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archiTECTONICS: pre- and trans-disciplinary reference in beginning design

Pedagogical approaches to beginning design in architecture often assume multi-disciplinary modes of exploration to filter problem parameters and sculpt perceptual outlook for iterative potential. A closer look suggests moments within the architectural design process that come before, or around, the discipline itself with *pre-* and *trans-*disciplinary undertones accompanied by associated principles and goals. Iterating and perceiving through every disciplinary dynamic, instance, and/or action in the process of designing transcends, builds, and structures its neighbor for explorative sequencing, intention, and growth of sensibilities for design resolution. An acute awareness of disciplinary state, in a maturing design process, can alleviate obscurity of ideological foundation and facilitate growth for *trans-*disciplinary thinking, making, and communicating for a root discipline such as architecture. This article discusses an amplification of *pre-* and *trans-*disciplinary undertones to achieve this in a beginning architectural design studio sequence. Serving as a baseline for design images, drawings, and concepts, this dynamic brings principles, ideas, and iterations for design into focus when the beginning design student faces complex problems. The developed exercise series is structured to recognize that *root* disciplines potentially transcend *pre-* and *multi-*disciplinary processes for *trans-*disciplinary effects. Highlighting the developmental stages of an early design process, recognizing variation in pace, purpose, and intention of design instances, partly induced by a combination of digital and analog tools, instills clarity for *pre-*disciplinary reasoning, perceiving, and operating (*archiTECTONICS*) in a *trans-*disciplinary design scape.

First Semester Sophomore Beginning Design Studio

The primary goals and learning outcomes of this foundation architectural design studio hinge around principles, skills, tools, sensibilities, and techniques associated with fundamental beginnings of architectural design. Giving these fundamentals context, the perceptual and operational stages are presented by establishing distinctions, relationships, and dynamics as they relate to design processes and disciplinary instance. The perceptual stage critiques assumptions, often unstated or biased, defines limits to the problem, places the problem in its proper context, and constructs meaningful and useful questions (*thesis*) while the operational stage employs mechanisms, or design logic, by which the problem can be explored, tested and solved (*synthesis*). These two stages are structured into an exercise sequence by breaking one main design problem down into a series of obstructions categorized by design stage. Traditional architectural design phases of analysis, schematic design, and design development, layered with associated principles and a topological framework for parametric response, build the sub-categories of perception and operation for defining individual exercise objectives and goals. This, in effect, builds disciplinary awareness and offers structure to an overall design problem increasingly inherent to the young designer's mindset.

Trans-disciplinary Sensibilities to Pre-disciplinary Fundamentals

In developing perceptual and operational understandings for an architectural design problem, the beginning design student often employs presupposed notions of the discipline itself, distorting synthesis, dynamic, and potentiality for spatial composition. As a tool for re-associating the notion of architectural design to inspirations, ideologies, and conceptualizations, *trans*-disciplinary sensibilities are established for recognizing, developing, and processing design problem parameters and goals. Basarab Nicolescu discusses the *trans*-disciplinary attitude in his article, *The Transdisciplinary Evolution of Learning*:

Trans-disciplinarity is rooted in the sciences and, "...based on questioning, as well as on the rejection of all a priori answers and certitude contradictory to the facts. At the same time, it revalues the role of deeply rooted intuition, of imagination, of sensitivity, and of the body in the transmission of knowledge."
(Nicolescu 1999)

As a mechanism for integrating *trans*-disciplinarity, site analysis, and programmatic analysis into the perceptual stage of the design process, sensibilities are drawn from a documentary style of filmmaking called *Cinéma Vérité*. This 1960's style of documentary filmmaking, also sometimes called *Cinema Direct*, does not rely on, or make extensive use of preconceptions, scripts, sets, or fantasies for the capturing and composition of footage. The name itself literally translates as "film truth". It is an unobtrusive time-based documentation of actual social and cultural situations, (McConnell PhD 1997), which are then organized and edited, with a developed logic, to communicate ideas, situations, and events. Considering the perceptual stage of the design process, the particular manner in which site and programmatic imagery and information are documented, diagrammed, and composed holds direct potential for design iteration. Edward Tufte, in *"Envisioning Information"*, describes a precise axonometric of midtown New York by Constantine Anderson:

"The fine texture of exquisite detail lead to personal micro-readings, individual stories about the data: shops visited, hotels stayed at, walks taken, office windows at a floor level worked on – all in the extended context of an entire building, street, and neighborhood."
(Tufte 1990)

