From Scratch: Designing Architecture School

"Details, when they are successful, are not mere decoration. They do not distract or entertain. They lead to an understanding of the whole of which they are an inherent part."[1]

— Peter Zumthor, *Thinking Architecture*

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MAKING

What is making? Is it a simple means of representation, an image of architecture? For us at Marywood it goes well beyond this cursory understanding. We use the act of making as the datum for our curricular sequence; it is the heart of our pedagogy. It is also the means by which we deliver a wide array of content to our students. More than technique, it is a strategy for teaching.

Making is the core driver of design. At Marywood, we strive to privilege the act over the resultant product. It is through the act of making that ideas can be cultivated, tested, and ultimately communicated. We see making, not simply as a condition of representation, but rather as a form of inquiry. It is the means by which we learn, and explore.

Our students operate under the notion that new ideas can emerge from the act of making.[2] We also believe that they can develop gradually over time through iterations of a single concept. From the first moment that a component is placed in relation to another the mind wanders and visualizes possibilities those components might realize. Further addition expands upon some of those possibilities, opens our eyes to even newer ones, and eliminates some that aren't worthwhile. Ideas are cultivated from the imagined possibilities (and impossibilities) of architecture through the acts drawing and building.[3]

Our students are encouraged to fail, and fail spectacularly. Making, as a generator of ideas is not beneficial without reflection. Students must test the limits of ideas that emerge from their craft.[4] They push ideas until they no longer work, or even better, until they fail catastrophically. It is only at that moment that the true potential of the architectural idea is understood. Furthermore, it is at that moment that the student will look back at all of the possibilities that were discarded, and possibly synthesize them into an even better version of their design. The heuristic approach to design thinking allows students to test and challenge their own preconceptions.[5]

Our students sometimes know what they are talking about; …sometimes they don't. Making something that clearly communicates an idea is not beneficial if the idea is not yet resolved. However, lack of resolution also doesn't absolve the students of the obligation to communicate clearly. Often, they make things that are solely intended to communicate to themselves. They analyze and synthesize phenomena in a way that better enables them to understand it. Our students are encouraged to recognize the difference between the diagrams that are intended to present a position to someone else, versus the one that is intended to clarify the unordered, unrecognizable, or overly complex.[6] They leverage their skills in crafting to analyze and observe architecture and its contexts in order to better understand them. They also leverage their techniques in making to clearly present the resultant concepts to others.[7]

To put it bluntly, we encourage our students to think with their hands.

With these notions of craft as it is linked to inquiry – thinking and making – the school has sought to closely integrate resources and facilities with our pedagogical approach. The building in which our studios take place serves as didactic. It incorporates strategic reveals through which students can observe mechanical systems, exposed structural/foundation elements, and small memorials to its prior life as a gymnasium. The Architecture building, in all possible places, reveals how it was made, giving students a chance to see not just the tangible construction but also the design strategies and tectonic logic of the architecture.

Additionally, as we have acquired more equipment – laser cutter, 3D printer, CNC router, and assorted power tools – we have integrated them into the curricular objectives. These are not passive acquisitions, but very strategic inclusions to the way we teach. Each acquisition is seen as a new lens through which a student can observe a problem; they represent new opportunities for design thinking.

Decisions regarding the use and integration of new tools and equipment are always surrounded by highly critical discussion regarding the relationship between the tool and our driving vision – that making is thinking. Especially pertinent are the discussions surrounding the role of digital craft versus handcraft techniques. Both are forms of making, but they engender disparate modes thinking. The interface between designer and medium is different. Issues of scale are often different. Opportunities provided by each mode of craft are different. How can these techniques be reconciled within a singular design process? It is our goal as a School to explore methodologies of hybridization between techniques and modes of making. Each professor brings new modalities to the skill-sets deployed by our students. These modalities are crucial to our approach to design process.

Environmental Stewardship _

What does it mean to be a "steward of the environment?" At Marywood we are developing our school in a way that takes this notion beyond just issues of climate and sustainability. We look at the gestalt context of the human environment and encourage our students to acknowledge that their design has the potential to affect culture, community, economy, and climate. From the beginning environmental stewardship has been a key ingredient in the development of the new School of Architecture, but with it comes a healthy skepticism and criticality. We strive to eliminate "sustainability" as a politicized buzzword, and instead look to "stewardship" as a set of goals and strategies. We look to our students to be environmentally responsible and aware in their decision-making. We hold them accountable for design strategies that account for climate and

respond to it efficiently. We hold them accountable for the ways in which their designs engage the community at large and provide for the needs of the civic environment. We hold them accountable for the functions of their designs and the interior environment of their inhabitants. We hold them accountable for synthesizing these concepts.

