting model & perspective rendering or animation (Digital OR Digitally painted version of daylighting model) The most intimate experience with a building occurs at the scale of the room, where the hand can touch materials and see how connections are made. Visual refinement, architectural hierarchy, proportions, choreographing of program activities.

*Mon 2/23 at 5:30pm in 206LA: **Shelley Poticha,** Natural Resources Defense Council, Washington, DC*

WEEK 9 PRESENTATION

Assignment: Verbal and Visual Communication Create schematic layout and schedule, verbal delivery

Wed 3/4 & Fri 3/6: Presentation Rehearsal

WEEK 10 FINAL REVIEW To be scheduled

WEEK 11 EXIT INTERVIEWS

PROCESS: FOSTERING DESIGN DEVELOPMENT

The class will challenge students to try new design methods that integrate rational and imaginative thinking in a productive process. The class will consider how design processes can stimulate creativity, and how to refine and communicate design ideas. Students will be encouraged to try new approaches and set a personal agenda for honing specific design skills.

A structure of weekly themes, scheduled charrettes and assignments will give unity to the individual explorations and maximize dialogue. Class time will be used for presentations, individual desk crits, small group discussion, internal pin-ups and formal reviews. Each student needs to take responsibility for pushing boundaries in design exploration and production.

PARAMETRIC DESIGN AND ANALYSIS: Given that the building must function within larger natural systems, we will focus on optimizing daylighting and sun-shading. We will use solar simulation at an urban scale to identify where and when the building receives direct sunlight; then overlay the program to define desired types of daylighting. By analyzing how variations of folding sun-shading motifs transmit or block direct sunlight, we can customize shading devices.

Research is a crucial part of the design process. Students can choose topics and resources to maximize interest, everyone needs to dig, think critically, and share how to apply discoveries to the project.

Students will be encouraged to generate explore design alternative to understand implications and develop the best option. Designers need to efficiently create 3D sketches and study models in order to consider extremes and find the boundaries of possibilities. The studio will encourage initial development through physical means: lots of sketches on trace paper and quick models to foster fast ideation. As the ideas progress, digital studies will be important for studying, refining and communicating the work.

REQUIREMENTS AND EVALUATION

Students are expected to come to all classes prepared and on-time. Fulfilling assignments in a complete and timely manner is critical to academic advancement, and critical for professional practice. Pinups and reviews serve as benchmarks to evaluate competency and readiness for the next phase. For communication, the students will share their work by uploading a PDF of their efforts after each third of the course (week 4, 7 and 11).

STUDENT ENGAGEMENT INVENTORY

Activity	Undergradd	Grad	Visitor
Course attendance	108	108	76
Assigned Readings	12	14	20
Design development	45	70	30
Writing assignments	4	8	8
Field trips	16	16	16
Independent Research	3	24	Opt
TOTAL hours:	180	240	150

Projects must successfully address these National Architectural Accreditation Board's student performance criteria:

A.2. Design Thinking Skills, A.5. Investigative Skills, A.8. Ordering Systems
B. 1. Pre-Design, B.2. Accessibility, B. 3. Sustainability, B.5. Life Safety, C. 1. Collaboration

GRADUATE STUDENTS

Graduate students are expected to research and develop their work more thoroughly than undergraduates by spending more time and by using prior educational and professional experience. This will be reflected in stricter standards for grading graduate students as well as differences in specific requirements.

Graduate Research Report: Graduate students are required to give a verbal and visual presentation about a research topic relevant to their project. The topic should relate to the project through a conceptual metaphor, visual properties or technology. The report should describe design principles, illustrating cutting-edge possibilities with case studies.

VISITING ARCHITECTS

The visiting Shanghai architects will:

- Work with Oregon students on Milwaukie *Site Design*. (weeks 1-4)
- Work on a Milwaukie *Building Design* OR Advise on the designs and *Research* a relevant topic of interest.
- Present a previous design project to the class for green redesign
- Contribute to a public lecture on 2/2.
- **Visiting Architects' Report:** Reflect on design, research and travel through online posts (week 4, 7 & 11)
- Additional time will be scheduled for internship preparation.