Approaching site and program analysis with sensibilities of *Cinéma Vérité* and information diagramming in mind offers opportunities for the perceptual stage to readily and directly affect mechanisms and tools in the operational stage, in turn, design solutions. Beginnings for the architectural design student, by default, integrate models for *multi*-disciplinary discovery and dynamic as a strategy and analytical tool for new understandings and ways of seeing for a given design problem. This dissipates presupposed notions of potentiality, process, and goals for architecture. Foundations for this, as a realized pedagogical approach in a fundamentals studio, require developing *pre*-disciplinary awareness for traversing realized principles and conditions that precede information diagramming, architecture, and even design. In this vein, understandings and principles of *Visual Literacy* are introduced as *pre*-disciplinary beginnings for facilitating *root*-disciplinary (architecture) discovery through *trans*-disciplinary processes (Information Diagramming and *Cinéma Vérité*) the goals of which precede and transcend those of *root*-disciplines. Donis A. Dondis, in *A Primer of Visual Literacy*, discusses understandings *Visual Literacy*:

“From nearly our first experience of the world, we organize our needs and pleasures, preferences and fears, with great dependence on what we see, or what we want to see. ... We accept it without realizing that it can be improved just in the basic process of observation or extended into an incomparable tool of human communication. ... The toolbox of all visual communications is the basic elements, the compositional source, for all kinds of visual materials and messages and objects and experiences.”
 (Dondis 1973)

These *pre-conditions* incorporate *Visual Literacy* to frame how one might see and perceive the world around us. This launches into *trans-disciplinary* discovery in a pair of perceptual exercises titled *Site-Direct* and *Program-Direct* coupled with an operational one, *the Infinite Strip*. In both *Site-Direct* and *Program-Direct*, exercise intentions are presented in *root-, pre-, and trans-disciplinary* terms, critical components to the conceptual development of an architectural project. The documentation, organization, and composition of contextual and programmatic information and imagery serve as operational fuel by realizing linkages of architecture to other disciplines. In this case, film serves as a means to explore the importance and role of situation in both site and programmatic analysis while suspending associated preconceptions. Similar to the fundamental approach of *Cinéma Verité*, these exercises ask students to logically document, organize, visualize, and edit contextual and programmatic information to communicate direct understandings, questions, conceptualizations, and thesis of problem parameters. These first two exercises of the semester series require teams of students to identify, describe, and illustrate major observations using photographic imagery, descriptive text, and information mappings for both contextual and programmatic conditions in development of two analytical poster series. Information mappings reference examples of precedent site diagrams and *trans-disciplinarily* linkage to Edward Tufte’s *Envisioning Information*. *Pre-disciplinary* principles of Visual Literacy reinforce and break down compositional and diagrammatic content into basic languages. These give birth to a beginning visual dialect of the student’s particular design approach built from the basic visual elements of dot, line, value, texture, dimension, etc. In effect, site and program analysis diagrams (*root-discipline*) directly related to situational and characteristic conditions are realized through *pre-disciplinary* understandings for *trans-disciplinary* discoveries. Contextual mappings guide interpretations of the given site while the programmatic bridged into fundamentals of ordering principles and spatial relationships. In essence, the design logic, dynamic, and process for gathering, documenting, and responding becomes architecturally implicative, even more so when the perceptual stage is coupled with the operational.



Fig. 1 (left) *Site-Direct*, Fig. 2 (right) *Program-Direct*, student examples

An operational mechanism folds into the perceptual allowing spatial tectonics to emerge with analytical composition through the employment of a topological framework, the *Infinite Strip* (Arquitectum 2006). This furthers *trans*-disciplinary sensibilities linked to *Cinéma Verité* and information diagramming by directly filtering analytical findings from two to three-dimensions. The *Infinite Strip*, a rectilinear möbius strip, establishes this transcendent relationship before, among, and within multiple disciplines for spatial implications of analysis, envisioned information, visual idiom constructs, and composition. *Site-Direct* and *Program-Direct* lead to 3-dimensional Design-Direct as situation, conceptualization, and composition are parametrically versioned into a spatial exploration sequence using the *Infinite Strip*. Texture, dimension, direction, and other Visual Literacy elements also carry through from two to three-dimensions. The *trans*-disciplinary call and response sequence of visual idiom constructs to spatial idiom/tectonic constructs (*Site-Direct* > *Infinite Strip* versions 01-02, *Program-Direct* > *Infinite Strip* versions 03-04) structures new ways of seeing, understanding, exploring, and iterating potentialities in architectural design resolution. In the process of coupling perception and operation, while maintaining their distinction, each analytical, fundamental, and principle discovery layers, obstructs, and synthesizes into spatial iterations only realized through an individualized process for design directly tied to its parameters.