Good Design

What is "good design?" At first glance, this is clearly subjective. However, when seen through a lens of the priorities and values of an institution, "good design" can be loosely defined. The Marywood University School of Architecture has taken a position that "good design" should satisfy certain fundamental criteria.

First, it should be sensitive to the experience, and activities of its inhabitants. Architecture is a constructed environment, and as such it has an obligation to the way that occupants perceive it. We design with light, texture, and proportion to create spaces ideally suited to human occupation and program. Experience is important.

Second, it should be systemic. Architecture is an ordered construct that sequences space and activity. The relationship between spaces should be derived from an overarching logical system that structures not only program, but also experience in transition from one space to another. Concept is important.

Third, it should be made with an awareness and sensitivity toward material, structural system, and construction technique. Space is determined by structure and structure can lend itself toward the sculpting of space. These issues should not be afterthoughts, but developed in tandem with the core positions and ideas of the project. Craft is important.

We strongly believe that by adhering to these principles of "good design," we are acting as environmental stewards. For a piece of architecture to truly be sustainable, it must foster social investment and value. The alternative, no matter how environmentally sustainable, is an object that may lack the potential to be repurposed for the future. To be sustainable, a building should be sustained. It is unlikely for this to happen if it is not "good design."

PEDAGOGICAL SCAFFOLD

Our Pedagogical Scaffold is fashioned around an idea of "Quilted Knowledge" established by the Founding Dean of the School as a crucial component of its driving vision. In this ideal, courses other than studio cross-reference one another. They build upon one another in series. And, most importantly, they are evidenced in studio. Studio becomes the place of application. It is expected that skills learned in various "techne" courses are applied on projects in studio. It is also expected that knowledge from various "episteme" courses is leveraged in the design conception of studio projects. This, in combination with the core content of the studios themselves, provides an educational model in which courses are interdependent and reinforce content one to another.[8]

As stated previously, making is at the heart of our teaching methodology. Organizationally, it acts as a datum around which the rest of the Curriculum is arrayed. Each stage of the curriculum is responsible for delivering primary content that reinforces that which came before it and prefigures that which comes after it. Ideally, this structure creates a pedagogical continuum in which the content of a any given unit is not given up as "what we did last year" but is instead incorporated into an ever evolving design process that continually builds upon itself.[9]

As in many other Schools, there is an ongoing conversation about the role of digital craft in architectural education. Is it simply another tool for visualization, or can it be incorporated into the students' design process? Does it (should it) supplant tried and true models of education through handcrafted drawings and models? Is it even a form of craft, or just a time saver?

The current mind-set of the Marywood School of Architecture is one of hybridization. We regard the digital tool as a form of craft – a form of making – and as such seek opportunities to combine and augment it with other forms of making. Handcraft is not replaced by digital craft; instead it is hybridized in ways that permit students to explore their ideas across a wider range of media.

The following outlines the core content at each year in our curriculum as seen through lens of making. (Figures. 1 and 2)

1st year: Tectonic Assembly

In the First Year we don't make buildings; we make space. Instead we focus on fundamental principles of design such as organizational patterns, sequences, and spatial narrative. This is all accomplished through a medium of Semperian Tectonics.[10] In this the students begin to critically evaluate connections between elements as they express both physical and spatial relationships. They are introduced to a taxonomy of components – masses, planes, and frames – as the building blocks of architectural composition.[11]

The emphasis on space instills a mindset of formal discipline in which form acts in service to space. The tectonic composition pre-figures the assembly of building components and larger scale tectonic logics for buildings.

2nd year: Architectonic Strategy

In the Second Year students are tasked with their first building projects. What was before a narrative evolves into program. What was once a generic surrounding context is now a site. Here they translate their knowledge of tectonic composition into a more formalized architectonic logic that contributes to a larger conceptual understanding of the design. Their projects are now imbued with an agency. Where before there were experiments with light, material, and proportion, there is now a sense of habitation, and deliberately designed experience.[12]

The introduction of site systems, experiential conditions, and basic programming reinforces issues of narrative and composition from before. They continue to rely on tectonic composition, but have added the greater responsibility of basic building elements. These things pre-figure the later years in which the students will be tasked with understanding and implementing, building systems in greater detail. Their understanding of site prefigures the inclusion of social, cultural, civil, and climate issues.

