

UNIVERSITY of NOTRE DAME
School of Architecture

DESIGN VI/ ARCH 41121

BUCCELLATO STUDIO SPRING 2016

Environmental Stewardship through Interdisciplinary Research and Design

Course Syllabus

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Meetings: Monday, Wednesday & Friday; 1:15 – 5:00 pm
(AME 47431: Monday, Wednesday & Friday; 1:30 – 2:50 pm and reviews)

Course Status: Required for B. Arch Degree

Course Credit: 6 hours

Course Content:

This semester, you will undertake a series of three related analysis and design projects, culminating in a comprehensive and multi-scale design exercise set within a small campus Master Plan for a new experimental research facility to support the advancement of global change research. Your investigation of the design problem will include the study of traditional principles of urbanism and detailed building design solutions focused on the integration of the following considerations: impact and influence of context (history, culture, climate, localized traditions, existing conditions), *with particular emphasis on* the relationship between construction materials and methods and the integration of site, structural and environmental systems, accessibility and regulatory requirements, and sustainable and passive energy design approaches.

Project 1:	Context, Climate & Architectural Form	(1.5 week)
Project 2:	Critical Circumstances	(2 weeks)
Project 3 (2 parts):	Research & Education Campus at ND-LEEF	(~13 weeks)
	Project 2a: Site & Precedent Analysis	
	Project 2b: Master Plan & Comprehensive Building Design	

Environmental Stewardship through Interdisciplinary Research and Design

Your primary design investigation this semester will be in support of the mission and vision of the Notre Dame Environmental Change Initiative (ND-ECI), a \$10 million University-funded Strategic Research Investment “focused on sustaining ecosystem services and well-being”¹, and the initial funding source for the proposed experimental research facility that is part of those efforts.

¹ As stated in the research proposal submitted to the University SAPC by ND-ECI Director and Professor of Biology, Dr. David Lodge; reference: G. Lamberti (Professor of Biology and Project Steering Committee Director) LEEF-ND Presentation to the Board of Directors of the St. Joseph County Parks. November 16, 2010.

In order to maximize the impact of the research to be undertaken there while simultaneously minimizing the overall impact of the proposed campus on the natural environment (in this case, St. Patrick's County Park), your design of the experimental research facility is expected to integrate durable and sustainable principles of architecture and urbanism at every opportunity. From the guiding Master Plan to the design of the buildings and the materials and methods employed in their construction and operation, the facility that you propose must serve the mission of the Biology Faculty and the critical global change research to be undertaken there, and should itself become an enduring and didactic example of thoughtful environmental stewardship.

The critical project values that you identify through your study of the site and your clients' needs – or the “Basis of Design” – will be further enhanced by your practical collaboration with senior engineering students who will be embedded in the studio, working alongside you to generate and interpret performance analyses of your designs *throughout – and in service to – the design process*. Through this collaboration, you will work together to achieve buildings that are designed to “perform” on many levels (physical and cultural), and explicitly as structures intended to optimize passive methods of energy and environmental control.

Building upon your understanding of fundamental principles of durable design and construction, your comprehensive design investigation this semester will involve an iterative collaborative approach with your engineering colleagues, who will use prevailing building modeling and energy performance analysis software and tools to provide rapid feedback on the anticipated performance of your building designs. Your design presentations this semester (interim and comprehensive) are expected to include explicit, iteration-specific feedback and analysis from your engineering cohorts presented alongside the resulting design influence(s) that resulted from your collaboration.

This collaboration is meant to enhance both the architects' and the engineers' preparation to enter into their respective professional practices, where such collaboration is expected, particularly in light of increasing demands for integrated project delivery in design and construction, and associated initiatives by the National Council for Architectural Registration Boards (NCARB; organization that governs licensure), the National Architectural Accreditation Board (NAAB), and the American Institute of Architects (AIA) to foster and encourage cross-disciplinary engagement during the education of the architect.

Client Engagement and Review:

This semester, you will have several opportunities to interact with your clients, key Faculty on the Steering Committee for the ND-ECI/ LEEF-ND Project and leadership of St. Patrick's Park.

Throughout the semester, project meetings and your juried presentations may be attended by representatives from the Steering Committee, the Park, and the University Offices of Public Relations and Development. Your presentations may be selected to represent the work of our studio this semester on this interdisciplinary research initiative in various public and private exhibitions, including fundraising initiatives and public awareness campaigns.

