Landscapes on Structures
The Architecture of Roof Gardens and Ecoroofs

Course: ARCH 4/510 CRN: [tbd], 4 credit hours
Satisfies technology requirements. Additional enrollment based on availability. Open to PSU students, space available.

Instructor: Adjunct Professor Ben Vaughn, bvaughn2@uoregon.edu
Office hours by appointment

Class Meeting: Tuesdays and Thursdays, time TBD
White Stag Building - Room TBD

Prerequisites: ECS 1 or 2 or equivalent

Course Description and Overview
This course will introduce students to the technical aspects of landscapes built over structures. The course will explore “intensive” (roof garden) and “extensive” (ecorooft) style gardens. Emphasis will be placed on the detailed study of materials and construction techniques involved in the design and documentation of these landscapes. This course is intended to serve as preparation for professional work within the field of Architecture and Landscape Architecture. The vocabulary and technical skills required to design these unique landscapes will be essential for the next generation of design professionals.

Course Format

Michael Van Valkenburgh Associates
The course will be presented in a collaborative format, with lectures from the instructor and from professional guests, interactive discussion, class exercises, student presentations and critiques. An emphasis will be placed on design through detail and design techniques inherent to landscapes built over structures. Several on-structure landscapes will be explored first hand in Portland during class hours. You will conduct a few assignments individually and others as design teams to study a hypothetical roof garden project. Each team will work together to produce construction document level boards. The boards will highlight details, materials, and design images from class exercise and the field trips. Information will be presented through a layer of the construction documentation process typical of the profession.

Course Evaluation: graded or Pass/No Pass

Each student will be evaluated based on:
- Relating lecture and site visit topics into exercises and group projects
- Thorough analytical studies of materials, detail, and design
- Attendance and participation in class discussion and exercises
- Clear presentation skills, including written, graphic and spoken

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<th>Evaluation Area</th>
<th>Weight</th>
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<tr>
<td>Attendance, Participation, Discussion</td>
<td>10%</td>
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<tr>
<td>Assignment Exercises (5 total)</td>
<td>50%</td>
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<tr>
<td>Detail and Design Sketchbook</td>
<td>10%</td>
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<tr>
<td>Final Project and Presentation</td>
<td>30%</td>
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Information will be presented through a layer of the construction documentation process typical of the profession.

Course Materials

The following materials are required for each student in this class (not needed until class #2) and can be purchased at Art Media or the UofO Bookstore:
- 1 5x7 or 8x10 sketchbook or journal with 1/4-inch grid.
- 1 25-foot tape measure
- 1 8.5x11 graph paper
- 1 Pentel Sign Pens, black, ($1.50 each)
- 1 Niji Stylist Pen, black, ($1.29)
- 2 red Prismacolor “ColErase” (0.60c)
- 2 blue Prismacolor “ColErase” (0.60c)
- 2 2B pencil ($1) or mechanical/drafting pencil ($6)
- 1 architectural 6” length flat scale

Optional (each team needs at least 1, but you will find these useful in your career)
- 1 architectural triangular scale
- 1 roll of 12” trace paper (white or yellow) 50 yards

A digital camera will be important for site investigation and for the final report. Each design team must have access to at least one.

Computer Software
Students will be given flexibility in their choice of presentation medium. Computer aided drawing is encouraged and drawings can then be presented with the aid of a combination of InDesign, AutoCAD, Illustrator, Photoshop and Word, according to team and student abilities and preferences. Final reports should be submitted in 24x36 hard copy(rolled) and in Power Point. A working knowledge of all these programs will be professionally very useful (if not essential) so students are encouraged to familiarize themselves with these relatively simple programs. The use of AutoCAD or Sketchup is not required and you can produce a design boards without it, but if you or your team are familiar with and have access to these programs, by all means employ them.

**Course Readings**
There are no required textbooks for this course. Excerpts from several texts will be provided but you do NOT need to purchase any of them. There are many excellent reference books for this topic and the following is a list for reference:
1. Roof Gardens History Design and Construction, Theodore Osmundson
2. Green Roof – A Case Study, Christian Werthmann
3. Living Systems, Liat Margolis // Alexander Robinson
4. Green Roof Plants, Edmund C. Snodgrass
5. Planting Green Roofs and Living Walls, Nigel Dunnett
6. Vertical Gardens, Anna Lambertini, Mario Ciampi, and Jacques Leehardt
7. Rain Gardens: Managing Water Sustainably in the Garden and Designed Landscape, Nigel Dunnett
8. Green Roof Systems, Susan K. Weiler

**Other References**
1. City of Portland, Bureau of Environmental Services
   www.portlandonline.com/bes/
2. Green Roofs for Healthy Cities www.greenroofs.org

