ARCH 4104 - STUDIO
DESIGN RESEARCH

Spring 2016 Syllabus
University of North Carolina at Charlotte, School of Architecture
Instructors: Azarbayjani, Beorkrem, Ellinger, Lin
6 Credit Hours: MWF 2:00 – 5:30 pm; Prerequisites: ARCH 4103

PREMISE
Upon completion of ARCH 4103 and the fulfillment of the criteria associated with NAAB’s Integrated Design requirement for the accredited professional degree, students in ARCH 4104 embark on an experimental agenda rooted in technology and aligned with design research and professional engagement. In order to catalyze the spring semester, students revisit their completed fall semester projects, originally conducted in pairs, as individuals. Each student begins by isolating a specific design theme or question that is both evident in his/her project from ARCH 4103 and resonant with a general theme defined by his/her ARCH 4104 studio instructor. The objective is not simply to further develop a component or a system from the completed project, but rather to use the project as a starting point for a “deep dive” into questions raised by a space, a component, or a system in the project.

Although the completed project from ARCH 4103 is the generator of the spring semester inquiry, students are expected to decontextualize their starting point from its original constraints and parameters, and then to recontextualize it, through the guidance of their instructors and their engagement with various types of professionals, within a frame that produces a new set of rigorously speculative design outcomes, which will complement those of ARCH 4103 but also go beyond merely supporting or developing the premise of the completed project. This intention is to use the completed project as the generator of a new, albeit related, inquiry. The spring semester is NOT an extended design development phase. Instead, it should be considered the beginning of a new phase in the students’ career—a design inquiry that begins to define professional aspirations and that expands the normal scope of work produced in an academic studio. Self-initiative is paramount.

METHOD
Each of the studio’s three sections will be led by a member of the SoA’s faculty, each of whom will offer a section-specific umbrella topic, under which students may conduct a variety of technology and practice related design inquiries. This year, the sections cover the general themes of Building Science (Azarbayjani), Computation (Beorkrem/Ellinger) and Urban Design & Community Engagement (Lin). Students will select a section based on the umbrella topics, all of which will be both specific enough to generate a studio-wide focus and general enough to allow for varying types of inquiries, methodologies, and outcomes.

Instructors will present their methodological and thematic frameworks to students toward the end of the fall semester, and section assignments will be made prior to the end of the semester, so that students may begin to consider spring semester project proposals over the semester break. Students in each section will be encouraged and prompted to collaborate with their peers in the other sections and to seek the expertise of the other instructors. The studio as a whole is envisioned as a design thinktank with three overlapping focal points, and exchanges between the section will enrich the experience.

The semester begins with a two-week proposal-development period, during which students work with their instructor and conduct research on their interests. Students then present their proposals to their instructors, and the design-as-research begins. All inquiries should require research not limited to normative design work: readings of professional journals, books, conference proceedings, and product/technology specifications, as well as interviews and meetings with external experts. However, the primary outcomes of the studio will be design-based (projects, not papers), and the semester will end with formal presentations of spring semester design work. For reference, and as a way to celebrate the completion of the professional degree, fall semester projects will be on display in a separate area.
Responsive Envelopes: Skin Strategies for Energy and Aesthetics
ARCH 4104- Fifth Year Studio Spring 2016 - Prof. Mona Azarbajani [mazarbay@uncc.edu, Office 242]

[Theme]
To design an energy efficient and environmental friendly building that upholds beauty is challenging. This studio is dedicated to developing design methodologies at the scale of the building envelope that balance aesthetics, thermal comfort, indoor air quality, and sustainability principles in response to climate. A responsive façade, in contrast to a conventional façade, adjusts its characteristics in order to mediate the effects of changing environments on user comfort and optimal energy efficiency. In the best cases, such a façade takes advantage of its performative features in order to enhance the aesthetic value of an architectural project.

Students in this studio can use their fall semester project as a catalyst to study the potential of facades to perform and to create an architectural identity. The first step will be to decontextualize the existing projects from their original constraints and parameters, such as their context in Charlotte, their program and scale requirements, and/or their massing strategies. New parameters and constraints defined by each student will then guide a new research inquiry dedicated to envelop design. The goal is to develop an inquiry to explore and evaluate a range of technologies for creating sustainable façade.