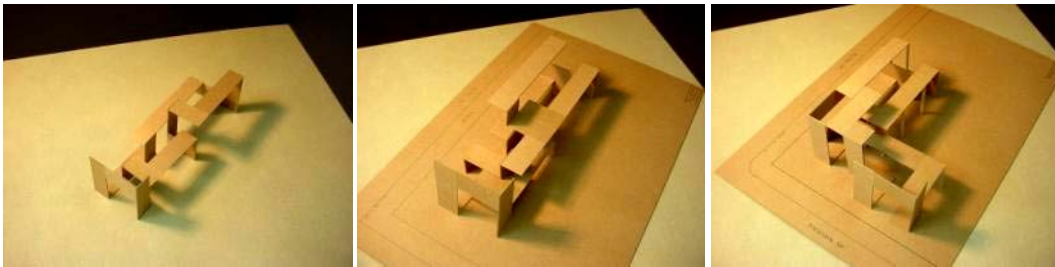


Fig. 3, 4, & 5 *Infinite Strip* versions 1-3, student examples

After a phase of schematic design for the overall umbrella project, students engage in a final exercise phase of design development, titled *Go Big!*, with respect to spatial, material, and communicative refinement, again, directly linked to *pre*- and *trans*-disciplinary beginnings. The title, *Go Big!*, is a reference to a phenomenological graphic series by designer Shepard Fairey known as the *OBEY* sticker campaign. Fairey describes the first aim of phenomenology, “...is to reawaken a sense of wonder about one’s environment. The *OBEY* sticker attempts to stimulate curiosity and bring people to question both the sticker and their relationship with their surroundings.” To achieve this, stickers and stencils for this campaign incorporate the image of *Andre the Giant*, a professional wrestler of the ‘80s and ‘90s, transformed into an iconographic and subversively bold image that is unmistakable. Initiated in the late 1990s, the “*OBEY Giant*” stickers can be found on boarded up storefronts, trash cans, subway stations in large and small cities around the world, allowing the campaign to take on a life of its own.

“...Heidegger describes Phenomenology as the process of letting things manifest themselves. Phenomenology attempts to enable people to see clearly something that is right before their eyes but obscured; things that are so taken for granted that they are muted by abstract observation.”
(Fairey 1990)

The bold subversion and iconographic transcendence of this campaign provide students with a *trans*-disciplinary reference for reawakening the dynamic of earlier design processes directly folding into design development and communication. In this particular instance, a graphically charged stage emphasizes design intention using dynamic line weights, deep shadows, refined overall compositions, in addition to few, very meaningful, words. This is then employed to re-stimulate previous explorations and their potential manifestation into an iconographic syntax for design and design communication. Initiating and framing these phenomenological graphic clarifications, the notion of *archiTECTONICS* *trans*-disciplinarily synthesizes perceptual and operational conclusions by breaking them down to terms of *Visual Literacy*. A preliminary definition describes the notion of *archiTECTONICS*:

architectonic: 1. of or relating to architecture or design 2. having qualities, such as design and structure, that are characteristic of architecture.
(Farlex 2003)

With definition in mind, *Visual Literacy*, *OBEY Giant*, and spatial composition serve as *pre*-, *trans*-, and *root*-disciplinary frameworks for the discovery of design clarifications, filters, languages, and characterizations of processes, expressions, and results. Suspending presumed ideas for architecture, this exercise charges the young designer with discovery and expression of a deduced *archiTECTONIC* nature of their analysis, ideas, and iteration by utilizing texture, proportion, direction, motion, etc. to modify a previously executed orthographic projection drawing. Here, *trans*-disciplinary exercise provokes *pre*-disciplinary foundations through disciplinary awareness and agility all furthering unique possibilities for *root*-disciplinary understandings and composition.

