New Curriculum Strategy

University of Minnesota
School of Architecture
We believe a fixed curriculum, no matter how visionary, is less valuable than a provocative infrastructure with clearly stated values that allows courses to evolve and students to navigate on individual paths.

This curriculum is guided by three primary values: Building on Tradition, Embracing Challenges and Expecting Change. It is facilitated by a structure which facilitates two very different modes of working: “slow burn” and “agile/nimble”. Each fall semester is “slow”, taught in semester-long coordinated courses and each spring semester is “agile”, containing combinations of 7-week modules. This booklet is organized around the three major values and illustrates them with work drawn from both slow and fast types of courses.

The very best curriculum invisibly sets in motion certain trajectories; it allows faculty to teach their to their strengths and students to assemble the patchwork of serendipitous moments that inspire life long learning. We live in a time where extreme care must be taken in stewarding education, specific skills need to be taught, urgent issues must be addressed and change is a desirable state to maintain. We believe this curriculum does not simply meet current needs but projects forward to shape the future.
We build on tradition

Architecture is its own mode of thought requiring a particular way of understanding the kinds of problems it deals with, common constructs, and modes of evaluation. The context of the problems presented as fuel to this inquiry must be complex enough (such as urban environments) to elude simple solutions and thorough enough to involve the logic of construction. Ironically, to prepare graduates for a future where design plays an expanding and unfamiliar role, long-established architectural principles are more important than ever. Architecture and buildings must be understood from their social and historical context as well as aesthetic and technical issues.

The goal of the Fall Semester curriculum is to establish the core values and procedures essential in cultivating an architectural intellect. Design is a process of developing reasonable solutions to unreasonable problems.

Our school is one of the oldest in the country and like many, has its own proud tradition of design excellence. The forward-thinking educational model we outline here respects this past. Specifically, we believe the maddeningly-slow-to-learn process taught in design studio is vital to the future of architectural education. We are aware of its many weaknesses: it is resource intensive, favors individual talent, too often personality driven, can be exclusive and non-collaborative and sends the message that design is valued over other curricular areas. However, a well-placed, well-run and well-coordinated design studio has enormous power to activate an entire curriculum. The types of questions that can be framed in studio create the “need to know” which is the basis for synthetic learning. The energy invested in creating this active state of inquiry is justifiable: it is the means by which we teach critical thinking. If it finds a strong base in the design studio, critical thinking easily expands to include other topics such as building technologies, professional practices, history or theory.

In this curriculum, we devote half of curriculum to create three coordinated design studios, one in each fall semester of our three-year curriculum. Each coordinated semester has a different set of sub-goals and combination of non-studio classes, but all share a most important learning objective: critical thinking skills.
In the first studio, students develop evolutionary formal logic, then test that logic in differing theoretical constructs and against specific physical limitations. Scale and scope of projects are chosen to create a cycle of investigation between large and small, complex and abstract. The logic and material language of architecture are explored in light of its role contributing to the public realm. Most of the exercises are team taught with some variation among instructors.

Integration of architectural design with theories of emerging building production and the exploration of material technologies and selection methods. Develop curriculum and research that explores the linkage between the quality of the environment, innovative design procedures, material qualities and building production methods. Excellence in developing and teaching building technology lectures and design studio with a demonstrated research record focused on innovative construction technologies, sustainable materials and building production methods.

Architecture is the intersection of material form and human habitation and thus engages both formal structure and cultural interpretation. Rigorous and critical thought is characteristic of the design intellect. Simply assigning and testing solutions is not sufficient. Architectural solutions must evolve.

Students consider five conditions of the building: how the wall is constructed, how an opening is made in the wall, how the wall turns a corner, how the building meets the ground, and how the building meets the sky. These conditions are posed as questions very early in the design process and continue through sketches, physical and digital
This studio provides an opportunity to experience a holistic way of organizing the conceptual work of an architect. Thus the pedagogical emphasis of each studio section is on bringing critical insight and discipline into the design process—structuring ways of conceiving, conceptualizing, exploring, and developing architectural ideas. The sequence of initial exercises/projects prepare students to design a complex and conceptually comprehensive project—a design for a (preferably) public building in an urban context. The final project must be thoughtful and competent enough to support comprehensive technical development in the required Comprehensive Design module. Individual instructors frame topics for each studio section.

The inspiration for this bridge came from research into balsa construction—especially constructions where weight was crucial such as airplanes, particularly the fuselage and wing makeup. The design evolved in order to account for construction problems.