NB: In order to share the outcome of our collaborative efforts with your colleagues in the College of Engineering this semester, you are *encouraged* (although not required) to collaborate as a studio to contribute a presentation and exhibition of work for the Annual Undergraduate Scholars Conference (Friday, April 29, 2016) held by the Center for Undergraduate Scholarly Engagement at the University of Notre Dame. **The date to submit an abstract for Conference consideration is typically the third Friday in March.** Conference Information and Guidelines will be available in late January, at <http://undergradresearch.nd.edu>.

Fundamental Learning Objectives:

As architecture is a discipline across scales, the fundamental principles of composition must be considered at every level – at the scale of land-use and urban planning, to the composition and organization of a building, to the character of a building, its tectonics and detail. Your comprehensive solution for the proposed research campus will involve investigation across all scales, and through a series of exercises and analyses **the following fundamental learning objectives will be met:**

1. Further develop your understanding of what is to be gained by studying the roots of traditional building systems and the adaptation of those systems to suit the contingencies of place; ie: a region, its climate, local resources, economics, and necessity.
2. Enhance ability to think critically about construction materials and methods and the integration of long-standing traditions and emerging technologies.
3. Establish methodology or methodologies for identifying the normative conditions of a place, whether urban or rural, its building types, architectural character and details, and localized permutations, and the cultural influences and traditions fostered.
4. Develop a clear methodology for how one approaches the design of an urban intervention and/ or new building in *any* context and at *any* scale.
5. Enhance your foundational knowledge of western classicism and how that knowledge can contribute (*vis-a-vis* rigor and application) to your understanding of long-evolved, and in this case, vernacular, architectural traditions.
6. Enhanced presentation modes, methods, and collaboration skills through team-based design projects and practiced-based collaboration with mechanical engineering students.

Grading²:

Comportment/ Studio Performance:	20% *
Project 1:	15% **
Project 2:	25% **
Project 3:	40% ** (<u>5% interim pin-ups, tech’ memos;</u> <u>5% mid-reviews</u>)
TOTAL:	100%

* Attendance in studio is mandatory for the full class period (1:15-5:00 pm), unless special permission is granted by your instructor. This grade incorporates **evaluation of design process**, including preliminary site and building design investigations and analyses, interim presentation, and studio participation.

** Project presentations and final submissions must include images and analysis of all precedent sources and references for the project(s) in addition to a written bibliography of sources used. **Projects presented/ submitted without this information will be considered incomplete and will not receive a passing grade (see also requirements described in the individual Project Briefs).**

General Disclosure:

The Instructors retain the right to modify the contents/requirements/deliverables for this course throughout the semester. The students retain the right for adequate notice of any changes via email or in-class announcements.

Class and Studio Conduct:

¹ For the Grading Scale, refer to The University of Notre Dame Undergraduate Studies *Bulletin of Information*

1. **Attendance is required in studio and on all field trips.** Students are expected to attend class regularly and *punctually*. Three unexcused absences will result in a lowered grade for the course; 1 grade point per 3 absences. Absences due to illness or personal and family emergencies will be evaluated *by the instructor* on an individual basis².
2. Full participation in class is integral to learning (and will be counted as part of your grade for this course).
3. Project requirements are due on the dates stipulated in the course calendar and project briefs.

Late work will not be accepted.

4. In order to promote a constructive learning environment, use of **ANY** electronic devices is not permitted during class (lecture, studio, field trips): cell phones, visual or audio playing devices.
5. Entering Notre Dame you were required to study the on-line edition of the *Academic Code of Honor*, to pass a quiz on it, and to sign a pledge to abide by it. The full *Code* and a *Student Guide to the Academic code of Honor* are available at: <http://www.nd.edu/~hnr/code/docs/handbook.htm>. Perhaps the most fundamental sentence is the beginning of section IV-B: The pledge to uphold the *Academic Code of Honor* includes an understanding that a student's submitted work, graded or ungraded – examinations, draft copies, papers, homework assignments, extra credit work, etc. - must be his or her own.
6. In order to limit disruption and distraction in class (not fair to your peers or your instructor) please refrain from eating in class. If you must eat in class, please do so with the utmost respect for your classmates, University property, your instructor, and guests.
7. All students entering the School of Architecture were invited to sign a form giving the School permission to hold their work for exhibition and to publish it. If you signed that form, work done in this course may be retained. It will of course be available to the author for scanning/photographing and will be returned. Because work held for exhibition may be held beyond graduation, be sure that it is labeled on the back with your name and an address to which it can be returned.