3rd year: Building Technics

In the Third Year students make more complex, aggregated buildings. Here they focus on dwelling and relationships between domestic and civic environments. Where they had dealt with site as a series of compositionally related systems, they now address issues of sustainability, climate, and local cultures. They do all of this while maintaining a command of the fundamental information that came before. In the Third Year the students also receive an opportunity to build at full-scale. Their acumen with tectonic composition and conception moves forward into a greater knowledge of building systems.

It is in the third year that students really begin to question their own role in the diverse discipline of architecture. They have learned a majority of the content they will need to be successful architects and are struggling with finding more specific areas of interest. The accumulation of technical building knowledge reinforces the more compositional, fundamental content from before, and prefigures the comprehensive, integrated application that is to come.

4th year: Integrated Systems

In the Fourth Year students are expected to synthesize the wide range of knowledge and ability they have accumulated so far into the design of a single building. It is expected that everything they have done so far, from the first year on to the third, be evidenced in their comprehensive building projects. In this year building technics and concept are integrated within the limits of single set of strategies. This project is to account for both the physical and metaphysical – the technical and the experiential – and find ways in which those mutually inform one another. It is in this year that students should be defining the path that they will eventually take toward their own interests in architecture.

5th year: Self-determined

Once the students have fully developed a building, they are given a project that encourages them to explore specific aspects of the discipline. Here they leverage their knowledge gained so far in the completion of a project that focuses their ideas on architecture. It is expected that they continue to apply all of the skill sets so far gained, but that they are to emphasize only a few aspects that permit them to explore their specific interests. This lays the groundwork for an optional additional year of more formalized research.

HEURISTIC EDUCATION

A new school of architecture relies on a designed curriculum. Just as any other endeavor of design goes through iterations, so must an architecture curriculum continuously reinvent itself in response to the ever-shifting discipline. However, often curricula get mired in tradition and expectation. Curricular misalignments are frequent when new courses are forced to fit into spaces between older ones. Courses are often left unchanged because of nothing other than a commitment to the way things have always been.

And, pedagogical effectiveness is sometimes difficult to gauge in an established school. One must always ask if the students do what they do as a result of their own exploration, or merely because the live up to the expectations of prior generations.

In a new school of architecture these issues are irrelevant. There are no traditions to uphold or expectations to question. The curriculum is fluid and dynamic. When an idea occurs to faculty, there is little resistance to overcome in attempting it. In the first three years of the existence of the Marywood School of Architecture the curriculum was rearranged and substantially altered twice. Issues in student work, knowledge and performance are always a reflection of the faculty's teaching, uncolored by standards, traditions, or expectations. This makes problems easy to identify and the curriculum agile enough to respond. We continue to change and evolve at a rapid pace. The design community of faculty and students would have it no other way.

While this kind of agility is a crucial ingredient in the design of an Architecture School, it also presents some unique issues. Expectations of prior generations

ENDNOTES

1. Zumthor, Peter, Thinking Architecture, Birkhauser Architecture, Basel, 2010
2. The idea presented by Juhani Pallasmaa that "only embodied knowledge divorced from conscious attention seems to be useful in creative work" lends credence to our goals of linking craft and conception such that the architectural idea is permitted to emerge from the act of making. Pallasmaa, Juhani; The Thinking Hand: Existential and Embodied Wisdom in Architecture; John Wiley & Sons; 2009
3. Many principles of craft and conception deployed in our pedagogy are allied with those presented by Andrea Deplazes. Deplazes, Andrea, Making Architecture, GTA Publishers, Zurich, 2011
4. James Eckler has written about design methodologies for making as it promotes the emergence of architectural ideas. These writings are required reading for First-Year, Marywood Architecture students. Eckler, James, Language of Space and Form: Generative Terms for Architecture, John Wiley & Sons, Hoboken, 2012.
5. In addition to an ethic of craft and making, our pedagogical strategy for iteration is closing allied with those being deployed at the ETH in Zurich. Angelil, Marc and Hebel, Dirk, Deviations: Designing Architecture: a Manual, Birkhauser Architecture, Basel, 2008.
6. This is the sort of diagram from which design can be extracted. Sanford Kwinter states that "The diagram is an invisible matrix, a set of instructions that underlies--and most importantly organizes--the reservoir of potential that lies at once actively and stored within an object or an environment. It determines which features are expressed and which are saved. It is in short, the motor of matter, the modulus that controls what it does." from Kwinter, Sanford; Introduction (titled The Judo of Cold Construction) to The Atlas of Novel Tectonics by Jesse Reiser and Nakano Unemoto; Princeton Architectural Press; 2006.