Building Structures was once taught by teachers from engineering departments. While it established a physics-based understanding of the technological issues in architecture, it did little to incorporate these issues into design thought. We are committed to teaching building technologies as organic to design thought—not simply as a technical skill necessary to completion of construction documents.

GDII structures represents a different condition in terms of collaboration between design and technology. Here four instructors follow very different paths toward a common goal. Unlike the common problem model of the GDI studio, four different design and pedagogical models emerge from this studio. Common connections with technology classes are made difficult by this model. Instead, design studio will interface with Structures by creating a “need to know”. Design instructors may individually dip into the Structures curriculum as they see fit in terms of the role of structures in their particular project and pedagogy.

This project will challenged students to reinterpret the spatial and structural relationships of different Case Studies. The student’s task is to model accurately the whole and each of the components of their chosen Case Study structure and later interpret them as interconnected spaces, volumes, and forms. Students are asked to reconsider the structure as a simple armature of the physical construction and use the embedded information of the model to diagram the structure-space relationship of the building. This project requires students to explore and negotiate the act of translation from representation model to analytical model by means of a three dimensional diagram. This diagram should refer to the structure model but it should not be the structure itself.
Comprehensive design module explores the design potential inherent in technical development of a design project. Course work will test design concepts by developing details, integration of building systems, structural bay, enclosure, cost considerations and regulatory compliance. Exercises are intended to encourage students to expand projects from previous studio semesters to a high degree of technical competence. Student test concepts, develop details, integrate building systems. They address structural bay enclosure, cost considerations, regulatory compliance. A variety of media is used for documentation and design including Building-information modeling, 3D digital modeling and analog representation.

TO DESIGN WELL IS TO BUILD WELL: A PROPOSAL FOR RENEWING ARCHITECTURE – Student Essay 1

Although the sky is not yet falling, those who deny the presence of its cracks will not be interested in this manifesto—which is too bad, because it is they who need to read it most. As engineers of the built world, architects have played the hero’s role in both the emergence and ignorance of these stratospheric cracks. Instead of rushing to repair the cracks, though, much of the discipline remains committed to architecture as nothing more than an essentially formal, aesthetic pursuit. Indeed, by prejudicing delight over the ideals of commodity and firmness, architects have weakened the Vitruvian triad to the point of destruction. The world needs architects who are willing to approach their discipline differently: we can and must do better than simply functioning as expensive form-givers. It is time for architects to think less like designers and more like Master Builders.

FIRST AND FOREMOST, I BELIEVE ARCHITECTURE IS ART. – Student Essay 2

Art is a universal, human expression of value. The worthiness of its contents is derived from meaning, and meaning is derived from something that cannot be articulated; perfection. Beautiful art evokes clarity, inspiration and desire, for in it, we recognize an artist’s search for universal value. The visual experience it provides is unique, yet familiar. While we all are not artists, we feel art. We feel it more deeply if it relays something of our specific condition, if it connects us to the zeitgeist, yet too has regional perspective. We respect its attempts for positive social change. It is not interested in the clichés of popular style, nor is it a result of concentrated rebellion; it does not try too hard. Good art is evolutionary, yet traceable. It is developed from intuition. Intuition is learned and accumulated over time; an artist’s gut feeling is informed by precedence abstracted. Therefore, a beautiful work is a part of a story and while this story contains visual dissonance, it too has appropriateness and order. 1 The motif of the story is beauty and its usefulness is not sought, but derived. 2 Informed by the human experience, good art is live.
This seminar explores the architecture of a number of currently leading architects whose work is derived from and reflects a particular philosophical and/or theoretical paradigm, including phenomenology, rationalism and post-structuralism. The students will focus on a particular building, its underlying premises, canon of architectural form and order, potential meaning, and implications for architecture in general. They will analyze the physical product (the building), the process used in its creation and the interrelationship between process and product.

The Port Cities program can be taken as a module or semester long exploration of how cities on bodies of water grow and change over time. The program combines architecture and landscape architecture graduate students for sketching and drawing exercises, historical exploration, charrette exercises with Portuguese students, and studio work in Venice as well as urban exploration of Lisbon, Porto, Barcelona and Venice.
Traditional distinctions between the historical city, and suburb-center and edge, old and new, static and growing—are being erased and replaced with notions of the expanding city, metacity, regional city, global city and megalopolis. This new territorial city is defined by an animate and dynamic set of forces determined by and determining the places, people and events within its thrall. Despite the growth of this active and expanding city, the need to construct urban settlements still exists. Initial attempts have ranged from saccharine New Urbanist enclaves to conceptual proposals intended to link local conditions to the dominant and expanding urban field.