**** Please retain and scan at high resolution *all* presentation drawings and important process drawings at the completion of each project; these will be due to the course Box.ND site prior to each – and every – project deadline.**
8. The custodial staff is always careful to avoid disturbing material on desks and layout tables; however, anything that is left on the floor of the studio is subject to being thrown away during routine nightly clean-up. Further, you are asked to keep the floors as clear as possible around your desk and layout table so that regular daily cleaning by the custodial staff is not unnecessarily encumbered.
9. Please check your Notre Dame e-mail account regularly. Any communication from the instructor(s) about this course outside of regular class hours will be directed to your University account. *You are responsible for knowing all course communication in a timely manner.*

² Refer to page A-9, sections 13.1 and 13.2 in *du Lac* for the University's policy on absences.

Required Texts:

- Edward Allen and Joseph Iano, *The Architect's Studio Companion: Rules of Thumb for Preliminary Design*, 5th Ed., Wiley.
- Francis Ching, *Building Construction Illustrated*, 5th Ed.

General Reference Texts (1 Copy of each on Reserve in Bond Hall Library):

- Edward Allen & James Iano, *Fundamentals of Building Construction, Materials & Methods*, 5th Ed.
- Edward Allen & Patrick Rand, *Architectural Detailing*, 2nd Ed.
- James Ambrose, *Construction Revisited: An Illustrated Guide of Construction Details from the Early 20th Century*
- James Ambrose, *Simplified Engineering for Architects and Builder*
- Bjorn Berge, *Ecology of Building Materials*
- G. Z. Brown, *Sun, Wind and Light: Architectural Design Strategies*
- Francis Ching, *Architecture: Form, Space, and Order*, 2nd Ed. or later
- Ching and Winkel, *Building Codes Illustrated: A Guide to Understanding the 2006 International Building Code*, 2nd Ed.
- Norman Crowe, *Nature and the Idea of the Man-Made World* and *Visual Notes for Architects and Designers*
- Philip G. Knobloch, AIA, *Good Practice in Construction*
- Fuller Moore, *Understanding Structures*
- Harry Parker, *Simplified Design of Roof Trusses for Architects and Builders*
- Harry Parker, *Simplified Design of Wood Structures*
- Harry Parker, *Simplified Design of Structural Steel*
- Ramsay, Sleeper, *Architectural Graphic Standards/ Student Edition*
- Trust and Choudhury, *Design of Mechanical and Electrical Systems in Buildings*
- *International Building Code, 2009 edition* – or later
- ICC/ AMSI A117.1-03 “Accessible & Usable Buildings and Facilities” (available on-line)
- Szabo and Barfield, *Afghanistan: An Atlas of Indigenous Domestic Architecture*
- Inaba and Nakayama, *Japanese Homes and Lifestyles: An Illustrated Journey*
- Clark and Pause, *Precedents in Architecture*, 3rd Ed.
- Yoshida, *The Japanese House and Garden*
- Givoni, *Man, Climate, and Architecture*, 2nd Ed.
- Engel, *The Japanese House*
- Fitch, J.M., *The American Building, 2: The Environmental Forces that Shape It*
- Markovich, Preiser, and Strum, *Pueblo Style and Regional Architecture*

- Sanford, *The Architecture of the Southwest*
- Newcomb, *Spanish-Colonial Architecture in the United States*
- Oliver, *Dwellings*
- May, *Buildings Without Architects*
- Smith, *Prefab Architecture*
- Baird, *The Architectural Expression of Environmental Control Systems*
- Sloane, *An Age of Barns*
- Architecture for Humanity, ed., *Design Like You Give A Damn: Building Change from the Ground Up, Vols. 1 and 2*
- Kennedy, Joseph, ed., *Building Without Borders: Sustainable Construction for the Global Village (e-resource)*

NAAB CRITERIA – ARCH 41121/ Design VI*

The Bachelor of Architecture programs at Notre Dame is accredited by the National Architectural Accrediting Board (NAAB) as “professional degree,” one that satisfies the academic requirements for practice. That accreditation is given on the basis of extensive review of the program. Design VI is required to satisfy the following items from a list of twenty-six criteria for student performance:

- A.2. **Design Thinking Skills: Ability**
- A.3. Investigative Skills: ability
- A.4. **Architectural Design Skills: Ability**
- A.6. Use of Precedents: ability
- A.7. **History and Global Culture: Understanding**
- A.8. **Cultural Diversity and Social Equity: Understanding**
- B.2. Site Design: ability
- B.3. Codes and Regulations: ability
- B.4. Technical Documentation: ability
- B.5. Structural Systems: ability
- B.6. Environmental Systems: ability
- B.7. Building Envelope Systems & Assemblies: understanding
- B.9. Building Service Systems: understanding
- C.1. Research: understanding
- C.3. Integrative Design: understanding
- D.1. Business Practices: understanding

* Updated per revised guidelines issued on 12/17/2014 (JS)