[Method]
The studio project will follow an iterative process that responds to students’ individually defined research inquiries under the main theme. Students will initiate and develop a new envelope, which will then become the vehicle through which issues such as performance, indoor environment, materials, and/or environmental systems will be explored. They will critically discuss and present their research inquiry in the development of the envelope or components of their design buildings. Based on their inquiry at each stage of the project, new information will be generated and incorporated into the design, with the aim of resulting in a component or system that is well-developed to respond to the initial hypothesis.

[Phases]
Studio consists of four phases:
I: Defining/Problematising a Topic and Planning a Research/Design Project (2 Weeks)
II: Literature Review (6 W)
III: Iterative Design: development of design based on the research inquiry (6W)
IV: Integrated design development: integrate the envelope response to the whole project (2W)
V: Final: Presentation of the one semester design and detail work.

[BIBLIOGRAPHY]
Benham, R. Architecture of the well-tempered environment (2nd edition
INTRODUCTION
This course is an option studio focused on computational design methodologies. The premise of this studio is to engage in advanced computational techniques and methods, including Building Information Modeling/Management (BIM), scripting, and performance analysis in preparation for professional practice and/or advanced graduate research. The goal is to research, design and implement novel computational methods towards the advancement of the architectural design workflow. This will be achieved by using the advanced computational tools available as standalone resources and embed them in a parametric loop to provide immediate feedback in design. Students can expect to work through self driven experimentation to develop their own working method using a variety of computational tools. This studio will be limited to 6 students.

OBJECTIVES
- To acquire skills in advanced digital and computational tools and methods (Revit, Dynamo, Flow Design, Vasari, Ecotect, Robot)
- To experiment, and develop problem-solving skills with these methods
- To investigate new applications for combining and developing iterative design methodologies between them in practice
- To explore the uses of digital fabrication to create customized components using automated methodologies
- To cultivate a critical mindset regarding the strengths and limitations of logical and procedural systems within the design process
- To create more informed designs through the integration of ecological data and performance criteria

METHOD
During the course of this semester students will propose and attempt various combinations and sequences of project development. Using their existing Fall studio programs students will create various sequences of iterative design development, focusing on program analysis, solar analysis, daylighting analysis, wind simulation, structural analysis and simulation, to create various iterations of their project based on multivariate design optimization. It is expected that these new iterations will be compared against but vary significantly from the Fall iteration of the project.
ARCH 4104 – Design Research Studio  
Vertical Urbanism: Architecture in Contemporary Urban Network  
Center City Building 1002  
MWF 1:30-5:00pm, Spring 2016  
Instructor: Zhongjie Lin, Ph.D.

Premise: Urban centers are often characterized by compact urban forms celebrating density and verticality. Vertical urbanism not only means tall buildings but, more importantly, refers to a complex and interactive three-dimensional network consisting of infrastructure, space, information, and ecology, on which our contemporary urban life depends. The characteristic of verticality informs the development of a variety of multi-used urban areas and can be seen in many reinvented urban building typologies such as multimodal transportation hubs, vertical farming, and urban mall complex.

This session welcomes proposals of thesis project that address the broadly defined issues of verticality and multiplicity in urban context. The topic can be approached as either an urban design question or one focusing on a type of urban architecture that is undergoing transformation under contemporary urban conditions including, but not limited to, skyscraper, transportation center, university, library, hotel, museum, shopping/entertainment complex, modular living, and urban park.

Method: Students will work on self-initiated projects using design as means of inquiry into contemporary urban condition. The initial phase of project will be analytical in nature and based on study of urban forms and building precedents, which lays the foundation for ensuing design phase. A site should be chosen in a high-density urban area to facilitate exploration of verticality and multiplicity. The instructor will serves the primary advisor in the process of research-design, while a student can also have an additional consultant either from the SoA faculty or from practice.

Studio time is M/W/F, 1:30-5:00pm. Mondays and Wednesday are mainly used for discussion, desk crit, and pin-up, and Fridays are usually workdays or reserved for individual consultation by appointment.


Instructor: Dr. Zhongjie Lin is Associate Professor of Architecture and Urban Design and Director of Master of Urban Design Program at UNCC. He received a Ph.D. in Architecture from University of Pennsylvania and a Master of Architecture from Tongji University. He is the author of *Kenzo Tange and the Metabolist Movement: Urban Utopias of Modern Japan* (Routledge, 2010) among several other books and dozens of journal articles. His research interests including architectural Avant-guard movements, urban design theory, and contemporary Asian architecture and urbanism.