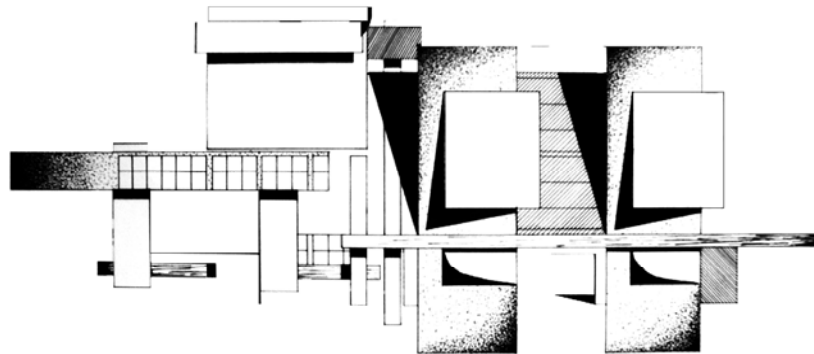


Fig. 6 *archiTECTONIC* elevation, student example, scan of pencil on trace paper

Second Semester Sophomore Beginning Design Studio: ARCH254

This second semester foundations studio begins by striking connections of inspiration, conceptualization, and critical thinking to skills, techniques, and principles associated with the previous semester. The main objectives work to stimulate growth of beginning architectural design sensibilities for confronting dynamical and complex conditions within the fundamental stages of perception and operation using *pre*-, *trans*-, and *root*-disciplinary references. The related exercises work to catalyze new ways of thinking, reasoning, and seeing beyond prescribed, or assumed, solutions into potentialities for architectural design. The first two, in a series of three overall, stimulate direct relationships of inspiration, place, and space. Bringing the first and second semester project series together, smaller scale exercises bind key design ingredients with early

understandings of *archiTECTONICS* and position the young designer to explore new ones:

architectonic: 3. of or relating to the scientific systemization of knowledge.
(Farlex 2003)

Immanuel Kant expands on the notion of *archiTECTONICS* as related to reasoning and method in his book, "*Critique of Pure Reason*":

"By the term Architectonic I mean the art of constructing a system. Without systematic unity, our knowledge cannot become science; it will be an aggregate, and not a system. Thus Architectonic is the doctrine of the scientific in cognition, and therefore necessarily forms part of our Methodology."
(Kant 1878)

Foundational skills, techniques, and principles have the potential to create, develop, and refine conceptual and critical thought as they relate to design problems. The notion of *archiTECTONICS*, as related to a structuring and organization of reasoning, composes sensibilities for design and manifests itself through writings, artistic experiments, and design iteration for particular characteristics of architecture directly related to problem parameters. Furthering the importance of structured reasoning in design, these efforts, both perceptual and operational, link purpose and intention of design drawing and modeling. William Kirby Lockard discusses three types of drawing in his book *Design Drawing* as related to purpose, intent, and use:

As art, drawing values self-expression, choice of subject, virtuoso technique, many levels of communication, and, above all, the drawing itself as a unique, one of a kind. As drafting, drawing values mechanical accuracy and efficiency and relates to reality through a rigidly formal set of orthographic abstractions. As design drawing, drawing must satisfy several paradoxes. Design drawing should be committed to clear, complete representation of design and simultaneously tentative and open to improvement. They may be informal but they must be accurate. They should represent the design at once objectively and quantitatively as an integrated object and also subjectively and qualitatively as an environment to be experienced. They are absolutely essential in generating, evaluating, improving, and recording design.
(Lockard 2000)

A young designer who develops an active design sense that recognizes, organizes, and purposes these efforts during the design process can accelerate design growth and maturation of technique for creative problem solving. The initial project in this second semester sequence begins by exploring how inspirational sources might be identified, interpreted, and used, influencing iterative processes, explorations, and outcomes in architectural design. A sense for disciplinary awareness and agility serves as a primary learning objective by asking students to identify and interpret a musical piece of jazz into an abstract two-dimensional expression with descriptive, *pre-disciplinary*, text. This *pre-disciplinary* stage continues with previous themes that incorporate Visual Literacy as a primary tool for filtering concepts into a language capable of revealing *trans-disciplinary* potential. Verse, chorus, solos, and improvisation transform and translate from a time-base auditory format into compositions of dots, lines, textures, values, saturations, etc. Descriptive text tracks each student's identification, organization, and

dynamic of reasoning, *archiTECTONIC systems of thinking*, from inspirational beginnings to *pre-disciplinary languages*, *archiTECTONIC beginning characteristics of architecture*. The compositions of ideas and *pre-disciplinary languages* then employ design drawing as a clear and purposed means to translate interpretations into suggestions of context-scape, or project context, for a series of four connected spatial follies with reference to Tschumi's compositional spatial examinations at Parc de la Villete. In this case, each of the follies were to be used as an opportunity to explore particular *archiTECTONIC* concepts and characteristics, deduced from the original piece of jazz, two-dimensional interpretation, and response to context-scape, translated to architectural languages and composition. Similar in some ways to Tshumi's follies, the actual programmatic condition of each folly follows a conceptual *root-disciplinary* agenda to explore ideas, languages, and manifestations of space without specificity to any particular typology. The exposed design mechanics for translating inspiration to spatial effects affords each young designer the opportunity to concentrate on developing a strong participatory sense for perceptual and operational exchanges while achieving *archiTECTONIC* results and facilitating new ways of seeing for architectural design without presupposition.