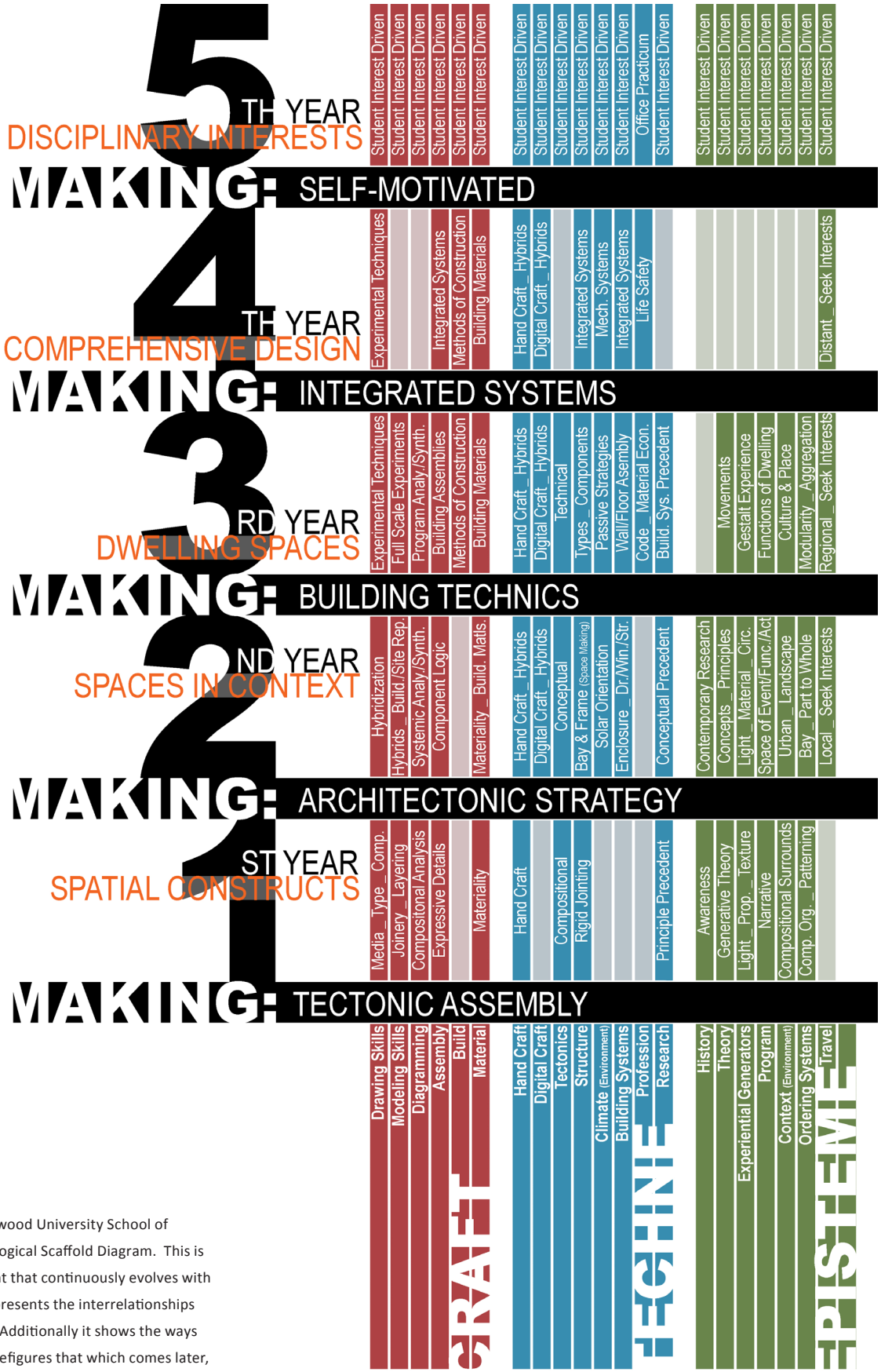

Figure 1: The Marywood University School of Architecture Pedagogical Scaffold Diagram. This is a working document that continuously evolves with the program. It represents the interrelationships of course content. Additionally it shows the ways in which content prefigures that which comes later, or reinforces that which came before.