_All class readings will be posted on Blackboard and/or distributed in class._

**Detail and Design Sketchbook**
Each student is required to keep a 5x7 or 8x10 sketchbook or journal with 1/4” grid to be used in the recording of information during site visits and class lecturers. The sketchbook exercise shall be completed individually and sketchbooks are due on the final day of class. The sketchbooks shall include the following for each garden visited. No make up site visits will be arranged for those roofs where special arrangements were made. The objectives are to capture the essence of roof quickly through gestural sketches:
- General / Vicinity Information (project name / major cross streets / garden type / date visited / weather )
- Two detailed sketches for each garden visited (field measurements required for one sketch)
- Diagrammatic Site Analysis (prevailing wind, views, public spaces, microclimates).
- General Plant Types (soil depth, plant species)
- Diagrammatic cross section through garden (optional)

**Group Project**
Your design team will be considered as a consulting firm for an urban infill green roof project. The assignment will be to refine the design of the project’s roof garden through details and material selection. Design teams can select from instructor’s design examples or provide a unique solution with the instructor’s approval. Your team will be required to provide (3) three 24”x36” boards: Image Board, Detail Board, and Site Plan Board with detail callouts, finish schedule, grading spots, and material legend. Reference material from the boards can be derived from the site visits, details discussed in class exercises, course readings, and explorations of design through photo documentation and sketches. These boards will be an excellent opportunity to explore design through detail and build material for your career portfolio. The boards should be creatively and professionally crafted in 24”x36” format, color or black and white. The final class will provide an opportunity for each design team to present their work to the class in Microsoft Power Point. The Board and Power Point presentation will include, but not limited to the following information:*

- North arrow, scale of each drawing or detail
- Design Statement (50 to 75 words).
- Site analysis diagram (shade study, climate, circulation, views, experiential factors).
- Material schedule, finish legend, furnishing legend.
- Six representative design and material images. Two representative plating images.
- Custom site details (scales t.b.d.). (A minimum of 2 details for each team member)
- Reference to all details, images, and material on Site Plan with callouts.
- Technical, scaled site plan (hand drawn or AutoCAD) with conceptual garden design, architectural & structural features, major dimensions, property lines, drains, furnishing, schematic grades, materials, and detail callouts.
- Cross sections through site and surrounding streets.
- Summary of project’s costs.
- Team projects will be presented at the Final Presentation in Power Point. Each team’s power point presentation will be used to assemble a book representing the final projects; publishing releases will be obtained from each student.

*Additional assignment information to be distributed during the term. Subject to change
Course Schedule (subject to change)

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<tr>
<th>Wk</th>
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<th>Assignment</th>
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| 1  | Introduction | **Exercise #1:** Green Roof Images  
Due: class 2 |
|    | Student introductions  
Course objectives, schedule, materials  
A brief history of green roofs (Portland and beyond)  
Major green roof types (Intensive vs Extensive)  
Collaborative design process  
Design through detailing process  
Case Study (Guest)  
*In-class discussion: What are the benefits of Roofgardens? (ecological, social, function, environmental)*  
**Fieldtrip** - East Side |
| 2  | Roof Garden Detail and Design (Intensive) | **Exercise #2:** t.b.d  
Due: class 3 |
|    | Major Environmental Influences (shade, climate, sun, soil, views)  
Architectural Structures that support landscapes  
Roof Garden Design Principles (materials, grading, architecture)  
Overview of Green Roofs Components  
Case Study (Guest)  
*Individual student presentations and Discussion of Green Roof images.*  
**Fieldtrip** - Pearl District |
| 3  | Roof Garden Components (Intensive) | Review and Understand Group Project. Come to next class with questions. |
|    | Planting types  
Soil types and saturated weight  
Soil depth requirements  
Planters, walls, and paving types  
Drainage System  
Case Study (Guest)  
*Introduction to group project and formation of Design Teams (Exercises 3-5)*  
**Fieldtrip:** Downtown |
| 4  | Ecoroof Detail and Design (Extensive) | **Exercise #3:** Detail Call Outs and Material Schedule  
Due class 5 |
|    | Different Systems and Approaches  
Ecoroof Components  
Guest Architect (Guest)  
Special Considerations  
Select an appropriate design scheme for the group project.  
**Fieldtrip:** Southwest Park Block |
| 5  | Design and Detail Process / Structure | **Exercise #4:**  
Details and sections  
Due: class 7 |
|    | Details (scale, callouts, getting started)  
Material selection  
Development of design through details  
Guest Architect (Guest)  
*Group Callout and Material Presentations*  
**Fieldtrip:** South Waterfront |
6 Sustainability
   Incentives / Requirements
   Stormwater (Guest)
   Energy
   Habitat
   Food Production
   *In-Class Detail Work Session (30 min)

Fieldtrip: Southwest

7 Constructability and Cost Analysis
   Lessons Learned
   Case Studies (Guest)
   *In-class exercise: cost analysis spreadsheet

Fieldtrip: PSU Research

8 Structural Considerations
   Structure Types
   Drainage and Column Layout
   Load Calculations (Guest)
   Grading and Drainage
   *In-class exercise: Load Calculations

Presentation Rehearsal

9 Team Final Presentations

10 UO Final Review Week (no class)
11 Final Exam Week (no class)