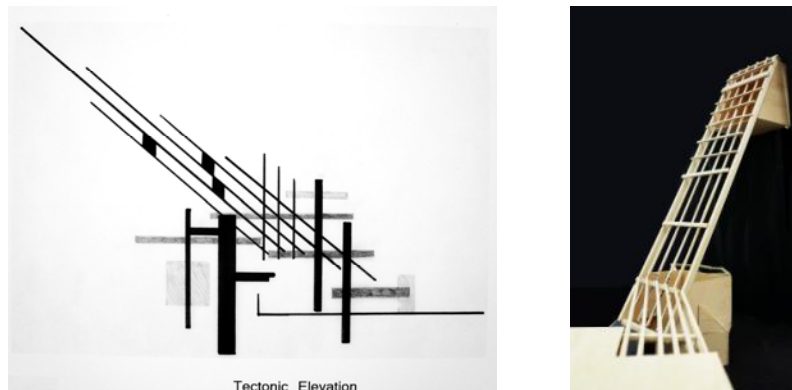


Fig. 7 (left) *archiTECTONIC* elevation, Fig. 8 (right) physical model, student example

The second main project for this semester, *De-Frag*, continues in this trajectory for exploring inspirational beginnings of design through the utilization of *pre-*, *root-*, and *trans-disciplinary* discovery. The title refers to the dynamical intent of the project itself, to defragment a series given of image fragments into an architectural expression by developing an *archiTECTONIC* design strategy and language. As an initiating pre-exercise, this overall sequence is, in a sense, set into reverse. An identified space is asked to be broken down into an *archiTECTONIC* expression by posing the following question. “*In a given space, what are the material textures, scales, layers, connections, overlaps, and juxtapositions (detail archiTECTONICS) that define spatial experiences, conceptualizations, and intended/unintended uses?*” Answering the question involves exploration by conceptually understanding a space or series of spaces and their associated functions through a process of photo documentation, interpretation, systematization of reasoning, and conceptual expression. Formal organizations, spatial relationships, and architectural languages, coupled with Visual Literacy, provide the design tools to read the space(s) as related to experience, concept, function, and materiality. Giving this pre-exercise some deliverable structure, discovered definitions, narratives, and iconographic associations for the space(s) are mechanized by documenting, reasoning, fragmenting, and illustrating particular points of view through a poster series of tectonic imagery and descriptive text. Both *archiTECTONIC*

expressions and organizations of thought are purposed in composing realized understandings of a given space directly linked to its manifestation.