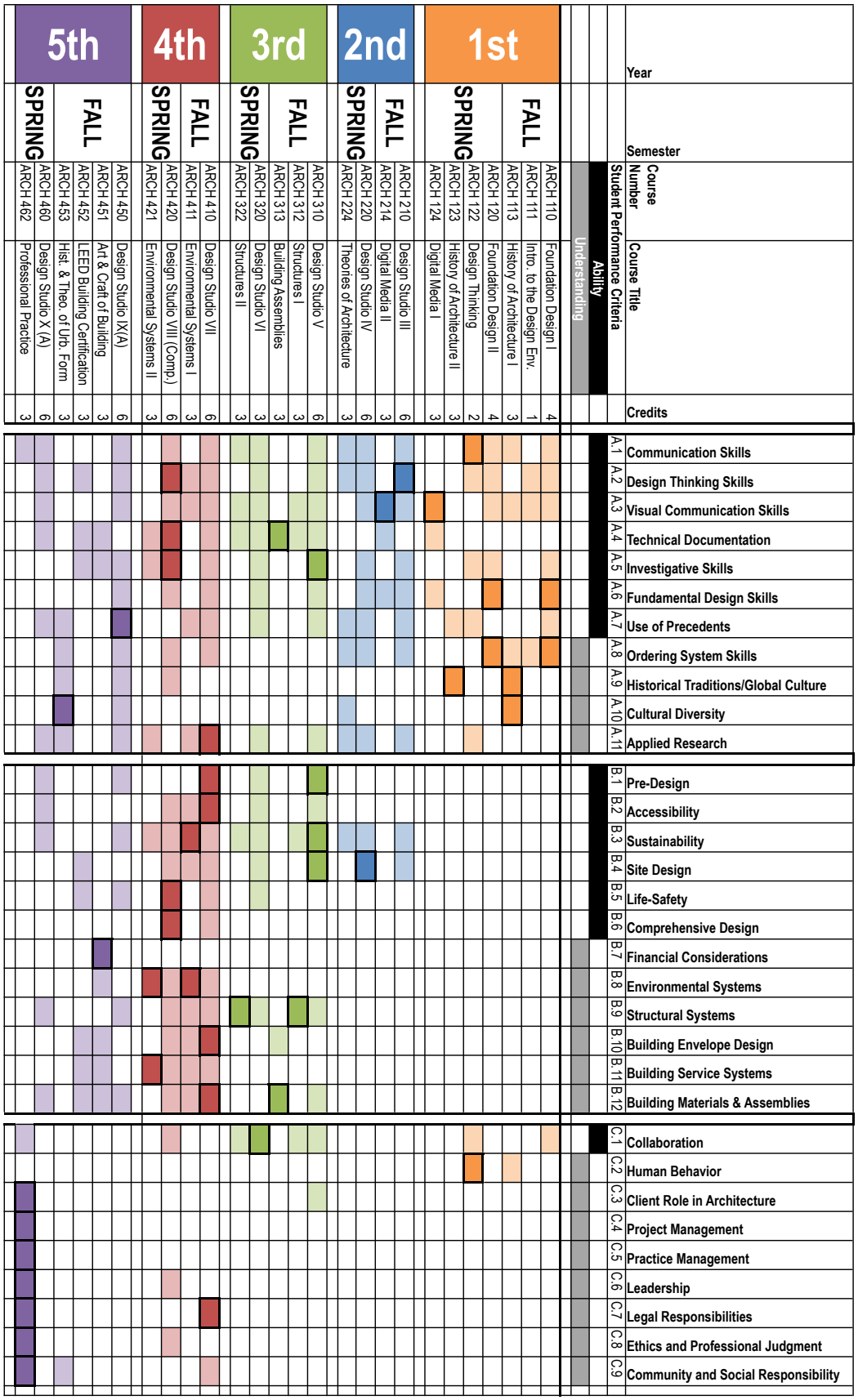

Figure 2: The Marywood University School of Architecture NAAB Performance Criteria Diagram.

of students at established institutions act as a kind of safety net. They establish a minimum level of performance. And, students are assured that, even if they aren't quite sure of a project, they at least know what a successful one looks like. Generally, it becomes easier to raise the bar when students can stand on the shoulders of those that came before. In the case of starting a new school from scratch, that kind of studio culture must be built a little at a time, and each assignment must be carefully constructed toward that goal.