SITE ANALYSIS & DOCUMENTATION

Assignment 1: draft due

Students will split into groups to address

1) Natural System: *Investigate the local eco-system and climate. Map green network & water system, summarize guidelines. Find areas of vulnerability, biggest threats and best opportunities.Identify resource and waste streams of the vicinity, looking for opportunities for re-use in neighboring properties.*
For the advanced: *Examine how one local organism thrives within the specific microclimate to reveal useful strategies for architectural design. How does it collects nutrients, takes shelter, and sheds waste? How does is its structure and skin adapted to the microclimate and location? Sketch architectural applications.*

2) Urban Structure: use Kevin Lynch's techniques to map the city: Nodes, Paths, Edges, Districts, Landmarks as well as Anne Whiston Spirn's Prospect, Refuge and Source.
Create digital & physical site models

3) **Organize** photos, sketches, references and links so all information is accessible online.

Primary Reading: Girling / Kellett, Skinny Streets & Green Neighborhoods: Ch. 1-3.
Yang, Chinese Conception of Space: Chinese Perception of Nature - Landscape
Lynch: Image of the City, Ch. 3: http://books.google.com/books/about/The_image_of_the_city.html?id=_phRPWsSpAgC
White: Site Planning

ADDITIONAL CONSIDERATIONS

SPECIAL NEEDS

Appropriate accommodations will be provided for students with documented disabilities. In the first week of class, students should alert the instructor of any requirements for an optimal learning situation.

STUDENT CONDUCT

All students are required to familiarize themselves with the UO Student Conduct Code (http://conduct.uoregon.edu) This code represents a compilation of important regulations, policies, and procedures pertaining to student life. It is intended to inform students of their rights and responsibilities during their association with this institution, and to provide general guidance for enforcing those regulations and policies essential to the educational and research missions of the University.

Students must follow academic honesty, copyright and fair use requirements. Be sure to cite all sources when you quote, paraphrase or insert an image (http://w2.eff.org/IP/eff_fair_use_faq.php)

DIVERSITY

It is the policy of the University of Oregon to support and value diversity. To do so requires that we:

- respect the dignity and essential worth of all individuals.
- promote a culture of respect throughout the University community.
- respect the privacy, property, and freedom of others.
- reject bigotry, discrimination, violence, or intimidation of any kind.
- practice personal and academic integrity and expect it from others.
- promote the diversity of opinions, ideas and backgrounds which is the lifeblood of the university.

UO employees, including faculty, staff, and GTFs, are mandatory reporters of child abuse and prohibited discrimination. This statement is to advise you that that your disclosure of information about child abuse or prohibited discrimination to a UO employee may trigger the UO employee's duty to report that information to the designated authorities. Please refer to the following links for detailed information about mandatory reporting:
https://hr.uoregon.edu/policies-leaves/general-information/mandatory-reporting-child-abuse-and-neglect/presidents-message
http://around.uoregon.edu/mandatoryreporting

CONFLICT RESOLUTION

Several options, both informal and formal, are available to resolve conflicts for students who believe they have been subjected to or have witnesses bias, unfairness, or other improper treatment. It is important to exhaust the administrative remedies available to you including discussing the conflict with the specific individual, contacting Glenda Utsey (gutsey@uoregon.edu), the Associate Department Head for student affairs, or Judith Sheine (jesheine@uoregon.edu), the Department Head. Outside the Department, you can contact:

- **UO Bias Response Team: 346-1139 or http://bias.uoregon.edu/whatbrt.htm**
- **Conflict Resolution Services 346 -0617 or** http://studentlife.uoregon.edu/SupportandEducation/ConflictResolutionServices/tabid/134/Default.aspx
- **Affirmative action and Equal Opportunity: 346-3123 or http://aaeo.uoregon.edu/**

INCLEMENT WEATHER

In the event the University operates on a curtailed schedule or closes, UO media relations will notify the Eugene-Springfield area radio and television stations as quickly as possible. In addition, a notice regarding the university's schedule will be posted on the UO main home page (in the "News" section) at http://www.uoregon.edu. Additional information is available at http://hr.uoregon.edu/policy/weather.html.

If an individual class must be canceled due to inclement weather, illness, or other reason, a notice will be posted on Blackboard or via email. During periods of inclement weather, please check Blackboard and your email rather than contact department personnel. Due to unsafe travel conditions, departmental staff may be limited and unable to handle the volume of calls from you and others.