During three weeks students intensively study housing and urban design projects in Amsterdam, Almere and Leidsche Rijn (Utrecht). Field visits and seminars with designers, academics and developers address the question “What is so extraordinary about Dutch Housing and Urbanism” from three perspectives: (1) land, water & transportation (2), planning & development (3) materials & urbanism.

In addition to completing a weekly charrette, and a final paper, students keep extensive sketch books of the sites. Bottom left is a plan of Almere City Center. Student notes scale change and pattern from north to south, and that spaces between object buildings are often awkward- too restrictive or too expansive.
We embrace challenges

The Classes of 2010 and beyond face challenges more complex and urgent than previous graduates. Globalization, climate change and digital data tools are transforming the profession and each of these interconnected forces require multifaceted and multidisciplinary responses. The enormity of the charge is intimidating, yet it is clear that there is a knowledge-base and skills-set that will be valuable in addressing these issues. To activate these assets, students must use the reasoning skills gained from a design studio-based education. But perhaps even more important, their education must instill the will, the passion and the energy to take on these challenges. The expressed goal of this curriculum is to give students the confidence to grapple with large messy problems and impassion them to ask very big questions and fearlessly probe in specific and tangible ways. The courses supporting this approach are spread throughout the curriculum, sometimes occurring in the coordinated fall semesters and sometimes in the compressed format of the spring semester modules. In all cases, students are encouraged to expand the definition of traditional architectural practice by including factors such as sustainability, research, cultural diversity and community outreach.
In one of the only required spring modules, we use the intensive immersion to quickly delve into critical luminous and thermal issues. We intend to equip all students with an informed understanding of ecological and environmental problems in the built environment and develop their capacity to address these problems with environmentally responsive architecture and urban design decisions. We will cover issues such as the complex interactions of built and natural environments; the importance of generating knowledge that can mitigate social and environmental problems; the ethical implications of decisions involving the built environment; and to the necessity of nurturing a climate of global awareness, including a commitment to meeting the goals of the Architecture 2030 Challenge.

Understanding of the principles of sustainable design, including: embodied energy, energy efficiency, indoor air quality, bioclimatic design, solar geometry, passive heating and cooling, daylighting, carbon-neutral design, as well as the application of appropriate performance assessment tools.
The School of Architecture is committed to the idea that architects should contribute to the public good. We teach our students the skills they need to work within communities, understanding the complex set of contextual issues that every project must address, ranging from spatial, urban, social or political. There is a learning opportunity provided by Gulf Coast reconstruction that can complement activities closer to home. It is our goal that our participation in programs in Biloxi and New Orleans can improve conditions for communities there. Equally important, those programs can support our students’ passion for creating positive change and teaching them the skills and base for expertise needed to effect that change. It is our intention that the work in the Gulf Coast is one part of a “fly-wheel,” inspired by and inspiring work done in local communities.

In these research studios, students directly link research methods with design methods by means of architectural projects. Analysis and synthesis emphasize the continuous cycle between design process, idea and research. Faculty-led studio agendas model methodologies expected in student-driven thesis in semester following this studio. Parallel architecture and landscape architecture studios collaborated throughout the semester.

In this particular studio section, students used their research both collaboratively and individually to address issues of contamination and remediation of the site as drivers in their design work. In-situ processes such as phyto-remediation, bio-remediation, engineered solutions, and ground and surface water cleaning have been influential sources of landscape and architectural design development throughout the term.

Graduate Architecture and Landscape Architecture students research and design proposals for the Ford Ranger Twin Cities Assembly Plant site in St. Paul, MN.

Beck Park Pavilion, Biloxi, MS
GREENLIGHT STUDENT ORGANIZATION

Greenlight is a group of motivated individuals who are looking to revolutionize the way we live, design, build and interact with our environment. We believe we can shape our world and positively contribute to our growing ecological and social awareness through creative exploration. We believe sustainability not only has the capacity of shaping our physical environment, but also can guide our everyday lives and relationships so we can have a more meaningful existence. Greenlight seeks to attract a network of individuals with a variety of interests who are personally invested in creating fundamentally positive social and ecological change. We foster an environment in which individuals can come together to create awareness about sustainable issues both at the personal and systems level. We seek to recognize the many forces and ideas that affect our natural environment and understand ways of living more harmoniously with our surroundings and each other. We believe that through raising awareness, we are creating a platform, which will foster and nurture innovative ideas.