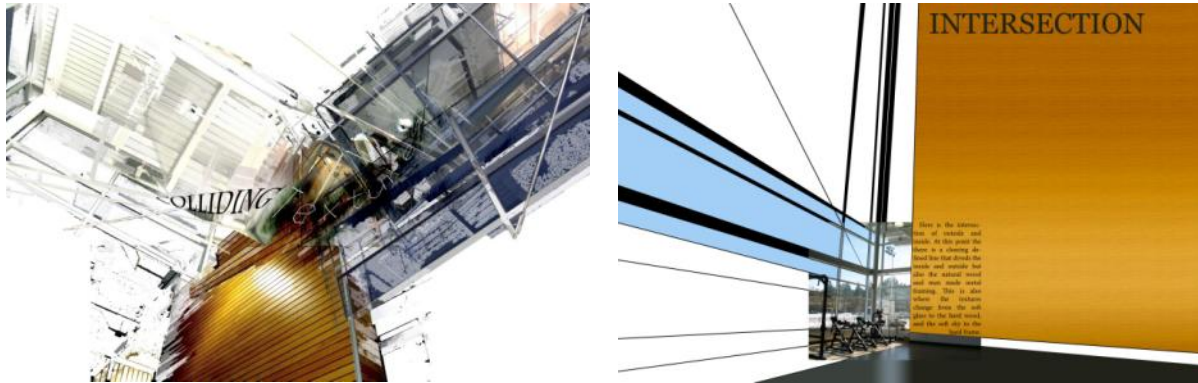


Fig. 9 & 10 Space-Frag pre-exercise, student examples

As the pre-exercise transitions to the primary, a series of carefully arranged image fragments are given without any particular indication of use or context. Here, individual processes for reading, interpreting, and exploring the images through *archiTECTONICS* are used as primary perceptual and operational exchanges to realize an organization of reason first explored in a second poster series of imagery and text deduced from reading the image fragments. Defining an architectural expression, which outlines project context, type, and design iteration, follows while maintaining direct relationships to inspirational beginnings.



Fig. 11 (left) De-Frag poster, Fig.12 De-Frag physical model, student examples

Once skills for identifying and interpreting inspirational beginnings through *archiTECTONICS* for spatial suggestions have been exercised, the young designer is better equipped to define their own course in the architectural design process. The final project in this series is structured to instill ownership of the design processes to each student where obstructions, such as the Infinite Strip, a musical piece of jazz, or a series of image fragments, are not given but required to be individually defined. Types of particular design efforts and their sequencing are driven by trajectories, hierarchies, and goals strategically outlined by each student. In other words, one student may be keying in on a rigorous series of image manipulations to develop design sensibilities while another might be working through a number of generative study models. Critique offers an opportunity to encourage a balance of design efforts while in keeping with each students' apparent strength and design trajectory legible in individually chosen design reasonings, explorative tools, and iterations. It is also an opportunistic discussion for referencing previous exercises and their outlined learning objectives as

disciplinarily specific points of departure for an increasingly individualized approach to architectural design.

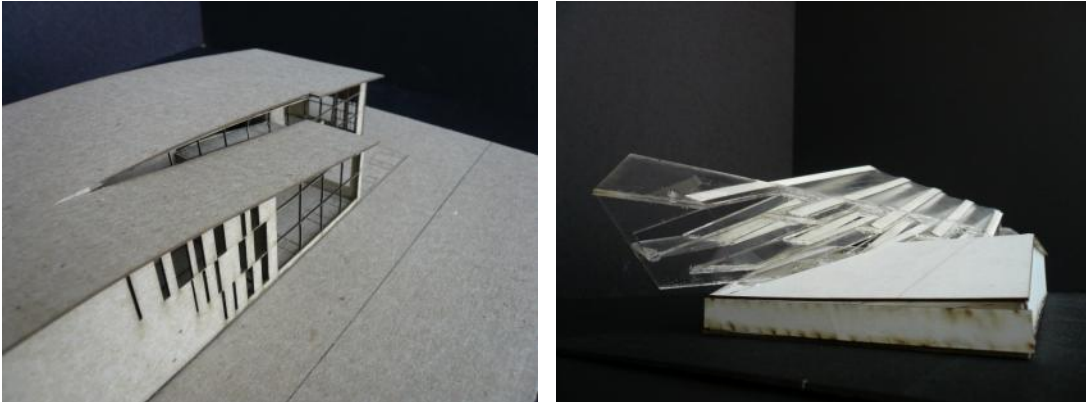


Fig. 13 & 14 Moscow Bath House, final physical models, student examples

archiTECTONICS is a *pre-*, *trans-*, and *root-*disciplinary binder for architectural discovery through organizations of thought, reasoning, and intent. Design instances, such as writing, drawing, modeling, and imaging, are dynamically and directly responsive for an evolutionary approach to catalyze new ways of seeing, thinking, and iterating for the growth sensibilities in architectural design. With this, *archiTECTONICS* is syntax for the design process itself and, if realized, can serve a *pre-*, *trans-*, and *root-*disciplinary guide for its organization, development, and creative language. This developing exercise series employing *archiTECTONICS* recognizes and cycles through this syntax for design ideas including reasoning, conceptualization, and iteration in a *trans-*disciplinary sequence, allowing the beginning design student to recognize *pre-*disciplinary ideology, pace, and purpose when processing ideas through fundamentals of architectural design. Engaging this as a strategy for seeing, thinking, reasoning, and maneuvering through a dynamic process provides design agility and clarity for processing and communicating in a *root* discipline. *Trans-*disciplinary exercise provokes overall disciplinary awareness and *pre-*disciplinary foundations, such as Visual Literacy, which further unique possibilities and readiness for *root-*disciplinary potentials and results.

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