It is especially evident with the cultural changes associated with this latest generation of students. More and more students are very good at performing when given explicit instructions and a defined end-goal. They are less adept at seeking novel ideas through heuristic exploration. This reality has necessitated frequent adjustments to projects and entire curricular sequences, especially in the beginning design years. Early in the curriculum, it is necessary to provide many quick projects with explicit instructions. Built into these projects must be questions that require the student to interpret and speculate. Over time, those questions become more open-ended, requiring the student to provide gradually more complex design ideation. In effect, we must teach them to investigate and iterate before we can teach them to design. We must teach them that observing the failure of a version of an idea often provides the best information on how to move a project forward. Being in an environment perfectly positioned to make adjustments according to their specific skills and shortcomings has been most beneficial to this crop of future architects.

STRUGGLES AND TRIUMPHS

As of this writing, the Marywood University School of Architecture has just graduated its very first group of professional degree holders. The School is currently a candidate school in the National Architectural Accreditation Board. Along the way we have received high accolades from visitors and have had several curricular areas awarded distinction by the visiting team.

As a fledgling school we have achieved much, but have struggled also. As a community we are proud of how far we have come, but also understand the long road still in front of us. Without the momentum of tradition, things that are typically taken for granted – student clubs, recruiting, or a sense of community – can become massive undertakings.

While we strive to achieve accreditation and continue the successes we have enjoyed so far, we also look to our future to see what we want to make of this new School. At the moment, we look to the completion of the accreditation of our Bachelor of Architecture degree. After that, we will seek to establish the Master of Architecture degree. Are there other options in our future? Will we expand into other facets of the architectural allied disciplines?

Most importantly, when we finally become an established School of Architecture, will we be able to maintain our fluidity and eagerness to design the School itself? We seek to establish our own traditions and expectations for our students, but, if possible, will do it in a way that never compromises our current ability to reflect, dream, and change.

7. According to Peter Eisenman, "the diagram is historically understood in two ways: as an explanatory or analytical device and as a generative device." Adopting this notion for the multivalent role of the diagram in architectural conception is crucial in a craft based pedagogy. Understanding the diagram itself as an act of making enables architectural ideas to be both generated and communicated. It also provides a framework for further acts of construction toward the resolution of those ideas. Eisenman, Peter and Somol, Robert. Diagram diaries. Thames & Hudson, London, 1999.

8. The approach described by architectural curricula is not unlike the approach a new student of design takes in appropriating knowledge and skill. Content is acquired piece-by-piece in ways that one piece is able to inform a greater understanding of another. Jeffery Balmer and Michael Swisher propose that when beginning design education is "approached systematically, the cumulative tools for descriptions begin to form a basis for future observations and judgments. They start to build a method. This process of making a system of thought about design clarifies both analysis and judgment. It empowers the designer to make better decisions. It builds an arsenal." This is the same pedagogical logic that is carried through the entirety of Marywood's Architectural Curriculum. Balmer, Jeffery and Swisher, Michael T., Diagramming the Big Idea: Methods for Architectural Composition, Routledge, New York, 2012.

9. During early struggles with curricular consistency, students would often abandon principles from prior years. In their mind they had completed these as if they were tasks from a list. Our current curricular changes are aimed at inculcating an sense of content culmination rather that distinct blocks of information.

10. Gottfried Semper provides insight into the extent to which fundamental elements of form influence design at many scales, across the allied "technical arts." Through architecture "we also encounter those simpler works to which the artistic instinct was first applied." This school of thought establishes the conceptual starting point of our curriculum at Marywood University School of Architecture. Semper, Gottfried. Style in the Technical and Tectonic Arts; or, Practical Aesthetics. Translated by Harry Francis Mallgrave and Michael Robinson. Los Angeles: Getty Research Institute, J. Paul Getty Trust, 2004.

11. Using Gottfried Semper's four tectonic elements aids students in understanding the spatial implications of form without resorting to fantastical formalism. No matter the complexity of form "the original constituent parts can still be distinguished" by virtue of these basic elements. Semper, Gottfried. The Four Elements of Architecture and Other Writings. Translated by Harry Francis Mallgrave and Herrmann Wolfgang. Cambridge: Cambridge University Press, 1989.

12. Bötticher "distinguished between the Kernform and Kunstform; between the core of the timber rafters and the artistic representation of the same elements" in his understanding of tectonic "as signifying a complete system binding all parts of the Greek temple into a single whole." In contrast Semper's tectonic taxonomy divided the building into multiple built systems and distinguished only between "two fundamental procedures: the tectonics of the frame and the stereotomics of the earthwork." As a broader basis for Architectural composition, this school of thought guides the furtherance of our curriculum into more complex conceptualization. Frampton, Kenneth. Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture. Cambridge: The MIT Press, 1995.