The Awareness Campaign began as a method of informing students and teachers about the consumption of resources at CDES (formerly CALA). The Campaign started after our annual workshop in 2005 called, “Greening CALA.” When the participants learned about the amount of resources consumed within the school, they wanted to share this information with other students and faculty. We all have an opportunity to be at the forefront of a revolutionary change, and at CDES Greenlight, we embody the philosophy that through creative thinking, networking, and motivated actions we will begin to create stronger connections between ourselves, our environment, and each other.

CONSTRUCTIONS OF SACRED SPACE

This seminar explored the ways in which sacred space in the Islamic religious tradition can be perceived. A key objective was to investigate the idea of architecture as a hermeneutical process and focus on how the construction of a cultural sense of being and place is enabled (or denied) through expressions of the sacred in the built environment. The course began with a series of exercises aimed at tracing a possible evolution of sacred architecture through the Abrahamic faiths of Judaism, Christianity and Islam.
We expect change

Traditional systems of higher education, those determined by old notions of disciplines or driven by the utility of specialized knowledge, fail when confronted with the dynamic character of changes triggered by globalization and new technologies. A few years ago, the New York Times published an article exploring a growing trend—the fact that the most successful corporations employ people with advanced degrees in fields such as cultural or political studies because they are trained to understand difficult non-quantitative issues. These individuals were shown to be more productive than those who come with the specialized expertise of business or production. These apparent outsiders, the article suggested, come with intellectual attitude and skills that are essential for shaping the global economy and responding to change.

Expanding the role of architecture to encompass challenging urgent issues is important, but there are times when this is not enough. Sometimes the very role of architecture needs to be challenged. In these times, completely new ways of thinking must be encouraged. Courses that take a hybrid, speculative approach have a place in our curriculum as modular courses offered each spring. In the break between these modules are four-day “catalyst” workshops. During these intense workshops, no other classes meet. Students work with small teams of regular, adjunct and visiting faculty in safe havens that encourage high-risk work. The short time period allows for more possibilities of collaborations that “fly under the radar”, free from the typical university constraints of course listings and semester-long coordination. Short duration, variable modules/workshops and the semester-long coordinated studios are each made stronger by their comparison. Shifting between different modes of work, students develop agility and alternate between working with known peers and mixed groups from different year levels and other disciplines.
The central question posed in developing the seminar was “what is the primary advantage of BIM as a representation tool and how can we teach students to leverage this advantage?” We developed a seminar with the assumption that our learning objectives should address the kinds of thinking that BIM could facilitate, but need not include the software itself.

Most recently, the introduction of software allowing the construction of a virtual building has influenced project design, delivery and communication between architects, engineers, manufacturers and other stakeholders. BIM (Building Information Modeling) and the new way of working that it engenders is generally known as Integrated Practice (IP). The advent of such new practices has been heralded as a paradigm shift—the long anticipated digital revolution dwarfing any incremental change seen to date. BIM and IP, coupled with the drive to understand the enormous role that the built environment plays in climate change, have combined to create what amounts to a state of crisis in architecture.

Students progressively spent more and more time on the design of their projects, checking their work against biological principles.

The biological functions learned were then applied by informing the design of the exterior rain screen system.
The primary goal of each catalyst is to raise the level of discourse about design and to provoke leaps in perception of what design can be. The catalysts serve as intense, rigorous, transformative and creative breaks.

Catalysts range from experienced educators running shortened versions of drawing or diagramming exercises developed in other schools to practitioners leading students on a four-day set of experiments starting with a bucket of new materials provided by a locally based award winning furniture fabricator. Catalyst participants report back to their peer groups ideally having learned new ways of thinking, novel techniques or simply having had an intense immersive experience. Though the catalyst teachers are not substantially different in skill level from our own faculty, their visitor status and the intensity of the work create an atmosphere akin to a retreat.

Visiting faculty member Elise Co, from the Tokyo-based firm Minty Monkey, gave a four day workshop on Interactive Design. Students learned basic circuitry and programming to create mock-ups of interactive environments that reflected the life of the School.
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